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Acting on Climate Change for Sustainable Development in Africa: Challenges, Opportunities and Policy Options

Report of the Proceedings of the Seventh African Development Forum
(ADF-VII)


African Union


African Development Bank


Economic Commission for Africa

Table of contents

Foreword

Of the many ways of looking at climate change, two stand out.

Firstly, many people see climate change as a disaster in the making for Africa. They see the huge challenges ahead as an impossible extra burden on the development of an already disadvantaged continent and its people – an additional load foisted by the wealthiest in the world on the poorest. First slavery, then colonization and now climate change! Such a view, however valid, is limited and condemns Africa to a future at the back of the queue with begging in hand.

Alternatively, there are those who see climate change as the opportunity for which Africa has been waiting. Climate change affects the whole world and can only be addressed successfully by transforming the global development agenda – economic, social and environmental – with the active participation of all countries and people in the world. Africa has a hugely important role in assisting global efforts to pursue this transformation and so much to gain from the process that it cannot simply be ignored. Africa and African Institutions and people must work together to ensure that the continent seizes the best of new opportunities and thereby benefits to the utmost.

With this in mind, the African Union Commission (AUC), the African Development Bank (AfDB) and the United Nations Economic Commission (UNECA) for Africa - together with the United Nations Environment Programme - organized the seventh African Development Forum in October 2010 to address the need for action on climate change for sustainable development.

It comes at an important time. Africa is developing and there is a great need to examine the whole climate-change agenda and integrate it into African development processes. The goal is to ensure that growth is sustainable amid the great changes that the future holds.

Climate change is not an environmental 'fashion'. It will not go away but will become increasingly important in all walks of African life – until long after developed economies reign in their emissions. And there is precious little sign as yet of that happening. Climate change will affect all people, all countries and all livelihoods. It cannot be ignored.

There are already impacts of climate change in many parts of Africa and elsewhere. And while there is already much concern, the full significance of climate change for development in Africa is not yet widely appreciated, especially by politicians and decision makers. Much needs to be done to raise awareness – but now Africa is rolling up its sleeves and preparing for the challenge. The Seventh African Development Forum (ADF-VII) was intended to contribute to this effort to raise awareness and nurture the discussion on sustainable development paths for Africa - like the green economy - in the face of a changing climate.

ADF-VII required a lot of hard work by a team of many individuals. At the Forum there were numerous excellent presentations addressing the many facets of climate

change and life in Africa. The general response from delegates was that it was very worthwhile as a forum on a topic of the utmost importance to Africa today.

For completeness, as a record of the proceedings, documentation for the Forum is presented here together with priorities for the way forward. In addition there were several notable side events at the meeting, including the launch of the ClimDev-Africa programme, with the Africa Climate Policy Centre (ACPC) being instigated and hosted by the ECA on the UN campus in Addis Ababa.

Institutions engaged in African development are expected to propel the outputs from ADF-VII, particularly the Action Plan, forward as best they can under the auspices of ClimDev-Africa, in association with ACPC and other partners.

AUC AfDB UNECA UNEP

Acronyms and abbreviations

ACMAD	African Centre of Meteorological Application for Development
ACPC	Africa Climate Policy Centre (within UNECA)
ADF-VII	Seventh African Development Forum
AfriCASO	African Council of AIDS Service Organizations
AfDB	African Development Bank
AMCEN	African Ministerial Conference on the Environment
AMCOW	African Ministers' Council on Water
APF	Africa Partnership Forum
APRM	Africa Peer Review Mechanism
AR	*Assessment Report* of Intergovernmental Panel on Climate Change
ATPC	African Trade Policy Centre (within UNECA)
AUC	African Union Commission
BCA	Border carbon (tax) adjustments
CAADP	Comprehensive Africa Agriculture Development Programme
CBO	Community-based organization
CDM	Clean Development Mechanism
CIF	Climate Investment Funds
ClimDevAfrica	Climate for Development in Africa
CRM	Climate risk management
CoDA	Coalition for Dialogue on Africa
CAHOSCC	Conference of African Heads of State and Government on Climate Change
COP	Conference of the Parties (to UNFCCC or other convention)
CoRDEX	Coordinated Regional climate Downscaling Experiment
CRC	Convention of the Rights of the Child
CSO	Civil society organization
CTF	Clean Technology Fund
DBSA	Development Bank of Southern Africa
DFID	Department for International Development
ECA	Economic Commission for Africa (UNECA)
ECOWAS	*Economic Community of West African States*
EU	*European Union*
FANRPAN	Food and Natural Resources Policy Analysis Network
FM	Frequency modulated (radio)
GCM	Global Climate Model
GCOS	Global Climate Observing Systems
GDP	Gross Domestic Product
GFCS	Global Framework for Climate Services
GHG	Greenhouse gas
GSP	Global Sustainability Panel
GWh	Giga-watt hour
ICPAC	IGAD Climate Prediction and Applications Centre
IGAD	Inter-Governmental Authority on Development (Eastern Africa)
IK	Indigenous knowledge
ISS	Institute for Security Studies

IPCC	Intergovernmental Panel on Climate Change
ICSU	International Council for Science
ICT	Information and Communication Technology
IPR	Intellectual Property Rights
IRI	International Research Institute for climate and society
IWMI	International Water Management Institute
LDC	Least Developed Country
MDB	Multilateral Development Bank
MDGs	Millennium Development Goals
NAPA	National Adaptation Programmes of Action
NEPAD	New Partnership for Africa's Development
NGO	Non-governmental organization
NPCA	NEPAD Planning and Coordinating Agency
NYCC	Nigerian Youth of Nigerian Youth Climate Coalition
ODA	Overseas Development Assistance
PACJA	Pan-African Climate Justice Alliance
PoA	Programme of activity (in the CDM)
ppm	parts per millions – a unit of concentration
PPP	Public Private Partnerships
PS	Private Sector
PSC	Peace and Security Council
REC	Regional Economic Community
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SCF	Strategic Climate Fund
SSA	Sub-Saharan Africa
SADC	Southern African Development Community
SEI	Stockholm Environment Institute
SIDS	Small Island Developing States
STI	Science technology and Innovation
TERI	*The Energy and Resources Institute*
UNCSD	UN Commission on Sustainable Development
UNCTAD	United Nations Conference of Trade and Development
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environment Programme
UNFCCC	*United Nations Framework Convention on Climate Change*
UNFPA	United Nations Funds for Population Activities
UNHDR	United Nations Human Development Report
UNIDO	United Nations Industrial Development Organization
UNWESS	United Nations World Economic and Social Survey
WFP	World Food Programme
WMO	World Meteorological Organization
WTO	World Trade Organization

Policy makers' summary

I. INTRODUCTION

1. The African Development Forum VII, held in October 2010 at the UN Conference Centre in Addis Ababa, Ethiopia, was attended by over a 1,000 people from different walks of life (see annex 6). They participated in a great diversity of presentations and discussions as the Forum attempted to cover the many important aspects of life in Africa that are –and will be –affected by a changing climate (see annex 3 and 4). The Forum sought to raise awareness of the need for action in proportion to the rapidly expanding problem. Its goal was to reach consensus on a development agenda drawn up by Africans for Africa.

2. The ADF-VII comes at an important time. Africa is developing and there is a great need for full integration of climate change considerations to ensure that the development is sustainable. Climate change is already making its impacts felt and there is growing concern that its full significance for development in Africa is not yet sufficiently appreciated, especially by politicians and decision makers. The ADF-VII showed that Africa is rolling up its sleeves, ready for the challenge.

3. Climate change is not an environmental 'fashion': it will not go away but will become increasingly important in all walks of African life–until long after developed economies reign in their greenhouse gas emissions. As the Forum showed, a more hostile climate will affect all people, all countries and all livelihoods and cannot be ignored. The Consensus statement (see annex 5) confirmed the topic's utmost importance. It conveyed the diverse concerns of the many participants, strengthened the African common position on climate change, and challenged Africa's leadership to respond with appropriately scaled policies, planning and practices.

4. In addition to the excellent presentations and diverse discussions, there were several notable side events at the meeting, including the launch of the ClimDev-Africa programme by the AfDB, the AU and UNECA and partners, with initiation of the ACPC. The ADF-VII's outputs, particularly the action plan (see annex 7), provide a wealth of ideas to be further developed under the umbrella of ClimDev-Africa, with the technical support of ACPC and numerous other institutions.

II. WHY THE PROBLEM OF CLIMATE CHANGE IS SO SPECIAL IN AFRICA

5. The many presentations at the forum emphasized just how vulnerable Africa is to climate change; how climate change will affect all aspects of development sooner rather than later, and how much fundamental change (adaptation) is required if

development is to be sustained. Africa, a relatively dry continent already has food secure problems – and increase in climate variability will make this worse.

6. ***No turning back:*** Climate change is the biggest challenge for the future of Africa, and the world. Since, ultimately, the future of civilization on planet earth is at stake, this 'collective action problem' must be addressed comprehensively through global partnerships. In the absence of a strong global response to the challenge, there is relatively little that Africa can do on its own to adapt to all the expected impacts of a changing climate. 'Business-as-usual' holds a grave problem for Africa's future. Current development pathways are simply unsustainable: the damage to people, their livelihoods, their environment and society is just too great. While the green economy, much discussed in the Forum, offers the promise of a better way forward, with opportunities for everyone, it is critically dependent on a strong global agreement on transforming the way we treat the planet[1].

7. ***Negotiating a way forward:*** Current negotiations under United Nations Framework Convention for Climate Change (UNFCCC) are absolutely vital for the future of the continent, and a better world. Africa must pursue every effort to secure a firm and fair global agreement. The continent has a unique and important catalytic role to play in climate change negotiations because it has contributed the least to global warming; will suffer most from the impacts of climate change; and, it has the potential to lock up significant quantities of atmospheric carbon, relatively cheaply and quickly, by re-vegetatiing degraded land. It can play this role by nudging developed and emerging economies towards a clean, green agreement, which is in everyone's longer-term interest.

8. ***A lead from the front***: At present, Africa is under-prepared for adapting to climate change, and yet expectations are high - as discussion at the Forum made clear. Visionary leadership and political ownership of the challenge are absolutely essential. In rural Africa there is much concern about the impact of already changing local climates and the extreme exposure of so many communities to an increasingly hostile climate. Countries are being forced into "reactive adaptation", which is more expensive and less effective than planned adaptation. It is imperative that Africa's leadership take up the challenge of strengthening resilience to climate change now – the climate agenda has become the development agenda.

9. ***Getting into gear:*** But not all leaders have access to the resources and technology needed to address yet another complex, macro-constraint to development that requires tough policies, coordinated responses and costly changes. Too few people and institutions have taken ownership of climate-change issues and made them their own. Much needs to be done to prepare for and initiate action in response to the problem on the scale required. To this end, countries are negotiating global agreements with adequate finance and appropriate mechanisms. Developing a continental strategy and master plan for a more resilient Africa would be an important step. It would enable the continent to pursue a more equitable and sustainable development path in the face of a more hostile climate.

[1] For example UN World Economic and Social Survey 2010 Retooling Global Development http://www.un.org/esa/policy/wess/.

III. PRIORITY ISSUES

10. The Forum demonstrated that climate change has the potential to affect all people from all walks of life in Africa. Thus there are different ways of 'classifying' the many threats and opportunities that it presents. This Report has concentrated on the many priorities identified in the Consensus statement into the following 10 Areas for action, five of which are general, while the other five address more specific 'sectoral' concerns:

(a) **Leadership**: **Africa and international climate-change negotiations:** common negotiating position, financing adaptation: and mitigation (CDM);

(b) **Governance and leadership in setting priorities and implementing adaptation actions**: Coherence: integrating climate change concerns into development policies, strategies and programmes in Africa, and ensuring sound investments for the future;

(c) **Capacity development**: strengthening institutions, organizations, communities and individuals with knowledge, especially on climate-risk management: disaster-risk reduction: climate-data and information;

(d) **Science, technology and innovation:** tools necessary to help address this unique, complex and uncertain problem;

(e) **Partnerships and the private sector:** combining complementary knowledge and skills for more effective action (from global mitigation to community adaptation);

(f) **Peace and security,** without which development is unsustainable;

(g) **Natural resource management** including: agriculture and food security the sustainability of the environment and ecosystem : environmental security; water resources, biodiversity, changes in land use, forestry REDD+, desertification;

(h) **Social and human development:** health, population, education, of the youth, gender issues;

(i) **Economic development**, trade and industrial development, access to optimal technology; the potential of the green economy; and

(j) **Infrastructural development**: energy, water, ICTs, transport, urban, industrial and coastal: *towards solving Africa's water and energy problems*.

11. Within these issues of particular note are:

(a) The importance of appreciating the potential magnitude of the problem and responding accordingly with bold initiatives with predictable finances;

(b) The need to make decisions in times of uncertainty; risks must be managed with the support of quality climate information services;

(c) The importance of integrated agricultural, water and environmental policies;

(d) Unfairness: climate change tends to affect poor people disproportionately;

(e) Certain countries and small island States are much more vulnerable than others;

(f) The need to empower women and other stakeholders by involving them in all decision-making processes;

(g) Linking negotiations: coordination is needed between African negotiators, for instance under the United Nations Framework Convention on Climate Change (UNFCCC) and the World Trade Organization (WTO) – a role for joint ACPC and the African Trade Policy Centre (ATPC);

(h) The need to adapt infrastructure to make it resilient to climate change;

(i) The need for favourable policies to make the best use of the private sector;

(j) The importance of keeping the peace through pro-active conflict resolution, and;

(k) The necessity of incorporating climate change into the educational system.

IV. KEY CHALLENGE: PREPARING FOR COHERENT RESPONSES IN PROPORTION TO THE SIZE OF THE PROBLEM

12. Climate change is complex: not everyone at the Forum was clear on the many important issues. To ensure coherent and congruent responses in all walks of life, it is essential that a critical mass of people understand the intricacies and scale of the problem in Africa.

13. While long-term planning, with coherent policies linking sectors, stakeholders and scales of decision-making, is vital for investing funds wisely, and mitigating future problems, it is not easy to achieve. In particular, coastal climate-risk management is an emerging issue in Africa because of the dangers associated with very rapid urbanization. There is an urgent need for information and tools necessary for land planning, policy and regulatory frameworks that take due account of the associated climate risks.

14. All development processes must incorporate climate risks. It is of paramount importance to propagate a culture of proactive climate-risk management. All sectors, stakeholders and scales of decision-making must take such risks into consideration in their actions.

Scales of action

15. Continental Africa must be able to engage effectively and articulate its climate-related interests–including carbon pricing and links with trade, disasters, the environment, pollution, migration, reparations and aid–as part of the global

community. This must include educating citizens in developed countries about the vulnerability of people in Africa.

16. **Continental Africa** comprises 54 countries acting together in their common interest, led by the AU, the AfDB and UNECA. Further integration is essential for optimizing responses to climate change, especially at the continental level. Systematic monitoring of progress and evaluating the impact of policies and programmes is essential. The ACPC has a vital role to play in stimulating action and encouraging best practices, supported by capacity building through the African Centre for Meteorological Applications for Development (ACMAD) and sub-regional institutions.

17. **Subregions embody** strengthened capacities to enable countries to work together in greater harmony, expressing their full comparative advantages through common policies and programmes (such as transboundary water management, power and risk 'pools').

18. **National policies** are the cornerstone for driving compatible and effective adaptation, mitigation and development for all citizens. Since all countries face common issues there is ample opportunity for developing and sharing best practices.

19. **Local actions** require that all stakeholders be enabled to adapt as and when they need to.

V. KEY OPPORTUNITIES

20. There are a growing number of opportunities for countries and organizations that have prepared their climate-change response strategies. Significant financial support is already available for sound investments and much more is promised. Opportunities include:

(a) Adaptation and development, funded through Climate Investment Funds (CIF);

(b) Mitigation funding, green economy and instruments like the Clean Development Mechanism (CDM) , REDD+ and the restitution of degraded land through carbon taxes;

(c) The renewal of infrastructure for a different future, especially energy related;

(d) Global transformation towards greater equity in a moderated consumer society;

(e) Engaging the dynamism of civil society: Africa occupies the moral high ground;

(f) Insurance and risk pools to offset increased climate variability; and

(g) Private investment, but conditions on 'land grabs' must be transparent.

VI. POLICIES AND ACTIONS

21. Many initiatives have been launched to help address climate change issues in Africa, although they represent a tiny fraction of what is needed to address the full scale of the problem. There is a great need to build on progress made so far by identifying best practices in order to scale up such initiatives across the continent appropriately. The Indicative action plan (annex 7) outlines many Forum initiatives that need to be taken forward in conjunction with on-going actions.

22. The main groups already active include:

(a) The World Bank pilot programme for climate resilience (with the International Finance Corporation and regional development banks using Climate Investment Funds);

(b) Fast-track climate finance; the adaptation fund;

(c) The AfDB, AUC and UNECA with ClimDev-Africa – launched during the Forum ;

(d) The ClimDev Special Fund administered by the AfDB;

(e) UNDP Africa Adaptation Programme, financed by Japan;

(f) Other donors, like the EC Global Climate Change Alliance, active in Ethiopia;

(g) See CD-KN.org website, financed by the Department for International Development (DFID);

(h) Many international NGO actions, like Oxfam, raising awareness; and

(i) Many local NGO actions to help communities adapt to a more variable climate.

VII. CONCLUSION

23. The ADF-VII sought to promote action on climate change for sustainable development in Africa. The many diverse issues were assessed together and the resulting Consensus statement provided the basis for a comprehensive action plan. Now the action plan needs to be implemented through ClimDev-Africa, while at the same time on-going actions are consolidated. The purpose of the CCDA annual conferences is to maintain the momentum set by the ADF-VII by bringing together all partners and actors collaborating on the monumental task of adapting to climate change and mitigating its adverse effects.

Report of the Forum proceedings

I. INTRODUCTION

1. The United Nations Economic Commission for Africa (ECA), in cooperation with the African Union Commission (AUC) and the African Development Bank (AfDB), convened the Seventh African Development Forum (ADF-VII) in Addis Ababa, Ethiopia, from 10 to 15 October 2010 under the theme: *Acting on climate change for sustainable development*. The Forum was organized to address the challenges of climate change in Africa and establish a consensual African-driven development agenda. As an integral part of the Forum, pre-forum activities, including parallel meetings and workshops, were held on different themes relevant to the Forum. The outcomes of these meetings and workshops fed into the deliberations of related Forum sessions.

2. Poor people are particularly exposed to climate change, as they tend to live in environments that are most susceptible to droughts, floods and other extreme events. Climate change is one of the most challenging threats to sustainable development in Africa. Although the continent's contribution to total greenhouse gas emissions is negligible, its countries are among the most vulnerable to climate change in the world. The vulnerability results from a multitude of stresses and low capacity to adapt. Africa is a relatively dry continent whose rainfall is variable. Soils are generally poor and the potential for irrigation is limited. African economies rely heavily on climate-sensitive sectors, such as agriculture, fisheries, forestry, other natural resources and tourism. The ability to adapt is restricted by widespread poverty, poor infrastructure, conflicts, limited capacities, and inadequate technologies and financial resources.

3. The overall objective of the Forum is to raise the awareness of all stakeholders and partners, and mobilize their commitment and actions in proportion to the scale of the problem. Climate-change concerns must be integrated into development policies, strategies, programmes and practices in Africa. The ADF-VII also aims to strengthen Africa's participation in international climate-change negotiations to help ensure that any international climate change regime beyond 2012 adequately reflects the continent's concerns and priorities.

II. ATTENDANCE

4. The Forum brought together over 1,000 delegates, representing African governments, non-African countries, international, regional and subregional organizations, community-based organizations, civil society organizations, the private sector, development partners, United Nations agencies, academia, the media,

women's organizations and the youth. The Forum was attended by several dignitaries, including, H.E. Mr Meles Zenawi, Prime Minister of Ethiopia, H.E. Mr Jens Stoltenberg, Prime Minister of Norway, Mr Festus Mogae, former president of Botswana and Chairperson of the Governing Board of the Coalition for Dialogue on Africa (CoDA). The Forum received goodwill messages from HRH The Prince of Wales, President Barrack Obama of the United States of America and President Goodluck Jonathan of the Federal Republic of Nigeria. Several ministers of the environment, energy, water resources, agriculture and finance and economic development also attended the Forum. The list of participants and their affiliation is presented in annex 3.

III. OPENING SESSION

5. Opening statements were made by Mr Abdoulie Janneh, UN Under-Secretary-General and Executive Secretary of the ECA; Ms Esther Agbarakwe, African Regional Coordinator of the UN Commission on Sustainable Development (UNCSD) and Coordinator and Co-Founder of the Nigerian Youth Climate Coalition (NYCC); Mr John Odey, Nigeria's Minister for Environment, Mr Jean Ping, Chairperson of the AUC; and His Excellency Girma Wolde-Giorgis, President of the Federal Democratic Republic of Ethiopia.

6. Mr Janneh expressed his profound pleasure and honour in welcoming participants to the ECA and ADF-VII, adding that the active participation of its large and diverse constituency gave the ADF meaning and significance. The period since the last ADF in 2008 had been challenging for the African continent, especially as the sustained growth it had enjoyed since the beginning of the Millennium was derailed by food, fuel and financial crises, culminating in a full blown economic downturn. Mr Janneh stressed that, while the short-term cyclical downturn hurt Africa's development prospects, it was insignificant compared to the long-term damage that climate change would cause to economic, social and communal life in Africa.

7. He saw the Forum as an opportunity for stakeholders to engage in a broad-ranging discussion on the various facets of climate change, including the appropriate response by the authorities. At the same time it was an opportunity for the stakeholders to assess: the evidence of climate change and its impacts; and the strategies that Africa should use to mitigate the effects and adapt to them. The Forum was an excellent occasion to strengthen Africa's preparation for and involvement in upcoming international negotiations, especially within the scope of the United Nations Climate Change Conference to be held in Cancun, Mexico at year-end. He thanked all partners who had provided significant support to make Climate for Development in Africa (ClimDevAfrica) and the African Climate Policy Centre (ACPC) fully operational. In conclusion, he emphasized the need for ADF-VII to end with action-oriented outcomes.

8. In her message to the Forum Ms Esther Agbarakwe pointed out the significant challenges that climate change posed for future generations. Young people in particular face unprecedented challenges due this phenomenon, and share the responsibility of addressing it. She stressed that advocacy and behaviour change

through awareness and education were crucial. To that purpose, she called for present and future leaders to work together to find solutions, while ensuring that the voices of the youth were heard and that their perceptions were taken into account. At the 15th Conference of the Parties (COP15) African governments included the youth in their delegation and gave them a role to play. As a result, many representatives of the youth interacted with governments and took part in policy processes and procedures concerning climate change.

9. Climate change is a crosscutting issue that transcends national boundaries, necessitating cooperation among various stakeholders, such as intergovernmental agencies, the young and vulnerable people. Integrated and holistic approaches are vital in addressing it. It is important to see beyond the environmental and energy aspects of climate-change and consider it as fundamental to sustainable development. She cited examples of recent actions undertaken by the youth, including the planting of trees, cultivation of community gardens and installation of solar panels, and stressed the importance of their contribution overall, without forgetting that of leaders.

10. The Chairperson of the AUC, Mr Jean Ping, in his opening statement noted that the presence of many prominent personalities and experts bore testimony to the importance of environmental issues. He stressed the role of diplomacy in addressing climate change concerns, highlighting key instruments put in place by the international community. He underscored the importance of the ADF-VII, especially as it coincided with many African countries' participation in climate-change negotiations. The Forum was therefore appropriate for boosting Africa's environmental diplomacy.

11. In Mr Ping's view, cooperation among African countries is crucial, notably the adoption of an African common position on climate change. He cited positive results of such cooperation, including the commitment demonstrated by Africa's political leaders through the Conference of African Heads of State and Government on Climate Change and the establishment of ClimDevAfrica. However, much more needs to be done, given the continent's enormous environmental challenges, and that Africa did not get the commitments it expected from the Copenhagen Summit of 2009. He urged development partners to meet their commitments. Mr Ping concluded by promoting collective action as the only way for Africa to bring its full weight to bear in international negotiations.

12. Nigeria's Minister for Environment, Mr John Odey, presented a goodwill message from President Goodluck Jonathan. He said that the ADF-VII provided a platform for contributions to Africa's common position for the Cancun meeting. He noted that African countries were the most vulnerable to the impacts of climate change although they contributed the least to the phenomenon. Mr Odey included insecurity and the breach of peace, natural disasters and environmental migration among the potential impacts of climate change. Appropriate management of the effects of climate change calls for a clear African position on funding for the initiative, and for good governance. It is imperative for African countries to develop the skills and infrastructure required to cope with natural disasters. He concluded by pointing out that countries lacked the capacity to face the challenge of climate change individually, and urged them to work together in tackling it. He expressed the

commitment of Nigeria to working with other countries to find ways to mitigate climate change.

13. In his opening address, H.E. Ato Girma Wolde-Giorgis, President of the Federal Democratic Republic of Ethiopia welcomed delegates to Ethiopia and to the ECA. He stated that climate change was an inescapable global challenge whose effects were most devastating on Africa. The President considered the theme of the ADF-VII, "Acting on climate change for sustainable development" most fitting, and the Forum, a challenge to every participant and the world at large. He commended the awareness of Africa's leaders at the highest political level, their unprecedented approaches and commitment in rising to the challenge posed by climate change. He applauded Africa for staying on track in its efforts to eradicate poverty, and sustain growth, stability, peace and security and the ecosystem.

14. The President pointed to two bold actions taken by African leaders, namely to: forge a common African negotiating position for the ongoing international climate change negotiations; and establish, at the highest level of political leadership, the CAHOSCC, under the chairmanship of Prime Minister Zenawi. He also cited groups of people who have already made heavy sacrifices as a result of climate change, among them millions of mothers who have lost their children owing to the famine and malnutrition associated with frequent and severe drought; and pastoralists across Africa who have lost their livelihoods and sometimes their lives as conflict over meagre resources escalates.

15. Ato Girma Wolde-Giorgis concluded his address by urging for the outcome of the ADF-VII to include the following: deepening Africa's reach and mobilizing governments to play their role in response to climate change; equipping diverse partners with the knowledge, funds, technologies and capacity required to adapt to and mitigate the effects of climate change; and optimizing Africa's opportunities in responding to climate change.

IV. PLENARY SESSION 1 – HIGH-LEVEL LEADERSHIP DIALOGUE ON GOVERNANCE AND LEADERSHIP RESPONSE TO CLIMATE CHANGE

16. The session was chaired by Mr Ping and moderated by Mr Achim Steiner, Executive Director of the United Nations Environment Programme. The panellists were Mr Donald Kaberuka, Prime Minister Stoltenberg, and Prime Minister Zenawi.

17. Mr Ping started by welcoming participants and panellists to the Forum. He noted that the ADF conference was not designed to develop a blueprint for UNFCCC Cancun but to generate ideas and reach a consensus on some of the key issues. He then introduced the three panellists and gave the floor to the moderator, Mr Steiner, who invited the panellists to make brief opening statements.

18. Mr Kaberuka reiterated the fact that while Africans contributed negligibly to climate change, they were paying an enormous price for it. He noted that the solution had to come from consultation between the developed North and the developing South. He considered as crucial the willingness and ability of those in power to deal with the effects of climate change. While acknowledging Africa's role in adaptation to and mitigating the effects of climate change, he emphasized African countries' right to develop their economies. By way of example he mentioned the opportunity to adopt clean energy frameworks to address the continent's enduring energy deficits.

19. For his part, Mr Stoltenberg commended the tremendous progress made by Africa in economic and social development in the past decade. However, he noted that there was growing awareness that climate change – which was not a problem of Africa's making – would impose major costs on Africa. It will profoundly affect Africa's prospects for economic growth and poverty reduction, and for attaining the Millennium Development Goals (MDGs). Mr Stoltenberg mentioned some tangible measures that Africans could take, such as limiting forest depletion. Norway is supporting such activities through result-oriented programmes and projects, where funding is directly linked to tangible results.

20. Mr Zenawi discussed lack of leadership in climate-change negotiations in developing and developed countries alike. He pointed out the reluctance of political leaders in developed countries to take risks in the interest of the environment, unless their citizens were behind them to stand up to the vested interests that stood to benefit the most from lack of progress in negotiations. He emphasized the need for the citizens of developed countries to enhance their awareness of climate issues. He called on the developed North to embrace the spirit of global citizenship more fully. Given the prevailing lack of leadership, Mr Zenawi doubted that the UNFCCC Cancun or Durban meetings would achieve a comprehensive legally-binding agreement

21. Referring to funding to mitigate the effects of climate change, Mr Zenawi noted that delivery on the Copenhagen Accord's commitment to provide USD 100 billion per annum by 2020 to finance adaptation and mitigation was feasible. However, adequate, predictable and reliable resources must be allocated to Africa in line with its needs and its own constrained resources. Furthermore, a simple and efficient mechanism for the delivery of aid is necessary. It must reflect the lessons learnt and the principles agreed on to ensure that the aid is effective.

22. Mr Zenawi urged for a multilateral approach to coordinating financial contributions of bilateral donors so as to lower transaction costs involved in obtaining funds for mitigation and adaptation initiatives. He discussed the proposed African Green Development Fund to be hosted by the AfDB, and whose role will be to collect and disburse climate change funds. Mr Zenawi echoed Mr Stoltenberg's opinion that carbon pricing would represent a major source of new climate change funding.

23. The Panel agreed that, in spite of its weaknesses, the UNFCCC represented the only legitimate forum for discussion and agreement on climate change. It discussed the need to work around the framework and introduce changes, as required. The Panel agreed that a common African position ensured that the continent's voice was heard more clearly in Copenhagen in December 2009. However, it reasoned that in future negotiations it would be in Africa's vital strategic interest to rally behind a

common position rather than continue addressing issues in a discordant and undisciplined manner.

24. The Panel also agreed that reaching a comprehensive legally-binding agreement might not be possible in Cancun or Durban. However interim 'building block' agreements in forest management, financing mechanisms, and technology may be attained - which would serve as a platform for future efforts to reach a full agreement.

Recommendations

(a) Africa welcomes the proposed African Green Fund to be hosted by the AfDB. Africa's leaders should engage with management of the Fund to ensure that countries receive large shares of available resources;

(b) African countries need to build robust national institutions to deal with funds for climate change, as this will encourage development partners, who increasingly provide funding based on results;

(c) Political leaders of developed countries need to show leadership in proper carbon pricing, which is indispensable for raising funds to mitigate the effect of and adapt to climate change;

(d) Political leaders of developed countries should also make greater effort to educate their public on the impact of climate change in developing countries. Commitments on funding for activities related to climate change should not be viewed as "yet more" aid to developing countries but rather as contribution towards tackling a global problem to which African countries contributed the least but to which they are most vulnerable.

(e) African leaders should step up efforts to reach out to leaders and the wider public in partner countries in order to raise awareness of Africa's perception of financing for climate change mitigation and adaptation;

(f) While rightly demanding financial contributions from developed countries to tackle the impacts of climate change, African countries should use all available funds - including those generated internally – appropriately and in a transparent manner;

(g) African countries should not wait for agreements in international negotiations before taking action to raise funds for climate change mitigation and adaptation. They should collaborate with each other in seeking ways to generate relevant investment projects, looking inwards for opportunities to finance green development; and

(h) African countries should respect their common continental positions on climate change at international meetings, rather than expressing contrary views.

V. PLENARY SESSION 2 -EVIDENCE AND IMPACT OF CLIMATE CHANGE

25. The session was moderated by Mr Jeff Koinange, Chief Anchor, Capital Talk Show Host, K24 (Kenya). The panellists were: Mr Johan Rockström, Executive Director of the Stockholm Environment Institute, in Sweden; H.E. Mr Brice Lalonde, former minister for environment and Ambassador for Climate Change Negotiations, France; and Dr Abdalah Mokssit, Vice President of the Intergovernmental Panel on Climate Change (IPCC) Working Group 1.

26. The session began with a short documentary video entitled "The Gods must be Angry". The 30-minute documentary presented aspects of climate in Africa, including the deforestation of the Congo rainforest, the advancing of deserts, lowered water levels, the reduction of fish production and the migration of communities affected by climate change. The video highlighted the impact of climate change on West Africa, showcasing Keita village, in Ghana, whose communities rely on fisheries and farming. The rise in the sea level has displaced over 12,000 people from the area surrounding Keita.

27. In his presentation, Mr Rockström asserted that humanity had begun damaging the environment at the national and global levels, in what he described as a quadruple squeeze. The first squeeze concerns demographic growth and its 20/80 dilemma, whereby 80 per cent of the population are the victims of environmental degradation caused by remaining 20 per cent.

28. The second squeeze refers to a dilemma represented here by greenhouse gas emissions (GHG) concentration levels of 550/450/350 ppm (parts per million carbon dioxide in the atmosphere). The world is witnessing the worst-case scenario considered by the IPCC. The GHG rate is faster than anticipated. While a level of 400 ppm was estimated to be safe for the planet, current CO2 levels are already approaching 450 ppm. The consequence is evident in the increase in temperatures, rise in sea levels, loss of biodiversity and the arctic ice melt, among other things.

29. The third squeeze, he explained, was the 60 per cent deterioration of the global ecosystem. Recent scientific research suggests that concrete action must be taken this decade to counter climate change, and thereby stabilize the environment. There is a need for policies that focus on ecosystems.

30. The fourth squeeze lies in failure to appreciate that changes in ecosystems happen in incremental rather than linear ways. He noted that 99 per cent of change in the ecosystems could be due to 1 per cent of human action. Unexpected changes can happen rapidly. Science has monitored the sea ice extent for years, but failed to predict the 40 per cent reduction in Artic Sea ice in 1997. This appears to be due to a well-known feedback mechanism, where less ice means that less of the sun's radiation is reflected back out to space, which accelerates the warming of water and melting of the ice. Yet the actual change in sea ice extent still came as a surprise. He cited Mr Ban Ki Moon, the UN Secretary-General, who warned in the COP15 in September 2009 that, "We have our foot on the accelerator driving towards the abyss…".

31. Mr Rockström asserted that we had already transgressed certain planetary 'boundaries', which meant some environments could change suddenly and irreversibly. The Greenland ice sheet could melt and slide into the ocean, leading to a seven-metre rise above sea level across the globe. There is tremendous pressure on the environment from different angles that require immediate action. They include nitrous oxide and methane gas emissions, the frequency of climatic disasters, over fishing, shrimp farms, the flux of nutrients and subsequent eutrophication of water bodies, and agricultural land expansion. Scientists set nine planetary boundaries, which include: global warming (350-500 ppm CO2); ozone depletion; atmospheric aerosol loading; the acidification of oceans; global freshwater use; chemical pollution; land system change; the rate at which biodiversity is lost; and bio-geo-chemical loading – global nitrogen and phosphate cycles. Carbon dioxide is not merely a climate change issue - increased concentration of CO2 in oceans is intensifying their acidity, thereby corroding the calcium carbonate shells of marine organisms and releasing more CO2.

32. Crucially, climate science suggests that the planet should have already warmed by 2 °C, but this has not all happened yet. To some extent this is due to masking by air pollution, which has the net effect of protecting the earth from heating. It is easier to remove air pollution than to remove GHGs. So we are stuck with the likelihood of global warming, which may well become evident once air quality is improved. Other important effects include the absorption of some of the heat by oceans, while forests soak up more carbon. However the capacity of oceans and forests to mitigate the effects of climate change appears to be diminishing. Ultimately the risks linked to climate change will increase. Mr Rockström remarked that for poor people risks started to accumulate around the 2°C warming threshold. It is important to note however, that there is little scientific evidence that the 2-degree threshold is safe

33. Mr Rockström concluded by saying that the world could achieve the global emission pathways, in compliance with a 2°C guardrail, if it managed to de-carbonize by 2015 to 2020. He cited an article published in the *Nature* scientific journal before the Copenhagen COP15, which asserted that we had to reduce emissions to zero without delay to succeed in meeting the 2-degree target. Echoing the moderator's introduction, Mr Rockström summed up by saying that there was no good news in his presentation.

34. Ambassador Lalonde reminded us of our collective responsibility vis-à-vis global warming. He noted the critical role of scientists in mitigation and adaptation initiatives; in understanding the causes of climate change; and providing the necessary technologies and means to apply them. He commended the work of the IPCC in this regard. He acknowledged the need for decision makers and qualified and specialized scientists to manage the climate-change agenda. Beyond national and subregional strategies, we need an implementable global framework with gender-sensitive, equitable and sustainable policies supported by a clear vision for a better future – rather than projections of cataclysm.

35. Climate negotiations are complicated in part because we don't have the right tools. While we are far from perfect, our generation should adopt the right policies. We need to invest in capacity-building programmes in appropriate research and development, the transfer of technology, mitigation and adaptation. We need policies

to address equity and justice by determining who causes the climate changes that affect the most vulnerable population groups.

36. The third panellist, Mr Abdalah Mokssit, Director of the National Meteorological Service of Morocco and President of the Scientific Advisory Committee of the ACMAD made a presentation on '*Le point sur les changements climatiques'*. Mr Mokssit defined our role as being to predict the ramifications of climate change using measurements and projections. It is important to understand climate trends and variability in the African context.

37. People want to confirm whether climate change is already with us. Over the last 12 years we have observed the warmest summers in a century. Communities are experiencing increasing effects of climate change, in the form of floods and rising temperatures, among other things. Morocco has had eight floods in eight years. The fourth IPCC report contains evidence of rising temperatures in Africa. Some areas of Africa have seen an increase in precipitation while others have seen a decline. The icecaps on Mount Kilimanjaro, for example, have retreated in the past century.

38. Mr Mokssit pointed out that while it was possible to simulate seasonal change, it was not possible to do so for small land areas. Climate projection models need to produce information at national and sub-national levels to help politicians in different sectors of the economy make decisions. Climate projections should not only be for meteorological use but for use by policy makers in socio-economic planning. In Morocco, for example, an increase in temperature resulted in the migration of people from less arable places to more arable land. Climate change in Africa results in water stress, which affects agricultural production, trade and the migration of animals.

39. To proactively carry out mitigation and adaptation initiatives, we need to build our capacity to adapt. We can ensure this by: conducting our studies by region and using early warning systems. These, along with other tools and mechanisms provided by the World Meteorological Organization (WMO), will help us project ahead and prevent harmful effects of climate change. This is the *raison d'être* of the WMO and the ClimDevAfrica programme.

40. The main issues raised in discussion included:

(a) UNFCCC - How to rebuild trust in negotiations after Copenhagen. According to the panellist, Africa did not lose out on Copenhagen. While all partners should understand each other, this cannot happen overnight. We are working together, and ultimately, people should be able to understand climate change, be mindful of it and seek a solution. It is a collective action;

(b) Although Africa has greatly enhanced its research and access to scientific evidence for negotiations lately, it needs further work to keep the negotiations on the right track. The continent needs to build capacities at all levels, including academia and the transfer of technology. It must review its educational systems to ensure that they produce the necessary skills. The African Green Fund should allocate a larger portion of finances to research and development;

(c) Africa should not only speak with one voice, but also assume its important role in addressing issues, such as: an interdisciplinary approach to research; a steward for ecosystems; integrated water resource management. These are important areas where Africa should take the lead. The ACPC is a great opportunity to develop an integrated climate policy;

(d) Major needs identified included: comprehensive insurance to safeguard communities against climate-change effects; national climate plans covering all economic sectors; strategies for adaptation based on long-term projects at the global, regional and national levels; data to support policy formulation; and, the strengthening of grassroots organizations; and

(e) Given that in 2050 Africa's population will be bigger than those of China or India and that most of the continent's population will be urban, designing tomorrow's cities is very important and must be included in national climate plans.

41. In their concluding remarks, panellists concurred on the need for a climate surveillance programme to prepare Africa and ensure its self-sufficiency. There is a need to build human and institutional capacities, conduct studies and gather reliable data at the national or regional levels. The WMO supports such gathering of information and assembling of policy makers and others to ensure that decisions are made in full knowledge of the facts. The panellists urged for a repository of data on climate change that are easily accessible to all African countries.

Recommendations

(a) Support Africa's efforts to strengthen **its technical, technological, financial and institutional capacities to enable it to address current** and projected impacts of climate change on its development goals;

(b) Strengthen the capacity of African institutions to undertake research and development activities through the African scientific community and institutions; among other things, establish regional and national climate-change observatories and centres of excellence by increasing the resources allocated, by the African Green Fund and other sources, to climate change research in Africa;

(c) Strongly support Africa's efforts to promote sustained broad-based, equitable, resource-efficient and environmentally-sustainable growth, as this is essential to poverty reduction**;**

(d) Actively **ensure that countries make** the significant **emission cuts demanded by science, consistent with the principle of common but differentiated responsibilities and respective capabilities, in order to stabilize** GHG **emissions at levels that will** halt **further damage to the global climate system;**

(e) African countries should develop sustainable green-growth strategies. This includes the development of green cities, energy-efficiency plans, national early warning systems, etc.;

(f) **Strengthen the capacity of African leaders to** participate in international negotiations;

(g) Strengthen the role of the ACPC and accelerate the implementation of the ClimDev programme;

(h) Support the development and implementation of regional and national climate-change science plans and strengthen capacities of African countries to build a climate-change knowledge repository with reliable data and scientific evidence; and

(i) Support African educational institutions (universities, research and development institutions) to develop a critical mass of skilled human resources for climate change research, adaptation, mitigation and monitoring, including through the management of international collaboration and the transfer of technology.

VI. PLENARY SESSION 3 - CLIMATE CHANGE ADAPTATION AND MITIGATION:

Part 1: Challenges and opportunities

42. Mr. Ben Dostei Malor, of UN Radio, moderated this session. The panellists were: Mr. Andrew Steer, the World Bank's Climate Change Envoy; Colonel Matar Cissé, Director General of the National Agency of the Great Green Wall in Sénégal; and Mr. Jaako Olavi Nuottokari of the International Development Projects at the Finnish Meteorological Institute.

43. Mr. Steer reiterated that climate change arguably posed the biggest challenges to Africa's development. The continent has contributed little to climate change, but is set to endure the heaviest burden, albeit of variable magnitude. Many priority actions will be required in areas, such as irrigation, water management, climate-resilient infrastructure and agricultural research, to ease the burden. However, climate change can bring development opportunities. Five of these stand out: integrating climate-resilient actions and strategies into development planning; tapping into carbon-market markets, which the continent has yet to harness fully; expanding access to electricity, particularly clean and renewable energy; improving trans-border cooperation among African countries, particularly in areas critical to long-term development; and, making the Conference in South Africa a triumph for the continent and steering it toward sustainable development.

44. HRH The Prince of Wales delivered a message by video. He reminded the audience that the thrust of the Forum was to exchange ideas on ways and means of tackling climate-change challenges while addressing long-term development issues. The two sets of challenges are intertwined. It would be impossible to address the first without properly addressing the second, and vice versa.

45. Colonel Cissé described the main features of the Great Green Wall project and presented it as an integrated rural development initiative that goes beyond tree planting. It is an African response to climate change and carbon sequestration. The project will respond to desertification, climate change and poverty by restoring natural resources and the ecosystem and making them more resilient. It will certainly have an impact on the livelihood of the people of the Sahel.

46. Mr Nuottokari presented African meteorological and hydrological services as existing resources that had been overlooked by climate change adaptation and mitigation initiatives in the region. Low funding and visibility and weak institutional capacities bedevil the services in spite of their high return on investment. They are unable to deliver timely and accurate data and information to support policy development. Finland considers these services as key institutions and provides support to the Southern African Development Community's (SADC) climate services and the ClimDev Project.

Plenary session 3 Part 2 The green economy

47. Ms Madeleine Mukamabano, former chief anchor and producer of Radio France International's "African Debate", Moderated this part of the session. The lead speaker was Dr Achim Steiner, Executive Director of the United Nations Environment Programme (UNEP). The panellists were: Mr Janos Pasztor, Head of the Global Sustainability Panel (GSP) Secretariat; Mr Benoit Lebot, Regional Technical Advisor on climate change and energy, United Nations Development Programme (UNDP); Mr Lucas Assuncao, Head of the Trade, Environment, Climate Change, and Sustainable Development Branch of the United Nations Conference of Trade and Development (UNCTAD); Mr Brice Lalonde, France's former environment minister and current Ambassador for climate change negotiations; and Mr Henri Djombo, Minister for Sustainable Development, Forest Economy and Environment of the Republic of Congo.

48. Mr Steiner defined the concept of green economy, asserting that it was neither a new paradigm nor an attempt to create a parallel economy. Instead it represents an opportunity to sharpen the focus of the sustainable development agenda by bringing together environmental, economic and social issues. In countries where the concept is developed, it has received significant support from practically all stakeholders and is taken into account in national strategies for a green economy.

49. Mr Pasztor described the structure and functions of the Global Sustainability Panel. The panel comprises high-level personalities, including three from Africa, and is co-chaired by Finland's President, Tarja Halonen and South African President, Jacob Zuma. It is responsible for promoting low-carbon growth and enhancing resilience to the effects of climate change, as well as tackling the challenges posed by poverty, hunger, and limited access to water and energy. The panel concentrates on leveraging political support to address significant gaps in programme implementation.

50. Mr Lebot indicated that adoption of a green economy was a necessity rather than an option. Non-renewable sources of energy are depleting at a rapid pace. Climate

change is a reality and countries have to confront its effects. A green economy represents a necessary transition.

51. Mr Assuncao discussed the complex issues related to international trade, sustainable development and the green economy. He mentioned the friction between the traditional economy that is concerned with growth and the green economy that is based on environmental sustainability. He highlighted major issues being raised by developing countries, including managing the transition to the green economy and its implications for growth, trade, income, development and employment. The success of this new concept will depend on how its benefits are shared globally in a manner that favours development.

52. Mr Lalonde told the Forum about the need to go beyond meetings and declarations and concentrate on launching green-economy initiatives on the ground. He presented the Nairobi-Paris Initiative as a real success in expanding access to electricity in Africa.

53. Mr Djombo noted that African countries were taking legislative measures aimed at Reducing Emissions from Deforestation and Forest Degradation (REDD+) and changing consumers and firms' behaviour towards environmental citizenship. He stressed that the green economy was instrumental in supporting economic diversification.

54. Discussion from the floor was lively and included the main points summarized below.

(a) The Great Green Wall initiative by Senegal was mentioned as a concrete example of measures to mitigate the effects of climate change. African leadership supported the Great Green Wall and sparked a global response. Participants requested that the initiative incorporate measures to reduce the evaporation of Lake Chad;

(b) Africa's priorities mostly concern resilience and adaptation to the effects of climate change. Responses will require the full involvement of all development actors, the harnessing and linking of existing technology and knowledge and the sharing of best practices;

(c) The launch of a green economic path has four stages: behavioural changes at all levels; improved efficiency at all levels of production and consumption; a focus on non-renewable sources of energy; and building institutions and capacities to manage development in a sustainable manner;

(d) Many participants raised the issue of funding for mitigation and adaptation. The rigidity of funding mechanisms makes it challenging for African countries to gain access to resources in a viable manner. The participants urged the donor community to ease restrictions on financing for such initiatives, and on development partners to distinguish between immediate and longer-term needs. They cited the proposed programmes and projects of the National Action Plan for Adaptation in Africa's least-developed countries, which, lamentably, have stalled owing to lack funding;

(e) The involvement of women in the planning process is essential;

(f) While the link between climate change and desertification is clear, there is still a crucial need for synergies at the international and national levels in planning responses;

(g) Energy production on the continent is vital for development, and given that the unit cost of renewable energy remains high and hampers sustainable development, participants urged development partners to invest in renewable energy;

(h) There is need to strengthen the institutional capacity for weather and hydrological information to provide timely information on extreme weather conditions;

(i) Climate change presents the opportunity for Africa to value its natural resources and utilize them in a sustainable fashion; and

(j) While the green economy presents an opportunity for Africa, there is a need to spell out the costs that the opportunities entail in terms technological choices, economic growth and development. It is important that the harnessing of natural assets prove the economic viability of green economy choices. The green economy can help reduce poverty by creating employment.

Recommendations

(a) Promote the integration of climate change mitigation and adaptation and the green economy in national development plans. Harness regional cooperation to achieve economies of scale. Through advocacy with different stakeholders, strengthen the case for financing;

(b) Sectoral dialogue at the national level is important in promoting the green economy –an increasingly crosscutting issue. There is a need to enhance dialogue and coordination between environment and finance ministries so that they can consider the environment as an economic criterion to be included in GDP calculations;

(c) Africa needs to strengthen its research, training and development capacities. It is therefore crucial to use the education system in African countries to invest in technology and technical capacity.

VII. PLENARY SESSION 4 – AFRICA AND THE INTERNATIONAL CLIMATE CHANGE NEGOTIATIONS: AFRICA'S CONCERNS AND EXPECTATIONS FOR A POST-2012 INTERNATIONAL CLIMATE-CHANGE REGIME

55. Ms Peace Rhoda Tumusiime, AUC Commissioner of Rural Economy and Agriculture, moderated the session. The panellists were: Mr Dan Bondi Ogolla, Chief Legal Adviser of the UNFCCC Secretariat; Mr José E.B. Endundo, Minister for Environment, Nature Conservation and Tourism of the Democratic Republic of the Congo; and Dr Augustin B. Njamnshi, Executive Secretary of the Bioresources Development and Conservation Programme, and National Coordinator of the Access Initiative, in Cameroon.

56. Introducing the session, Ms Tumusiime underscored the need for Africa to maintain a united front in the run-up to and during Cancun. She reasoned that climate change was the pre-eminent geopolitical and economic issue of the 21st century. She pointed out the objectives of the Kyoto Protocol, which had established valid guidelines that needed to be taken into account for further negotiations. The integration of climate change into development strategies can help African countries meet MDGs and generate benefits.

57. She noted that Africa needed to play a meaningful role in the global governance of the environment for sustainable development. It should negotiate for new and additional, adequate, dependable and sustainable financial resources under the guidance and supervision of the UNFCCC/COP. It should also establish a fund managed by the Parties. She highlighted the importance of adequate capacity-building and called for a more equitable geographic distribution of clean development mechanism projects. The development and transfer of technology is vital to the success of adaptation and mitigation initiatives.

58. She concluded by urging Africa to champion and defend its common position in the global climate negotiation, and to remind developed countries to fulfil their moral obligations. She affirmed the AUC's commitment to work with all AU member States and stakeholders as well as appropriate institutions in pushing forward Africa's common interests.

59. Mr Ogolla discussed the ongoing international negotiations on climate, key issues and the potential outcomes from Cancun. He pointed out that the negotiations followed a two-track process, namely the Kyoto Protocol and the Bali Action Plan, and described them as complex and time-sensitive.

60. He spelt out the issues of concern, including: changing the structure of the climate change regime; the need for new means of implementing adaptation and

mitigation initiatives; the scale of emission reductions; ways to define and adopt targets; and the nature of pledges (either bottom-up or top-down). He also acknowledged the importance of putting in place an international mechanism to address loss and damage due to climate change. There is also a need to review compliance and the consequences for non-compliance and to reach consensus on a second commitment period. He noted that Cancun was viewed with mixed feelings and expectations, and that much work had to be done on fundamental agreements.

61. Speaking on behalf of US President Barack Obama and his government, in a recorded video message, Mr Todd Stern, US Special Envoy for Climate Change, expressed strong support for the ADF-VII. He underlined the two major, interlinked challenges being addressed by the ADF-VII: climate change and development. He advised that an agreement on climate should not merely focus on reducing carbon emissions as part of its global response to these challenges. Rather, it should be complemented by the development of a sustainable low-carbon economy. He reiterated the United States' commitment to supporting sustainable energy economies, which drive job creation and investments. He described the Copenhagen Accord as a big step forward, noting the short-term and long-term of financing commitments made by donor countries. He pledged the USA's full commitment to contributing its share. During the 2010 fiscal year, the USA committed 1.7 billion USD, which included a ten-fold increase in assistance towards adaptation initiatives. Africa got a significant proportion of that amount. Funding will increase further in 2011, pending Congress approval. He urged the ADF-VII to move climate negotiations forwards. The Copenhagen Accord achieved a balance on two fronts: all major developed and leading developing economies pledged to be transparent in their commitments to mitigation; and developing countries, particularly the most vulnerable, received landmark financial commitments to support technology, adaptation efforts and the protection of forests. Mr Stern urged that this balance be maintained.

62. Honourable Endundo reiterated that while Africa was responsible for only 3.5 per cent of pollution, it was the continent most vulnerable to climate change. Africa is paying for the crimes of others. He explained that the DRC had coordinated the African negotiation team, and that the African position in climate negotiations was based on 10 principles. These include: providing security for Africa; fairness and historical responsibility; mitigation and adaptation through support for the Kyoto protocol; the principle that the polluter pays; new adequate and sustainable funding; accountability through measurable, reportable and verifiable commitments; technology transfer; effective governance and institutions; and multilateralism in line with the Bali roadmap.

63. Dr Njamnshi called for the updating of the African position, using scientific evidence on climate. Africa should pursue full implementation of the Kyoto Protocol, including by urging the United States to participate. It should oppose any effort to establish adaptation as an obligation, rather than a right, or to use adaptation as a means to divide developing countries. Africa should promote the polluter-payer principle. He stressed the need for Africa to be united, and among other things, urged developed countries, at least, to honour the African Group's demand for $150 billion immediately in "special drawing rights", $400 billion in fast-track financing; and 5 per cent of annex I GNP in longer-term financing. He reaffirmed the commitment of the African civil society, under the umbrella of the Pan-African Climate Justice

Alliance (PACJA), to work together to improve the lives and livelihoods of African people affected by climate change. He concluded by citing an adage that says "If you want to go fast, move alone but if you want to go far, move with others". It is in this spirit that Africa has chosen to cooperate with others in its international climate negotiations.

Recommendations

(a) All stakeholders, including parliamentarians, local communities, indigenous people and the private sector and civil society organizations (CSOs) should be involved in climate negotiations. Greater effort should be made to strengthen women's participation in the negotiations. It is vital for the outcome of the negotiations to take into account the benefits to women;

(b) Africa should approach the climate negotiations with a strong voice and united front; African countries must make it clear that they are already feeling the effects of climate change. They should build their negotiating position on the continent's claim for its rights in the light of the damage it has suffered. Developed countries should be urged to fulfil their commitments, including those agreed upon in Copenhagen, and ensure that these funds are new, additional, reliable and sustained;

(c) ADF-VII participants should convey messages from the Forum to constituencies in their countries and ensure the implementation of Forum recommendations;

(d) Africa should harness its potential in terms of available resources and capacity to undertake adaptation actions, while negotiating for additional resources to help them scale up their efforts;

(e) Africa should reform CDM in order to ensure a more equitable geographic distribution of CDM projects;

(f) African negotiations should be informed by outcomes from ministerial conferences and meetings, such as the African Ministerial Conference on the Environment (AMCEN) 2010 meeting in Bamako, and the ADF-VII;

(g) Sustainable land management in Africa should be considered as an important issue in climate negotiations. It is also important to ensure links between the three Rio Conventions (on Desertification, Biodiversity and Climate Change);

(h) Regional institutions, including the AUC, the ECA, the AfDB, and RECs should put in place mechanisms for monitoring REDD+ and other mitigation and adaptation measures; and

(i) Africa should forge and strengthen partnerships to ensure that negotiations deliver a legally binding agreement.

VIII. FOCUS BREAKOUT SESSIONS – IN THREE THEMATIC CLUSTERS

TC1. Climate change, food security and economic development

64. This cluster of three breakout sessions were chaired by Ms Tumusiime and Mr Fred Jachan Omach, Uganda's Minister of State for Finance, Planning and Economic Development.

TC1.1 Climate change, agriculture and food security

65. The lead speakers on climate change, agriculture and food security were Dr Namanga Ngongi, President of the Alliance for a Green Revolution in Africa; and Ms Sheila Sisulu, Deputy Executive Director of World Food Programme (WFP). The discussants were Ms Lindiwe Majele Sibanda, CEO of the Food and Natural Resources Policy Analysis Network (FANRPAN); Mr Aly Abou Sabaa, AfDB Director of the Agriculture and Agro-Industry Department, Mr Cissoko Mamadou, Spokesperson from the African Conference on Agriculture, Food Security and Climate Change; and Mr Johan Rockstrom, Executive Director of the Stockholm Environment Institute (SEI)

66. While the presentations overall concur that climate change is occurring, the questions persist: at what rate? What will the ramifications be for farmers? Climate change strategy for Africa needs to take into consideration the fact that agro-ecological zones will shift, thereby creating further complications.

67. Africa is already pursuing a number of best practices and successful sustainable environmental initiatives, such as community-based rehabilitation and reclamation of land. A notable example is Ethiopia. Therefore, there is no need to reinvent the wheel. This means that for any recommended strategies all stakeholders must redouble their efforts to deliver results: be held accountable; and to work together on common frameworks for adaptation and mitigation action.

68. The main issues raised included the need :

(a) For the establishment of insurance schemes to tackle climate variability and enable farmers to adapt to climate change more appropriately;

(b) For vulnerability indicators to help assess the vulnerability of different population groups;

(c) To increase funding for adaptation and mitigation measures;

(d) For greater synergy between adaptation and mitigation actions at different levels; for example, the link between rain harvesting, conservation agriculture and ecological sanitation;

(e) To improve access to technology, especially for women;

(f) For greater collaboration between ministries of agriculture and natural resources in a changing climate;

(g) For the integration of nutrition issues into food security policies;

(h) For strengthened collaboration between climate scientists and agricultural scientists;

(i) To include agriculture in the educational curricula;

(j) For more effective extension services and rectification of dysfunctional markets;

(k) To mobilize internal resources - for example respecting the Maputo declaration;

(l) To recognize the importance of indigenous knowledge;

(m) For better analysis of food security at the household level, and;

(n) For farmer participation in policy formulation and implementation.

Recommendations

Incorporate climate change into every decision made in Africa;

(a) Adopt a gender-sensitive 'package' approach in addressing food-security and climate-change issues, including access to extension services, markets, technologies, finance, social protection, education, data, land and water/ catchment management;

(b) Seek ways to upscale existing best practices and technologies;

(c) Create an enabling environment at the international, regional and national levels for agriculture, food-security and climate-change policies;

(d) Call on governments to build mechanisms for accountability related to commitments and enhance monitoring, reporting, learning and adaptive management;

(e) Urge African climate-change negotiators to take into account the concerns of farmers, researchers, policymakers, civil society, the private sector and the most vulnerable communities as the drivers of the next climate-change negotiations;

(f) Strengthen partnerships between different institutions working on climate change;

(g) Establish contingency funds for farmers to deal with climate change issues;

(h) Urge governments to enhance regional integration and establish an African common market for food and agricultural products, so as to moderate the impact of climate change on food security;

(i) Expand weather index-based insurance schemes and safety nets to all countries; and

(j) Urge governments to promote innovative financing mechanisms, including the use of carbon markets, for agriculture and food security.

TC1.2 Climate change, trade and industrial development

69. The speakers in this session were: Mr Fred Jachan Omach, Uganda's Minister of State for Finance, Planning and Economic Development; Mr Stephen Karingi of the ECA; Mr Alhaji Bamanga Tukur, Executive President of the African Business Roundtable; and Mr Ivan Mbirimi, Research Associate at the South African Institute of International Affairs.

70. Mr Omach discussed the importance of the connection between climate and agriculture for Africa, given that 90 per cent of its population is engaged in this sector. Since industrialization in Africa is about adding value in agriculture, there is need to maximize resource allocation. Climate change also has ramifications for infrastructure, and its costs on trade should be taken into account. It is important to determine how to moderate problems related to climate change. The carbon economy, science, innovation and technology can be used to help address these issues. Africa needs to take a position on the way forward and include the necessary strategies in its development agenda.

71. Mr Karingi discussed "Climate Change and Trade Openness: Issues and Challenges for Africa", in response to the issues paper. He highlighted the link between the climate change negotiations under the UNFCCC and trade negotiations under the WTO. Empirical research has studied the economic and social impact of climate change, and its findings indicate that the rise in greenhouse emissions will intensify carbon concentration. The question is what the consequences will be for global output, production and trade patterns. If the remaining trade distortions are removed, under the Doha Round, they are likely to cause a small increase in GHG emissions. This means that opening up trade only makes a negligible contribution to climate change.

72. Nonetheless, failure to mitigate climate change will force a significant change in agricultural and exports patterns. It will be much more expensive to sustain trade between nations with increasing climate change. There are three ways of addressing the challenges posed by the phenomenon. First, there is the global climate regulation (a global carbon tax), which does not address the common but differentiated responsibilities and variable geometry across countries. A second approach is to set a ceiling on emissions (free allowances as is the case of the European Union (EU)). The third option is to level the playing field by imposing border carbon tax adjustments (BCAs), which is the equivalent of a carbon tax. However, BCAs pose challenges in terms of WTO consistency and on competitiveness, because countries that are not obliged to reduce emissions will be affected by border tax considerations. Used as trade measures, BCAs could contravene the General Agreement on Tariffs and Trade, opening the floodgates for discrimination, depending on the notion of "like products". This allows for discretion when determining whether product two (similar) products are alike if different energies and carbon intensities are used in their production.

73. Climate change is a global security issue and takes precedence over all other global challenges. Restricting trade openness may not help reduce GHG emissions because research shows that trade's contribution to the problem is negligible. However, developed countries are likely to use BCAs as protectionist measures to shield declining industries. As such, there is a need for international trade laws in addressing climate change. This poses a challenge for African countries because it requires coordination between African negotiators under the UNFCCC and the WTO to safeguard the necessary flexibilities in either set of negotiations. Africa could strengthen such coordination by building technical capacities using the ACPC and the ATPC. The GSP system under the WTO can also be used to support flexibilities for developing countries with regard to BCAs. In addition, Africa needs to scale up its technical work and knowledge so as to understand and determine the right carbon pricing.

74. Mr Tukur discussed the importance of developing the industrial sector, especially because the operating environment is skewed against African operators, who have to compete in global markets. This engenders additional costs in terms of technologies and standards when producing environmentally-compliant goods, which in turn impedes trade. The question is where to obtain the necessary resources for Africa's industrial development. While African countries need to raise funds from the private sector, they also need to intensify the promotion of investment to attract the funds. It is important for Africa to continue it's imitative at policy level, in spite of the fact that negotiations on climate (Copenhagen) and trade (Geneva) have stalled. National policies in Africa need to stimulate the economy in order to fund key sectors, such as agriculture, and to get the private sector involved.

75. Mr Mbirimi contributed to the discussions by reiterating that African countries would bear the brunt of climate change. Without suitable action now, Africa may have policies and actions imposed on it by others. Climate change mitigation brings about change in trade and production parameters, creating opportunities. As the world shifts towards new energies, technologies and less carbon-intensive production methods, and as consumption patterns change, Africa should take advantage of the new climate policies. However, this is only possible if the required policy frameworks are in place to facilitate the shift from agriculture to other sectors. With global climate change we must think ahead or remain stuck in our present development paths. Africa's dependence on agriculture largely determines the effects of climate change on the continent, which translates into a high degree of vulnerability. Fisheries are also vulnerable owing to ailing fresh water habitats, as is tourism because of damage to infrastructure and the migration of species.

Recommendations

(a) There is a need for developing countries to raise public awareness on the carbon/energy content of their produce to help eliminate existing biases against their products;

(b) It is important to concentrate on economic diversification to enhance industrial development in a changing climate. Africa should define its leadership in trade and industrial development;

(c) Africa should engage in WTO negotiations to help integrate climate change challenges for developing countries in global trade agreements. It is also important to understand better the link between industrial competitiveness and climate change;

(d) Africa's industrial sector is still embryonic, which makes it difficult for the continent to implement environment-friendly strategies. In addition, most financial resources in Africa come from abroad. This calls for innovative financial mechanisms to: foster trade-related infrastructure that takes into account climate change; and promote investments through partnership with the rest of the world. Public-private partnerships are a key factor in this regard;

(e) There is need for international climate agreements that help harmonize climate policies to ensure that the various national strategies comply with climate change issues;

(f) A major effort should be made to enhance the capacities of universities to carry out indigenous research, including on Africa's competitiveness in global markets due to limited technologies; and

(g) Trade opportunities for Africa exist in organic production and the development of efficient energy sources, and may be further developed.

TC1.3 Climate change and infrastructure development (energy, water, transport, ICT)

76. The lead speakers for this session were: Mr Kandeh Yumkella, Director General of the United Nations Industrial Development Organization (UNIDO) and Chair UN-Energy; and Mr Bai-Maas Taal, Executive Director of the African Ministers' Council on Water (AMCOW). The discussants were: Mr Bruno Richard Itoua, Minister for Energy of the Republic of the Congo and former AMCOW Chair; Mr Nzabanita Emmanuel, the AfDB's Chief Power Engineer; Mr Simon Thuo, Regional Coordinator of the Nile Basin Initiative Secretariat; and Mr Raffaello Cervigni, the World Bank's Regional Coordinator for Climate Change .

77. In a recorded video message, Mr Yumkella thanked the organizers for affording him the opportunity to contribute to the discussion as part of the ADF-VII. He stressed that climate change was the defining issue of our time and that business as usual was no longer an option for Africa. For that reason, Africa should lead the way in addressing climate change. He noted that the continent was the poorest in energy and essential services, which in itself was a serious obstacle for MDGs. He urged Africa to lead the fight for change, contending that it required major structural transformation to move from poverty to wealth creation, advance the economic empowerment of women and create modern economies. All this calls for greater access to energy. Referring to a global campaign to declare 2012 the year for energy access, he expressed the hope that the ADF-VII outcomes would contain such a declaration. He urged Africa to make great strides and meet the target of universal access to energy by 2020. The continent should also target access to energy to enhance productivity.

78. Mr Taal pointed out that while water was an engine for growth, it did not receive adequate attention in planning or financing. Overall Africa has the lowest average per capita for water storage and harnessing. The investment of one dollar in water returns nine dollars. The availability of water is high, while access is low because of low levels of investment in water infrastructure. This renders access to water one of the biggest development challenges for the African countries. Water is an important factor in peace and security, food security and human health. Donor money does not go to the poor countries that need it the most for water development. There is a need for cooperation and dialogue among the ministries responsible for water and those responsible for financing to ensure that water infrastructure is given due attention in national development and funding.

79. Mr Itoua asserted that the African negotiators faced difficult negotiations ahead. Our countries need to act with common vision and identify the continent's priorities. Africa should turn climate challenges into opportunities by, for example, assuming the lead role in renewable energy. He emphasized the importance of Africa in setting its own energy vision and not waiting for others to impose one on it. He called on Africa to ensure that investment thrived in its vast underutilized energy resources, such as solar.

80. Mr Emmanuel decried the restriction of Africa's economic expansion due to inadequate infrastructure. Inadequacies in transport, water and energy infrastructure make inter- and intra- African trade difficult and curtail investment. Ultimately this is very costly for African countries and the continent as a whole. He enumerated the benefits of investment in infrastructure, which included attracting foreign direct investments, private sector investment, facilitating inter- and intra-regional trade and connecting the African region to global trade. He argued that investment in infrastructure was essential in preparing for disaster management. By way of example, he compared the resilience of countries that had experienced natural disasters, such as Hurricane Katrina in the USA, and the country's rapid recovery. Pakistan, on the other hand, struggled to recover from the floods of 2010. In that light, he also encouraged greater cooperation in disaster preparedness. He also emphasized the need to build climate-resilient infrastructure, upgrade existing ones and invest in green technology. Equally important is the need for reliable climate information and access to it.

81. Mr Thuo noted that to a large extent 'mitigation is energy and adaptation is water'. According to him transboundary water management is essential for adapting to climate change. It is equally important for agriculture, food security and energy. For these reasons, countries need to cooperate to create greater economies of scale. He found today's financing mechanisms cumbersome and urged that procurement processes for investment be simplified, and the performance of financial systems be improved. It is also necessary to Integrate water development in national planning policies. The private sector should be encouraged to help improve access to water by investing in all categories of water projects, ranging from those at the household level to big infrastructural projects. It is crucial to focus on the social and environmental impact of large-scale infrastructure and on efforts to put appropriate mitigation measures in place.

82. Mr Cervigni considered lack of infrastructure as an obstacle to Africa‘s goals and reasoned that good infrastructure would boost economic growth. He cautioned that addressing the uncertainty linked to climate change and the tradeoffs across sectors could become more challenging. Taking advantage of the trade in power between countries that will help reduce emissions and seeking solutions outside of infrastructure could create opportunities.

Recommendations

(a) Improved cooperation between countries is essential for developing continental infrastructure; power and transboundary water management should be reinforced;

(b) Greater inclusion of the private sector in infrastructural development is needed, as is a greater role for public-private partnerships;

(c) Join the campaign to declare 2012 as the year for energy access;

(d) The special needs of Small Island States are important and should be factored in climate-change discourse at all levels;

(e) The gender dimension of climate change impacts and management have to be fully incorporated in all activities and projects to mitigate climate change and adapt to it; and

(f) There is a need to have diverse sources of funding for big infrastructure projects instead of relying on one source of funding or donor.

TC2 Climate change, human development, security and ecosystem sustainability

83. Mr Eugene Owusu, UN Regional coordinator and Resident Representative for Ethiopia, chaired the second thematic cluster.

TC2.1 Climate change and human development

84. The lead speaker for this session was Mr Bunmi Makinwa, Regional Director-Africa of the United Nations Fund for Population Activities (UNFPA). The discussants were Mr Patrick Noack, Scenario Development of HIV/AIDS and Human Development; Mr Abdelkader Bacha, Associate Director of Global Alliance Services; Mr Cheick Tidiane Tall, Executive Director of the African Council of AIDS Service Organizations (AfriCASO); and Ms Esther Agbarakwe, Coordinator/Co-Founder of the Nigeria Youth Climate Coalition (NYCC).

85. Mr Makinwa addressed the issue of “Climate and Human Development”. He started by stressing that human beings were central to sustainable development, naming education, health and employment as areas to focus on in Africa. While economic advancement and progress in the development of infrastructure have helped improve social sectors over the last decade, challenges persist. Pointing out that health indicators were still poor, he focused on the link between health and climate change. The link concerns the effect of climate change on water, forests, agriculture and land, with children and women bearing the brunt of the impacts.

86. Climate change will affect progress made in education because of increased diseases, population displacements and disability. Employment will also suffer owing to increased migration and urbanization, which will cause job opportunities for young people and agricultural production in rural areas to dwindle.

87. Mr Noack referred to similarities between the human immunodeficiency virus infection / acquired immunodeficiency syndrome (HIV/AIDS) and climate change, observing that Africa could learn some useful lessons from this. Like HIV/AIDS, climate change has significant ramifications for Africa and for development, in terms of funding, governance, poverty, the youth and employment, among other things. Lessons to be learned include the risks of "commodification" and low absorption capacity of financial resources. Like HIV/AIDS, climate change does not bring new problems to Africa, but exacerbates existing ones. Other parallels between climate change and HIV/AIDS include migration and employment, which necessitates the involvement of the youth in adaptation and mitigation initiatives. Moreover, there are climate influences in MDGs 4, 5 and 6 to MDG 7[2].

88. Mr Bacha illustrated how climate change aggravated the problems faced by vulnerable groups, especially women and children, at the family level. He discussed the effects of climate change at the sectoral level, including agriculture and water. With both sectors showing evidence of the impact of climate change, he stressed that Africa's human capital was at risk because of low agricultural output, poor food intake and scarce water resources, which could worsen diseases, migration and HIV/AIDS.

89. In his presentation Mr Tall observed that Africa's numerous competing development challenges were putting pressure on access to limited resources. He feared that climate change risked overshadowing other key African priorities.

90. Ms Agbarakwe reiterated the effect of climate change on health and education, stressing its importance to the youth as they bore the brunt of it. She remarked that young people were neither well informed about nor aware of the challenges posed by climate change on their lives and future prospects. She presented cases where the youth were involved in raising awareness, especially in rural areas. The green economy is of utmost importance for them as it represents the future. Therefore, young people in Africa need to be seen as part of the solution. She stressed that because climate change was also about intergenerational equity and partnership, it was a moral imperative to improve governance and ensure that financial resources were properly used.

91. A number of other issues were raised in discussion:

(a) Africa has less than 20 per cent of functional infrastructure. There is a need to revitalize and strengthen the legal and infrastructural framework to address climate change in Africa. Government and other stakeholders need to initiate discussions among themselves to address climate change;

[2] MDG Goals 4, 5, 6 and 7 are respectively: reduce child mortality, improve maternal health, combat HIV/AIDS, malaria and other diseases and ensure environmental sustainability

(b) Citizens should be involved in adaptation and mitigation initiatives early enough to assume ownership of the initiatives and thereby make them sustainable. Plans are for people: abstract terminologies should be avoided and people should be engaged in negotiations, planning and actions at all levels. Gender analyses should articulate the concerns of the most vulnerable group(s) - revisit agenda 21 to inform on gender issues in the agenda;

(c) There is a need to ensure that climate change is addressed through education from pre-school to tertiary education, which will lead to behavioural change;

(d) Discussions and negotiations should highlight the serious implications of migration that is triggered by climate change, and partners should act on this issue;

(e) Communities are being displaced and conflicts over arable and grazing land are intensifying. The developed world is receiving increasing numbers of undocumented immigrants. Africa needs to take charge of these development issues because development cannot be delegated; and

(f) This thorough diagnosis of the impact of climate change allows recommendations to be tailored to suit local and national contexts.

Recommendations

(a) Education is fundamental. Africa should focus on building human capacity to implement the change required in so many development processes;
(b) To deal with emerging challenges, stakeholders should devise a holistic approach that integrates initiatives addressing existing development issues;
(c) There is a need to learn from other sectors about how they are coping with climate change, and to be more united on the global scene;
(d) The 'additionality' principle should be adopted for the funding of adaptation and mitigation actions. Investment in education, health and the creation of employment should not be at the expense of other social investment;
(e) It is necessary to limit reliance on external resources by mobilizing domestic resources for sustainability;
(f) Africa should empower women, especially to strengthen their economic resilience, through capacity-building (education and health) and access to resources;
(g) It is important to extend national coordinating mechanisms to the local level so as to ensure meaningful participation of civil society organizations and mutual accountability; and
(h) There is a need to promote and strengthen community participation in climate-change issues, and adopt a bottom-up approach.

2.2 Climate change, governance, peace and security

92. The lead speakers for this session were: Mr Ramtane Lamamra, the AUC's Commissioner of Peace and Security; and Mr Jacobus Cilliers, Executive Director of the Institute for Security Studies (ISS). The discussants were Mr Jose Endundo,

Minister for Nature Conservation, DRC; and Mr Mersie Ejigu, President and CEO of the Partnership for African Environmental Sustainability.

93. The discussion raised the main points below:

(a) **Issues of peace and security in Africa, including climate-change security-related matters**, **are highly correlated** with **good governance. Many African conflicts**, **including** those linked to **climate**, **are** caused by the **mismanagement of natural resources (forest, mineral and water resources);**

(b) **The AUC/Peace and Security Council (PSC) Protocol is silent on, and does not yet take into account, issues of peace and security related to climate change**;

(c) **Training and research on climate change should be encouraged to provide for more accurate and systematic data for planning purposes**;

(d) **The**re is a need to **protect and conserv**e the **equatorial rainforest**, **not only** in order to safeguard **biodiversity but** p**eace**, **stability** and **related issues as well**;

(e) **African countries need to introduce green accounting systems in order to analyze the impact of climate change in their respective countries. Climate change is** spawning **a new generation of conflicts and destabilization** by **increasing competition for scarce natural resources**;

(f) African countries n**eed to** incorporate **gender in climate-change policies because women and children** bear the brunt **of the** effects of climate change;

(g) Adaptation and mitigation initiatives need to take into **perception and legitimacy** - **formal rule of law and informal (traditional) rule of law and security. Traditional institutions are very important in** preventing and resolving **conflict in Africa**, and **should be revived**; and

(h) It crucial to preserve p**eace and security** so as **to protect the environment** and prevent **ecological destruction**, **which** would otherwise aggravate **climate change and lead to further conflicts.**

Recommendations

(a) AUC/PSC protocol should be amended to take into account security issues related to climate change;

(b) African governments need to enhance their capacity of to conduct green accounting systems and to analyze the impact of climate change in their respective countries;

(c) It is necessary to encourage training and research in climate change in order to ensure accurate and systematic data sources;

(d) The early-warning system of the AUC/PSC should expand to include issues of peace and security arising from climate change, such as land degradation, drought, famine and floods;

(e) The use of preventive diplomacy should also be considered in addressing issues of climate change for peace and security;

(f) The AU, ECA and AfDB should assist governments and decision-makers in taking appropriate measures to address climate change; and

(g) Traditional institutions should be encouraged and given equal opportunity to address conflict resolution in Africa.

2.3 Climate change and ecosystem sustainability

94. Mr Henri Djombo, Minister for Forest Economy, Sustainable Development and the Environment of the Republic of the Congo, was the lead speaker for this session. The discussants were: Mr Kossivi Ayikoe, Togo's Minister for Environment and Forestry; Thomas Staal, Mission Director of the USAID's Africa Bureau; Mr Soumitri Das of the Forestry and Biodiversity Area, The Energy and Resources Institute (TERI); and Colonel Matar Cissé, Director General of Senegal's National Agency of the Great Green Wall.

95. Describing damage caused by climate change on biodiversity and natural ecosystems, Mr Djombo cited the degradation of 60 per cent of ecosystems services in the last fifty years. Environmental degradation has led to poor health, increased food insecurity, reduction of wealth, and intensified conflicts. He lamented that mankind was in the process of erasing the earth's hard disk without knowing the essential part of the data it contained. The world does not have a good understanding of the economic benefits of biodiversity or what its loss would cost. According to FAO, forests have completely disappeared in 25 countries, while 29 other countries have lost 90 per cent of their forest cover. Since 1900 50 per cent of wetlands have been lost, while fishing, pollution, diseases and bleaching have led to the degradation of 30 per cent of coral. The last two decades have seen the disappearance of 35 per cent of mangroves.

96. He outlined a series of measures that could help resolve the problem of ecosystem degradation, promote growth and support adaptation and mitigation efforts in Africa. The measures include sustainable use of biodiversity, sustainable agriculture, integrated water resource management, sustainable forest management through REDD+ and the emerging green economy. The measures should be implemented in an integrated manner, taking into account the links between the Rio Conventions. Current negotiations on climate and biodiversity present a unique opportunity for Africa to address related issues globally and use their outcome to restore its degraded ecosystems, preserve biodiversity, mitigate the effects of climate change and adapt to them.

97. Mr Ayikoe noted that climate change was transforming ecosystems and worsening water shortages, floods and the rise of sea levels. These disasters cause damage indiscriminately and know no national boundaries. In order to address this, African countries need to strengthen their capacity to protect the ecosystem and guarantee the survival of those whose livelihoods depend on it. Africa should speak with one voice at Cancun to ensure the establishment of a green fund. Moreover, Africa should be the greatest defender of the green economy, including green trade.

98. Monitoring systems should be put in place to enhance understanding of these phenomena and appropriate response. He also pointed out that in order to respond effectively we need to harness science and technology, be innovative in using our internal resources, appropriately focusing on the poor and most vulnerable, creating a favourable environment and enhancing the role of the private sector.

99. For his part, Mr Das showed documented evidence that the current human development path had degraded the ecosystem, thereby significantly contributing to climate change. He outlined the impacts of climate change on development. They included exacerbating poverty, slowing down economic growth, reducing agricultural productivity and challenging the human capacity to achieve ecological, economic and social objectives. He discussed measures, inter alia, afforestation, reforestation, use of forestry products for bioenergy, improving land management and the restoration of degraded lands, that use the ecosystem to mitigate climate change. He underscored the importance of maintaining healthy ecosystems so as to sustain the supply of raw materials needed for the economy. Equally important is the assimilation of wastes generated by economic production. In conclusion, he emphasized the need for a paradigm shift to better integrate economic growth in sustaining the ecosystem.

100. Colonel Cissé discussed the Great Green Wall initiative for the Sahel, which reflects Africa's pro-activeness in planning and promoting integrated and transboundary projects and programmes. The initiative takes into account all the Rio conventions. Among key activities are tree planting and sustainable land management. The programme fosters the exchange of experience and synergies with other sustainable development initiatives. A pan-African agency for the Great Green Wall has been created to spearhead this programme.

Recommendations

(a) Climate change poses challenges for the sustainability of ecosystems and the exploitation of the opportunities provided by vast, diverse ecosystems and natural resources. Africa should give priority to the green economy as a vehicle for addressing these challenges to sustain its development. To this purpose, African countries should promote Payment for Ecosystem Services;

(b) Africa needs to promote human-centred ecosystem management as a key to enhancing ecosystem goods and services. This would be a basis for improving the livelihoods of local communities while helping to mitigate climate change and adapt to it;

(c) Governments in Africa should create a favourable environment including policy, institutional and governance mechanisms, and enhance coordination so as to manage ecosystems appropriately and sustainably;

(d) The development and implementation of REDD+ initiatives in Africa should be encouraged and take into consideration the goal of poverty eradication as well as the needs of local communities, in particular vulnerable groups, including indigenous people, women, and children. As such the initiatives should include sufficient safeguard policies;

(e) Africa needs to adopt an integrated approach to ecosystem management across sectors and landscapes. The Great Green Wall for the Sahel provides a framework for implementing this approach. Transboundary projects that foster joint action and cooperation among countries should be developed and implemented at subregional and regional levels. This could reinforce a common African voice. The Guinea Current Project and the Great Green Wall for the Sahel provide sound initiatives to build upon. The ECA, AUC, AfDB and RECs should collaborate with development partners to develop priority actions aimed at promoting such subregional and regional initiatives;

(f) There is a need to put in place and strengthen systems for monitoring climate change and its effects on the sustainability of ecosystems at all levels, including community level. To this purpose, African countries should promote accessible, affordable and appropriate technology and encourage the use of simplified and well-contextualized science;

(g) It is important to simplify procedures for obtaining climate-related funding and strengthen mechanisms to ensure fairness, transparency, timeliness and accountability; and

(h) South-South cooperation should be fostered to address Africa's priorities. These include capacity-building, funding and transferring technology to sustain ecosystems, mitigate climate change and adapt to it. Trade and investment initiatives should take into consideration sustainable management of ecosystems.

TC3 Harnessing means of response to climate change

101. Mr Festus Mogae, former president of Botswana and Chairperson of the Governing Board of the CoDA chaired the third cluster.

3.1 Climate risk management: monitoring, assessment, warning, disaster-risk reduction

102. The lead speaker for this session was Mr Stephen E. Zebiak, Director-General of the International Research Institute for climate and society (IRI). The discussants were: Mr William Westermeyer, Deputy Director of the Global Climate Observing Systems (GCOS) Secretariat; Mr Mounkaila Goumandakoye, UNEP's Regional Director for Africa; and Mr Alhassane Diallo, Director General of the African Centre of Meteorological Application for Development.

103. To commence, a short video was presented on the ***Coalition*** for ***Dialogue*** on ***Africa***, a development think-tank that advocates for the continent, provides a platform for African voices to be heard and promotes dialogue on emerging and pressing challenges.

104. Mr Zebiak then presented an analysis of Climate Risk Management (CRM), with a focus on opportunities, and resources available to support pertinent activities in Africa. He pointed out that since five out of eight MDGs were climate sensitive, climate was an important development issue. Hunger, weather-related disasters and

epidemics are particular climate-sensitive developmental problems in Africa. He explained that over time, weather and climate-related disasters and vulnerability to such disasters had increased in Africa, particularly in the semi-arid belt. This has had ramifications for many sectors of the economy. He used the example of Ethiopia and United Republic of Tanzania to illustrate the correlation between GDP growth and rainfall. Climate change is increasing the variability in weather and climate - hence the need for improved means of managing climate risks, and for long-term climate-change strategies. Mr Zebiak proposed an integrated CRM approach that identifies climate-related vulnerabilities and opportunities, as well as a raft of solutions, including tools, technologies, policies, practices, plans and contingencies for managing climate risks. There is need to address immediate development goals affected by climate variability, while developing future resilience.

105. The key ingredients for CRM are: adequate data/information; institutions that can understand climate risk from a development perspective; policies for adopting climate-risk practices; effective communication of knowledge; incorporation of best science; and investment to support the process. He cited Index Insurance as a tool that is successfully used in Malawi to deal with climate risks faced by smallholder farmers. He concluded by citing ClimDevAfrica and the Global Framework for Climate Services as two major opportunities for Africa to deal with climate risks. He stressed that these two projects would help Africa share knowledge and information, build capacity and translate knowledge and information into practical decisions and policies for the mitigation of climate change.

106. Mr Westermeyer gave a brief description of the work of the GCOS and its importance for effective CRM, noting the direct link between climate observations and climate services for CRM. He applauded the launch of the ClimDevAfrica Programme and its readiness for implementation. He stressed the need for greater networking, particularly at the country level, because national weather services are not the only institutions concerned with climate data.

107. Mr Goumandakoye observed that the presentation by Mr Zebiak focused on climate information and CRM. He noted the importance of taking into account environmental factors and those that intensified climate change– particularly in monitoring and assessing the environment. To illustrate his point Mr Goumandakoye mentioned UNEP's ongoing activities to monitor the environment and assess risks related to it. He informed the session that the *Global Environment Outlook*, a UNEP publication that is in its 5th series, provided a clear assessment of the challenges and opportunities that climate change presented. *Africa Environment Outlook*, on the other hand, goes further, taking into account the socio-economic impacts of climate change. He also mentioned the Africa Environmental Information Network, which seeks to harness and enhance access to information and knowledge to support the management of Africa's environmental resources, given their importance for sustainable development. Coverage by the Africa Environmental Information Network is still low, with 13 countries covered so far, but plans are under way to extend it to all African countries.

108. He asserted that opportunities existed for strengthening the capacities of African member States, including by sharing information. This involves using the aforementioned and other initiatives, such as the CDM, which allows African member

States to exploit investment and capacity-building resources in sectors where the continent has huge potential. He explained that under the guardianship of the CDM, the number of climate-related projects had grown from under 40 in previous years to over 3,500 clean energy-related projects identified to strengthen the existing energy generation capacity or for harnessing clean energy potential. In conclusion, he expressed the hope that national programmes of adaptation would strengthen the capacity of member States by bringing them into line with development programmes and sectoral priorities.

109. Mr Diallo reiterated that climate change affected precipitation, temperature, and sea-level rise that could cause disasters. He pointed out that already there was an increase in disasters that were affecting human life and the economy. Africa is suffering from the human and economic losses brought on by droughts, floods, hurricanes and epidemics. Mr Diallo urged for information and the strengthening of the capacity to mitigate the impact of disasters. He stressed the need for people to understand climate-related risks and prepare for them, and for countries to adopt national policies and put in place early- warning systems. To manage climate-related risks and achieve development, it is important to: build institutional capacity, capacity in scientific and technical expertise, knowledge on how to predict precipitation; and exchange data and information. He concluded by appealing to partners to work together in order to tackle climate change. He emphasized the need to set up observatories for assessing climatic variables, and for a new paradigm for managing climate-related disaster risks.

Recommendations:

(a) Coastal climate-risk management is an emerging issue in Africa because of the risks associated with very rapid urbanization. There is an urgent need for information and tools for land planning and policy and regulatory frameworks that take due account of the climate risks associated with rapid urbanization. This should be considered a top priority;

(b) The management of climate risks raises three challenges that Africa needs to address: the production of information; institutions capable of using such information; and, collaboration between scientists and policymakers. Based on experience with the assessment and dissemination of real-time production forecasting for ECOWAS, the main challenge concerns using information in decision-making, for instance, to manage trade flows at the country/subregional levels, and by policymakers for finance and trade;

(c) In recent times the Red Cross has relied heavily on getting the right information from early warning systems to plan logistics and formulate contingency plans ahead of time so as to respond appropriately to natural disasters by providing humanitarian assistance. This exemplary collaboration should be transferred to other areas and development communities. It is necessary to obtain feedback from information users and establish proper channels of communication to enable humanitarian agencies to help climate scientists and services enhance responses to climate-related disasters;

(d) Africa cannot expect everything from the North and must assume responsibility for capacity-building and scale it up for local populations, which possess rich ancestral know-how. African countries must also develop their own initiatives, such as the "Feed-in tariff" in Kenya, which allows for the connection of the geothermal energy sub-sector to the power grid;

(e) ClimDevAfrica and partners, such as UNEP, should solidly support the creation and re-building of regional and subregional ecological surveillance and monitoring systems that could also be used to conduct prospective studies. It is important to ensure that shaping and implementing the Global Framework for Climate Services (GFCS) takes into account Africa's special needs;

(f) Africa should expand country-level dissemination of guidelines on accessing CDM funds for climate-sensitive sector projects. Countries should have access to resources to develop CRM-related projects;

(g) Considering that some participants expressed scepticism about index insurance, it is necessary to disseminate best practices and demonstrate how viable the approach is in different settings; and

(h) Given the important role that young people can play in CRM, there is a need to mobilize them in several ways, including: involving them in the assessment of problems; providing grassroots youth and women's organizations with the resources to help them integrate disaster-risk reduction into their on-going development processes and programmes; incorporating CRM in curricula at all levels of the education systems; and, promoting accountability at all levels.

3.2 Financing climate change adaptation and mitigation actions

110. The lead speaker was Mr Anthony Nyong, Manager of the AfDB's Compliance and Safeguards Division. The discussants were: Ms Sinazo Sibisi, Divisional Executive, Development Planning of the Development Bank of Southern Africa (DBSA); and Mr George Awudi of the Pan-African Climate Justice Alliance.

111. Mr Nyong highlighted three key messages: urgent and bold climate change financing needs for Africa; the inadequacy of existing sources of financing and disbursement mechanisms; and, the crucial need for appropriate financing mechanism for Africa.

112. Starting with the first message, he put Africa's needs at an estimated US$ 22-31 billion per year, by 2015, and US$52-68 billion per year by 2030. The estimates are arguably lower than the economic benefits of adaptation and mitigation. Turning to the second message, he asserted that pledges fell short of the amounts required to address the challenges posed by climate change. He added that Africa had not fully tapped into the carbon market pathway through the CDM. His third key message was that Africa's priorities were not well addressed. The continent needs an appropriate funding mechanism to address its specific challenges. The proposed Africa Green Fund at the AfDB constitutes an adequate response.

113. Ms Sibisi started her presentation by urging Africa to act now to tackle the challenges posed by climate change. In responding to the challenges, the continent should have greater understanding of the impact of climate change on its development path. It should also be supported by new funding mechanisms and by institutional changes. She noted that for Africans to ensure that their response has an impact, they must act now, and collectively.

114. Mr Awudi highlighted a key objective of the PACJA: to ensure that the outcomes of climate-change negotiations were fair to all, including African countries. In particular, PACJA seeks to advocate and lobby for a multilateral global fund that is fully accountable and equitable with respect to the needs of Africa. Such a fund should also be guided by the principles stipulated in UN conventions. The fund is necessitated by the inherent shortcomings and flaws associated with existing funds, especially the fast-track initiative. The shortcomings and flaws include: the magnitude of the resources available through such funds, without rigorous analysis and assessment; restrictions on access to the funds and their limited additionality; failure to account for broader commitments, such as devoting 1.5 per cent of developed countries' GDP to funding mitigation and adaptation in developing countries; distorted priorities; and, the loan component that is part of the support offered by the funds.

115. The main issues raised during discussion include the need for:

(a) An emergency fund so as to start tackling the impact of climate change before the long-term financing scheme takes hold;

(b) Africa to be proactive and to design institutions that articulate a clear plan during the climate change negotiations, and thereby establish a coherent voice for the continent;

(c) Multinationals and the private sector to absorb the negative impact of climate change, and;

(d) Research-based evidence to help assess the total cost of the impact of climate change.

Recommendations

(a) The pursuit of financial compensation for damage caused by climate change should not divert the continent's attention from long-term development challenges. Harnessing the full potential of funding for climate change initiatives would largely depend on the extent to which mitigation and adaptation strategies are integrated into long-term and homegrown development planning;

(b) Such funding should be predicable, commensurable with needs and aligned to the priorities of the continent. Additionally, the funding should be located in Africa and managed by African institutions for the sake of ownership. The incorporation of gender in climate-change response initiatives should count among the criteria for access to this source of funding;

(c) The continent should establish the Africa Green Fund, hosted by the AfDB and supported by on the UNFCCC. The hosting by the AfDB is justified by the need to ensure: ownership of the process; the improvement of Africa's participation in decision-making; better access to the fund's resources; and, a balanced distribution of the fund's resources between adaptation and mitigation; and

(d) The continent should immediately establish a clear programme for fast track funding.

3.3 Science, technology, innovation, capacity-building for adaptation and mitigation

116. The lead speaker for this session was Prof. Bruce Hewitson, Head of the Climate Science Applications Group of the University of Cape Town. The discussants were: Prof. Sospeter Muhongo, Professor of Geology at the University of Dar Es Salam, United Republic of Tanzania; Mr Kevin Urama, Executive Director of the African Technology Policy Studies Network; Ms Susan Burns, CEO of the Global Footprint Network; and Dr Jabavu Clifford Nkomo of the CCAA Programme of the International Development Research Centre (IDRC), Kenya.

117. Professor Hewitson made a presentation entitled "Building Capacity in Science and Technology". He identified the main problems faced by African scientists - limited access to quality data and information and policymakers' limited knowledge on the use of specialized information. In the short term it is important to put a premium on the knowledge required to make progress, and to identify and overcome critical barriers. Investments must deliver on real social needs. Africa should establish a link between existing knowledge networks and platforms to meet thresholds for success.

118. With respect to decision making about climate change, the requirement includes understanding past events, current circulation changes, Global Climate Model (GCM) simulations and 'down-scaling' for different regions. We then need to integrate these factors into our understanding of the impact of climate change. This will help create scenarios of climate change in different regions, with the results disseminated effectively to policy stakeholders.

119. Using a practical example, the presenter showed that the UNFCCC negotiation process required African negotiators to be skilled and competent in the nuances of African climate information. He urged for the production of scientific articles ahead of the 17th Conference of the Parties to the UNFCCC. Learning from the past in order to establish what works, and identifying bottlenecks in communication are important for both scientists and policymakers. There is a need to prioritize challenges, invest in strengthening existing capacities, and facilitate African community engagement in key international actions. He gave an example of the Coordinated Regional climate Downscaling Experiment (CORDEX), instituted by WMO. CORDEX is established in all regions to produce high-resolution images for Africa, and its outcomes are expected to help the continent strengthen its negotiations.

120. He concluded by calling for an environment where people are free to innovate and partner with the developed world to address Africa's needs. He reiterated the need for multi-disciplinary and multi-institutional research, and the consolidation of scientific capacity through education in order to meet priority requirements, such as negotiations on long-term climate change.

121. Professor Muhongo, made a presentation entitled "Science, technology, innovation and capacity-building for addressing climate change: Harnessing means of science-based response to Climate Change". He stated that a science-based response to climate change was essential but that finance and capacities in Africa were inadequate. Many problems, such as the loss of species, worsening water scarcity and the emergence and remergence of infectious diseases on the continent are largely man-made, and anthropogenic global warming will aggravate them. He stressed the need for major investment in education–human capital –notably in frontier sciences, ICTs and space technologies, biosciences and biotechnologies, nuclear sciences and nuclear technology, and nanotechnology, to help protect the continent from the effects of climate change.

122. Dr Urama made a presentation on 'Harnessing Science, Technology and Innovation for Climate Change Adaptation and Mitigation'. He asserted that improved science, technology and innovation was essential for development in a changing climate, and that the critical issue was the type of capacity to build and how to build it, taking into account collective and national priorities.

123. As climate change is a crosscutting challenge with multi-faceted impacts, it requires multi-disciplinary and trans-disciplinary approaches, taking systems into consideration and responsible innovation. Africa should build its own indigenous scientific and innovative capacity so as to assess risks and vulnerabilities for key economic sectors, develop early warning systems, estimate costs of adaptation and mitigation, thereby ensuring their inclusion in overall economic policy and planning. He lamented that Africa faced obstacles in its efforts to deal with the effects of climate change. The obstacles include: the public perception of scientific and technical information; funding-driven initiatives that fail to assess priorities; technology transfer vis-à-vis knowledge sharing; overall poor collaboration among actors and, lack of coordination of national systems of innovation.

124. Dr Urama suggested specific actions to address these challenges in Africa. The actions include assessments of technology needs for adaptation and mitigation initiatives. Based on the assessments, countries should develop national action plans for climate change adaptation and mitigation. The plans can be realized through climate innovation incubation programmes, and innovation awards schemes. In all this, there is a need to build synergies, collaboration and coordination to harness complementarities among existing national, regional and pan-Africa institutions that specialize in scientific and technical information. In particular Africa needs to ensure access to the sustained production of reliable climate data and information. He strongly recommended institutional collaboration and coordination in research and development programmes and projects, as well as improved infrastructure and capacity to develop innovative solutions. Africa also needs to address the issue of the brain drain.

125. In her presentation on 'African Footprint/Human Development Framework: Accelerating Development Success', Ms Burns discussed the need for more sophisticated tools, other than GDP, to track economic performance, the quality of life and environmental sustainability; she called this the ecological footprint indicator.

126. Through facts and figures, she explained how an Ecological Footprint provided a way to track a country's demand on ecological resources in relation to the availability of such resources. The Ecological Footprint measures, for any given year, the amount that nature provides (bio-capacity) and the amount that we consume (footprint) against the capacity available to regenerate the consumed resources. She argued that the Ecological Footprint was a cost-effective policy tool for weighing policy options, especially in a changing climate. It links choices with potential consequences. By focusing on national self-interest, it helps reveal the economic opportunities of development that works with, rather than against the budget of nature. It also counteracts the perception that such development is an additional economic burden rather than a fruitful investment with quick and reliable returns.

127. In attention to ecological risks amplifies the potential damage to countries that are not prepared to mitigate them. In contrast, rigorous ecological resource accounting – given that it supports decision-making on budget priorities, investment opportunities, negotiation positions, trade strategies and development policies – becomes as useful and as significant to national success as financial accounting. She concluded by informing the meeting on the African ecological footprint joint programme between the ECA-International Council for Science (ICSU) Regional Office for Africa and the Global Footprint network, scheduled to start in four pilot countries: Ghana, Morocco, Rwanda and United Republic of Tanzania.

128. Dr Nkomo reasoned that improving the adaptive capacity of people vulnerable to climate change is a key requirement for mitigation and adaptation. To this end, it is necessary to build the capacity of researchers to do quality research. He mentioned the role of the private sector, CSOs and international development partners, and the involvement of policymakers. Decision- makers need concise information in a usable format. It is vital to strengthen key capacities, including: the ability to package information for the intended audience without distorting it, and to use the right media for their intended purposes. For example climate information may reach the intended audience and be unusable, owing to conflict with traditional knowledge at the local level. Can both sets of information be used in risk management? In some cases, traditional information or knowledge yields better results than scientific information. Through research the two can become complementary.

129. The main issues raised during discussion were as follows:

(a) There is a need to create an incentive mechanism for researchers. A lot of researchers get frustrated and change their profession owing to the constraining environment;

(b) The footprint model for assessing environmental/climate change requires multiple sources of data gathered both from inside and outside the country to determine the situation in a given country;

(c) Africa needs to use the potential of its scientific community, for example, in MDG villages it would have been useful to use science advisors;

(d) With respect to solar power, Africa has untapped potential. The panellist mentioned the proposed project in the Sahara to produce solar energy and export it to Europe. That is the energy of the future;

(e) In terms of education, there is a need to focus attention on enhancing the quality of vocational education and create a better link between research and industry;

(f) While science and technology are important, we cannot rely on scientists to transfer high-level knowledge to communities. We need trained people in the middle to translate this to the communities in their language and at their level of understanding; and

(g) Creating climate innovation and incubation centres in Africa is very important. There will be an initiative next year on climate innovation awards for the youth.

Recommendations

(a) African countries should increase their investment in quality science education, and research and development, and introduce incentive mechanisms to attract more girls, women and the youth;

(b) Countries need support to conduct national assessments of their technology needs for adaptation and mitigation. Based on the assessments, countries need to develop national action plans for adaptation and mitigation that could include climate innovation incubation programmes and innovation awards schemes. To this purpose, we should build synergies and collaboration to harness complementarities among existing national, regional and pan-African institutions;

(c) Countries and their development partners should support the development of a real-time Internet-based data/knowledge collection infrastructure to assist researchers to better study climate change and its impacts, and to formulate mitigation strategies;

(d) African governments should promote greener economies through investment in development and the use of renewable energies, especially the continent's ubiquitous solar and wind energy resources;

(e) It is important to support communication for science to ensure timely access to relevant information for better and informed decision-making in climate change;

(f) Africa should create general awareness and common knowledge on climate change and its consequences, and strengthen its countries' negotiation capacity;

(g) The continent needs to promote a mechanism for sharing research facilities, quality data, knowledge, technologies, innovations, human and financial resources for combating climate change, and to work in partnerships within and outside the continent;

(h) Africa needs to exploit its traditional/indigenous knowledge and use a participatory approach to enhance local community involvement;

(i) African governments should develop mechanisms to address the issue of the brain drain and encourage brain gain and brain circulation through South-South and North-South scientific cooperation;

(j) African institutions dealing with natural hazards and disasters should collaborate more to provide improved services to decision makers and end-users;

(k) There is a need to develop a climate change innovation policy at the national and regional levels and promote innovations relating to climate change and technology transfer centres; and

(l) It is necessary to incorporate climate change education and research findings into Africa's planning and development policies.

IX. PLENARY SESSION 5: PRIVATE SECTOR RESPONSE TO CLIMATE CHANGE

130. Ms Abiola Dosumu, Chairperson of the Emerging Markets Oil and Gas Ltd, ABR, and Ms Tumusiime Rhoda Peace, the AUC's Commissioner of Rural Economy and Agriculture chaired this session. Mr Nzabanita Emmanuel, the AfDB's Chief Power Engineer was the lead speaker. The panellists were: Mr Lloyd Chingambo, Chairman of the Africa Carbon Credit Exchange; Dr Simon Young, Chief Executive Officer of the Caribbean Catastrophe Risk Insurance Facility; Ms Angela Kallhague, Senior Advisor, in the Climate Change Section of the Swedish Energy Agency; Mr Shadreck Mapfumo, Vice President of the Crop Insurance for Africa and Asia, Micro Insurance Agency; and Mr Dotun Ajayi, Regional Manager of the African Business Roundtable.

131. Mr Nzabanita emphasized the importance of coordination among all partners in tackling the complexities of climate change. He highlighted the need for private sector contributions to meet climate change challenges. Perhaps the private sector should provide as much as 86 per cent of the financing through its engagements in all development sectors (including potable water supply, agriculture, energy and health care). It is crucial to make the policy environment more favourable to the private sector. This is not the case, barring a few exceptions, such as Kenya and South Africa. Africa's leadership needs to demonstrate much greater commitment to attracting private sector investments to the many opportunities across the continent.

132. Mr Nzabanita summarized key policies and strategies adopted by the AfDB to assist its regional member countries in addressing climate change. The Bank is helping its regional member countries put in place the necessary regulatory frameworks to attract the private sector. Africa will also need to develop larger markets through proper regional integration. The Bank will play its role as the continent's premier development institution, working to make international financial resources accessible to the private sector, much as it does with ClimDevAfrica, the

Climate Investment Funds, the Clean Energy Fund, and the proposed Africa Green Fund, among others.

133. Ms Kallhague made a reference to challenges facing the private sector in the carbon market in Africa, and to lessons learnt through collaboration between private sector organizations in Sweden and Africa. The continent faces many challenges in meeting its financing requirements for climate change. The challenges arise in part from the small size of projects proposed, which is a reason for the failure to attract substantial funding resources. In some countries, including, Kenya, United Republic of Tanzania and Zambia, key players are collaborating to build capacity by promoting and strengthening communication between the commercial sector and government, and thereby enhancing mutual understanding. Capacity-building, involving clean development mechanism programmes, will ease access to the resources. She concluded by noting that public/ private partnerships were possible in Africa and should be a short- to medium-term objective.

134. Mr Lloyd presented Zambia as a case study on partnerships with the private sector in national economic development that embraces the climate change agenda. He noted the improved communication between the private sector and the government, which had increased the chances of meaningful collaboration. The Zambian government is developing an innovative framework for discussion with all stakeholders, including banks, in order respond to everyone's needs. The goal is to define appropriate ways of addressing key issues, such lack of knowledge, funding and markets, so as to enhance access to the broad array of funds, including the carbon credit exchange, that are available for Africa's development.

135. Dr Young addressed the need for effective risk-management tools. To illustrate his point he mentioned the Caribbean, where insurance and re-insurance companies help manage climate risks. Beset by frequent catastrophic events, such as cyclones and earthquakes, the region has assessed risks and developed appropriate adaptation strategies that differ greatly from country to country. The region has also set up an Insurance pool for countries facing similar risks. He concluded by calling for the creation of African risk pools as an important way of spreading risks and costs. Farming communities need to establish cooperative structures that could help improve individuals' access to weather-risk insurance. For this to happen African governments need to develop favourable policies to promote stronger partnerships between the private and public sectors.

136. Mr Mapfumo assessed the role of weather-related crop insurance in Africa, reasoning that private-sector involvement in such insurance was marginal. He added that Kenya, Malawi, Rwanda and United Republic of Tanzania had launched such insurance schemes on a pilot basis. While the demand for weather insurance in Africa is high, the environment is not favourable for the private sector's participation. The lack of efficient and adequate weather infrastructure in farming areas makes it difficult to evaluate local climate risks. Farming is generally a reserve of smallholders relying on subsistence practices, which keeps insurance premiums higher (10 per cent) than the 2 per cent farmers are prepared to pay.

137. The continent should develop risk pools, which are instruments for evaluating and pricing risks and which could help reduce premium prices from 10 per cent

towards the desired 2 per cent. Mr Mapfumo urged for the development of a continental weather index insurance framework, to help adjust the cost of insurance to the weather index rather than to the actual loss of production.

138. Mr Ajayi reiterated the role of the private sector in addressing climate change. There is a need to mobilize domestic resources, including those of the private sector. This cannot happen without good governance and policies that favour investment. Climate-change policy and trade policy should be compatible. He urged governments to focus on developing trade-related infrastructure, which could help ease access to all the opportunities international system offers that relate to climate change.

Recommendations

(a) Africa should create an enabling policy environment to harness the private sector's expertise, resources and creativity, and encourage it to work in partnership with public-sector and CSOs. This will help accelerate efforts to address challenges posed by climate change on the continent. Africa needs to develop policies to help overcome key climate-related risks and provide incentives to encourage climate-friendly investments;

(b) There is a need to establish minimum standards for local and foreign direct investments that promote climate-sensitive investments and business decisions in the region;

(c) The continent should develop a pan-African risk pool by merging small markets with bigger ones in order to spread risks and lower costs. Africa should use the experience of countries, such as Japan, in developing policies to support the informal sector, and that of the Caribbean in creating risk pools to spread the risks and costs related to climate change;

(d) The private sector should be encouraged to work with key public organizations and institutions to share and disseminate knowledge, experiences and expertise. This will promote awareness of the essential role of the private sector in investment, and of business opportunities that address climate change mitigation and adaptation; and

(e) African governments should work with the private sector to encourage research and development that will: create Africa-specific technological solutions to climate change challenges; and, support low-carbon technologies, taking into account Africa's rich indigenous knowledge systems.

X. PLENARY SESSION 6 AND 7: CONSIDERATION AND ADOPTION OF THE CONSENSUS STATEMENT

139. Dr Josué Dioné presented the draft consensus statement for consideration by the meeting. After constructive discussion, the Forum adopted the consensus statement presented in annex 5.

X1. CLOSING SESSION

140. In closing, and on behalf of the three organizers – the ECA, the AUC and the AfDB, the ECA's Deputy Executive Secretary, Mrs Jennifer Kargbo acknowledged the invaluable contributions, made in various ways by all the participants, to the success of the event. She reiterated that climate change was a real existential problem for Africa and expressed the hope that each delegate would carry forward the issues discussed during the Forum's frank, enriching and intensive dialogue. She hoped that the participants would implement recommendations presented under the section on the "Way Forward" of the consensus statement– the most significant expression of the Forum's collective effort.

141. She asserted that without all the delegates' active participation and commitment, the Forum would not have been able to achieve its objective. She reserved her most sincere gratitude for CoDA members for their wisdom in addressing the very important segment on "Harnessing means of response to climate change". This is at the core of Africa's capacity and ability to carry its development agenda forward. Her special thanks went to former president Festus Mogae of Botswana and Chairperson of CoDA, the CoDA convener, Professor Abdoulaye Bathily and Dr Speciosa Wandira Kazibwe, former vice president of the Republic of Uganda for supporting the initiative.

142. On behalf of the organizers, she extended her sincere gratitude to Their Excellencies President Girma Wolde-Giorgis and Prime Minister Meles Zenawi of the Federal Democratic Republic of Ethiopia, Prime Minister Jens Stoltenberg of Norway, President Goodluck Jonathan of Nigeria, US President Barack Obama and HRH The Prince of Wales for their exemplary leadership, commitment and contributions to the success of the event. She also commended ministers from member States and partnering countries for the energy they brought to the sessions, and their encouraging support to the ECA's major initiatives. Similar sentiments were conveyed to all the participants and resources persons, including chairpersons, lead speakers, moderators, discussants, panellists and representatives of CSOs, for their energy and fresh perspectives, which enlightened and educated the ADF.

143. Mrs Kargbo concluded by commending all the staff of the ECA, AfDB, AUC, other UN agencies and DFID for the collaborative manner in which they organized the Forum through the ADF-VII secretariat and its steering and other committees. She commended the government and people of Ethiopia for the generous hospitality and excellent arrangements provided for the Forum, and declared it closed.

Annexes

1. Concept note

2. Overview

3. The set of 12 issues papers

4. Agenda and programme

5. Consensus statement

6. List of participants

7. Indicative action plan

Annex 1. ADF-VII concept note

Acting on climate change for sustainable development in Africa

I. Background and justification

1. Climate change is one of the most challenging threats to sustainable development in Africa. Although the continent contributes less than 4 per cent of total GHGs, its countries are among the most vulnerable to climate change in the world. This vulnerability is attributable to multiple stresses, made worse by limited capacity to adapt to climate change. Firstly, many African countries are located in regions with warm and relatively dry climate. The continent has extensive marginal areas with poor soils and highly variable rainfall. Secondly, most African economies rely heavily on climate-sensitive sectors, such as agriculture, fisheries, forestry, other natural resources and tourism. Thirdly, the continent is unable to respond adequately to the direct and indirect effects of climate change because of widespread poverty, poor economic and social infrastructure, conflicts, limited human and institutional capacities and inadequate technologies and financial resources. In Africa poor people bear the brunt of climate change because they tend to live in environments that are most susceptible to droughts, floods and other extreme weather events.

2. The *Fourth Assessment Report* of the IPCC and other major reports, such as *the Stern Review on the Economics of Climate Change*, mention evident and expected impacts of climate change on Africa's development. The impacts threaten the achievement of the MDGs and sustainable development in the region. They include:

(a) Increased water stress and water-related conflicts;

(b) Restricted agricultural production and increased food insecurity;

(c) Increased energy constraints–a further challenge to industrial development;

(d) Rising sea levels, that cause damage to livelihoods, infrastructure and the environment in coastal regions;

(e) Loss of biodiversity, forests and other natural habitats, threatening the wellbeing of millions of people, whose livelihoods depend on biodiversity resources;

(f) An expanded range and prevalence of vector-borne diseases, adding to the challenge of the HIV/AIDS pandemic that affects mostly poor

people, who live in desperate conditions and lack access to health care; and

(g) Increased risks of disasters, conflicts, instability and security threats, associated with massive population migrations sparked by extreme climate events.

3. African countries must make concerted efforts to adapt to climate change overall to increase the resilience of their societies and economies to the many new challenges. Solid global mitigation actions taken now could still prevent the worst impacts of climate change. For such actions to be effective all stakeholders will need to incorporate concerns over climate change into their development policies, strategies, programmes and practices. Sectors that are vulnerable to climate change will require particular attention. Such actions should be conceived and implemented in full cognizance of the evidence, impact and challenges of climate change, and of the opportunities associated with climate change. Chief among these are opportunities for Africa to adopt low-carbon and greener development pathways. The provisions of a post-2012 global agreement must bring optimal benefits to Africa in terms of technology, funding and capacity-building for adaptation and mitigation.

4. Africa has so far succeeded in articulating its concerns and interests in a common position and conveying them to the international community in the ongoing climate change negotiations. Although the negotiations at the UNFCCC's Fifteenth Conference of Parties (COP-15) concluded without a legally-binding agreement, the resulting Copenhagen Accord made steps in the right direction. Notably, developed countries pledged to curb their GHGs and provide financial support for adaptation and mitigation efforts in developing countries. As negotiations continue towards a hopeful conclusion at COP-16 in Cancun, Mexico in December 2010, it is important for Africa to remain on course and united in refining and managing its common position.

5. The ADF-VII aims to provide a multi-stakeholder platform for discussion and the building of consensus on the foregoing pressing issues. *The Forum will offer an opportunity to exchange information, knowledge and experience on the best ways for Africa to implement policies, strategies, programmes and practices to cope with climate change. The ADF-VII will also help strengthen the African common position in the ongoing international negotiations by raising awareness and building consensus among all African stakeholders and with its development partners on concerns and expectations for a post-2012 global climate-change agreement.*

II. Objectives

Overall objective

6. The overall objective of the Forum is to the raise awareness of all stakeholders and partners at all levels and mobilize them to integrate climate change concerns into development policies, strategies, programmes and practices in Africa. The ADF-VII also aims to strengthen Africa's participation in international climate change negotiations with a view to ensuring adequate reflection of the continent's concerns and priorities in a post-2012 international climate change regime.

Specific objectives

7. More specifically, the ADF-VII will:

   (a) Provide compelling evidence and demonstrate impacts of climate change and the need for widespread adoption of quality climate-risk management practices, using reliable information services, in order to boost adaptation and mitigation policies and practices;

   (b) Deliberate on the many challenges that climate change poses to Africa's development, and the opportunities it presents;

   (c) Promote the sharing of experiences, best practices and lessons learnt in integrating climate change concerns into development policies and practices;

   (d) Define priority actions and measures needed to adequately address challenges posed by climate change, including by exploiting the opportunities it presents;

   (e) Boost Africa's common position on climate change in preparation for the international climate change negotiations in Cancun, Mexico; and

   (f) Build new strategic alliances and partnerships to further Africa's climate change agenda.

III. Expected outcomes and outputs

Outcomes

8. Discussions and dialogue during the ADF VII will help ensure that:

   (a) African stakeholders are better informed about the threats and opportunities associated with climate change;

   (b) African stakeholders enhance their knowledge in managing climate risks by incorporating climate change concerns in development policies and practices;

   (c) African stakeholders boost their capacity to address challenges posed by climate change and exploiting opportunities it presents;

   (d) Africa participates adequately in the Cancun climate-change negotiations;

   (e) Support for the implementation of Africa's priority climate-change initiatives and programmes is strengthened; and

(f) Strategic alliances and partnerships for Africa's climate-change agenda are consolidated.

Outputs

9. During and after the Forum the following key information and follow-up products will be produced and disseminated:

(a) A Forum report;

(b) A consensus statement;

(c) An indicative plan of action;

(d) Press releases;

(e) Daily bulletins;

(f) Web publications; and

(g) A compendium of the Forum's proceedings.

IV. Overall theme

10. From a people-centred livelihood and sustainable development perspective, the ADF-VII will focus on **"Acting on climate change for sustainable development in Africa."**

The plenary sessions set the stage

11. The following four main themes will be considered successively in plenary, setting the stage for the three-day dialogue:

(a) Governance and leadership response to climate change

Given the magnitude of the predicted impacts of climate change on all societies, economies and ecosystems, there is a need for strong and committed leadership, worldwide, to spur a response that matches the challenges at hand. The theme on *governance and leadership response to climate change* will take the form of a ***high-level leadership dialogue***, to be chaired by Mr Ban-Ki Moon[3], the UN Secretary-general. Distinguished and high-level leaders and personalities will address the Forum. They include, His Excellency Meles Zenawi, prime minister of the Democratic Peoples' Republic of Ethiopia, coordinator of the Conference of African Heads of State and Government on Climate Change. Prime Minister Meles is also the co-chair of the High-Level Panel on Climate Change Financing, established by the Mr Ban-Ki-Moon, to follow-up on the Copenhagen Outcomes on Financing. He will speak and discuss this very important topic. Dr Pachauri, chairperson of the IPCC,

[3] In the event Mr Ban-Ki Moon was unable to attend.

will make a high-level statement on the evidence of climate change, to set the tone for subsequent discussions on this interesting subject;

(b) Evidence and impact of climate change

It is now scientifically established that the earth's climate is changing. The *Fourth Assessment Report* of the Intergovernmental Panel on Climate Change (IPCC AR4-2007) concludes that our climate system is warming as a result of human activities. Not only do rising greenhouse gas emissions threaten the environment, they also undermine development and have devastating consequences for Africa's economic and social wellbeing. Without adequate understanding of future climate trends to enable us to manage our unstable climate, Africa may not achieve the MDGs.

While all countries in the world will suffer the consequences of climate change, African countries are particularly vulnerable and will bear the brunt. Different models predict that for Africa the effects of a temperature increase of around 2°C - that is highly expected - could mean a loss of USD 133 billion or 4.7 per cent of GNP, mostly due to losses in the agricultural sector. A temperature rise of 2.5-5°C, would mean 128 million more people affected by hunger and 108 million by flooding, and sea levels rising by as much as a metre, with devastating effects.

Therefore, a good starting point for serious action-oriented debate on climate change would be a common understanding of: the evidence of the phenomenon; and the extent of its present and projected impacts on economic growth, social development and environmental sustainability in Africa.

(c) Climate change adaptation and mitigation: challenges, opportunities and the green economy;

It is important to integrate climate risks into national decision-making on development policies, programmes and practices so as to reduce the damage caused by climate change to resources, livelihoods and the wider economy. Such integration should include the challenges that climate change poses and the opportunities it presents for sustainable development. Notable among the opportunities are those associated with the green economy. Dialogue on such challenges and opportunities should also help place responses high on governments' policy agendas, recognizing that this 'environmental problem' is really a major challenge to development; and

(d) Africa and the international climate change negotiations

The ongoing climate change negotiations are complex and challenging, as the issues under discussion concern all aspects of development. To ensure that African countries participate effectively in the negotiations and develop well-informed positions for Cancun, all relevant stakeholders, including government actors, the private sector and civil society, should participate in the process. It necessary to raise the awareness of everyone concerned of the key issues and elements under discussion. Equally important is the need to build consensus on the continent's vital concerns and expectations within the scope of the negotiations.

Focus sub-themes developed in three breakout parallel sessions

12. The ADF-VII will offer a platform for more focused and in-depth discussion on the following sub-themes, clustered in the three parallels sessions identified in paragraph 5 above:

(a) Climate change, food security and economic development;

(b) Climate change, human development, security and the sustainability of the ecosystem; and

(c) Harnessing the means to respond to climate change.

Climate change, agriculture and food security

13. According to projections, climate change will severely compromise agricultural production-- the backbone of most African economies-- and aggravate poverty and food insecurity in many sub regions of the continent. Arable land, the length of growing seasons and irrigation and yield potential are all expected to decrease significantly, particularly along the margins of semi-arid and arid areas. More frequent and severe droughts, floods and weather extremes will compound the constraints on crop and livestock production systems. Declining fisheries resources in oceans, seas and large lakes, due to rising water temperatures, will hurt local food supplies. The combined impacts of these events threaten the livelihoods of large proportions of the African population and curtail the prospects for broad-based economic growth, poverty reduction and food security on the continent.

14. Smallholder farmers in developing countries like in Africa are on the frontlines of climate change. Quite often, this poor segment of society bears the brunt of the impact of climate change. Climate change and food security are the greatest challenges that Africa will face in the coming years. Serious studies indicate that "unchecked climate change" will result in a 20 per cent increase in child malnutrition by 2050. It is thus vital to combine the climate change and agriculture agendas, and adapt agriculture to the new climate reality. To this effect, all actors should participate at the outset, in initiatives to widen the development scope beyond traditional actors, and engage stakeholders and partners in a truly positive process.

15. To address the effects of climate change on agriculture, including crops, livestock and fishing activities, it will be necessary to apply new analytical approaches, supported by appropriate institutional setups. The current decision-making process, involving vulnerability and risk analyses, agricultural monitoring, food security early warning, environmental assessment and resource mobilization, needs to be reviewed and adjusted to the changing realities. Equally important is the need to adopt policies and strategies that will empower communities to respond to the new complex challenges and adapt to them.

Climate change, trade and industrial development

16. Climate change is affecting African trade and industrial development in several ways. Climate-induced reduction of agricultural output would make Africa

more dependent on food imports. Some modelled projections of the effects of climate change show a 10 per cent to 40 per cent increase in dependency on food imports. Significant declines have been predicted for Africa's net agricultural exports, ranging from 9 per cent in Mozambique to 74 per cent in Zambia. Concurrently, prospects for a green economy offer new opportunities for future pathways to industrial and trade development in Africa. To carry out action that is effective in to coping with climate change, sustaining economic growth and reducing poverty in Africa, we must have a solid understanding of the challenges and opportunities that climate change presents for trade and industrial development.

Climate change and infrastructure development

17. Investment in infrastructure has been neglected in much of Africa in the last few decades. Consequently there is a large gap in infrastructural to be filled, in addition to adapting existing infrastructure to a changed climate, and for use with low-carbon fuels. The infrastructural challenge alone is colossal.

Water and Sanitation

18. Climate change will increase existing water stress and water shortage in Africa. Decreasing the availability of water is expected to affect water quality, exacerbate water-borne diseases, and reduce available hydropower. Coupled with increased demand on water for different uses (agriculture, industry and energy), this will adversely affect the livelihoods of hundreds of millions of people and aggravate water-related problems. Adapting and enhancing existing infrastructure must be driven by projected constraints on resources.

Energy

19. A combination of increased demand for power and reduced water flows to hydropower dams and greater depletion of biomass energy resources, due to climate change, could seriously compromise the already dire energy situation. The resulting constraints on access to energy would further impede industrial development throughout the continent. This notwithstanding, Africa is still blessed with considerable opportunities to develop renewable energy resources.

Transport

20. The transport infrastructure is particularly vulnerable to increased risks of floods from larger storms and rising sea levels. Road and railway networks, airports and harbours will all need to be upgraded or replaced if they are to remain functional. Carbon-based fuels (coal, gas and oil) will need to be phased out in a low-carbon development pathway. As such, the bulk of infrastructure will need replacement.

Information and communication technology

21. Information and communications technology plays important roles in adapting to climate change. While some existing infrastructure will need upgrading (due to the risk of greater flooding) other networks will need expanding to improve communications (including distance learning) and reduce the need for travel.

Urban, industrial and coastal infrastructure

22. Very difficult decisions will need to be made about protecting coastal land and infrastructure from sustained sea-level rise. Increased risk of floods due to storms and sustained water shortages will complicate the situation further. Maintaining urban infrastructure in mega-cities in the face of climate change will be challenging in the extreme, especially where urban migration is unrestrained owing to weak, unenforced or inexistent measures to stabilize rural populations.

Climate change and human development (health, education, employment)

23. Climate change is expected to produce changes in temperature and rainfall. This will warm environments, alter rainfall patterns and increase incidences of vector-borne diseases in parts of Africa. It is predicted that many sub regions, including the Sahel, Southern and Eastern Africa, will experience increased outbreaks and severe vector-borne and water-borne diseases such as malaria, cholera, yellow fever, trypanosomiasis and rift valley fever. These diseases will prevent children, the most vulnerable segment of the population, from attending school. Climate change will thus compound the challenge of the HIV/AIDS pandemic, with the poor being the worst-hit owing to paltry living environments and lack of access to health care. Agriculture remains the primary provider of employment in most African countries. The reduction of agricultural output caused by climate change will be a serious blow to the most vulnerable population groups, namely women and children. Dialogue under this sub-theme will focus on core drivers of human and social development, with the emphasis on gender, the youth, health and education.

Climate change, disaster-risk reduction, peace and security

24. Increased climate variability is likely to cause an even greater number and frequency of disasters. Unless the increased risk of extreme climate events, such as storms, floods and droughts, is attended to with greater preparation for disaster-risk reduction, Africans will migrate in greater numbers from rural to urban areas. Desertification will drive people away from increasingly arid areas. Rising sea levels will force people away from low-lying coastal areas and reduce the productivity of small islands. The resulting migrations must be managed well to maintain peace and security, reducing conflict over access to and control of key livelihood resources, such as land and water. These additional pressures will further complicate the already complex issue of migration flows within and between the continent and the rest of the world.

Climate change and ecosystem sustainability

25. Life on earth relies directly or indirectly on ecosystems and ecosystem services. However, we know very little about the natural limits or the risks of collapse of these ecosystems, which are under increasing pressure from climate change and other environmental factors. Over the years, the increasing pressure on ecosystems, which are the source of economic wellbeing, has underscored the need to place an

economic value on them. This will prompt us to modify the manner in which we recognize and manage the environment, social responsibility, business opportunities and the future for humankind and nature alike.

26. Within the scope of the threat of climate change, the management and sustainability of the ecosystem plays a vital role in adapting to and mitigating the related impacts. In order to cope with the rising sea levels, for instance, it will be necessary to improve the management of coral reefs, mangroves and coastal areas to increase their resilience. Similarly, the prevention of and coping with severe flooding will require securing catchment forests and the reforestation of degraded areas. Therefore with climate change, the management of ecosystems and the services they provide becomes evermore important.

Climate-risk management: monitoring, assessment and early warning

27. Based on current evidence, a consensus now exists within the global scientific community that human activities are the main source of climate change. Yet Africa is faced with the following scientific and socio-economic challenges: understanding the science of climate change, and; monitoring, mitigating and developing resilience to natural and human-induced hazards and disasters in Africa (for instance droughts, floods, landslides, tropical cyclones, wildfires, earthquakes, tsunamis, the submergence of islands and desertification). It is essential for Africa to use a climate risk-management approach to produce adequate climate information for policy-making and adaptation practices.

Financing adaptation and mitigation actions

Harnessing science, technology and innovation, and building capacity for adaptation and mitigation

V. Format

28. Discussions and dialogue during the ADF-VII will take place in:

(a) Pre-Forum meetings and workshops;

(b) Plenary sessions for setting the scene and reaching agreement on a consensus statement and indicative plan of action;

(c) Parallel break-out sessions, facilitated by keynote presentations and moderated interactive discussions/dialogue around focus sub-themes; and

(d) Moderated high-level dialogue on governance and leadership response.

VI. Work programme

(a) Pre-ADF events (days 1-2)

(b) ADF stage-setting plenary sessions (day 3)

(c) Sub-thematic breakout sessions (day 4)

(d) High-level dialogue and concluding consensus plenary sessions (day 5)

(e) Exhibitions and side events (days 1-5)

VII. Categories of participants

(a) Eminent personalities, including heads of State and government

(b) African member States

(c) Regional economic communities

(d) Regional and sub-regional climate centres

(e) The private sector

(f) Academia, the science and technology community

(g) Civil society organizations

(h) The African Diaspora

(i) United Nations partners

(j) Bilateral organizations/partners

(k) International and regional financial institutions

(l) South-South cooperation organizations

Annex 2. Overview:

climate change and sustainable development in Africa

I. Introduction

1. **The purpose** of this overview is to provide context for a range of discussions at the ADF-VII, in order to drive forward actions in response to climate change in Africa. It provides a background to issues, opportunities and constraints related to sustaining development in a changing climate. It does not seek to provide a detailed examination of the diverse aspects of climate change science: many such documents already exist. Rather it seeks to provide the reader with the big picture. In order to address the matter of sustainable development in Africa in the face of a changing climate, it is important first to appreciate the true scale of the challenge and then respond accordingly. Anything less may be irrelevant.

1. The task

2. The fundamental task of the Forum is to examine the challenge posed by climate change and determine what actions are required today to ensure that Africa's future development is *resilient*. To achieve this, it is essential to consider the *whole problem in a long-term perspective and an inclusive global context*. Only then is it possible to identify the best ways forward and the opportunities to exploit.

2. Current global development pathways

3. Although global warming (the cause of climate change) is only part of a larger set of major environmental degradation problems, it is a very significant indicator. There is compelling evidence that the impacts on the environment from humankind's development activities as a whole are heating up the planet towards levels that are dangerous for life. This demonstrates unequivocally that *current global development practices taken all together are fundamentally unsustainable at planetary scale.* Global warming is a clear and stark manifestation of this non-sustainability. Humanity cannot survive climate change without addressing the fundamental causes of environmental degradation, which are integral to current development pathways. Continuing with development-business-as-usual is a dead end: it will become increasingly disastrous for Africa and the world as climates become evermore hostile, ecosystems become unstable, and environmental services break down, one after the other.

3. All change

4. In order to address this planet-wide crisis, there must be a rapid global shift to a development pathway in which sustaining the planet – the people and their environment - is paramount. The ideas for long-term sustainable planetary development are embodied in the concept of a green economy. It is vital that Africa and the world seize and develop the many opportunities in a green economy and curve out a genuinely sustainable path to development. Combating climate change is a huge challenge, but it could be the catalyst for transformation to a much better world for everyone, given good global governance.

II. Why climate change is important for Africa

4. Global warming

5. There is unequivocal evidence that the world is getting warmer[4]. Much of this" global warming" is caused by human activities that release" greenhouse gases" into the atmosphere. The two main sources of these emissions are the burning of fossil fuels (oil, coal and natural gas) together with agricultural and other land use changes, especially deforestation, as elaborated in table 1 below.

Table 1: Main sources of greenhouse gas emissions

Sector*	All GHG Emissions	CO_2only
Electricity and heat	25	32
Agriculture, land use change and forestry	34	24
Transport	13	17
Manufacturing and construction	10	13
Other fuel combustion	9	10
Industrial processes	3	3
Waste	3	-
Lost emissions	3	1
Total	100%	100%

** Note these percentages are indicative, depending critically on the precise definition of sectors*

6. Over the last 60 years, the rate of emissions has escalated, driven by rapid global economic development, with little regard for the environment. As a result, global warming to date is 0.8º C. While an overall rise of 2º C is considered "probably manageable", a rise of 4º C is considered highly risky for the future of the planet as natural processes[5] will amplify man-made warming and any "control" that we might have could be lost. Going by present trends, we will pass the 2º C emission threshold

[4] UNFCCC, NOAA, Hadley Centre,

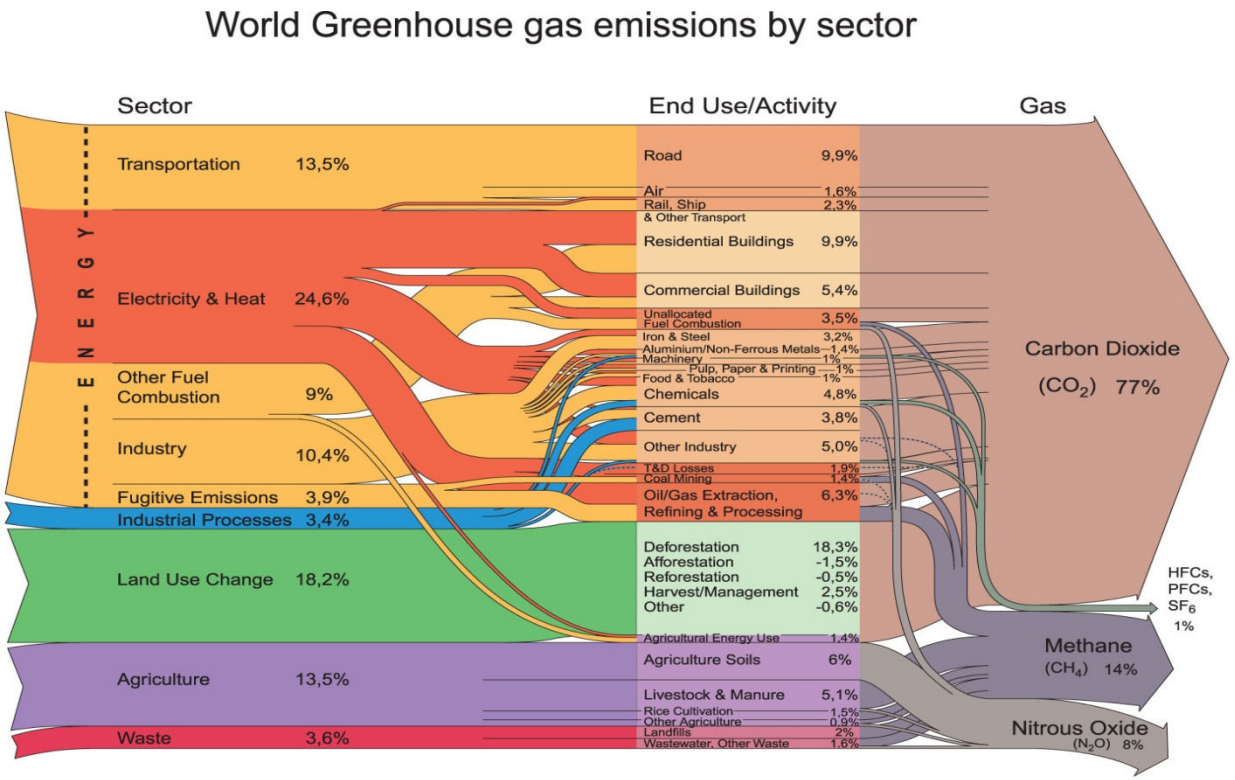
[5] For example, as currently frozen tundra melts in a warmer world, it releases much methane.

around 2025[6] so the window of opportunity for meeting the Copenhagen accord is already closing.

5. Mitigation

7. To keep the average temperature rise within the "manageable" limit, we must reduce global emissions rapidly and make serious progress this decade. This requires phasing out the use of fossil fuels and changing many of our current land use and practices regarding agriculture, waste, consumption and construction. Overall, this is a huge challenge because global GDP is currently on course to triple ($45 trillion to about $130 trillion) by 2050. Emissions are likely to follow suit, in other words, triple, as developing economies, including those in Africa, grow. The scenario is different only if a major technological breakthrough appears, or incentives are changed, resulting in growth patterns that consume radically less energy and/or carbon. For Africa, this is not such a big problem because per capita energy consumption is still very low, and so there is considerable potential to leapfrog towards a clean energy pathway through existing and emerging funding mechanisms. Payments by developed countries to mitigate and temporarily "offset" their emissions could be a substantial opportunity for financing clean development in Africa

Figure 1: Greenhouse gas emissions from different sectors (*global percentages*).



All data is for 2000. All calculations are based on CO_2 equivalents, using 100-year global warming potentials from the IPCC (1996), based on a total global estimate of 41 755 MtCO_2 equivalent. Land use change includes both emissions and absorptions. Dotted lines represent flows of less than 0.1% percent of total GHG emissions.

Source: World Resources Institute, Climate Analysis Indicator Tool (CAIT), Navigating the Numbers: Greenhouse Gas Data and International Climate Policy, December 2005; Intergovernmental Panel on Climate Change, 1996 (data for 2000).

[6] It takes 25 years or more for emissions to express themselves fully in warming: we are already committed to about a 1.5 ºC rise although only 0.8 ºC is already observed.

6. Climate change

8. Global warming is causing local and regional climates to change in many ways, thereby modifying climate risks. The changes will have various ramifications for human habitats and livelihoods, and the situation will intensify as the climate becomes hotter and more unstable. The bigger and faster the changes, the more likely it is that adverse effects will dominate. The main changes include:

(a) Increases in local mean temperature and extremes – both land and water;

(b) Changes in rainfall - its onset, seasonal distribution and extremes;

(c) Increases in the frequency and intensity of large storms and tropical cyclones;

(d) Increases in evaporation losses from plants and water surfaces; and

(e) Increased melting of glaciers and other ice bodies.

Associated effects include:

(i) Sea level rise and the acidification of oceans;

(ii) More severe droughts and floods;

(iii) Greater damage from high wind in storms;

(iv) Disrupted crop cycles, with different pests, diseases and water requirements;

(v) Heat waves and the spread of diseases (such as malaria) to new areas; and

(vi) Increased water demand and reduced water availability.

9. **The main impacts** on people and society are likely to result from increased vulnerability, as climate-induced hazards exacerbate a wide range of underlying risk conditions, thereby aggravating already evident environmental stresses. The impacts include[7]:

(a) Increases in drought, flood, windstorms and other extreme climate phenomena, which will increase the number and intensity of disasters, reduce freshwater availability, threaten food security and human health, diminish industrial production and weaken the physical infrastructure base for socio-economic activity, resulting in reduced development;

[7] After the Africa Partnership Forum (APF) 2008, IPCC 2007, GEO5 2010, MDG Summit 2010 and many other similar documents

(b) **Changes in rainfall, with decreases in river basin run-off;** changes in rainfall and in river sensitivity to climate variation will reduce the water available for agriculture and hydropower generation. Models suggest a likely increase in rainfall in eastern Africa, and reductions in northern and South-eastern Africa. Agro-climatic zones will shift, and farmers will have to address increased variability in many factors critical to crop production; and

(c) **Sea level rise** will lead to coastal erosion and flooding, particularly in western, eastern and northern Africa, and bleaching of coral reefs along the Red Sea and Indian Ocean coastal zone. With more than one-quarter of the population living within 100 kilometres of the coast and most cities concentrated there, the vulnerability to marine-induced disaster from tidal waves and storm surges will increase.

10. The net effect will be to exacerbate socio-economic vulnerability, undermining people's ability to cope with life in a more hostile climate.

11. **Adaptation:** While Africa has contributed relatively little to the causes of human-induced climate change, it will be among the first and worst affected regions. It is believed that some dry regions of Africa will get drier, while wet parts will become even wetter. Adaptation is therefore a much more important and immediate concern for Africa than mitigation. Almost everyone in Africa will suffer the effects of climate change, one way or another. It is imperative to adapt current practices to "life in an increasingly hostile climate". For African countries to sustain their development, they must make it more resilient to climate change. They must be proactive in preparing for change, which will be costly. But it will be even more costly if we delay and only react to changes when forced to do so. A case in point is the floods in Pakistan early in 2010.

Known and uncertain aspects of global warming to consider

1. Permanent change

Simply put, changes will be permanent. We will have to live forever with raised temperatures (2˚C, 4˚C…), raised sea levels (1m, 10m…) and changed rainfall patterns. Even with low-carbon development, the planet will take a long time to re-adjust back to previous norms - if ever.

2. Controlled warming

Today, we probably still have some control over the scope of future warming. But we must reduce global emissions immediately and radically. Then the level of permanent temperature rise *may* be manageable.

3. Uncontrolled warming

There are several factors that risk heightening planetary warming. If the warming reaches critical points, we will lose the little influence we still have. Environmental mechanisms will speed up the warming, possibly making planet Earth too hot to support life.

4. Lack of knowledge

We do not fully understand planetary processes. We just do not know how much warming is manageable; how quickly climates will change; how much this will affect our lives. But if we do not respond fast enough, we risk finding out the hard way.

5. Quantifying risk

The risk of hitting critical points rises very rapidly as global temperature continues to change. While an overall rise of 2° C may be safe, a rise of 4° C is probably unsafe. But what is an "acceptable" level of risk when the future of humanity is at stake?

6. Trends in current emissions

Globally, greenhouse gas emissions are rising faster today than the worst-case scenario described by the Intergovernmental Panel on Climate Change in their *Fourth Assessment Report*. Emissions from fossil fuel grew around 1 per cent per year in the 1990s, to more than 3 per cent in 2007.

7. Present trajectory

We have already experienced a 0.8° C rise. With current emissions, we are heading towards a rise of at least 3° C and possibly 4° C this century. A ceiling of 2° C cannot be achieved with a global economy based on fossil fuels.

8. Time-lag

At present GHG emission rates, we will be committed to over 2°C of warming around 2025, although this may not be evident in temperature records until nearer 2050. With immediate and drastic reductions in emissions, we can postpone these dates; but inaction over the last 10 years has severely reduced the window of opportunity.

9. Adaptation

It takes decades for emissions to translate into changed climates. Given the present inertia, there is a risk of being lulled into a false sense of normality, postponing efforts to adjust to a changing climate until it is too late.

10. Precautionary principles

We need to embark on a global "damage limitation" process, using the best available knowledge to manage the risks. We must remain within limits deemed manageable. Are the alternatives even worth considering: life on a dying planet?

12. **Living with uncertainty:** What we know about climate change is alarming. What we don't know is even more worrying. However, the need to deal with uncertainty is an essential aspect of managing the effects of climate change. Standard techniques exist for managing risks. Effective risk management requires understanding and utilizing research outcomes and policy variables, which may be expressed in probabilities. Climate-risk management is a recently developed approach for managing existing climate variability, and also offers an entry point for addressing a changing climate. CRM is already practised a little in Africa (see Issues paper No. 4) but needs to be extended to all sectors, scaled up for all countries, and adapted for other aspects of development in a changing climate

Uncertain sea-level rise in a warming world

The prospect of sea level rise demands careful consideration. Fluctuations in sea levels are normal in the history of the planet. Since the last ice age, 20, 000 years ago, sea levels have risen by more than 100 metres but remained stable for the last 7, 000 years until about 1900. Now they are rising again and unless current rates of global warming are mitigated, many major cities of the world will be submerged in the years ahead*. This, by any definition, is unsustainable global development.

How much? How soon?
Based on current understanding, the sea level will rise by less than a metre in the course of this century. Some analysis suggests that much higher rises are possible - maybe 1 to 3 metres if emissions are not controlled and temperature rises are extreme. If the 'less than 2˚C target' is actually achieved, then final sea level might be constrained at about 3 metres. However nobody is sure because humanity has never heated the planet this way before.

Impact on Africa
An assessment of the consequences of sea-level rise concluded that millions of people are likely to be displaced this century. While most countries will be affected to some extent, outcomes will be extremely unfair. Severe impacts will be limited to a relatively small number of countries, like Egypt and low-lying islands. In other countries, like the Gambia, life will become increasingly difficult.

Potential rise in sea level
In recent years (1993–2003), average sea level rise has been about 3 mm a year. This was caused by the expansion of water as oceans got warmer, and by melting land ice, in roughly equal measures. Potentially, the melting of all glaciers has a sea-level rise equivalent of about half a metre. The complete Greenland ice shelf is equivalent to over six metres and the whole Antarctic ice shelf another 70 metres rise. Any significant meltdown however, would probably take several centuries.
** See START Cities at risk http://start.org/programs/cities-at-risk for example*

7. Climate scepticism

13. For climate and earth-system scientists, the evidence is overwhelming that: the world is warming; the cause is excess emissions from the many activities of humankind; and, local climates are already changing as a consequence. Some people, however, strongly deny this interpretation of the facts, seeing it all as "natural" climate variability. The arguments of these "climate sceptics" have been disproven[8] many times - their interests are not scientific but economic. Working on behalf of organizations that stand to lose the most in the short term, the sceptics seek to delay a global response to the problem. Nevertheless they serve a useful purpose by prompting improved scientific communication on the problem, and governments' refinement of collective remedial strategies. This is essential for engaging people and communities everywhere in addressing the problem.

8. Geo-engineering

14. Of more concern perhaps, are suggestions to "fix" the global warming problem through technological means[9]. Methods either propose the removal of greenhouse gases from the atmosphere to reduce the warming effect, or reflection of

[8] See http://www.skepticalscience.com/argument.php
[9] See http://royalsociety.org/geoengineering-the-climate/ for discussion and an assessment

part of the incoming sunlight back into outer space to cool the planet slightly. Africa should be extremely wary of such proposals, and seek agreement through the UNFCCC to ensure that no deliberate large-scale manipulation of the planetary environment to counteract anthropogenic climate change will be attempted without exceedingly careful prior consideration and global agreement.

15. It is the cumulative series of relatively "benign" technological solutions that have taken place since the industrial revolution that has caused the global warming problem today. These include very many activities, such as coal mining for power and electricity generation, oil drilling to power motor vehicles, chainsaws used to deforest the planet, the intensive meat and dairy industry, construction with cement, and so on. One would have to have unlimited faith in technology to assume that there would be no adverse side effects from a technique for "fixing" the planetary heat cycle.

16. The temptation of geo-engineering is that it appears much less expensive (initially) than retooling the world for a low-carbon economy. It is also intended as a way to maintain current lifestyles with unsustainable consumption patterns in the developed world, and gets in the way of a genuinely radical shift to low-carbon living in line with ecological limits.

III. Extent of the threat from climate change to Africa

17. Climate change on top of existing climate variability is a big killer in Africa[10].

18. The overall threat from climate change on development in Africa is severe. Many of the changes are expected to occur earlier and are likely to be more serious in Africa than elsewhere. In addition, Africa is highly vulnerable to climate change on account of its large rural population that remains highly dependent on rain-fed agriculture for food, natural resource-based economy, and constraints on internal trade. Wealthy communities have more resources and hence more choices when it comes to adapting to change.

9. Vulnerability

19. The concept of vulnerability is important for understanding climate change in the context of social and human development. Firstly, global warming and climate change are expected to increase human vulnerability due to extreme weather events and long-term environmental degradation. Secondly, vulnerability hinges on: the multiple dimensions of social and human deprivation, such as social exclusion, gender inequity, migration, unemployment, and lack of access to healthcare and education; and, the coping strategies and resilience of those affected. To respond to the climatic, social and human dimensions of vulnerability, it is necessary to bring together adaptation, mitigation, coping mechanisms. Social cohesion and integration are also needed to help merge policies and actions on climate with social and human development.

[10] AU-NEPAD 2003 Environmental Action Plan, chapter 5 climate change paragraph 104.

Climate Change in Africa

Climate records show warming of approximately 0.7ºC over most of the continent during the 20th century, a decrease in rainfall over large portions of the Sahel, and an increase in rainfall in East and Central Africa. Climate-change scenarios, based on results from several general calculation models using data collated by the IPCC, predict temperature rises across Africa ranging from 0.2ºC per decade (low scenario) to over 0.5ºC per decade (high scenario). With a more rapid warming scenario, large areas of Africa would experience rainfall that significantly exceeds natural variability in the December to February and June to August periods, with resultant adverse impacts on many sectors of the economy, including agriculture, infrastructure, and healthcare facilities. This would hurt economic growth and efforts to reduce poverty.

10. Expected impacts

20. The kinds of climate changes happening and expected are likely to have a wide range of implications for economic, environmental, social and human developmental across the continent. They include:

(a) **Reduced agricultural production**

Increased temperatures and evaporation, coupled with decreased water availability, will reduce agricultural production. Over 60 per cent of people in Africa depend on farming for their livelihood, and 50 per cent of all exports are agricultural products. Furthermore, one-third of income in Africa is generated by agriculture, with crop production and livestock husbandry accounting for half or more of household income. The poorest members of society are those most dependent on agriculture for their livelihoods. As most agricultural production on the continent is rain-fed, it is highly vulnerable to changes in climate variability, seasonal shifts, and precipitation patterns; and

(b) **Reduced fresh water availability[11]:** The drier the climate, the more sensitive the local hydrology is to change. Relatively small changes in temperature and precipitation are already causing major changes in runoff in West Africa. Arid and semi-arid regions are particularly sensitive to reduced rainfall and increased evaporation and plant transpiration.

Extreme events like downpours are expected to become more intense. This will increase floods and runoff while reducing the ability of water to infiltrate the soil.

Changes in seasonal rainfall patterns will affect the regional distribution of both ground and surface water supplies. Reservoirs and wells will be affected. Changes at the surface will alter groundwater recharge and aquifers. Water quality may also respond to changes in the amount and timing of precipitation.

New patterns of runoff and evaporation will also affect natural ecosystems. Freshwater ecosystems will respond to altered flood regimes and water levels. Changes in water temperatures could affect the growth of disease organisms, and the diversity and

[11] After UNEP http://www.africanwater.org/climatech_fact_sheet13.htm and other sources

productivity of ecosystems. Changes in runoff, groundwater flows, and precipitation will affect water qualities.

Rising sea levels could invade coastal freshwater supplies. Coastal aquifers may be damaged by saline intrusion as salty groundwater rises. The movement of the salt-front up estuaries would affect freshwater pumping plants upriver.

Reduced water supplies will place additional stress on people, agriculture and the environment. The most vulnerable regions are arid and semi-arid areas, some low-lying coasts, deltas, and small islands.

(c) Loss of biodiversity

Biodiversity is the basis of Africa's wealth. It provides: consumer resources, such as food, fibre, fuel, shelter, medicine and wildlife trade; and non-consumer functions, such as stabilizing the environment and other ecosystem services. Losses in biodiversity are associated with erosion, floods, rising sea levels and the spread of invasive alien species. For example, the coral reefs in the Indian Ocean experienced massive bleaching in 1998, with over 50 per cent mortality in some regions.

(d) Increased food insecurity

Climate change affects food security in several ways. Not only will it affect agricultural production and supply, it will also have an impact on demand by exacerbating socio-economic risks and vulnerabilities. With local production declining, income opportunities and purchasing power will decrease. At the same time, decrease in production and increased global demand will lead to price hikes of 25 per cent to 150 per cent for the most important crops, including rice, wheat, and maize, by 2060[12]. Climate change will significantly increase the risk of hunger and malnutrition. Calorie availability in 2050 is likely to have declined relative to 2000 levels throughout the developing world.

(e) Increased health problems

Heat waves will have serious health consequences for people who work outdoors. Changes in rainfall will also influence disease vectors for malaria and greater susceptibility to water-borne diseases, such as cholera. Small changes in temperature and precipitation can boost the population of malaria-carrying mosquitoes. Increased flooding will also enhance breeding grounds for the malaria carriers in formerly arid areas. These problems will be aggravated by the inability of many communities to cope with the increased prevalence of the disease, thus raising health care costs.

(f) Increased migration

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

[12] WFP et al., 2009

sub-Saharan Africa, particularly in the Sahel, the Horn of Africa and the SADC area. The result has been widespread loss of human life and livestock, and substantial changes to social systems. It is estimated that about 60 million people will eventually move from the desertified areas of sub-Saharan Africa towards northern Africa and Europe by the year 2020[13].

11 All together now

21. Combined, the impacts of climate change are potentially disastrous for Africa as they intensify in severity through the rest of the 21st century, always exacerbating existing pressure points and creating new ones. Climate change has already set development efforts back, and rendered achievement of the MDGs significantly more difficult. The nature and extent of some of these impacts are explored further in the Issues papers.

IV. Understanding the full significance of climate change

12. Need for transformation

22. *Climate change is the defining human development challenge of the 21st Century*[14]. If global development continues with business-as-usual, the planet will probably become uninhabitable within the next few generations. If we continue to pollute our atmosphere as we are doing today, the future of the planet will be a hot one, with dramatic local climate changes, increasingly violent weather and sea level rise measured in tens of metres. The planet is heating up already, and to stop it going much further the world must radically change its ways – and soon: hence the creation of the UNFCCC.

23. **As the African Union and the New Partnership for Africa's Development (AU-NEPAD)[15] put it:** "*Climate change now provides a unique opportunity for the international community to question the modes of development currently in practice and to choose a new mode of development for the future. The key development sectors of the economy are at risk, with grave consequences for life on earth if climate change is not addressed. Hence, action must start now and involve all actors*".

24. **The United Nations World Economic and Social Survey[16]**: "*The food, energy, financial and climate crises that unfolded simultaneously at the end of the first decade of the twenty-first century have exposed major weaknesses in existing mechanisms designed to manage the process of global development…. Sustained and widespread future prosperity will require major reforms in global economic governance and new thinking about global economic development*".

25. "*A central concern of the new thinking will be the need for a focus concentrated on sustainable development — entailing an approach that would balance material wealth improvements with protection of the natural environment and ensure social*

[13] UNCCD, 2006
[14] UNHDR 2007/8
[15] NEPAD 2008, APF.
[16] UNWESS 2010

equity and justice — rather than one narrowly centred on economic growth and private wealth generation based on market incentives. Global solutions will be required for global problems and, given the interdependence of these problems, policy responses will need to be highly coherent at various levels if the international community is to achieve the multiple objectives associated with fair and sustainable global development".

26. **What is holding back response to the problem?** According to the United Nations Human Development Report (UNHDR), **"***The world lacks neither the financial resources nor the technological capabilities to act. What is missing is a sense of urgency, human solidarity and collective interest within a Global Governance. Climate change poses challenges at many levels. In a divided but ecologically interdependent world, it challenges all people to reflect upon how we manage the environment of the one thing that we share in common: planet Earth. It challenges us to reflect on social justice and human rights across countries and generations. It challenges political leaders and people in rich nations to acknowledge their historic responsibility for the problem, and to initiate deep and early cuts in greenhouse gas emissions. Above all, it challenges the entire human community to undertake prompt and strong collective action based on shared values and a shared vision, and the Green Economy Agenda could be the one".*

27. **What is meant by a 'green economy'**[17] *A green economy is typically understood as an economic system that is compatible with the natural environment, is environmentally-friendly, ecological, and for many groups is also socially just*. These attributes are the conditions that must be 'imposed' on an economy from the perspective of many green economy advocates. This conventional concept of a green economy may be alternatively described as "the greening of an economy". Some fundamental criteria for meeting these conditions have been established since the Rio Summit in 1992. They include: using renewable resources within their regenerative capacity; making up for the loss of non-renewable resources by creating renewable substitutes; limiting pollution within the sink functions of nature; and, maintaining ecosystem stability and resilience. Conditions for social justice may include: not compromising future generations' capability to meet their needs; the rights of poor countries and poor people to development and the obligations of rich countries and rich people to change their excessive consumption levels; equal treatment of women in terms of access to resources and opportunities; and, ensuring decent labour conditions. Additionally, issues of good governance and democracy are seen as critical for ensuring social justice and equity. Less understood, but perhaps of much greater interest, is a green economy as an *"economic system that is dominated by investing in, producing, trading, distributing, and consuming not only environmentally-friendly but also environmentally-enhancing products and services"*. In this sense, many green conditions, such as those listed above, should no longer be seen as constraints on an economy, but rather, as forces that generate new economic opportunities. The issue concerns expanding and reshaping, not reducing, the space for economic development and poverty reduction.

[17] Text on this page derived from UNEP 2009 Global Green New Deal and Preview 2010

13. Green Economy Initiative

28. This is a global initiative launched by UNEP in 2008 to seize the opportunities that the concept of a green economy has to offer. It seeks to accomplish two tasks. First, it tries to make a "beyond anecdotal" macroeconomic case for investing in sectors that produce environmentally friendly or environmentally enhancing products and services ("green investment"). Second, the initiative tries to provide guidance on how to boost pro-poor green investment. The goal is to encourage and enable policymakers to support increased green investment from both the public and private sectors.

14. A low-carbon economy

29. This concept is drawing increased attention amid rising public awareness of climate change and the urgent need to transform the economy. A low-carbon economy is one that emits a minimal amount of carbon dioxide and other greenhouse gases. However, what constitutes the minimum has yet to be established. What is important is that economies are reducing their carbon intensity over time, in both unitary (CO_2 per unit of GDP) and absolute terms. A low-carbon economy can be seen as an outcome of implementing a green economy. Investing in renewable energy and energy efficiency is expected to produce gains, such as generating new sources of income and jobs and reducing carbon emissions. A low-carbon development pathway is development with minimized emission of greenhouse gases- such as using renewable energy rather than coal, oil and gas.

Table 2: Carbon footprint from different sources of electric power

Estimates* of CO_2 emissions produced by different kinds of electric power plants.

Power Source	Nuclear	Wind	Hydro	Biofuel	Geo-thermal	Solar Voltaic	Gas	Oil	Coal
CO_2	**5**	**5**	**5**	**15**	**100**	**100**	**500**	**900**	**1000**

Units are grammes of CO_2 for each kilowatt/hour of electricity produced throughout the entire lifecycle of the power plant, including manufacture and construction.

* Indicative values compiled from several sources including UK DTI and US Department of Energy

15. The green economy strengthens sustainable development

30. The green economy with a low-carbon development pathway is firmly founded on the Rio concept of sustainable development. It goes further to deal with the problem of global warming and the challenges that climate change present. The fact that the whole planet is now warming owing to the activities of humankind is clear evidence that current global development is unsustainable. There is a need to transform the global economy in fundamental ways, ensuring that all actions are genuinely sustainable from the local to global levels. Transformation to a global green economy with a low-carbon development pathway is essential to safeguarding future generations, human civilization and even life on earth. It is not enough merely to revamp present practices.

31. What about A**frica?** Africa is on the verge of an economic and developmental take-off. However, pursuing the classic free market model of exploiting resources to the full, *"as if there is no tomorrow"* has consequences for the environmental. Is Africa going to contribute its own pollution load to a planet already under severe ecological stress or does it have an alternative pathway for economic growth? Can Africa develop a green economy and follow a low-carbon development pathway that values ecosystems and the services that they provide? Can green economic development meet the needs of a rapidly growing population and people's aspirations for higher living standards? Does such a pathway exist today'? The United Nations[18] believes so: *"…the shift to climate-friendly living and production is potentially achievable without sacrificing growth in the developing world if tackled from a holistic viewpoint that links climate change to a new development paradigm".*

32. **Green future**

Assuming that the rising demands of a changing climate will force humanity to transform the globe (economically, socially and environmentally) in the immediate future, and that national economies will take into account the enormous value of goods and services that nature provides, then a green economy with low-carbon development pathway would offer great potential for genuinely sustainable development in Africa.

33. Developing a green economy will be challenging. Many practices will need to be changed with immediate effect. Where green values overturn existing practices, the transition will be particularly difficult. The demands of a changing climate and the transformation of global systems will force the pace. However, Africa, with its small investment in fossil energy and abundant land resources suitable for locking up carbon, is in a unique position to benefit fully from the many opportunities the greening of the economy offers.

V. Responding to climate threats in Africa: opportunities and challenges - in relation to a green economy

34. *The magnitude, variety and nature of threats to Africa from a more hostile climate are profound and extend right across the economy and into all walks of life. As a consequence, measures and actions required for transition to a climate-resilient green economy will be many, diverse, often costly and difficult to deliver equitably. However, such transformation in Africa could be hugely beneficial for the majority of people today, as well as for future generations.*

35. **Mitigation is an opportunity:** Significant opportunities for the future of Africa appear to reside in arrangements for global mitigation processes, the CDM[19] in particular. This is designed to help reduce overall emissions, with developing countries being paid by industrialized polluters to lock carbon away (for example, through reforestation), thereby "offsetting" new emissions of greenhouse gases in the industrialized world. *The CDM allows emission-reduction (or emission-removal) projects in developing countries to earn certified emission reduction credits, each*

[18] Acting on Climate Change: the UN System Delivering as One, UN-GA 2009, MDG Summit 2010.
[19] See http://cdm.unfccc.int/index.html

equivalent to one tonne of carbon dioxide. These credits can be traded and sold, and used by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol. The value of these credits is expected to rise as pressure grows on industrialized countries to reduce emissions.

36. Africa has not had its full share of CDM projects to date. New arrangements are required to make the CDM more appropriate to Africa's circumstances. Africa's negotiating team on the UNFCCC must secure these changes and encourage innovative participation. The value of these "credits" should increase dramatically as the industrialized world struggles to honour its commitment made at Copenhagen to limit temperature rise to 2°C.

37. **Adaptation is the challenge - and an opportunity to make development sustainable:** The main challenges involve enabling a large and vulnerable population to adapt to the many changes and develop a better life that is resilient to an increasingly hostile climate. Wherever possible, adaptation to climate change should be planned and resourced. If planning is inadequate, adaptation will be reactive and less predictable, development will slacken, people will suffer and assets will be lost.

38. Planning adaptation involves better management of climate risks in all sectors, by all stakeholders, with all available means. There is a need for a new-risk management culture that takes into account climate concerns, as part of long-term planning, to increase personal and national resilience. It is necessary to support national and local development policy and budget processes to strengthen their ability to anticipate the effects of climate change and address risks. At the local level, organizations should be supported in planning their own adaptation processes. This could include support to community-based natural resource-management plans to improve environmental security in a changing climate.

39. **Green economy as integrator:** The green economy provides a rational way of integrating adaptation and mitigation processes into overall development policies and programmes. This would sustain long-term wealth creation and the quality of life in Africa and support existing development frameworks (MDGs, PRSPs, National Programmes of Adaptation, NAMAs, Strategies for the reduction of disaster, etc.). The frameworks are useful sub-mechanisms since they represent important multi-stakeholders and cross-sectoral interests. The transition from today's situation to a coherent green economy, however, will not be straightforward and many different measures will be required to take it forward.

40. **The top 10 essential measures** for addressing climate change by greening the economy in Africa comprise:

(a) Visionary **leadership** within a **global partnership**;

(b) Effective **governance**, guiding the many complex processes that affect the lives of over a billion people, and maintaining **peace and security** through radical change;

(c) Well informed policies for a **green economy** with a low-carbon development pathway, in order to deliver sustainable growth and reduce poverty;

(d) Coherent strategy on **adaptation to climate change** that builds resilience through improved management of climate risks in lives and livelihoods, including **food security, disaster-risk reduction and social protection;**

(e) Major, well invested **financial resources**;

(f) Major renewal of **infrastructure**, in harmony with a changing environment;

(g) Incentives for green **trade and industry** with a fully engaged private sector and unfettered access to low-carbon **technology**;

(h) **Transformed use of land and water** - agriculture, forestry, ecosystems, biodiversity - with improved environmental and food security for poor communities;

(i) Change in **human values**, aspirations and development frameworks with all citizens informed and engaged – especially women and the youth; and

(j) Strengthened **capacities** and a culture of **innovation** with quality **science** focused on sustainable development.

41. The purpose of the ADF VII is to consider the above measures holistically, within the scope of the whole problem, and for the benefit of the entire continent. The Forum needs to identify and recommend priorities and timescales for follow-up actions.

42. Reference is made below to some of the many issues that must be examined in each of the 10 essential measures. These are examined in greater detail in individual *Issues papers* linked to sessions of the Forum, as shown in annex 3, and summarized in Table 2.

43. With all the inherent uncertainties of climate change, there are many more questions than answers; humanity has limited experience with good planetary management to use for reference[20]. However, asking questions is an essential part of understanding the problem and identifying potential opportunities. In many cases, there are "soft" and "no-regret" actions, which pay off irrespective of what the future holds. For example, Africa with a green economy and associated improved food and environmental security, better governance, improved land and water management, functional ecosystem services, better disaster preparedness, etc., will be a much better place to live in, with or without climate change.

Essential measure (1): visionary leadership within a global partnership

44. The future of Africa will be very strongly influenced by the outcome of current global climate negotiations through UNFCCC.

(a) Does Africa need additional skills and support to obtain a strong and just global agreement in the UNFCCC negotiation process? The Africa

[20] Addressing the ozone hole by means of the Montreal Protocol is probably the best and only example.

Partnership Forum has been greatly beneficial, but does it go far enough? Should the Joint Secretariat be strengthened to play a more coherent support role?

(b) Green economy: Can future demands of a green economy be integrated into such an agreement to provide adequate opportunity for Africa's human, social and economic development?

(c) Global partnership: Does Africa's transition to a green economy depend on simultaneous global transformation, or can Africa go it alone?

Essential measure (2): effective governance, to guide the many inter-related processes of profound change that will affect more than a billion people – while sustaining peace and security

45. The many aspects of good governance are central to African economic development, realizing the MDGs, and coping successfully with climate change. Successful delivery of the fundamental changes will require visionary leadership with good and inclusive governance, and thriving public, private and civil institutions working towards similar goals. All efforts geared towards the management of climate change must entrench processes that are inclusive and participatory for all stakeholders to ensure respect by all for decisions reached as follows.

(a) Political governance. How many governments have the foresight, ability and political will to transform existing development programmes into low-carbon development pathways within a green economy, and thereby integrate adaptation, mitigation and development? How much new legislation will be needed, together with more effective implementation of existing laws, in harmony with neighbouring States?

(b) Stability: More pressure on existing stress points will threaten security and stability. Does Africa need to strengthen the rule of law and enhance its peacekeeping capacity? What special measures might be needed to facilitate adaptation in fragile States? Mass migration risks destabilizing cities and neighbouring States. Do regional support measures need to be strengthened to help control migration?

(c) Accountability: Is the African Peer Review Mechanism equal to the task of to bringing reluctant governments into line so as to respond to climate change or does it need further strengthening?

(d) Rights: What is the best way to ensure that the basic rights of vulnerable communities are not compromised further in the scramble to develop and adapt to a changing climate simultaneously?

Table 2: Summary of opportunities and challenges posed by climate change, as expounded on in the associated Issue papers.

Issue Paper	Subject	Main Issues	Challenges	Opportunities	Green economy
IP 1	Leadership and governance	Leadership and governance will be tested to extremes by all the changes required for adaptation to a green economy	Maintaining peace, security and human rights through rapid change; delivering the MDGs in a more hostile climate; good economic & financial governance	Opportunity for genuine sustainable development with greater regional coherence and solidarity from working together for a better future	*Sine qua non*
IP 2	Agriculture and food security	(a) Increased climate variability (b) Declining productivity in a warmer world	Maintaining production, minimizing emissions, feeding 2 billion people; Lack of water. Rural safety nets	CAADP, Sustainable land and water use, Carbon trading, Rural biofuel, Aquaculture, Livestock export; Index insurance	Transformation most beneficial if not essential
IP 3	Human Development	Increased vulnerability of poor and marginalized groups	Inclusion of all in climate-change debate and adaptation processes. Rural services and safety nets	Investment in rural livelihoods from carbon trading and adaptation funds. Employment for youth in infrastructural renewal	Transformation most beneficial
IP 4	Management of climate risks and early warning services	Managing uncertainty; CRM little practised in Africa due to weak climate services	Developing capacity for managing climate risk and integration in policy planning and practice.	CRM can provide positive benefits in terms of stabilizing markets (e.g. with index insurance), as well as disaster risk reduction	Vital tools
IP 5	Trade and industry	Mitigation of emissions from fuel, energy and processes. Role and function of Industry in a green economy	Agricultural trade and post-harvest processing more variable Fuel price rises and vulnerable trade routes	Carbon trading emission reductions, Index insurance to stabilize agricultural processing industry	Opportunities in transformation: trade essential
IP 6	Peace and Security: Disaster risk Reduction	Climate Change will stress existing pressure points Increased disaster risk; competition for resources	Sustaining rural livelihoods to minimize migration. Organizing adaptation processes in fragile States and insecure areas	Enhanced solidarity with collective response to assist countries worst affected. Improved environmental security.	Transformation most beneficial
IP 7	Financing actions	Little finance committed so far. CDM not fair for Africa. New financing	A strong and fair UNFCCC agreement with sufficient adaptation funding. Investment	Adapt the CDM for sectoral mitigation; Foreign Direct Investment in mitigation and carbon	*Sine qua non*

		framework required.	priorities and governance	credits; new funding mechanisms	
IP 8	Infrastructure	Infrastructure deficit due to past under-investment most present infrastructure vulnerable to extreme weather	Adaptation for extreme events; rising sea level and coastal infrastructure; increasing power to meet demand; Concrete causes much emission:	Carbon trading funds to renew energy, transport, agricultural and forestry infrastructure; Information and Communication Technologies	Opportunities in transformation: Energy a key issue
IP 9	Ecosystem sustainability	Current development practices are totally unsustainable: loss of ecosystem services: water & carbon are key linkages	Many interlinked problems that need to be addressed coherently: competition for water resources: changing behaviour of Trans-National Corporations et al.	REDD and other carbon trading funds for ecosystem renewal with agriculture, environment, water and rural energy working synergistically.	Transformation essential
IP 10	Science, technology innovation and capacity-building	Trained capacity lost, lack of investment, science remote from development practice, poor access to technology	Increase capacity to inform global negotiations, mitigation and adaptation policies; assist low-carbon pathway and improve environmental monitoring	Green technology transfer, science partnerships for development, innovation centres for adaptation and mitigation, reversing the brain drain	Fundamental elements
IP 11	Private Sector response to Climate Change	Need an enabling environment for investment and using innovative financing instruments to leverage private sector financing.	Designing policies that leverage private capital and know-how to deliver response at the scale and pace needed. The role of public finance mechanisms cannot be overemphasized.	Innovative financing instruments including direct project lending and lines of credit to local finance institutions as well as microfinance and other innovative products.	Fundamental elements
IP 12	Climate change, economic growth, and poverty reduction in Africa	Threat to economic growth is central to development and poverty reduction. Most impact on poor and disadvantaged people. A hostile climate will raise the cost of achieving development goals.	Cost of adaptation is projected at many billions of dollars a year, increasing pressure on African countries' development budgets. Besides financing, institutional innovations will be essential if adaptation measures are to be effective.	Integrating climate-risk management into development practice. Adaptation must be approached as a cross-sectoral issue and should no longer be perceived as the sole responsibility of the ministry of the environment.	Integrating element
Issue Paper	**Subject**	**Main issues**	**Challenges**	**Opportunities**	**Green economy**

Essential measure (3): Well-informed policies for a 'green economy' with a low-carbon development pathway for sustainable growth & poverty reduction

46. Macroeconomic policies in Africa, particularly the fiscal policies related to taxes, should encourage cleaner economic activity. Tax policies should reward users of clean methods of production, while penalizing those who use old, environmentally degrading methods. This situation is acute in the mineral, manufacturing and energy sectors:

(a) Do African economists and planners have sufficient understanding of the main implications of redirecting Africa's economy along a green, low-carbon path? Is the UNEP route map sufficient to inform Africa's UNFCCC negotiations?

(b) Can all countries in Africa be brought on board? How equitable would a green economy be for different countries? What about countries deeply engaged in the current high-carbon economy? Are the Regional Economic Communities (RECs) experienced enough in climate change issues to ensure the necessary regional harmonization?

(c) Are policy-making and planning processes robust enough at all levels? Does a dominant public sector have the flexibility and innovative skills to recognize and develop new green opportunities?

(d) And how can the entrepreneurial and risk-management skills of the private sector be engaged to the best effect? ICTs are powerful tools vital to a green economy: can governments be persuaded to be more supportive of them?

(e) Green values often relate to traditional values: can traditional leaders be enlisted to assist local processes?

Essential measure (4): Coherent strategy on adaptation to climate change that builds resilience through improved management of climate risks in lives and livelihoods, including food security, disaster-risk reduction and social protection

47. Increase in climate variability, is a precursor to climate change, has already led to a greater number of weather-related disasters, affecting many vulnerable communities, especially the poor, in Africa. Such disasters can lock people into endless poverty and become a powerful force for migration. The impact of such occurrences must be reduced through improved preparedness and resilience.

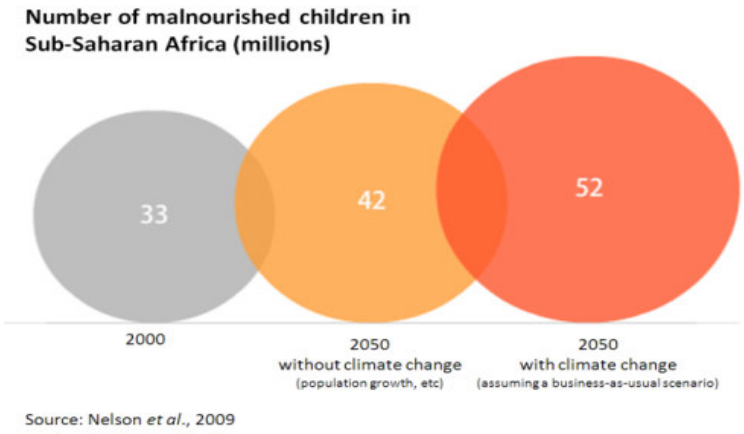
(a) Disaster-risk reduction: Are countries in Africa prepared for a significant increase in weather-related disasters caused by bigger and more frequent extreme events? How can we ensure that all stakeholders receive early warning information on extreme events?

(b) Climate-risk management offers many advantages for people, communities, business and governments, but is little practised in Africa in spite of its highly variable climate. Why are climate services currently so weak and so little engaged in the African development agenda? How can they be improved? How can

we increase community participation in making and using weather observations, to improve agricultural practices, for instance?

(c) Food security: The food security situation in Africa is set to worsen in a more hostile climate and further aggravate poverty. Can a green economy reverse the trend and feed a doubled population by 2050? How do we make sure that such a change translates into better access to food, poverty reduction and inclusive development? What are pro-poor adaptation technologies and practices, and how do we promote their adoption?

(d) Social protection: What instruments exist to address the socio-economic dimensions of vulnerability? What public risk-transfer and social protection schemes can be strengthened to serve as a platform for pro-poor adaptation? How can "productive safety nets" be made "adaptive safety nets"?



Essential measure (5): Well invested major financial resources

48. Financing adaptation to climate change in Africa demands really major resources, increasing through the next several decades, at least. Opportunities within the CDM do not suit Africa's potential for mitigation since Africa lacks investment opportunities for cleaning up industries that emit high quantities of GHGs. Clearly, for CDM to have an impact on economic and social development in Africa, some of the accounting rules and investment criteria need to be changed. Foreign direct investment in mitigation and transformation to a low-carbon economy could be of interest to transnational corporations[21]. There are many climate funds but little commitment, see http:// www.climatefund.info/ .

(a) Are **UNFCCC negotiations** likely to provide sufficient resources for Africa to adapt to climate change and transform to a green Economy? Are tabled commitments of about $40 billion per year by 2020 likely to be sufficient? Can States invest such sums in ways that attract further private sector investments of the kind required?

(b) What changes in existing mitigation-financing mechanisms are required to help provide resources for Africa to develop in a sustainable low-carbon way? How should the CDM be adapted to be more appropriate to Africa's interests?

[21] UNCTAD World Investment Report 2010

(c) How can Africa obtain more control over new climate finance for addressing its own climate change and development agenda? Can finance flows be made more predictable so that investments can be scheduled effectively? Is "Integration" of financial mechanisms both desirable and feasible?[22]

Essential measure (6): Major renewal of infrastructure in harmony with a changing environment

49. African infrastructure is run-down and weak owing to underinvestment over the past few decades. Much will need modifying to become low-carbon; and much will need replacing or adapting to greater extremes in weather and rising sea levels. Sectors whose infrastructure needs major revamping include energy, transport, water and sanitation, ICT, urban, industrial and coastal protection, agriculture, forestry and rural health and educational facilities.

(a) **Programming infrastructural development**: How can countries integrate existing plans for infrastructural development into the "low-carbon requirement"? Is it possible to adapt existing planning and construction regulations and enforce them effectively without paralyzing the whole process? Is suitable technology available? How can Africa plan for enhanced infrastructural investment to sustain growth and maintain employment?

(b) Is there sufficient information on expected changes in climate to help adapt the design of infrastructure? What long-term rise in sea levels should be accommodated in new coastal infrastructure - one, three, or seven metres? Which areas should be abandoned and which protected? Are best design and construction practices easily shared in Africa?

(c) A forward-looking low-carbon energy strategy: **National and regional power plans** may need adapting to accommodate rising demand from growing industries and the need for sustainable sources. Solar energy could meet many rural needs, given suitable investment.

Essential measure (7): Incentives for green trade and industry, with a fully engaged private sector and good access to low-carbon technology

50. Africa appears poised for economic take-off. Prospects for the African domestic market are promising. One critical challenge that Africa and the rest of the world face is how to make trade and climate-change policies compatible with each other. Given the reality of climate change, it is important to identify and take advantage of new green opportunities. The goal is to minimize climate change's potential adverse effects on trade and industry and strike the right balance between rules being developed under the UNFCCC to combat climate change and WTO multilateral trade rules.

(a) While the green economy offers many new trade and industrial opportunities, will they be broad and clear-cut enough to justify a change in economic direction for

[22] For example, as outlined in UNDP Discussion paper on Human Development in a Changing Climate: A Framework for Climate Finance

Africa? Is there any viable alternative for Africa? Is sufficient information available to help the private sector guide future investment strategies, for example?

(b) Should the AU programme for the Acceleration of Africa's Industrialization be revised for a green economy, to incorporate climate change considerations? Do regional and national governments have sufficient information to incorporate climate-change considerations into their industrial development frameworks and support for trade?

(c) Africa needs improved access to many low-carbon technologies for initiatives, such as rural electrification. How might trade policy be mobilized to support the transfer of low-carbon and environmental technology**?** Are African negotiators in the UNFCCC process pursuing the transfer of technology vigorously enough?

(d) Could national biofuel programmes support the development of the rural economy? With appropriate incentives, village biofuel production could drive improvements in local road and market infrastructure, leading to greater trade in surplus food yield and other products. This would benefit rural producers and local industries, traders and consumers.

Essential measure (8): Transformed use of land and water - agriculture, forestry, ecosystems, biodiversity, with improved environmental and food security for poor communities

51. The Comprehensive Africa Agriculture Development Programme (CAADP) is supporting participating countries in the fundamental reform of their entire agricultural sector while adhering to the "green" principles of sustainable land and water management. It seeks greater economic growth through agriculture-led development. The goal is to enhance food and nutritional security, eliminate hunger, reduce poverty and export growth. AU-NEPAD has been tasked with building on the CAADP and developing an African agricultural-based mitigation and adaptation framework. Its role is to integrate carbon sequestration into agriculture and carbon financing. Using an inter-sectoral approach, it will also bring together ministries of agriculture, the environment and water - a good basis for developing a green economy.

(a) **Ecosystem services:** In the present economy, ecosystem services are grossly undervalued, 10 –100-fold. Practical policies must be formulated. Financing mechanisms must create the right incentives for the rehabilitation of the degraded environment. Is it possible to inculcate into the planning and decision-making processes a new culture that values and optimizes sustainability in production and resources?

(b) **Land use and REDD**: Given the impacts of population growth, urbanization, globalization of markets, international investment flows, land purchases, carbon trading, the need for vast carbon lock-up in reforestation (REDD) and programmes to counter desertification, is pressure on land in Africa likely to increase markedly in decades to come? What will that mean in terms of multiple stakeholder interests, and how will that be managed equitably? Is Africa up for sale?

(c) **Agriculture:** A green economy could be of huge benefit to sections of African agriculture, but can existing support services cope with the demands for widespread changes in practices? Given the expected long-term decline in agricultural

productivity in a warmer world, can Africa feed a rapidly growing population? Can farmers be empowered through risk-management practices, such as index insurance, to cope with increased climate variability? Will the major opportunities for locking carbon away and mitigating emissions through improved agricultural practices raise rural incomes, but reduce productivity further, and so exacerbate overall food insecurity?

(d) **Water** is a scarce and valuable resource, but is often managed as if it were still in abundance. Climate change will severely aggravate water stress in arid and semi-arid areas. By 2025, nearly 50 per cent of Africa's predicted population of 1.45 billion will be faced with water stress or scarcity. Water policies must address this growing scarcity, through pricing or other means, to ensure that; water is used efficiently; watersheds are conserved; and funds are available for further investment. Competition for water is a primary contributor to environmental insecurity, and climate change will make it worse.

(e) **Environmental security:** Do we have sufficient understanding of the impact of climate change on the resilience of Africa's ecosystems, habitats, biodiversity, natural resources and, hence, people? Are environmental monitoring and management mechanisms sufficiently robust and fit for purpose in a green economy?

Essential measure (9): Change in human values, aspirations and development frame-works. with all citizens informed and engaged, especially women and the youth

52. While Africa's development through a green economy should have significant benefits for many disadvantaged groups – like the poor rural people – there is concern about its capacity to offset the increased risks of life in a more hostile climate. Adaptation programmes must engage all actors and reach all communities, involving them meaningfully in designing programmes to help meet their health, education and employment needs, and those of disadvantaged groups.

(a) **Youthful hope**: How can we engage the innovative energies of the youth in the process of adaptation, constructively combating the impacts of climate change? What is the best way to inculcate appropriate values for a sustainable world into the next generation?

(b) **Women:** Impacts of climate change are not gender neutral. Women will be disproportionately affected owing to their responsibility for household water supply, energy and food security, and their unequal access to resources. At the same time, they have proved effective in mobilizing communities to respond to and prepare for climate change and natural disasters. Climate-change initiatives must build on women's experiences, knowledge and coping capacity.

(c) **Inclusion:** How can we ensure that all society – including women, young people and socially vulnerable groups - is properly consulted in elaborating priorities and participates in creating sustainable societies? Many civil society organizations will relish the prospect of a green Africa in a more equitable world, but how can their many efforts be harmonized to the greatest developmental benefit?

Essential measure (10): Strengthened capacities and a culture of innovation, with quality science, focused on sustainable development

53. Africa requires major investment in climate and environmental sciences if it is to be competent in: extended global negotiations; transforming to a green economy; and, carrying out climate-change adaptation and mitigation efforts.

(a) **Capacities**: While human capacities need strengthening throughout Africa, what are the top priorities for investment vis-à-vis climate change? What should be done to reverse the brain drain and ensure that such capacities are available in Africa for the long term?

(b) **Innovation:** How can Africa promote innovation? Consensus is more valued in African society than individual brilliance. Does this stifle innovation or is there a lack of mechanisms for rewarding innovation?

(c) **Environmental monitoring**: Does Africa need to initiate a coordinated continent-wide programme for monitoring aspects of environmental change? Can the continent manage the whole adaptive process without a clear overview of changes and trends? Can Africa benefit from India's experience in large-scale transformation of agriculture, and also use the independent monitoring of environmental changes to manage and verify major REDD programmes,

(d) **Science for development:** How can science best support local CSOs working to increase resilience among poor rural communities? How should the science and practice of climate-risk management be advanced throughout Africa? How can Africa improve communication to ensure that decision makers (at continental, regional, national and local levels) are all supported with adequate scientific advice?

54. Finally, we have an integrated example (see box) to show how policy, biosciences, technologies and business could help develop a soft and no-regrets programme for action.

Waste to bio-fuel: urban waste disposal problem reduced by 80%.
Example of new green technology, innovation, employment,
good governance, mitigation of emissions and pollution

TMO Renewables Ltd has genetically modified 'compost-heap' bacteria into a biofuel engine. They have now signed a contract worth $25 million a year for 20 years to turn 102 million tonnes of non-recyclable municipal waste into biofuel each year. The process should convert over 80 per cent of residential waste into ethanol and recyclables, using no external energy or water inputs, and emitting a minimum of air and water. In addition to the revenue from 5 million gallons of ethanol produced from the first plant, there are significant 'tipping fees' for all the municipal and commercial waste that is treated.

This is second-generation biofuel technology, which uses cellulose rather than grain. Replication of similar waste to ethanol bio-refineries could drive significant green job creation and community economic development.

http://www.tmo-group.com/news/news-20-09-10.aspx

VI. Implications for international engagement

55. Climate change is the definitive global problem, affecting people and their lives at all levels, from the global to the household. As such, global climate governance is a *'collective action problem'* that requires full stakeholder participation in coherent responses. For this reason there is a need for international commitment and partnerships at all levels, not least, to assist in addressing the numerous "boundary" issues.

56. **Global voice:** Africa needs a **clear voice** in global negotiations in order to obtain a strong and fair agreement on limiting global warming, repairing damage done and developing a green economy. In such negotiations, Africa has an important role as third-party broker. The AU Committee of African Heads of State and Government on Climate Change would benefit from additional support to strengthen its voice in global governance on climate change and related agreements.

57. **Global partnerships:** The African Partnership Forum[23] is a good example of a global partnership that benefits Africa in terms of access to distilled knowledge and strategic thinking. It would be useful to examine other global and regional partnerships to see where they might be strengthened to take on new roles, and identify new needs for other similar initiatives. There may be a need for a network of international research and innovation centres to focus on developmental problems facing the least developed countries.

58. **Africa regional:** The need to address the climate change challenge has strengthened the role of the United Nations and other regional bodies, like the EU. Similarly, the AU embodies the ambitions of African States to form an urgently needed integrated active player on the world stage. But the AU lacks capabilities, especially in terms of funding. A stronger core for the AU is essential to support the many concurrent global and regional negotiation processes concerning climate change. The Joint Secretariat must provide greater guidance, with a strengthened AUC intensifying its participation in activities at the continental level, such as: leadership and good governance; maintaining peace in fragile States and supporting their security services; developing strategies and common policies; guidance for a green economy; and, monitoring continental climate and the environment and sharing knowledge.

59. **Africa subregional:** The RECS are the building blocks for the future, guiding and supporting common policies, programmes and actions and strengthening governance. They must be prepared to take on greater responsibilities and promote harmonized regional responses to climate change, encourage the African Peer Review Mechanism (APRM), and monitor and evaluate the effectiveness of investments, policies and practices.

60. **Africa transboundary:** There is a need for improved transboundary passage, trade, transport and communications to support development and the adaptation process. If surface waters in transboundary watersheds dwindle as a consequence of climate change, then it is important to agree on modalities for their equitable management to avert conflicts. This may also apply to the management of other common property resources, such as protected areas and coastal and maritime resources.

[23] http://www.africapartnershipforum.org/

VII. Knowledge management: policy, planning and practice

61. Responding effectively to climate change has many implications for the management of knowledge, information and data in Africa. The vast majority of development policies, planning processes and programmes will have to be adapted for life in a changing climate and green economy. They must be based on an understanding of the problems and opportunities. They should be consistent with mitigation and adaptation requirements, coherent between sectors, and delivered in coordination with many partners and stakeholders. High quality information is crucial for the integrated and timely decision-making that is necessary for effecting complex transformation amid much uncertainty and in a more hostile climate.

62. While the development community may consider integrating climate change into development, those who appreciate the scale of the problem see it more as maintaining development through climate change, and dub it as the green economy with a low–carbon development pathway.

63. ***Developing the capacity to manage uncertainty about climate*** *today and in the future is paramount.* While better information would clearly help reduce uncertainty about climate, this may not always be possible, *and a significant degree of uncertainty about our future climate will always linger*. The scarcity of quality information on climate is a particular challenge in Africa, and can hamper efforts to better define climate and climate change today. Despite scientific advances in understanding and modelling our climate, the biggest element of uncertainty is our future development path. This makes it necessary to monitor the climate and the environment continuously, assess vulnerability on a regular basis and possess reliable early warning systems.

64. ***Climate-risk management*** is the use of climate information to cope with impacts of climate on development and resource management. It covers a broad range of possible actions, involving improved resource management, *to minimize adverse effects and maximize opportunities* in climate-sensitive economic sectors. It addresses adaptation to climate change and disaster-risk reduction in any climate-sensitive development sector by focusing on actions that can be taken today, to improve outcomes and preparedness. It also seeks understand and anticipate the interactions of economic, environmental and social systems with future climates. The CRM is a new science for development and, as such, much is needed to implement it effectively in Africa. Capacity-building and substantial improvements in data supply, climate services and sectoral management practices are all essential.

65. ***Improved policy*** requires evidence and understanding of the impact of climate variability and change on development related outcomes, and the utility of climate information in reducing climate impacts. Evidence on impacts of climate variability and change will help justify the acceleration of mitigation and adaptation measures. The CRM is an essential tool for supporting policymaking processes.

66. **Improved planning:** In the longer term, ignoring climate change in planning will result in inefficient and suboptimal investments and decisions. Planners have historically managed climate risks with differing degrees of success, depending, in part, upon the quality and scope of the climate information available to them. In places with good climate records, simulations of future climate that are consistent with past variations have been used to develop projections of climate change. This information can be helpful to managers and policymakers looking at longer-term investments and strategies.

67. ***Improved practice*** on a large scale requires investment in: capacity building; training programmes; and policy dialogues; the management and generation of knowledge; the dissemination of best practices; tools and the transfer of appropriate technologies. It is vital to develop CRM methods and tools, and integrate them into the relevant economic and financial analyses that assess vulnerabilities and weigh risks. Such tools could help improve the economic rationale of decision-making in the face of climatic uncertainty. Integrated advisory services and networks of early warning systems would also be beneficial.

68. ***Improved climate services:*** Pro-poor services must be able to tailor and communicate information to user needs. Improved communication between climate providers and key climate-sensitive sectors is also essential. With the support of experts, technical advisory services on climate-risk management would play a crucial role in helping translate climate information products. ClimDevAfrica has started investing in upgrading regional climate services by strengthening regional and subregional climate resilience for development institutions. Nevertheless, it is necessary to exert more effort at the national level to support the development of the Global Framework for Climate Services.

Creating resilience strategies for water supply

Achieving water security and economic development effectively means using scarce water resources more efficiently and managing the risk of impacts from climate variability and change. Innovative solutions use the latest technology, such as remote sensing, global datasets and climate modelling and forecasting. Solutions may involve water policy interventions, including option contracts and insurance for water supply in times of scarcity and early-warning systems for floods and droughts. In some cases, additional investment in infrastructure, such as reservoirs and water treatment and reuse plants, may be necessary.

In Metro Manila, Philippines, the IRI works with the urban water-supply service, irrigators and national level agencies to create anticipatory strategies for managing water crises. Economic mechanisms, such as option contracts and index insurance, are used with climate information and forecasts. The reservoir that supplies water to Metro Manila is increasingly vulnerable to hydrologic variability, both drought and flood. A large irrigation area also relies on water from the reservoir in this shared water system. In times of water scarcity, questions of where the water should be allocated become critical and often contentious. Research indicates that incorporating seasonal forecasts into decision support systems can increase hydroelectricity and irrigation water in wetter years where water would usually be spilled over the top.

Despite the potential benefits of integrating seasonal rainfall forecasts into the operations of water resource reservoirs, it is rarely done, even in regions affected by water scarcity. This is often attributable to water managers' tendency to act in a risk-averse manner, preferring to avoid the consequences of inaccurate forecasts, at the expense of unrealized potential benefits. Work by IRI on hydropower benefits in Ethiopia's upper Blue Nile basin explored the effects of conservative reservoir decision-making, relying on critical dry forecasts only. Even with this limited forecast use, greater hydropower benefits were observed 97 per cent of the time, in comparison to operational decision-making based solely on average historical conditions. This demonstrates that water managers can remain risk averse **and** still realize benefits from climate forecasts.

69. ***Improved climate data*** are indispensable, and so too are observations for local use, national and regional planning and global change, in coordination with the user communities. While climate science has made substantial advances in recent years, and reliable information is increasingly available, it is essential to ensure that the relevant local communities have full

ownership of it and use it well. Some countries' data policies still restrict access to data, making CRM very difficult.

70. While the climate community is making efforts to put their house in order, much remains to be done. ClimDev-Africa is working on many fronts with the: Global Climate Observing System to improve climate monitoring; African Centre for Meteorological Applications for Development and regional centres to strengthen practices, and; Africa Climate Policy Centre to advance climate policies and CRM. The Global Framework on Climate Services is making initiatives to improve the situation overall. Nevertheless links remain extremely weak between climate services and rural communities in Africa. Climate services should work closely with different communities, using feedback to develop specialist services to meet their needs and encourage them to make observations and use the information in their own agricultural practices.

VIII. Conclusions

71. **Climate change is the biggest challenge for the future of Africa**, and the world. It must be addressed through a global partnership. In the absence of strong global responses to the challenge, there is relatively little that Africa can do on its own to adapt to all the expected impacts of a changing climate.

72. **Business as usual holds a highly problematic future** for Africa as a whole. Current development pathways are simply not sustainable: the damage to people, their livelihoods, the environment and society in general, is unimaginable. The green economy offers a way forward through climate change, with opportunities for everyone, but is critically dependent on a strong global agreement for transforming the way we treat the planet.

73. **Current negotiations under UNFCCC** are absolutely vital for the future of the continent, and a better world. Africa must continue every effort to obtain a strong and fair global agreement. Other global agreements must be harmonized with UNFCCC goals. There is a need to reform existing financing mechanisms for mitigation and adaptation to maximize the opportunity for Africa's development through a green economy.

74. **Moral high ground:** Africa has contributed the least to global warming; will bear the brunt of the effects of climate change; and has the potential to lock up significant quantities of atmospheric carbon relatively cheaply and quickly through re-vegetation. For these reasons, it has a unique and important catalytic role to play in climate change negotiations, nudging developed and emerging economies towards an agreement that is in everyone's best interest.

75. **Climate resilience:** In rural Africa there is much concern about the impact of already changing local climates and the extreme vulnerability of so many communities faced with a more hostile climate. It is imperative that Africa's leadership take up the challenge of improving climate resilience now. Countries in the arid regions of Africa are being forced into "reactive adaptation", which is more expensive and less effective than planned adaptation.

76. **Reluctance:** At present, Africa is unprepared to adapt to climate change. Leaders lack access to the resources and technology needed to address yet another costly, complex, macro-constraint to development. Too few people have taken ownership of climate change and

acknowledged it as their problem. Africa absolutely needs visionary leadership and political ownership to succeed in adaptation to climate change, using a green economy.

77. **In the meantime,** the continent needs to do plenty of preparatory work as it negotiates global agreements with adequate finance. It will need to integrate considerations on the adaptation to climate change into policy processes and decision-making across a range of sectors, from the continental to the local. Climate-risk management offers multiple ways to work more effectively in a variable and uncertain climate.

IX. Recommendations for action

Africa should accelerate its preparations for and response to the many threats from climate change and start working on opportunities for sustainable development in a green economy.

78. There is a need to **strengthen the information and skills available to the African negotiating team at UNFCCC** to ensure the best possible future for the continent in a more equitable world. The team must bring considerations for a green economy to the fore. To this end, negotiators must be empowered with solid scientific, social and economic arguments produced by a dedicated team such as the African Climate Policy Centre.

79. Africa needs to **develop a continental strategy and master plan** to map out the many issues related to climate change. This will help develop coherent policies and programmes in all pertinent domains, for combined mitigation, adaptation and development within a green economy. It might, thus, be necessary to establish a taskforce on climate change and a green economy for Africa, as part of the Africa Partnership Forum, and forge new partnerships continent- and worldwide to meet the needs of the combined process.

80. It is vital to r**einforce leadership and governance through the Joint Secretariat** (including RECs) and prepare for scaled-up responses in proportion to the monumental task, once funding for adaptation becomes available. To manage natural resources and energy, it will be important to improve regional policies and institutions to integrate climate risks, and identify transboundary issues and economies of scale. The continent needs to forge new partnerships through solidarity around the central, diverse concerns of various regions and countries.

81. There is an urgent need to **promote adaptation efforts**, using the considerable resources already available, to focus on the most vulnerable population groups. Adaptation strategies must address the consequences of a changing climate and seek to strengthen the resilience of vulnerable communities to short-term climate variability and new climate risks. Additionally, they must promote integrated and balanced long-term development. Adaptation programmes developed by different stakeholders, involving multiple “no-regrets” initiatives abound, waiting to be implemented: MDG and disaster-risk reduction and recovery strategies and the National Adaptation Programmes of Action may also provide a basis for early action.

82. Africa must r**everse the brain drain** by establishing key institutions to advance a green development in a more hostile climate, with organizational arrangements that are likely to interest African specialists currently working overseas.

Glossary of terms

Today climate is everybody's business. Stakeholders from various sectors and backgrounds have different conceptions and use the same terms in varying meanings. It is therefore, important to start by stating clearly how some of the most important terms used in this document should be interpreted.

The term adaptation refers to adaptation to present climate variability and anticipated climate change.

Carbon sequestration or carbon lock-up or carbon sink: Carbon sequestration is "the process of removing carbon from the atmosphere and depositing it in a reservoir". Carbon sequestration is mainly a natural process whereby carbon dioxide is stored in plants through photosynthesis. Carbon dioxide can also be stored as plant "organic matter" in soils. It is also a geo-engineering term for long-term storage of carbon dioxide or other forms of carbon to mitigate and/or defer global warming. It has been proposed as a way to slow the atmospheric and marine accumulation of greenhouse gases, which are released by burning fossil fuels. Carbon dioxide is naturally captured from the atmosphere through biological, chemical or physical processes. Some anthropogenic sequestration techniques exploit these natural processes.

Climate change, as defined by IPCC, refers to the change in the state of the climate that can be identified (for example by using statistical tests) by changes in the mean (average value) and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.

Climate information includes, historical data, analyses and assessments based on these data, forecasts, predictions, outlooks, advisories, warnings, model outputs, model data, climate projections and scenarios, climate monitoring products, etc., and can be in the form of text, maps, charts, trend analyses, graphs, tables, Geographic Information System (GIS) overlays, photographs, and satellite imagery.

Climate prediction includes forecasts and outlooks and predictions at monthly, seasonal, inter-annual, decadal, and multi-decadal scales.

Climate risk management is an approach to decision-making in climate-sensitive activities (for example, agriculture and food security, health, tourism, management of water and energy resources, urban planning and design, transportation, etc.), which seeks to reduce the vulnerability associated with climate risk (both variability and change), and aims to maximize the positive and minimize the negative outcomes for these sectors.

Global Framework for Climate Services
While the IPCC, through its assessment of climate, has raised political awareness, there is a need to take the next step. This involves making available regional and location-specific user-friendly climate information across a range of time and space resolutions for adaptation and climate risk management. Regarding the model of the weather services network, a mechanism must be put in

place to ensure the delivery of climate information to users and enable user communities to give feedback on their information needs to service providers.

By enhancing climate services, the Global Framework for Climate Services will empower communities to manage and plan for emerging climate risks and opportunities. It will help bridge a gap. The GFCS is a substantive outcome of the World Climate Conference, whose goal is, *"the development and provision of relevant science-based climate information and prediction for climate risk management and adaptation to climate variability and change, throughout the world."*

The GFCS has four major components: a user interaction mechanism; a world climate services system; climate research; and observation and monitoring. The latter two components are already well established, while the first two are new initiatives. The components recognize and build on the successes of past and ongoing research, assessment and observational programmes.

Green economy

Typically, a green economy is an economic system that is compatible with the natural environment, is environmentally-friendly, ecological, and generally, socially just. Many green economy advocates demand the imposition of these conditions on economies. This conventional concept of a green economy may be alternatively described as "the greening of an economy". Some fundamental criteria for meeting these conditions have been in place since the Rio Declaration. They include: using renewable resources provided that they can be regenerated; making up for the loss of non-renewable resources by creating renewable substitutes; limiting pollution within the sink functions of nature; and, maintaining the stability and resilience of the ecosystem. Conditions for social justice may include: not compromising future generations' ability to meet their needs; the rights of poor countries and poor people to development and the obligations of rich countries and rich people to change their excessive consumption levels; equal treatment of women in access to resources and opportunities; and, ensuring decent labour conditions. Additionally, issues of good governance and democracy are critical for ensuring social justice and equity. Less understood, but of much greater interest, is a green economy as an economic system driven by investment and trading in, and the production, distribution and consumption of environmentally-friendly and environmentally enhancing products and services. Therefore many green conditions, including the above, should no longer be seen as constraints on an economy. Rather, they should be regarded as forces that generate new economic opportunities. The issue concerns the expansion and reshaping, not diminution of the space for economic development and poverty reduction.

Green economy initiative is a global initiative launched by UNEP in October 2008 to seize the opportunities that a green economy presents. It seeks to accomplish two tasks. First, it tries to make a compelling macroeconomic argument for investing in sectors that produce environmentally friendly or environmentally-enhancing products and services ("green investment"). By a "macroeconomic argument", it mainly refers to the contribution of green investments to output and job growth. Second, the initiative tries to offer guidance on how to boost pro-poor green investment. The goal is to encourage and enable policymakers to boost green investments by the public and private sectors. The initiative comprises a range of research and advisory products and services to be delivered in partnership with organizations within and beyond the UN system.

Low-carbon development pathway
This refers to development with minimized emission of greenhouse gases, for example, using renewable energy rather than coal, oil and gas.

"A low-carbon economy is a concept that is drawing greater attention amid rising public awareness of climate change and the urgent need for transformation of the economy. A low-carbon economy emits a minimal amount of carbon dioxide and other greenhouse gases. However, what constitutes the minimum is still under debate. The importance is that countries are gradually reducing the carbon intensity of their economies, in both unitary (CO2 per unit of GDP) and absolute terms. A low-carbon economy can be seen as an outcome of putting in motion a particular dimension of a green economy.

Mitigation
This refers to actions to reduce greenhouse gas emissions and limit overall global warming.

A '**national climate service or national climate centre**' can be and often is an entity within a national meteorological service to, *inter alia*, carry out climate studies, conduct climate prediction and projection and develop and provide climate services. In some countries, climate functions can be mandated to other national entities, including other government agencies, universities or research institutions, in addition to NMHSs. Where needed in this document for discussion on climate service development and delivery, the term 'NMHS and other mandated institutions' is used.

National meteorological service (NMS)
For the purposes of this paper, an NMS is "an organization established and operated primarily at public expense to carry out those meteorological and related functions which governments accept as a responsibility of the State in support of the safety, security and general welfare of their citizens and in fulfilment of their international obligations under the Convention of the World Meteorological Organization". In many countries, the NMSs and a hydrological service are collocated, and are referred to as the national meteorological and hydrological service (NMHS).

Resilience is defined as "the capacity of a system to absorb disturbance and still retain its basic function and structure."

Service is used to describe an action, such as delivery of climate information (see above), guidance, or a product to a client or user, and does not normally imply a physical entity such as an organization or institute unless this is specifically described (as in NMHS above).

User or **decision maker** (frequently used interchangeably) are terms that refer to a client (perhaps an individual or organization) with responsibilities for decisions and policies in climate-sensitive settings, for whom a service is provided or to whom some form of climate information is delivered.

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Annex 3: The 12 Issues papers

Table of contents

1. Governance and leadership response to climate change

Issues paper #1

I. Overview

1. Good governance is a critical element required for effective and sustained peace and security, economic growth and human development. As African States make strenuous efforts to meet the goals enshrined in the internationally-agreed MDGs, it is increasingly apparent that without improved governance the goals cannot be attained. Managing climate change is also a governance issue. Africa is facing an uphill task as it seeks to adapt to climate change amid great adversity, instability and economic woes. Governments have the responsibility of designing and implementing effective climate-change mitigation and adaptation policies. This requires organizational and institutional capacities as well as coherent actions built on accountable, transparent and participatory systems of governance.

2. The concept of good governance is illustrated in the ADF-IV consensus document. According to the document, Africa's overarching challenge is to build a capable State where: peace and security are guaranteed; economic growth is distributed equitably, educational, health and social services are strong; freedom of expression and vigorous exchange of views through a free and thriving media sector are encouraged; sound macro-economic management, institutional reform, and investment in human resources development, including in the critical area of gender equality, are pursued; corruption is dealt with swiftly; and where the private sector is able to generate economic growth, jobs and income. At the core of the capable State are political continuity, reliable policies and a fair and consistent application of the rule of law. Tackling climate change needs all of these ingredients and much more, within the scope of an effective global climate governance framework.

3. African governments through the AU and its programme, NEPAD, have shown determined leadership by promoting good governance, underpinning a stable, democratic and prosperous continent. They make their endeavours through the APRM and other action plans that support efforts to accelerate progress and implement reforms.

4. In spite these and other initiatives that make substantial commitments and promote the understanding of good governance, many of the predicted impacts of climate change - natural disasters, disease, and food insecurity - are likely to reverse any gains already made. African countries account for less than 4 per cent of total GHG emissions. However, they are expected to bear a disproportionate burden of the environmental impact caused. These additional burdens cause further instability and aggravate existing stresses. Most African States lack the capacity to adapt to the altering circumstances caused by climate change as quickly as developed

countries. This further jeopardizes Africa's chance of achieving two major goals: governance and sustainable development.

Leadership: a governance agenda

5. A key element in good governance is the quality of leadership as measured by the degree of commitment, vision, transparency, efficiency and accountability in discharging State responsibilities. Recent reports such as the *ECA Governance Report* show positive trends for African countries regarding governance reforms. The indicators point to:

(a) steady consolidation of democracy;
(b) greater political inclusiveness;
(c) expanded voice and accountability; and
(d) improved economic management.

6. These are encouraging developments. There is growing concurrence on the notion of good governance across Africa, which may promote sustainable development and improve governance. Nevertheless a great deal still needs to be done. To avoid catastrophic reversals of recent successes in economic growth, African governments must create a framework for the implementation of good governance strategies.

II. The main issues at stake

United Nations Framework Convention on Climate Change

7. Africa's negotiating position within this framework is to obtain a just global agreement that is strong enough to give the continent a sustainable future. This is no easy task to perform in the full public glare of international negotiations. However, it is a task whose outcome will affect the future living standards of everyone in Africa. The key to this process is to strengthen Africa's position on how it wishes to meet its challenges. Africa must also inform the global debate by ensuring greater understanding of its interests and perspectives on how to curb harmful effects climate change.

Political governance

8. Political representation as a "central component of democratic governance" is a serious challenge in Africa. The executive and parliaments must represent the common good, especially in countries emerging from totalitarian rule, where parliaments tend to enact laws serving narrow factional interests rather than the wider public good. To improve the role of parliaments, they need greater independence from the executive to discharge their primary oversight role. Responding to climate change may well involve new investments that exceed current levels of foreign development assistance. Such investments will require scrutiny on expenditure, investigative capacity, fiscal management and so on. Accurate reporting of progress on adaptation and mitigation processes is essential. There is a need to build parliamentarians' capacity and skills to meet these new demands.

9. Across the continent, there is low representation of women, youth and rural voices in decision-making processes. Indeed, multiparty politics is increasingly becoming the acceptable way to compete for political space. However, governments still need to fill a wide gap concerning lack of: dialogue with citizens, and; the will to seek consensus on public policies. Political representation is an important mechanism for making voices heard. In relation to climate change, those affected have direct knowledge of the challenges and coping strategies. They also have the ability to mobilize communities to respond to and prepare for the impact of climate change and natural disasters.

Institutional capacity-building

10. In terms of public-sector reform, governments must improve the quality of performance and availability of climate-related information to citizens. Institutions should raise public awareness and increase public-service capacity. This involves upgrading skills and incentives to keep qualified and dedicated staff able to incorporate accountable and transparent mechanisms in the delivery of services. There is a need to simplify procedures for citizens to gain access to government, by designing them with the user in mind. This will help improve service orientation.

11. Capable institutions let the users guide them, which allows the users to participate more fully in decision-making and to articulate the specific needs and demands of a diverse society. This also means constant adaptation towards increased efficiency, transparency and accountability. Committees and non-governmental organizations (NGOs) may be enlisted to monitor and evaluate climate services, especially in rural areas. It is necessary to decentralize institutions and put in place special measures to ensure the participation of women, the youth, ethnic minorities and vulnerable groups.

Economic governance and public financial management

12. The economic cost of weak governance has devastating implications for Africa's ability to achieve sustainable development. Effective, transparent and accountable public financial management is central to a functioning democracy. Indeed, good governance, an enhanced business climate and stable macroeconomic policies drive growth. If Africa is to achieve growth and prosperity against the backdrop of the vulnerability caused by climate change, it must critically address the issues of inequality and achieve fairness and opportunity for all members of its society. At the core, to achieve sustainable development, Africa must reduce the impact of corruption by empowering its citizenry, establishing strong institutions and building the administrative and technical capacities of its public administrators.

13. Governments need to stimulate trade and investment and prompt private-sector activity. Given the potential of climate change to weaken key sectors, Africa needs, among other things, steady management of its natural resources and the active participation of its citizenry in the economy to progress towards pro-poor growth. The challenges facing Africa due to the indirect or direct effects of climate change are likely to impact its economic activities. The onus is on Africa to prepare robust strategies a plan to cope.

Private-sector development and corporate governance

14. The private sector plays a central role in climate change, both as a causal entity and in mitigating impacts and building resilience. Given appropriate incentive mechanisms, the unique expertise of the 'socially responsible' private sector, its capacity to innovate and produce new technologies for adaptation and its financial leverage, it can play an important part in the various efforts underway to mitigate the threats of climate change.

15. The impact of climate change will be felt most strongly in developing countries, which will need investments of $US26 to 87 billion annually in order to avoid an additional burden on their existing development needs (UNFCCC/TP/2008/7). Most of the climate change programmes and low-carbon growth plans, particularly in developing countries, are contingent on the flow of large sums of private funds through international carbon markets. Therefore, private investors, governments, and international financial institutions must work together to overcome barriers that restrict capital flows into the sectors that support climate-change mitigation and adaptation. This underlines the main ethos of the UNFCC Private Sector Initiative, which calls for effective engagement in the wider adaptation community as a means to support mitigation of and adaptation to climate change in a coherent and integrated manner.

Rule of law

16. Africa must strengthen its rule of law to ensure its effective enforcement and compliance with national legal frameworks that foster environmental commitments. The rule of law underpins virtually every issue. From food and product safety to environmental implementation, all variables hinge on effective rule of law, without which, Africa will be unable to raise awareness or prohibit illegal activities. Many of the important mitigation actions will be carried out in isolated areas, possibly out of the reach of the rule of law, where such actions are very vulnerable. It will be necessary to strengthen local capacity and the capacity of lawyers, judges and legal experts. Cooperation between law-enforcement agencies, within and among countries, will be necessary to avert the threats related to climate change, which risk sparking conflict among ordinary citizens.

Peace and security

17. As control of and access to natural resources become increasingly essential, adverse climatic conditions will force people to migrate in considerable numbers, which may increase the threat of conflicts and instability in the region. Mitigation strategies alone will not be an adequate response. It will be necessary to develop an adaptive strategy that addresses the increasing security risk posed by climate change.

18. Such action must include intensive efforts to understand the causal relationship between conflict and climate change, and address issues of disaster preparedness and building local adaptive capacity to moderate the migration from affected areas. It is essential to incorporate into existing conflict-prevention mechanisms measures to protect immigrants and displaced people.

Independence of civil society organizations

19. Non-governmental and civil society organizations can play a major role in strengthening local capacity to cope or by supporting local action. Successful adaptation requires a host of innovative measures developed with vulnerable communities to improve their present and future. This requires independent CSOs to develop and share best practices. CSOs and NGOs provide the people with a channel for their voices and the means to serve as watchdogs to enforce political transparency and accountability. However, CSOs are often seen as adversarial rather than complementary to government. Civil society attacks on State policies can sometimes undermine legitimate achievements.

20. A large number of CSOs operate exclusively as service providers, abandoning the important policy advocacy role crucial for pressurizing government. Furthermore, CSOs need to be differentiated based on their transparency and credibility. The reason is that they don't all operate as independent watchdog organizations and may be opportunistic and partisan. They, as well as individuals, may also be victim to laws that restrict their activities and infringe on their rights. Governments often question the legitimacy of human rights movements, thereby undermining their watchdog role.

Independence of the media

21. Working with the media to spread awareness and encourage active debate on priorities is important. The independence of the media is crucial for holding incompetent, inefficient and corrupt institutions or agencies to account, especially in terms of policies and service delivery. Climate change is complex, so well informed media are absolutely essential in maximizing its effectiveness and minimizing chaos and confusion.

III. Conclusion

22. In order to respond to the inevitable impacts of climate change, policy responses must be strengthened, and local communities, as well as national governments, need access to "appropriate economic resources, technology, information, skills and infrastructure". Creating an "enabling environment facilitated by suitable policies and programmes at the local, national and international levels" is vital. Moreover, African leaders must engage the international community firmly in the negotiations for political and economic solutions. Establishing a "common negotiating stance and a clear position" on the main issues is indispensable. Although a huge responsibility has been placed on the shoulders of African leaders, solutions must stem from Africa while developed countries "should ensure financing of adaptation and appropriate mitigation actions using new and additional sources of swiftly accessible funds which will ensure that the existing international aid and commitment are met" (former UN Secretary-General Kofi Annan and Nicholas Stern).

Main recommendations and actions required

23. While good governance is beyond the scope of 'normal' topics that embrace climate change, its improvement is critical and will bring about major collateral benefits. Fostering good governance in Africa means building a continent with capable democratic States, comprising strong institutions that promote public interest and involve all stakeholders,

particularly women, young people* and vulnerable groups. Africa urgently needs to coordinate its efforts to redress the lack of capacity, especially in the management of climate change, its harmful effects and the unique opportunities it presents.

Leadership

24. Good governance is a leadership issue. Within the scope of capable States working together for their common good, it involves the effective, transparent, and accountable discharge of responsibilities regarding climate change. Examples of leadership actions are listed below.

(a) Among the actions are the Conference of African Heads of State and Government on Climate Change, which needs active support by all heads of State, strengthened by: the best scientific information available; informed debate on issues, and; active efforts to raise awareness across the continent;

(b) Equally vital is the High-Level Panel on Climate Change Financing that is developing recommendations on methods of raising adequate finance, appropriate means of governance and disbursement measures. This work needs concerted support by the relevant stakeholders; and

(c) Through the UNFCCC, African negotiators, working under the umbrella of the Conference of Parties, must obtain a fair and strong agreement to safeguard the continent's future.

25. Improving governance in Africa is ultimately a national project that is part of a globally coordinated strategy for climate-risk assessment and management. For Africa to improve governance policies, practices and procedures, it must boost its understanding of the governance issues surrounding climate change. It must create a participatory political process that fosters political freedom and human rights, media freedom and civil society action. It needs to promote the institutionalization of languages understood by African populations and private sector development. This will help to better manage current challenges and reduce risks related to climate change and prevent other related crises.

26. In concrete terms, this requires:

(a) Greater awareness and African-led research and knowledge

African countries must be committed to local, national and international policies, plans and practices. This will help them seek to understand the causal relationship between climate change, governance, sustainable development, and peace and security. It will also build awareness and develop tools and processes to facilitate responses by the State, intergovernmental and non-state actors. It is also important to intensify efforts to invest in research and education, and thereby develop new and homegrown solutions to stimulate behavioural changes and accommodate climate change;

(b) African countries to develop strategies for adaptation to climate change

Although challenging, this is necessary for the prosperity of the development agenda. There is a need for a clearer understanding of the possible calamities that climate change can bring and for a discourse on how best to stave off the worst impacts. No longer can climate change be seen merely as an environmental problem or an energy challenge. African countries must design and formulate clear and coherent approaches so that, together, they address the challenges posed by

climate change. The problem is not localized but transcends national borders, potentially causing conflict and compromising national and regional security;

(c) Strengthened rule of law and regulatory frameworks

This will lay the foundation for the higher judicial standards and rigorous enforcement mechanisms that most African justice systems lack. Clear and concise laws and regulations are needed to ensure effective enforcement mechanisms and compliance. There are complex socio-economic and environmental challenges as well as endemic corruption within the legal system. An independent, efficient and accessible judicial and legal system that applies the law equally to all its citizens will go a long way: enacting new laws; strengthening of the enforcement of existing laws; demonstrating the legality and sustainability of initiatives related to climate change;

(d) Strengthened capacity of non-state actors

African governments, often challenged in their efforts to win local and national support, benefit from: well-organized NGOs and CBOs that serve to highlight their areas of concern, raise awareness, and support advocacy for relevant stakeholders; the media as another excellent tool for shining a light on the threats of climate change. This can help identify opportunities and formulate policies in response. A great deal can be gained from adaptation experiences in other local communities, and lessons can be learnt across the continent and the globe. The private sector, in particular, business associations, has plenty to offer, given its leading role in merging different governance initiatives into one comprehensive set of private-sector efforts to promote sustainable development. However, galvanizing non-State actors depends on available incentives to motivate private-sector companies, and on the companies' own role in defining those incentives;

(e) Reformed governance institutions

Reforms should strengthen the public sector, including local government institutions, so as to improve service delivery, develop adequate checks and balances, and incorporate climate-change issues into development policies and practices;

(f) Transformed international partnership

This requires increased financial assistance, technical support and access to the new, green technologies that African countries need to adopt. Shared problems, such as climate change, require shared solutions. NEPAD, for example, is a pact between Africa's leaders and its people on one hand, and between Africa and international development partners on the other. The principle of mutual accountability is central to restructuring international relationships, with climate interdependency being inevitable. NEPAD and APRM are designed to uphold precisely this kind of principle;

(g) Strong, effective partnerships built within Africa

This has the potential to strengthen existing regional institutional partnerships, which is line with the shared aspiration of developing an African-owned agenda for good governance. Regional institutions and other specialized agencies should be strengthened to take on climate change and governance issues, and collaborate with research and policy institutes to design mitigation policies and programmes for national, regional and international organizations;

(h) Tracking and monitoring

Good governance and compliance related to climate change are of paramount importance. Managing climate change is a global project that must not be allowed to fail. Rogue States must

not be tolerated. Failure to meet global emission reduction targets could cause a catastrophic decline in human population and civilization. As such, all organizations, including the AUC, AfDB and ECA, as well as national governments and regional institutions, should actively promote mechanisms for tracking and monitoring enforcement and compliance; and

(i) A Strengthened Joint Secretariat of the AUC, AfDB and ECA

This secretariat needs to be strengthened. Climate change is a global issue and Africa must speak with a clear voice in global negotiations. All its policies and actions must be harmonious. The need to address the climate-change challenge has boosted the role of other regional bodies, such as the EU. The AU embraces the aim of African States to form an integrated, active, body on the world stage. If confronting climate change together helps to achieve Africa's long-standing goal of regional integration, well and good. The AU lacks the capabilities, especially financial, and clearly requires external support.

IV Key questions

A. Improving governance

27. How can existing programmes designed to improve governance, like Africa Partnership Forum and APRM, be reinforced and scaled up? Is there need for more radical action with incentives and sanctions? Are there other examples of good practice?

B. Leading the transformation to a green economy

28. Do economists have sufficient understanding to redirect Africa towards a green economy? How many national governments have the necessary governance skills to transform existing development programmes into green, low-carbon development pathways to ensure the integration of adaptation and mitigation initiative into development? Are the RECs experienced enough in climate-change issues to ensure regional harmonization? How equitable would a green economy be for different regions, countries and communities? How can the entrepreneurial and risk-management skills of the private sector be unleashed to best effect in the green economy?

C. Strengthening democratic processes

29. Are democratic processes in Africa sufficiently robust to cope with the formidable challenges of climate change? How much sovereignty will countries willingly surrender to maintain solidarity in facing a more hostile climate? Can enough power be devolved to foster local adaptation processes? How best can traditional leaders be enlisted to assist local adaptation and mitigation processes?

D. Expanded voice

30. How can governments be persuaded to support ICTs more enthusiastically? How else can rural communities be included in the transition to a green economy? Why is the use of rural (FM) radios still limited in some countries but widespread in others?

2. Climate change, agriculture and food security

Issues paper #2

I. Overview

1. Climate change poses major challenges for agriculture and food security in Africa. It directly affects food production by changing agro-ecological conditions and indirectly affects growth and the distribution of incomes, and ultimately, the demand for agricultural produce. Therefore, a paradigm shift at all levels is necessary. This means that agriculture and food security should be at the heart of efforts to: sustain development and eradicate poverty, and; embrace growth that is resilient to climate change and has a low-carbon pathway.

Farming

2. This is the backbone of the rural economy, occupying some 60 per cent of the African population. Agricultural products constitute 50 per cent of total exports and 20 per cent of the continental GDP. However, rain-fed cultivation accounts for most of the seasonal production, which is already highly dependent on climate variability. The result is chronic food insecurity in many countries and obstacles to agro-industries and trade. Insufficient production to cover growing national needs, and limited food trade, particularly at the regional level, leave many countries overly reliant on food imports, and, ultimately, exposed to the vagaries of global trade. Given these underlying weaknesses, climate change will expose farming to multiple, complex impacts. Overall, the effects are likely to be harsh, especially if global warming exceeds 2°C.

Mitigation

3. While agriculture is a significant contributor of GHG emissions, which must be mitigated, it also provides opportunities for significant carbon storage, for example, in tree crops and soils. It is estimated that increases in organic soil carbon through improved agricultural practices will sequester one to six gigatonnes of carbon per year. A green economy with a low-carbon development pathway, offers new opportunities for carbon lock-up by changing crops, land-use and cultivation practices. Trading these would help diversify rural incomes and finance adaptation practices.

Neglect

4. While agriculture is vital to Africa, it often lacks priority and funding. The continent has not fully resolved complex issues that constrain development, such as land tenure. Furthermore, many calculations of the GDP exclude some agricultural practices, such as

subsistence farming and pastoralism, which possibly leaves them undervalued. With climate change, agriculture will become an even more pivotal sector and improving food security will be absolutely vital for so many people. Achieving this - with all the uncertainties of climate change - is a formidable challenge.

5. Some of the many issues to be addressed include:

(a) The impact of climate variability on food security;

(b) Declining agricultural productivity - both in Africa and worldwide;

(c) Insufficient water supply to stabilize production through irrigation;

(d) Impacts on livestock and fisheries;

(e) Sustaining rural livelihoods;

(f) Green agriculture for mitigation, adaptation and development;

(g) Shifting agricultural zones and associated land tenure issues, and;

(h) Funding for climate-change adaptation and mitigation specific to agriculture.

II. Main issues

A. Greater climate variability

6. This will make food production and prices more volatile and threaten food security. Many rural communities in Africa already endure chronic food shortages caused by climate variability. One of the first manifestations of a changing climate is greater variability, with extreme events becoming more severe and frequent. Climate change is expected to affect the timing of precipitation, which disrupts the timing of seasonal cues for planting, harvesting, etc. The result will be more floods, droughts, heat waves and storms, which, in turn, will have consequences for rain-fed agricultural production systems.

7. There could be a surge in new crop pests and diseases. The net result would be greater variability in yields from year-to-year, with concomitant volatility in food prices – both local and global. This is particularly threatening for African countries already plagued by food shortages. Without appropriate measures, food insecurity will worsen significantly. The recent rise in food insecurity is a clear indicator of a more hostile climate. The WFP reports that, for the first time in human history, the number of hungry people worldwide will exceed a billion in 2010. *African nations make up 36 of the 50 nations whose food supplies are most at risk.*

B. Declining agricultural productivity in a warmer world - Africa and the globe

8. The 2008 International Assessment of Agriculture concluded that unchecked climate change would make it increasingly difficult to feed a growing population. It warned that without radical change, the world would fail to support its population before the end of the 21st century. To avert this doomsday scenario, global food production would have to surge by 70 per cent to meet the rising demand from an ever-rising number of people. Africa's population is projected

to double by 2050, to about 2 billion. More than 60 per cent of the global population growth between 2008 and 2100 will be in sub-Saharan Africa. Climate change therefore represents a serious external shock that could compromise the food security of many millions of Africans.

9. Although agricultural productivity may increase initially at high altitudes and latitudes, this will be offset by diminishing productivity elsewhere. One scenario (among many) showed that cereal production in Africa could halve by 2050. In fact, a warming of 1 to 2°C is expected to decrease agricultural yields in arid, semi-arid and tropical regions. Agro-ecological zones may shift in ways difficult to predict: some traditional practices will become less relevant and more on-farm research and extension support will become necessary. The drying of the Sahel, with its harmful effects on traditional pastoral livelihoods, is an example of change that is already evident.

10. Reliable agricultural production needs a stable environment. The combination of greater climatic variability and a warming trend is threatening for food security and agricultural exports. Climate-risk management tools for developing greater resilience include improved early-warning systems and index insurance. These inform about, prevent, reduce and spread risks so that farmers and related commerce and industries are not impoverished by one bad season. Markets and food trade within Africa may be strengthened further if the WFP continues its policy of sourcing food aid from the continent.

C. Competition for water

11. This has led to insufficient irrigated food production**.** Africa only obtains about 10 per cent of its food production from irrigated lands – mainly in North Africa, where water is increasingly scarce. Some 95 per cent of total cropland in sub-Saharan Africa is rain-fed. Augmenting irrigation to levels typical in Asia is desirable, but the International Water Management Institute's (IWMI) assessment of water for irrigation in Africa puts the continent's potential for irrigation at more than15 per cent of its farming practice. Water is scarce and becoming more so in many places. Agriculture is the biggest user of water (about 70 per cent). Demand from other 'high-value' users is growing, so greater efficiency in irrigation is important.

D. Impact on livestock

12. Animals produce GHG too, especially when raised intensively. As the climate changes, livestock-based systems will inevitably, for instance, from increased heat stress, pests and diseases. At the same time, demand for meat and other products is growing rapidly – an opportunity to be harnessed. The challenge is to manage the livestock sector, through adaptive strategies that simultaneously mitigate emissions, reduce environmental impacts, without consuming grains. Animals raised extensively by pastoralists contribute less per head to global warming. Where traditional varieties are used, the animals tend to be more resilient to the harmful impacts of climate change. On the other hand, they contribute to global warming by degrading land, where ill-adapted policies and perverse incentives prevent sustainable pastoralism.

E. Impact on fisheries

13. These include:

(a) Problems with capture fisheries being intensified;

(b) Glaring evidence of fisheries already being depleted because of over-exploitation;

(c) The destruction of coastal and estuarine habitat being aggravated by rising sea levels

(d) Greater pollution from industry and habitation into rivers, lakes and coasts; and

(e) Some marine species already migrating towards poles in search of cooler waters.

14. The Integrated Coastal Zone Management and the Integrated Water Resource Management must ensure coherence between their actions.

F. Sustaining rural livelihoods in the face of climate change

15. The vulnerabilities of the rural poor to climate change should be addressed. The success of sustainable rural development depends on the development and implementation of comprehensive adaptation strategies for dealing with climate change, drought, land degradation and natural disasters. A significant proportion of the funds allocated by the UNFCCC to adaptation initiatives should be used to sustain rural livelihoods affected by these changes.

G. Green agriculture for mitigation, adaptation and development

16. Some agricultural practices can cause significant GHG emissions. For instance, land clearance using fire, rice production using irrigation, and the use of artificial fertilizer. To mitigate these emissions and adapt agriculture to a changing climate would entail profound changes, such as a green transformation with widespread acceptance of sustainable land and water management. For example, reducing the amount of tilling as an agricultural practice would be beneficial to the environment. To promote adaptation, it is crucial to develop crops that are more resilient to drought, heat, and pest infestation. To this purpose, scientists need to look to wild variants of common crops for clues. It is therefore important to maintain traditional plant varieties. Adaptation linked to agricultural biodiversity is expected to prevent 10 – 15 per cent of the projected drop in yield as the climate changes.

17. **NEPAD-CAADP:** In 2003, the African Heads of State adopted the Comprehensive African Agriculture Development programme to accelerate agricultural and rural development in Africa. CAADP seeks greater economic growth through agriculture-led development, which should help eliminate hunger, reduce poverty and enhance food security and nutrition as well as growth in exports. CAADP is helping countries reform their agricultural sectors, while adhering to the 'green' principles of Sustainable Land and Water Management. The goal is to invest at least 10 per cent of national budgets in agriculture.

18. The CAADP strategy addresses: institutional and policy issues; the development and deployment of technologies; knowledge management and capacity-building, and; investments and financing. The strategy includes sustainable natural-resource management, climate-risk management and combating land degradation and desertification. Sustainable Land and Water Management plays a key role in the complementary goals of agricultural production and a healthy environment.

19. In 2009, Heads of State and Government urged the AUC and the New NEPAD to: develop an African agriculture-based climate change mitigation and adaptation framework to; advance

the recognition of carbon sequestration and its integration into agricultural landscapes; incorporate carbon financing in global climate-change mitigation and adaptation measures, and; establish an inter-ministerial mechanism bringing together ministries of agriculture, the environment, and water to advance an inter-sectoral approach in addressing the climate-change agenda.

20. **Carbon trading:** There are major new opportunities in the green economy for absorbing carbon from the air, and simultaneously generating green products. Changing agricultural practices and improving land use in Africa's vast dry lands is considered to be a cost-effective way of reducing atmospheric GHGs. The restoration of degraded cropland soils can also increase soil-carbon storage and crop yields, while contributing to the conservation of agricultural biodiversity, including soil biodiversity. There is potential for global agreements to permit new 'crops and products' by tapping into new sources of funding through carbon trading and REDD.

21. For example, research is looking into the possibility of managing degraded lands for the production of bio-fuel and bio-char (biological charcoal). The lands would, at the same time serve as traditional grazing areas. Such actions could be a real winner, providing that they: enhance rural income; emit less carbon into the atmosphere; are a substitute for fossil fuel substitution, and; improve the functioning of ecosystems. There is risk, however, that bio-fuel production will compete with food crops, displace food production to other areas, causing conflicts over land use, exacerbate water shortages, or intensify emissions associated with land clearance.

22. Given current carbon prices and certification requirements, it is unlikely that payments will be sufficiently profitable on a small scale. Stronger institutions, or reductions in mitigation payments to large-scale agricultural producers, will be needed to facilitate payments to small farmers' associations .

III. Conclusion

23. Success in meeting the challenges that climate change poses to agriculture and food security will require a comprehensive approach in technical, institutional and financial innovations. The idea is to ensure that adaptation and mitigation strategies are consistent with efforts to safeguard food security, maintain ecosystem services, provide carbon sequestration and reduce emissions.

24. **Agriculture in Africa:** The sector is likely to be severely affected by climate change, and cannot continue in its present unsustainable way. The agricultural sector needs reform to attain much greater harmony with the natural and human environment. This is in tune with the principles of a green economy, and the ongoing agricultural reform process under the purview of the *Comprehensive Africa Agricultural Development Programme*.

25. **Sectoral synergies**: There is potential to pursue several critical development objectives synergistically by promoting CAADP's Sustainable Land and Water Management strategies in Africa. This involves supporting mitigation and adaptation initiatives, while: reducing land degradation; conserving biodiversity; combating poverty and food insecurity; and making the best use of limited water supplies. Such radical change, however, will require

limitless political will, major investment, improved infrastructure, cooperation among institutions from different sectors, and much improved rural communications.

IV. Key questions

A. Supporting change

26. Questions that need to be answered include:

(a) A green economy could greatly benefit much of African agriculture, but can existing institutions manage the demands for greening agriculture?

(b) Does Africa have sufficient agricultural infrastructure?

(c) Can research/extension services enable farmers to cope with increased climate variability through modern risk-management tools, such as index insurance and other formal insurance schemes?

(d) How will Africa finance all the necessary changes?

B. Future food security

27. Questions raised include:

(a) With the anticipated long-term decline in agricultural productivity in a warmer world, will Africa manage to feed its rapidly growing population?

(b) How can the CAADP process be accelerated?

(c) Should family planning programmes be expanded to mitigate future suffering in a world that cannot feed itself?

C. New opportunities

28. Key questions include:

(a) How might bio-fuel and bio-char be developed to help sustain rural livelihoods, while preventing harmful effects on the environment, food security and the availability of water?

(b) Will the major opportunities for carbon sequestration and mitigating emissions through improved agricultural practices raise rural incomes? Will they reduce agricultural productivity further? Will they worsen overall food insecurity?

(c) Will the African export market for extensively raised animals grow, as emission-intensive production declines elsewhere?

(d) How can African aquaculture be developed to replace declining capture fisheries?

(e) Does Africa offer sufficient incentives to involve the commercial sector in green agriculture?

(f) Are there opportunities for African countries to participate in global carbon markets through the agricultural sector, and what is the prospect for financing climate change mitigation and adaptation, specific to the agricultural sector?

D. International purchase of local land for agricultural purposes

29. Questions raised include:

(a) Will there be increased demand for land in Africa to grow food commercially for export as global food prices rise?

(b) Do such practices provide an opportunity for technology transfer (adoption and adaptation) and the demonstration of new processes in climate-risk management? Or are there risks from added commercial pressure on land and water?

E. Financing the green revolution

30. Questions that need to be solved include:

(a) How might recommendations from the Addis Conference on Climate Agriculture and Food Security be strengthened to ensure that agricultural mitigation practices qualify for funding in the UNFCCC process?

(b) How long and what will it take for African countries to launch carbon markets that would benefit green agriculture over and above emission reductions and related costs?

(c) Are there any best practices in the region other than carbon taxation on fossil fuels and vehicular levies?

3. Climate change and human development

Issues paper #3

I. Overview

1. Although climate change can hurt, frustrate, deter, and reverse social and human development, it also holds the potential to nurture and contribute positively. To address the effects of climate change, we require improved governance, shared knowledge and good practices. We also need behaviour change and to adopt a culture of risk management and resilience. This will help steer us towards better use of global goods and natural resources within a green economic strategy.

2. There is a number of generic and specific issues related to climate change, and social and human development. The key areas of interest are poverty, population, health and nutrition, education and employment, gender and socially vulnerable groups. The vulnerable groups cover children, the youth, older people, people with disabilities, and forcibly displaced persons (refugees, asylum seekers and internally displaced persons.

II. Issues at stake

A. climate change and vulnerability

3. The concept of vulnerability is important for understanding social and human development in a climate that is changing. Firstly, global warming and climate change are expected to increase human vulnerability as a result of a potential increase in the frequency and severity of weather events, long-term environmental degradation, and other effects of climate change. Secondly, vulnerability draws on the multiple dimensions of social and human deprivation as well as the dynamics, coping patterns and resilience of those directly affected. Thus, the climatic, social and human aspects of vulnerability require complex solutions, such as adaptation, mitigation, coping mechanisms, resilience building, social cohesion, social harmony and social integration. Resolving the issue of vulnerability involves interplays between policies and actions on climate change and on social and human development. In this regard, a human rights-based approach underscores the need for a deeper analysis to identify who will suffer the consequences of climate change and in what ways.

4. Generic Issue: Most countries in Africa are climatically and socially vulnerable. They lack the capacity to adapt to current and projected harmful impacts of climate change. Additionally, they lack the financial resources that would enable them to address their social problems. Africa's people and economies largely depend on natural resources for their livelihood and/or survival. Such high dependency increases the continent's vulnerability to changes in climate. Basic actions for better protection of vulnerable groups include: greater investment in disaster-risk reduction strategies that link climate-change adaptation measures with national development plans, and; building the capacity of local actors in climate change issues, and empowering affected populations so that they have a strong role and voice in preparedness, response, and subsequent recovery and rehabilitation.

B. Poverty aggravated by a changing climate

5. Climate variability and extreme events obstruct development, affect natural resources, damage agricultural productivity, cause water shortages and threaten the health of millions in the developing world. Climate change thus increases, not only development costs, but also poverty levels and inequity worldwide. Tropical countries are expected to bear the brunt of the effects of climate change on poverty, and in every nation, poor people will suffer the most. In addition, rising sea levels and extreme events risk destabilizing affected populations, thereby causing large-scale migrations, social upheaval and general human insecurity. Developed and developing nations alike need to take urgent measures to transform their economies in favour of green energy and sustainable consumption.

6. Climate change is already affecting the livelihoods of people and aggravating global poverty. Millions of poor people across Africa derive their livelihoods from common property and natural resource bases, such as land, water, fisheries, and forestry. Climate change is expected to affect these resources and their productivity, limiting options and the prospects of poor people in many ways. As such, climate change is a growing barrier to the achievement of the MDGs. Poverty will be exacerbated on the planet unless we put a halt to climate change and deal with its detrimental impacts.

C. Population

7. Population dynamics are an integral part of development efforts, both as causes and effects. They add to the pressures placed to the environment in different ways. Population dynamics not only involve size and growth rate, but also the changing distribution of population over space and its evolving composition over time. Population, environmental degradation and poverty are linked in the search for fuel-wood, food, water and other basic necessities, making impoverished people unwitting agents of environmental change. Rapid population growth that exceeds economic growth and the development of infrastructure intensifies pressure on renewable natural resources. Given that rapid population growth stems from high fertility rates, it is vital to fulfil the unmet need for family planning. This will improve the health and wellbeing of women and families by ensuring their right to decide the family's size, and the timing and spacing of their children. It will also slow the growth of population, thereby reducing human vulnerability to climate change.

8. The magnitude of the effect of rising sea levels and more frequent and severe climate events will take a toll on densely populated areas. Climate change is already affecting human migration on the continent, both within countries and across borders. It is essential to acknowledge the important role migration plays in development, so that both point of

departure and destination optimize the benefits that migration provides for development. Very little has been done so far to establish the link between the environment, climate change and migration. There is a crucial need for further analysis of the spatial distribution of population and gender-differentiated effects of population growth on the environment to help understand climate change.

D. Health and the right to adequate food

9. Beside environmental and economic damage, climate change ultimately represents a huge threat to our most precious resource--human lives and health. In this sense, the threat to human health and wellbeing is considered as one of the three main "adverse effects" of climate change in the 1992 UNFCCC . Indeed, climate change has critical health implications. For example, small changes in temperatures and precipitation have the potential to increase the frequency of vector-borne diseases, including malaria, dengue and yellow fever epidemics, and waterborne diseases, such as diarrhoea and typhoid fever. Furthermore, climate change is expected to increase human mobility, which could lead to the spread of communicable diseases, including HIV/AIDS.

10. Population health is already threatened by low access to poorly funded health services. Climate and environmental degradation are expected to worsen the situation, with infrastructure being under- or unmanageable, strained, or damaged during extreme climate events. Governments should be supported to increase essential expenditure to health within the scope of MDGs and regional commitments, including the Abuja Declaration, which calls on African governments to allocate 15 per cent of their national budgets to health. Addressing the impacts of climate change on population health will be the responsibility of the health sector. The sector will also need training to respond to the health risks due to climate change.

11. Climate change will result in the loss of agricultural productivity and environmental degradation. Food insecurity threatens people's nutritional and health status, which are already lowest in Africa compared to the rest of the world. According to the WFP, the effects of climate change will increase the number of malnourished children by 24 million by 2050, with the biggest increase predicted to be in sub-Saharan Africa. As gender discrimination in the allocation of food puts girls at greater risk than boys, particular attention must be paid to the gender-specific impact of climate change on the right to food[24]. The United Nations Special Rapporteur on the right to food emphasized the added value of using a human rights-based approach in climate change mitigation and adaptation policies. This will ensure that the policies are designed and implemented in ways that put a premium on the needs of the most vulnerable groups, and that climate change does not further accentuate inequality and poverty.

E. Education and employment

12. *Education:* There is a need to consolidate investment in education to promote local adaptation and mitigation measures. Education plays a critical role in raising awareness on the causes and consequences of climate change, thereby enabling African societies to implement context-specific remedies. Limited access to education, coupled with the poor quality of education and high levels of illiteracy among African societies, complicates climate-change mitigation and adaptation strategies and actions. Investment in education is instrumental in broadening the range of mitigation and adaptation actions, making them sustainable.

[24] BRIDGE (2008), Gender and climate change: mapping the linkages, p. 3

13. *Employment:* The Implementation of adaptation and mitigation actions throughout the continent will offer better employment prospects for the African youth and women. New financing methods for projects, such as adapted CDM and the renovation of infrastructure should provide long-term employment opportunities and improvement in living standards, in addition to the stimulus from economic take-off. If empowered, the African youth could create innovations that are superior to carbon-trading schemes for tackling climate change, and enhance the climate-change dialogue. Africa should concentrate on unleashing the informal and rural economies' huge potential for job creation, in line with the Ouagadougou 2004 Plan Declaration, and Plan of Action on Employment Promotion and Poverty Alleviation . It should also focus on: the social economy; social protection; enhancing productivity for better jobs and for the improvement of governance in the labour market (employment-policy planning, labour-market information system, public-employment services and labour administration).

F. Gender under a changing climate

14. Over the past decade, the significance of gender issues has become more apparent through attempts to address intractable challenges, such as poverty, vulnerability and environmental-resource degradation. Traditionally, African women have been the patrons of the environment in which they live. They have an intimate knowledge of the social and natural systems and are central to their families' and communities' resource management and wellbeing, notably in rural areas. Rampant poverty among women has undoubtedly limited these adaptive capacities severely. Recent evidence shows that poverty is higher among women in Africa than other regions in the world. It is widespread among households headed by women. The explanation lies partly in women's comparatively limited access to productive resources, including land, technology and credit, and their restricted access to decision-making processes. Climate change is likely to affect women differently given: gender differences in property rights and regarding access to information, and: the different cultural, social and economic roles for men and women. The impact of climate change on women's lives varies between countries, regions and cultures. For these reasons, the planning for mitigation and adaptation actions needs to consider situations individually.

15. *Issue:* While women are severely affected by climate change, they are under-represented and insufficiently engaged in decision-making and peace processes and solutions. There are no references to gender in the UNFCCC. However, over the last few years the growing portfolio of climate solutions is beginning to include gender-sensitive approaches and women's involvement. Gender concerns were raised in Bonn during UNFCCC negotiations in June 2009. In addition some NGOs , such as the international anti-poverty organization, CARE, and the Women's Environment and Development Organization, are championing gender justice more publicly.

G. Children and the youth

16. *Issue:* The majority of Africa's population – children and the youth - are excluded from climate change negotiations and programme activities. Social vulnerability and the exclusion of the youth are reflected in high unemployment rates, which exceed 20 per cent in some countries. Gross enrolment ratios in tertiary education are very low, estimated at around 5 per cent, compared to 17 per cent for developing countries as a group and 25 per cent for the world. Very few young people from vulnerable groups, such as people with disability, the youth from poor households, the youth living in rural, remote and marginalized areas, and young

orphans have access to higher education and formal jobs, mainly owing to lack of skills and resources to meet costs.

17. *Opportunity:* Empowering and enhancing young people's competencies by engaging them in gainful and productive economic activities will overall help ensure the effectiveness of programmes designed to address the effects of climate change. The impact of climate change on children and adolescents should be considered as an integral part of all international frameworks established to address global climate change.

18. The scope of climate change is such that the consequences threaten the overall progress of societies toward eradicating poverty. It calls into question the future of today's young people. Much progress has been made in recent years in vital areas for children. Given that climate change threatens these gains, efforts to support vulnerable communities in adapting to climate change are of paramount importance. Children, adolescents and the youth need to be cast as central agents of change in these dramatic transformations.

H. Ageing and disability

19. In Africa the number of older people and people with disabilities is increasing as a result of changing age structure, conflict, rapid urbanization and other forces. Both population groups share characteristics of high vulnerability, social exclusion, and low capacity to adapt to climate change. They are at great risk of enduring the harmful impacts climate change and social change. Extreme weather events threaten the health of older people and people with disabilities, making coping or evacuation more difficult.

I. Forcibly displaced populations

20. At the end of 2009, the total population of refugees, asylum seekers, internally-displaced people and stateless people in Africa stood at 15 million (half of whom were women and children). As in other disadvantaged groups, they are also exposed to vulnerability and social exclusion, and have less capacity to adapt to climate change. They are at greater risk of chronic stresses, as forced displacement is associated with a range of health and social issues, including social isolation and mental disorders. In many cases, reduced socio-economic status and associated health problems prevail.

III. Conclusion

21. Debate and policy dialogue on climate change is overwhelmingly dominated by economic, technical and environmental considerations. Social and human development issues get limited space and attention in climate change negotiations and in adaptation and mitigation measures. Africa is the continent reeling the most from the adverse effects of climate change. They are likely to strike poor people disproportionately and intensify inequities in health status, education, participation in the labour force, and access to adequate food, clean water, and other resources.

22. The development of coping mechanisms to address and avert projected climate impacts hinges on community actions. In the face of climate change, countries and communities must be enabled and empowered to manage greater shocks and fluctuations.

Communities in Africa vastly depend on natural resources and are highly differentiated in terms of access to resources. The differences are most significant in terms of particular groups' vulnerability and capacity to adapt. It is very important to broaden the climate-change debate in the local, national and international governance forums to include the full participation of vulnerable, disadvantaged and marginalized groups.

IV. Key questions

A. Green benefits for all

23. While the development of Africa through a green economy should have significant benefits for many disadvantaged groups, such as some of the rural poor, will it be enough to offset the increased risks of life in a more hostile climate? Is greater equity and inclusion in a transformed global society more than a pipe dream?

B. Women and UNFCCC

24. Do global climate change negotiations and legal instruments (Protocols and Treaties) reflect the different circumstances of men and women and how climate change may affect them? How can the capacity of women to cope with climate change-induced challenges at the local, national and regional levels be best developed and strengthened?

C. Scaling up

25. How can we ensure that all in a society – including women, the youth and socially vulnerable groups - are properly consulted in elaborating priorities and participate in creating sustainable societies? Many development NGOs will welcome the prospect of a green Africa in a more equitable world, but how can their many efforts be harmonized for optimal use?

D. Adaptation

26. How can adaptation programmes be best designed to help meet the health, education and employment needs of all communities? To what extent are health services able to respond to current and projected impacts of climate and weather change, given their potential to increase the prevalence of diseases?

E. Children and the youth

27. What can be done to instil the appropriate cultural values for a sustainable world into the next generation? How can we channel the innovative energies of the youth in the process of adaptation so as to combat the impacts of climate change effectively?

F. Are there other on-going programmes and initiatives that we need to strengthen?

28. The Africa Women's Protocol and the International Fund for Agricultural Development's Gender Strengthening Programme for Eastern and Southern Africa.

4. Climate risk-management monitoring, assessment, early warning and response

Issues paper #4

I. Overview

1. The recognition that people influence climate, and that our future climate depends on the global development paths we choose, has resulted in the proposal of global mitigation strategies. However, science also indicates that our climate will continue to change significantly despite the most optimistic mitigation scenarios. While global negotiations on mitigation continue, decision makers in Africa and elsewhere, must strive to develop a broad range of adaptation strategies to address current and future impacts of climate change.

2. Much adaptation to climate change involves managing weather and climate risks with known and proven development interventions. Protection from weather and climate risks is clearly a measure of development. Climate-risk management is the use of climate information to cope with possible impacts of climate change on development and resource management. It covers a broad range of possible actions, including early response systems, spreading the risk through diversification, dynamic resource-allocation rules, financial instruments, the designing of infrastructure and capacity-building. CRM seeks to minimize adverse outcomes and maximize opportunities in climate-sensitive economic sectors through improved resource management. It addresses adaptation to climate change and disaster-risk reduction in any climate-sensitive development sector by focusing on actions that can be taken today to improve outcomes and preparedness. It also does this by getting a better understanding of and, ultimately, anticipating more accurately the manner in which economic, environmental and social systems will react to possible future climates.

3. CRM is a new science for development and, as such, much is needed to implement it effectively in Africa. The continent must build capacities and make substantial improvements in data supply, climate services and sectoral management practices, while ensuring that such developments incorporate traditional disaster coping strategies.

II. Main issues at stake

A. Managing uncertainty in a changing climate

4. In practice, the need to mitigate climate change and adapt to it is an extra burden for many decision makers, who are unsure about the course of action to take, given the enormity of

the challenge and paucity of relevant and reliable information. The uncertainty surrounding future climate may result in confusion, paralysis or maintaining the status quo. However, managers routinely consider the uncertainty that high impact socio-economic drivers of change bring about. When drawing up national economic plans, planners take into account assumptions about demographic changes, including population growth and urbanization, great uncertainty notwithstanding. While climate uncertainty presents an additional challenge, it should not be a hurdle if it is demystified and treated as one more impact on many sectors and aspects of life.

5. Better understanding of climate variability and improved management of related risks inspires decision makers seeking to understand how to adapt to the phenomenon. The patterns of recorded past climate settings can help predict future climate trends. Climate, by definition, is the mean and variation of weather measured over a period of time, ranging from months to thousands of years in some cases. Changes in mean climate tend to be incremental, and, therefore, small, on a year-to-year basis, compared with natural fluctuations. For this reason, strategies developed to manage and build resilience to year-to-year climate variability contribute enormously towards the management of possible future climate change.

6. ***CRM in Africa:*** CRM is little practised in Africa, where national and subregional weather, water and climate institutions are often isolated from mainstream development work and relatively underresourced. Having recognized that extreme events can significantly undermine efforts to reduce poverty, African countries are increasingly interested in investing in climate-related information, research and services. A case in point is the ClimDev-Africa Programme, an initiative aimed at strengthening specialized institutional capacities to provide useful and reliable data, information, knowledge and services. Ultimately, it aims to support the consolidation of development policies, economic plans, socio-economic activities, and to climate proof investments across the continent.

7. ***Incorporating climate change in planning:*** In the long run, ignoring climate change in planning will result in inefficient and suboptimal investments and decisions. Planners have historically managed climate risks with differing degrees of success, depending, in part, upon the quality and scope of available information on climate. For example, designing water reservoirs based on short records of river flows have resulted in inefficient constructions and inequitable operating rules when the "expected" river flows did not occur. In places with reliable climate records meteorologists use them to simulate future climate so as to make predictions on climate. This information can be helpful to managers and policy makers looking at longer-term investments and strategies.

8. Developing the capacity to manage climate uncertainty today and in the future is paramount. While access to reliable information helps reduce uncertainty about climate, this is not always possible *and there will always be a significant degree of irreducible uncertainty about our future climate*. The scarcity of quality information on climate presents a particular challenge in Africa. This hampers efforts to accurately define the current climate and climate change. In spite of scientific advances in understanding and modelling our climate, the largest element of uncertainty is our future development and the GHG emission path. As such, need is to continuously monitor the climate and the environment, regularly assess vulnerability and acquire reliable early warning climate information systems. There is a great deal of uncertainty about feedback loops and interactions. For example, modelling the impacts of climate change on a single species is relatively easy; running the same model, considering interactions with other species and pressures is very complex and involves a high degree of uncertainty.

B. A practical approach to climate-risk management

9. A practical, problem-centred approach to managing climate risk should be adopted now and in the future. Practical solutions for some climate-sensitive sectors have been tested recently in Africa. There is a need to scale them up, while implementing "no regrets" strategies and safety nets for the benefit of the most vulnerable.

Managing climate risks: multiple benefits through index insurance

Throughout the world, crop insurance has allowed national economies to develop the full potential of their agricultural sector by transferring weather-related risks away from the farmer. This enables agriculture and related industries to sustain economic growth, in spite of seasonal variability in production. In Africa, "index insurance" is a way to overcome obstacles to traditional agricultural insurance markets.

Index insurance is linked to an index, such as rainfall, rather than crop failure. The insurance company does not need to visit farmers' fields to assess damages, which keeps costs low. If the rainfall amount is below the threshold, then the insurance pays out, and the farmer always makes the best decisions for crop survival.

Index insurance for Africa
In Malawi, the government uses index insurance to help subsistence maize farmers produce export-quality groundnuts by means of credits earned with insured repayments. In Ethiopia, index insurance is being used to strengthen the livelihoods of vulnerable farmers exposed to the risk of droughts. There is a successful scheme in force in Kenya to protect herders from droughts. Index insurance has also been used successfully to help manage water resources and irrigation schemes. It has the potential to spread the risk of climate impacts away from the most vulnerable population groups.

Rapid payouts are another major advantage of index insurance. In Ethiopia and Malawi, food security index insurance has been tested successfully nationwide to expedite quick responses in times of crisis.

10. ***Quick wins with CRM:*** The advantage of the climate -risk management approach is that it provides immediate assistance to the public and private sectors, while helping stakeholders confront possible future climate change scenarios. Climate risk- management identifies immediate actions needed to manage the climate variability that is currently affecting societies. Furthermore, it helps make the impacts of possible interventions evident and verifiable in the short term, and therefore more attractive to policy and decision makers. African climate institutions like the ACMAD, the Inter-Governmental Authority on Development (IGAD) Climate Prediction and Applications Centre (ICPAC), the SADC Drought Monitoring Centre (SADC-DMC) contributed to developing the CRM approach in conjunction with the International Research Institute for Climate and Society (IRI). They are building capacities for its smooth integration in sectoral decision-making processes, including those for agricultural production, food security, water resource management, health protection and disaster-risk management.

11. "No Regrets" strategies and safety nets are designed to perform well in normal or good years as well as reduce vulnerabilities to climate variability and change. These are often

technologies and practices geared towards improved efficiency; for example, developing markets, integrating climate monitoring and seasonal forecast products into their resource-allocation decisions or the restoration of their infrastructure. The technologies include tools, such as improved early warning systems and risk-transfer instruments such as index insurance, which reduce exposure to climate vulnerabilities and make it possible to exploit favourable climate conditions.

C. Strengthening of institutions and systems

12. Africa requires careful investment in policy, practice, services and data if it is to empower decision makers with practical skills in climate risk-management to meet the challenges in every sector and at all scales of development.

13. ***The improvement of policy*** requires supporting evidence from the field and understanding the possible impacts of climate variability. Equally important is an understanding of changes in development outcomes in general, and the situation of the most vulnerable populations at different geographical levels: from the sub-national to the regional. Evidence on possible impacts of climate variability and change will help justify accelerated mitigation and adaptation measures. Improved policies also require close cross-sectoral collaboration to ensure those developed in one sector do not adversely affect the ability of other sectors to cope with further induced changes.

14. ***The improvement of practice*** on a large scale requires investments in capacity-building, training programmes and policy dialogue, knowledge management and generation, as well as the dissemination of best practices, development of suitable tools and transfer of appropriate technologies. The development of CRM methods and tools is essential, as is their integration in relevant economic and financial analyses that assess vulnerabilities while weighing the risks involved. Such tools could help improve the economic rationale of informed decision-making and debates under climatic uncertainty. Integrated advisory services and networks of early-warning systems would also be of high value to all involved.

15. ***The improvement of climate-related services*** in pro-poor services requires the capacity to tailor and communicate information to user needs. There is a need to improve communication between climate service providers and key climate sensitive sectors. Technical advisory services on climate-risk management provided by experts to ensure the translation of climate information products remains the missing link. While ClimDevAfrica has started investing in upgrading regional climate services by strengthening regional and subregional climate and development related institutions, there is still room to scale up climate-related efforts at the country level, within the scope of the Global Framework for Climate Services.

16. ***Improvement of climate data*** is indispensable. Data include observations for local use, national and regional planning purposes and for the global monitoring of climate change, with the participation of the user communities. While climate science has made substantial advances in recent years, with more reliable climate information now becoming increasingly available, it is essential that this information be made locally accessible to the most needy, with full ownership by the relevant communities. Concerns still remain for CRM deliveries owing to the data policies in force in countries that restrict access to data.

III. Conclusion

17. CRM must become an integral part of the management culture of "climate-sensitive" development sectors. Investment in the supply of climate information alone will not result in climate-smart development. It is equally important to invest in identifying sectoral needs; develop targeted information; and build active relationships between "suppliers" and "users". This will help sectoral decision-making improve by incorporating and managing climate risks.

18. The main issues to be addressed are:

(a) The monitoring of climate, assessment of vulnerability and strengthening of institutions;

(b) climate services and the supply of information to decision makers and partnerships;

(c) The deployment of regionally integrated and community-based early warning systems; and

(d) The inculcation and sustainment of a shared culture of sectoral climate-risk management.

IV Key questions

19. **Identifying increased risks:** Has the African continent adequately identified the nature and magnitude of the risks to its natural resource base, and the interplay among them at all relevant levels of decision-making? Are African countries well prepared to respond to a possible significant increase in weather-related disasters, on the heels of much bigger and more frequent extreme climate-related events?

20. **Improving climate services:** Can early warning, preparedness and response processes be improved in African countries? How can we ensure that everyone has access to timely, integrated early-warning information on extreme events? Why have climate services been so poorly integrated into African development agendas? Can climate-related services be adequately developed to meet Africa's adaptation and development needs? Is it just a question of adequate finance? If climatology (and hydrology) are underfunded under present climate management systems, would it be possible to devise more innovative and effective ways for delivering more development-oriented climate services?

21. **Climate risk management:** Why is climate-risk management not adequately practised on the continent? What needs to be done to initiate and sustain a **culture of risk management** in every climate-sensitive sector? How can appropriate policies and practices be developed most effectively? Should global support promote national policies and practices?

22. **Environment monitoring:** How can we increase community participation in the production and use of weather, water, climate and environmental observations to improve lives and livelihoods? Do we need a different institutional setting of integrated environment and climate information services suitable for a green economy? Or could adequately resourced climate innovation centre "networks" meet the diverse needs of African stakeholders?

23. **Data policy:** What is the most appropriate data policy for CRM-related information on improving access to and use of data and knowledge in development?

5. Climate change, trade and industrial development

Issues paper #5

I. Overview

1. Africa's trade constitutes about 3 per cent of global trade. Exports are largely agricultural and unprocessed commodities from particularly resource-rich countries. Agriculture, mining and oil make up over 80 per cent of exports, traded mainly with Europe and North America. Trade between African countries constitutes only about 10 per cent of the total–with trade in agricultural and manufactured goods on the increase. For the future, Africa seeks greater conversion of natural resources to higher value products, to expanding local industries, with greater export opportunities and import substitution.

2. Africa appears poised for economic takeoff. Prospects for the African internal market are most promising. One critical challenge that the continent faces, together with the rest of the world, is how to make trade and climate-change policies compatible. Given the reality of climate change, it is important to: identify and take advantage of new opportunities arising; minimize potential adverse effects of climate change on trade and industry, and: strike the right balance between rules being developed to combat climate change under the UNFCCC and the existing multilateral trade rules under the WTO. Climate investments and opportunities in the green economy appear promising for strengthening economic and social development along environmentally sustainable pathways.

3. **Overall impact:** The effects of climate change are expected to reduce projected global output by 1 to 2 per cent by 2050, with developing countries registering the biggest declines. Climate change itself will have relatively modest impacts on aggregate trade, given that manufacturing and services increasingly account for the bulk of trade. Business-as-usual projections suggest that global trade will decline by some 3 to 4 per cent by 2050, mainly as a result of reduced output. Of particular concern to Africa is the anticipated reduction in agricultural outputs due to climate changes, which would reduce export crops and increase dependency on food imports. The expanding tourism industry in Africa (5 per cent of the global share) is expected to decline with higher fuel prices.

4. **Trade routes:** One of the clearest impacts of climate change will be on trade infrastructure and routes. Port facilities, as well as buildings, roads, railways, airports and bridges are at risk of damage from rising sea levels and the increased occurrence of extreme weather events, such as floods and storms. In addition, fuel prices are likely to rise significantly in the future, making some existing trade uneconomic but also opening up new possibilities.

5. **New industrial trend:** There is growing evidence of a new industrial trend on a global scale. Awareness of climate change, coupled with the various regulatory, policy and business responses, are already prompting economies and industries worldwide to restructure so as to reduce emissions. This is redefining the very basis of competitive advantage and financial performance for companies and their investors. If a company or industry is seen as a contributor to carbon emissions, its future is gloomy.

6. As the president of Volvo remarked "We feel we are part of the problem, and we feel we need to be part of the solution." In fact, some transnational corporations, with their formidable knowledge, cutting-edge technology and global reach, are taking part in the shift towards a low-carbon economy. However, this new industrial trend will not occur without challenges. For example, border carbon adjustments (BCAs) measures being imposed to address 'carbon leakage' mean that competitiveness will not be the ultimate determinant of the new global industrial structure. Accurate pricing of carbon will be crucial to ensuring that the BCAs are instruments for dealing with climate change rather than trade-protectionist measures.

7. **Opportunity:** For Africa, as for many developing countries, low-carbon investment supported by transnational corporations and international investment institutions can facilitate the expansion and upgrading of trade and productive capacity and export competitiveness, while helping the transition to a low-carbon economy. While green investment within a global partnership still carries economic and social risks for Africa, it offers unique opportunities for sustainable development and the attainment of the MDGs.

II. Many issues at stake

8. For Africa to carry out adequate action to cope with climate change so as to sustain economic growth and reduce poverty, it requires an in-depth understanding of the full range of the challenges to and opportunities for trade and industrial development. These abound and are often intertwined with other complex issues, some of which are listed below.

(a) Increased variability in food import/export

Greater seasonal climate variability and long-term decline in crop productivity in a hotter African climate will likely result in reduced exports and greater dependency on food imports - in a world of more volatile prices. The global intensive meat and dairy industry is a huge polluter (18 per cent of total emissions, by some estimates). As such, there may be opportunities for the export of free-range meat from African rangelands. Capture fisheries are in decline and aquaculture also offers growing opportunity.

(b) ***Opportunities for improved regional food trade***

Opportunity arises through the WFP process of sourcing food within the region, creating a stronger market, especially for farmers in districts with seasonal surpluses. There will also be opportunities to boost fair trade and organic produce for import and export ,regionally and internationally.

(c) ***Opportunities within the forestry industry***

To achieve sustainable products, Africa must establish appropriate institutional capabilities and land-use management programmes to benefit from the long-term financial flows that could be generated by REDD and afforestation/reforestation.

Potential investments in these forestry initiatives are estimated at $4 to $7 billion per year for 2015, rising to $14 to 20 billion per year by 2030.

(d) ***Opportunity for developing a sustainable biofuels industry***

Better access to global markets and technology could help build a biofuel industry to meet much of Africa's internal (mainly transport and cooking) needs, and for export. When developing such an industry, land and water constraints must be considered, along with respect for food production and objectives for deforestation. Biofuel could be a valuable 'transition' fuel, along Africa's low-carbon path, providing much needed power for industrial growth and for raising living standards.

(e) ***Opportunities in the insurance and financial services industry***

The insurance industry suffered severely in the early stages of global warming as disasters and weather- and water-related insurance claims exploded worldwide. Now it is considered to present major opportunities for advancing innovative solutions, including Index Insurance and other financial services. As such, it is an essential part of climate-risk management. Benefits are enhanced when insurance is coupled with the multiplication of micro-credit facilities.

(f) ***New opportunities through the green economy***

These will arise through carbon trading and a possible sectoral and programmatic CDM. Such re-formulation would allow countries to shift from project-based to sector-based and programme-related approaches, granting carbon credits for emission reductions relative to these. In addition, to providing an easier path to quantifying emission reductions, sectoral CDM will encourage policy interventions aimed at emission-intensive sectors, such as cement, chemicals or transport. It will also enable governments to reward high-achieving companies. By reducing the transaction costs for individual companies, the new approach will provide new financing opportunities for sectors that are under-represented in the CDM. Likewise, it will encourage the development and registration of small-size CDM projects, called programmes of activity, as part of a programmatic CDM approach, which could benefit much of Africa.

(g) ***Adaptation costs and benefits***

Existing industrial infrastructure may need protection from greater flood risks and rising sea levels. For example, in Alexandria, Egypt, which is home to about four million people and is the base of 40 per cent the country's industrial activities, a sea-level rise of 0.5m would inundate about 30 per cent of the city's entire area. The estimated economic costs of such an impact would hover around $US30 billion. Coastal adaptation would cost about $4 billion for Alexandria and Port Said together.

(h) ***Mitigation of emissions***

Substituting transport fuel and producing low-carbon electricity will achieve this to a large extent. Heavy polluting industries, such as the manufacture of cement, will need to pursue increasingly stringent alternatives. Trade-related issues under debate include: the liberalization of trade in low-carbon goods; intellectual property rights and the transfer of technology; investment in clean energy technologies and fossil-fuel subsidy reduction; flexibilities in trade laws on subsidies to address climate change, and; border carbon adjustment mechanisms.

(i) ***Compatibility with WTO regulations***

Clearly, WTO rules interact within the various areas of the climate agenda. Therefore, in resolving these trade-related issues, there is a need for common

acknowledgement of the Copenhagen Accord's place in the environmental law under which WTO rules operate. Ultimately, the challenge is to ensure that trade policy does not impede legitimate climate-change concerns. At the same time, climate-change concerns should not serve as a pretext to justify protectionist trade measures. Global trade policies should support the promotion of clean technology. Technologies that help reduce emissions should be easily tradable.

(j) ***Trade liberalization***

The liberalization of trade in environmental goods and services should help the climate-change agenda. There is a need to promote cleaner low-carbon technologies by eliminating or reducing tariff and non-tariff barriers to trade in environmental goods and services. This might be achieved first by focusing on 'unambiguous environmental goods and services' to help accelerate their liberalization in the WTO Doha round. However, sustained focus on the whole environmental scenario is also needed to help bring greater harmony into the climate-change negotiations.

(k) ***Capacity constraints***

In the current knowledge-based global economy, industrialization is increasingly driven by science, technology and innovation. The ability to develop, acquire, upgrade, and adapt technologies – particularly in relation to low-carbon pathways - is a key element in mitigating emissions and competing effectively on the global market.

(l) ***Water constraint***

Some industries, such as mining and agro-processing, are major consumers (and polluters) of water. Water resources are generally scarce and likely to become more so with climate change. As such, they are an important factor for selecting and locating industrial developments, without disadvantaging water-dependent communities.

(m)*Infrastructure constraints*

Infrastructure in Africa (see Issues Paper 8) is generally weak after decades of neglect. Lack of energy hampers industrial development. Poor transport infrastructure stifles markets, industry and trade. Some of the constraints could be eased through appropriate investment of climate-adaptation funds. Construction and public works within the scope of programmes to replace infrastructure will provide considerable long-term employment, sustaining growth, and offering multiple opportunities for innovation, such as low-carbon cement and the use of locally sourced green materials for the improved insulation of buildings, for example.

III. Conclusion

9. The global policy debate on tackling climate change is no longer about whether to take action: it is now about how much action needs to be taken, in what order of priority , by whom, with what means (finance) and within what integrator or global framework. Trans-national corporations and industry, as emitters and active players in low-carbon foreign investment, are inevitably part of the problem and the solution to climate change. Africa and many developing nations (the third party) though typically not large emitters of GHGs can still benefit from low-carbon technologies that could help enhance their competitiveness in the global export market and accelerate their transition to a green economy.

10. Beyond offering opportunities for mitigation, trade can also play a valuable role in helping humankind adapt to a warmer future. Climate change threatens to alter geographical patterns of production, with food and agricultural products likely to be the most affected. Trade can help bridge the gaps in demand and supply, so that countries where climate change creates scarcity are able to meet their needs by importing from countries that still have such goods and services.

11. There could be benefits from collaborating with the Global Partnership for Low-Carbon Trade and Industry. The object of the partnership would be to harness low-carbon foreign investment for sustainable growth and development. Such collaboration would entail, among other things, setting up clean investment-promotion strategies, promoting clean technology, and creating a single global standard for corporations' disclosure of their greenhouse gas emissions.

IV. Key questions include

(a) Green economy

Do new trade and industrial opportunities in a green economy need to be elaborated and communicated widely in order to guide future investment strategies of the governments and the private sector?

(b) Sectoral-based CDM

What do the African negotiators at the UNFCCC need to help them take an informed position on the possibility of a sectoral-based and programmatic CDM and its advantages for trade and industrial development in Africa?

(c) Climate change, green economy and the World Trade Organization

How might the dual global processes of climate change and trade negotiations lead to greater success in both domains? Do we have enough understanding on how the principles of common but differentiated responsibility and the special and differential treatment principles in the UNFCCC and WTO negotiations respectively are treated and how they might foster optimal results for Africa? Although many WTO processes, such as the liberalization of trade and the use of environmental technology, goods and services, are highly pertinent, is there any likelihood that they will be resolved in a timely manner?

(d) African leadership

Since the ECA now houses both the ATPC and the ACPC, it can be assumed that Africa will coordinate its climate and trade policies better in the future, especially in UNFCCC negotiations. Is there further need to strengthen leadership on climate change, trade and industry in Africa?

(e) Industrialization in Africa - continental

Should the AU programme on the Acceleration of Africa's Industrialization embrace climate-change considerations? For example, do we need to enforce or embrace standards, compliance and regulatory frameworks to ensure that industrial development and building codes have low-impact, low-carbon and face lower risk in a changing climate? Could adaptation and mitigation funds be invested accordingly as part of the 'innovative approaches' foreseen in the programme?

(f) Industrialization in Africa – subregional

Should RECs and national governments incorporate climate change considerations within their industrial development frameworks and support for trade? Have national and subregional power plans taken into account the need for sustainable resources to meet the rising demand from growing industries, and the increased risks from hydro-meteorological extremes? Are the RECS sufficiently aware of climate change issues to lead the process?

(g) Do biofuel and rural market infrastructure need special attention?

Should special consideration be given to the development of national biofuel programmes, in conjunction with the private sector? What parallel improvements will be needed in upgrading rural road networks and local-market infrastructure to promote trade in surplus food and other products, for the benefit of rural producers and local industries, traders and consumers?

6. Governance for peace and security in a changing climate

Issues paper #6

I. Overview

1. Africa's vulnerability arises from a combination of factors, including extreme poverty, rising population, frequent natural disasters – such as droughts and floods– and agricultural systems (crop and livestock production) that depend heavily on rainfall. This increases risk by exacerbating existing trends, tensions and instability, and undermining the sustainability of livelihoods.

2. Current scientific literature on climate change concludes that countries exposed to environmental damage – including deforestation and land degradation – and dwindling production capacities are more likely to experience internal and external conflict.

3. **Different countries** will experience the impacts of climate change in different ways. Some individuals, communities and regions will benefit from it while others will suffer as a result of it. Certain developing countries will be extremely vulnerable to climate change because they have already reached the limit of their capacity to cope with climatic events. Because climate change affects so many sectors and aspects of life, its impacts are likely to appear by exerting greater pressure on any pre-existing stress points. As such, the initial response to climate change should be to address current weaknesses in society decisively before they worsen and spread in a more hostile climate. Africa needs to improve its governance so as to defuse recognized problems.

4. **Weather-related disasters –migration and threats to peace, stability and security**– provide a nexus of concern for the future of Africa in a changed climate. Climate change is likely to bring about further decline in environmental security. This will probably manifest itself through pervasive decline in rural incomes and further environmental degradation, often as a consequence of decreasing water availability. When people are hungry they have three choices: starve, revolt, or migrate.

5. **Conflict and poverty** are the two biggest challenges to development and count among the primary causes of refugee problems, migration and population displacement on the continent. Perhaps as a result of the harmful effects of climate change on livelihoods, poor people are the most susceptible to conflict, especially over access to and ownership of natural resources.

6. **Growth potential:** Africa is a young continent with many small States and a few large ones. It is going through a long process of post-colonial readjustment as it stabilizes its power structures, flow of resource and pathways for wealth creation. It is now poised for economic takeoff and at the same time badly threatened by climate change and concerns about equitable and sustainable use of limited resources, such as transboundary waterways. Managing the necessary processes of adaptation and transition to a green economy requires a stable continent.

II. Main issues at stake

A. Stability and security as factors of climate adaptation

7. Stability and security are essential for ensuring the efficiency of the many adaptive and development processes. The relationship between climate change and security is complex. It is difficult to predict where conflict may break out. However, climate change may aggravate conflict in Africa in the following ways: changing patterns in climate and agricultural yield could intensify population movements and pressure on urban destination areas; the control of resources could become a political instrument; and Africa's natural resources may attract richer, resource-poor countries and conflicts could arise over competition for food, water, energy or land. Tension between farmers and herders is common: pastoral communities along borders are notoriously insecure and this could worsen in a more variable climate. Transboundary waterways may become flashpoints, where rainfall decreases, runoff becomes more variable or inter-State tensions arise from competition over limited water resources.

8. **Other potential sources of conflict** related to climate change include unregulated migration, destabilized settlements and increased recruitment into armed groups owing to reduced employment opportunities. The injustice of the effects of climate change will make such recruitment easier.

9. ***Opportunity to strengthen solidarity:*** Against this backdrop, urgent action is needed to improve responses to variability and change, and ensure greater cooperation across sectors and between countries. There is a need for greater awareness of climate change and its implications beyond national borders. The impact of climate change could help improve collaboration and co-existence if countries and their people work together to find solutions. There should be real benefits from sustained investment in adaptation and mitigation, job creation and stimulus for economic development. Adaptation activities that emphasize approaches, such as early warning systems and the participation of civil society in community and stakeholder consultations on climate risks, could help prevent conflict.

10. Likewise, adaptation could contribute to longer-term peace building in conflict-prone areas by enhancing the capacity of local communities to adopt a low-cost adaptation strategy to manage communal resources. Respect for the rule of law is essential for such activities, whether they derive from traditional authorities or the modern State. The present situation is such that the combination of water scarcity due to increased demand and changes to water resources caused by climate change have made the need for cooperative and equitable and sustainable management of transboundary water resources more urgent than ever.

11. **Promoting stability:** Ongoing programmes to strengthen governance, reduce conflict and promote stability require sustained support, and in some cases, fresh initiatives. These should include 'climate proofing', national and local development strategies and programmes that, in addition, generate employment. The methodology used for environmental security assessments can help in assessing the ways in which environmental change and the use of natural resources affect peace, food security and the sustainability of the ecosystem. Africa must consolidate its peacekeeping resources, maintaining some capacity on standby so that in the event of outbreaks of conflict, it reacts promptly and decisively to restore peace. The continent also needs to ensure that peacekeeping missions have adequate mandates.

B. Vulnerability of fragile States and States in transition

12. Fragile States and those emerging from conflict typically have weak government institutional structures and services, such as law and order, may inadvertently condone illegal and anti-social behaviour. This complicates efforts to assist communities in such countries (and neighbouring countries) to adapt to climate change. It also exposes neighbouring countries to much greater risk of being overwhelmed in times of crisis, by an influx of climate refugees from less organized and under-prepared States. The international community has recognized the importance of addressing the root causes of fragility and some donors are directing more than half their aid to fragile States. Greater priority must be given to repairing the social fabric of Africa and enhancing the capacities of key governance institutions.

13. As explained above, climate change poses significant security threats. Fragile States typically have weak structures and services, and are likely to struggle to address such threats. This makes such States particularly exposed to the risks created by climate change.

C. Large-scale migration

14. Conflicts ignited by competition for resources in the semi-arid areas of Africa are a growing concern. This is illustrated by conflicts among pastoral communities and by migration patterns, which, in turn, are affected by climate change. Drought, with attendant water shortages and food insecurity, is the biggest weather-related contributor to conflict and mass displacement/movement of pastoral communities. There is a need to monitor movements and for governments to put in place strategies and policies to facilitate safe passage across borders.

15. Desertification is the primary reason for the existence of environmental refugees worldwide and can be expected to intensify as a result of water shortage and increased population pressure. Many migrants end up in cities. Today over half of the world's population lives in urban environments, and urban migration or 'labour mobility' is an integral part of growth and development wherever jobs are available. While Africa is still predominantly rural, climate change is likely to disrupt rural livelihoods and accelerate urban migration. Not only is uncontrolled or forced migration a catastrophe for those concerned, it also: causes disease; absorbs resources; puts pressure on urban infrastructure and reduces food production, and; leads to conflict. In some instances where pressure on meagre resources becomes unbearable, making conflict inevitable it may be necessary to offer incentives to the affected community to migrate to safer environments.

16. **Africa already hosts the highest number of refugees** and **displaced and stateless people in the world**. Historically, migration patterns in Africa were determined by economic and social factors. Climate change and environmental degradation were rarely thought to play a major role in determining human mobility and migration. As such, climate is excluded from Africa's migration and development policies and plans. According to global estimates some 200 million people could become climate migrants by 2050, doubling today's statistics on migrants. The increasing number of women in African migration flows is a major emerging trend. The effects of climate change, including on pastoral communities, are now more conspicuous than ever. Evidence points to increasing levels of migration and conflict over scarce resources.

17. **Changing pressures:** Climate-induced migration used to be the consequence of natural disasters. As the climate changes, the scarcity of resources, food insecurity and water shortages will become primary triggers to voluntary, long-term climate migration in Africa in the 21st century. As such, it is crucial to identify and address potential flash points.

18. **Many small countries**

With its large number of relatively small countries, Africa is particularly prone to migration between countries in times of hardship. While refugees fleeing natural disasters can usually return home over time, future climate migrants could be forced to find new permanent homes, often in other countries. The AUC and RECs may need to work with States to extend the current freedom of movement within the region to the freedom of settlement, and provide appropriate incentives for this. Wherever possible, migrants should be encouraged and assisted to become self-supporting. Where international assistance is available, it should seek to enable migrants to integrate in the local communities and contribute to their economies, rather than become long-term burdens. Countries may need to update their migration strategies and policies to cover climate migrants. Government support may well be essential in such circumstances to turn necessity into opportunity, and avoid putting an extra burden on already resource-constrained communities. In most cases it is more cost-effective to reduce the causes of migration and keep people at home than react once they have moved.

D. Increased natural disasters

19. Increase in climate variability is an early sign, and sometimes, a confirmation of a changing climate. It has already led to a great number of disasters in Africa, affecting many vulnerable communities, especially poor people. The frequency and impact of disasters triggered by natural hazards, and the ensuing social and economic losses are rising in Africa. There is a need for greater understanding of the complex interplay between socio-economic factors and biophysical hazards, evidenced by the considerable exposure to disaster risks in several regions of the continent. Such disasters can lock people into endless poverty and become a powerful force for migration.

20. Current relief programmes try to respond to disasters quickly enough to keep communities together in their villages, with their livelihoods more or less intact. In a more hostile future climate, as disasters occur more frequently and have greater impact on livelihoods, pressures to abandon unsustainable livelihoods in traditional homelands will grow. African countries must mitigate such occurrences by consolidating their preparedness and resilience, inter alia, by enhancing their information, early warning, and safety

nets – such as index insurance, temporary shelters and refuges, food relief and assistance for reconstruction.

E. Hot spots

21. Climate change is far from equitable. While, initially, some countries may even benefit from a changed climate, others are particularly exposed and will suffer greatly as a result of the early effects of climate change. There is a need to examine the underlying vulnerabilities in the region and determine levels of resilience to climate change. This will help set benchmarks for increasing socio-economic resilience and decreasing social vulnerability.

22. This calls for research and innovation. There is a need to examine how certain regions have addressed particular types of problems and whether a transfer of knowledge is possible. The Horn of Africa is a case in point: pastoralist innovation systems help herders gain access to high-value fodder that enables their livestock to survive longer. Meanwhile cooperation enables farmers to sell hay to herders and to permit their livestock to graze on drought-stricken fields (CORRECT?). This is common practice in some parts of Darfur and might prove useful elsewhere. This suggests that, with proper support, households, local and national institutions can make valuable contributions to innovations.

23. It is expected that small island developing States and low-lying coasts in the Indian Ocean will be among the worst affected by climate change. Some islands even face total submersion from combined sea level rise and storm surge. Measures to protect coastal regions may postpone evacuation, but there is a limit to what dykes can do to hold back danger, as demonstrated by Hurricane Katrina in New Orleans.

24. The State has the primary responsibility for meeting the challenges posed by climate change. Internally, it is the State's duty to administer the use of resources, manage conflict and contend with security threats. Externally, the State is the principal agent in negotiating the use of internationally-shared natural resources.

III Conclusion

25. Evidently natural disasters are growing in number and intensity, putting further strain on existing pressure points in society. It is crucial for the African continent to pre-empt strife, thereby minimizing the disasters' impact and maintaining peace and security. Stability is essential for sustaining growth and improving the quality of life. Key issues for improving governance in this domain include:

(a) The need to maintain **stability and security** by ensuring broad-based development;

(b) Building a coalition for action through stronger institutions and regional cooperation to address conflict prevention and resolution;

(c) Supporting **fragile States and States in transition**;

(d) The risks of **mass migration** destabilizing cities and neighbours;

(e) Improved **disaster preparedness** to reduce impacts; and

(f) **Hot spots:** supporting States that are most exposed to climate change.

IV. Key questions

26. What measures do we take now to help peace, stability and environmental security survive the major environmental, economic and social changes ahead? What is the role of good governance in using adaptation and mitigation to prevent conflicts triggered by environmental changes and to address climate change itself? Do good governance and the rule of law extend far enough from capital cities? Are governments sufficiently aware of the importance of assessments on environmental security to help evaluate the manner in which climate change might increase security threats?

B. Fragile States and States in transition

27. What special measures must be taken now to strengthen fragile States and States in transition and help them adapt to climate change and adopt more sustainable methods of development? How do we ensure that disaster-risk reduction measures are integrated into post-disaster recovery and rehabilitation processes? What measures are needed to raise awareness of the links between natural resources and conflicts, and of the challenges to and opportunities for conflict prevention, peacemaking, and peacebuilding?

C. Large-scale migration

28. How can Africa avert the destabilizing effects of large-scale migration? What must it do to improve the environmental security of rural and urban dwellers? What strategies and policies does it need to address growing urbanization, the mashrooming of slums and growing concerns about the disproportionate exposure of poor urban and peri-urban people to environmental hazards and other risks posed by climate change. These population groups tend to live in ecologically fragile zones. How can Africa stem the population overload threatening its cities as a result of climate-spurred urban migration? What more do we need to do to appreciate the link between conflict and natural disasters and vulnerability, especially in parts of sub-Saharan Africa? In these regions, pressure on population is intensifying, while land degradation and desertification are increasing rapidly.

D. Increased natural disasters

29. Do African countries have an appropriate level of awareness or adequate mechanisms to respond to disasters? How do we strengthen collaboration and coordination across regionally based structures and trans-regional networks to mitigate man-made disasters and respond to them? How can we ensure that vulnerable communities are protected from flood, drought and storms during the many changes ahead, and therefore best preserve their basic rights?

E. Particularly hard-hit areas

30. What should be done for communities on vulnerable small islands or in areas that will bear the brunt of climate change? How secure are coastal defences against rising sea levels

and larger storm surges? Where will people in these regions go when their homelands are no longer liveable?

F. Ongoing initiatives

31. How should these be strengthened? How do we build greater collaboration and coordination across regionally based structures that include governments, the UN, donors and civil society in the following areas?

(a) risks identified, assessed and monitored; and

(b) comprehensive preparedness.

32. What steps are needed to ensure the availability of shared up-to-date data (climate change modelling, biodiversity assessments, etc.)? Are there other relevant programmes that we should reinforce? These may include:

(a) Capacity-building programme for peace and security as part of the African peace and security setup, for the rapid deployment of African peacekeeping forces (under the auspices of the AUC and RECs);

(b) Stability and security programmes in fragile States; and

(c) The implementation of the Africa Regional Strategy for Disaster Risk Reduction.

Increase in disasters and people affected: first impacts of climate change

In line with scientific observations and computer modelling of future climate conditions, climatic disasters are rising as the earth warms up. The year 2007 was fraught with climatic crises, often of an unprecedented nature. They included Africa's worst floods in three decades, phenomenal flooding in Mexico and South Asia and heat waves and forest fires in Europe, Australia, and California. By mid–November, the United Nations had launched 15 "flash appeals", the greatest number ever in one year. All, but one, were in response to climatic disasters. At the same time, more people are feeling the effects of disasters because of poverty, powerlessness, population growth and the displacement of people to marginal areas. The total number of natural disasters, mostly floods and storms, has quadrupled in the last two decades. Over the same period, the number of people affected has increased from around 174 million to an average of over 250 million a year (Oxfam-2007).

7. Financing climate change adaptation and mitigation actions

Issues paper #7

I. OVERVIEW

1. For Africa, the most critical climate change issue is to obtain sufficient financial support to manage adaptation and mitigation processes successfully, attend to development needs and continue to develop infrastructure, particularly energy. At present, there are huge gaps between needs and available financial, technical and human resources.

2. As Africa is one of the regions hardest-hit by climate change, adaptation is urgent, and will be costly. While African countries are not obliged under the Kyoto Protocol to mitigate their emissions to a fixed timescale, there are advantages in developing bold and specific strategies to obtain special finance and hasten the reduction of global warming. This would safeguard their moral high ground and support the green economy through access to modern technologies.

3. **Green economy** : A green economy with, with development based on low-carbon use, holds much promise for Africa. It could bring about major long-term employment opportunities (green jobs), infrastructural development, especially with the investment of climate-change funds. Significantly better use of natural resources – the backbone of the rural economy – can only be beneficial. Africa stands to gain from genuine sustainable development. Being a late developer, the continent is in a unique position to catch up, once a strong global agreement is reached to minimize global warming.

4. **Existing climate funds:** The many climate-related funding mechanisms can be grouped into two categories: existing international public funding initiatives and the Clean Development Mechanism. Some of the public funds and strategies are organized under the authority of the UNFCCC and its Kyoto Protocol (Convention funds), while others are managed directly by bilateral agencies or the World Bank and other multilateral agencies (non-Convention funding). These include the CIFs jointly managed by multilateral development banks (MDBs), with the World Bank as trustee[25]. The AfDB has also established the ClimDev-Africa Special Fund, the Africa Water Facility and the Congo Basin Forest Fund. It is also in the process of setting up an Africa Green Fund, based on Copenhagen (COP15) commitments.

5. UNFCCC funds include the Special Climate Change Fund (set up to fund projects in capacity- building, adaptation, technology transfer and climate change mitigation) and the Least Developed Countries Fund (designed to help countries with their national adaptation programmes of action).

[25] The CIFs comprise two funds: the Clean Technology Fund (CTF) and the Strategic Climate Fund (SCF).

6. **Clean Development Mechanism:** Established under the Kyoto Protocol, CDM promotes low-carbon development projects in developing countries and assists developed countries in complying with emission reduction commitments. The CDM market is a significant source of mitigation finance, especially for emerging economies. Africa must take greater advantage of existing carbon market opportunities and develop a clear position for negotiations beyond 2012.

7. **Insufficiency:** Resources generated under these funds are far from adequate for Africa's needs. Negotiations are under way to obtain significant new funding for all developing, as part of global climate change agreements, which also concern major issues of governance. A global agreement should include funding for adaptation, public funding for mitigation and private funding through carbon markets. The funds would meet the costs of low-carbon technologies and accelerate technological development and deployment. They would also help ensure the building of technical, financial, and policy-level governance capabilities. The recently established Adaptation Fund under the Kyoto Protocol issued its first call for "concrete" adaptation proposals from developing countries in 2010 (www.adaptation-fund.org).

8. ***Important financing issues*** and questions include:

(a) Working with uncertainty;

(b) How big is the climate change problem? How much financing is required?

(c) How much financing might be made available?

(d) New and reformed financing mechanisms; and

(e) Domestic stakeholders in a green economy.

II. THE MAIN ISSUES AT STAKE

A. Investing in uncertainty

9. Although climate change is a critical global problem that could make the world uninhabitable if left unchecked, many aspects of it remain uncertain. For instance, the size and sequence of sectoral impacts at specific locations remain unclear. Some particularly weak and vulnerable countries may suffer a series of ever-increasing disasters, exerting further pressure on existing pressure points. Such countries will struggle to keep up with current changes, let alone develop. Other countries with stronger economies and that are less prone to early changes will have time to steer ahead and invest wisely in adaptation for the future. The uncertainty inherent in climate change demands a well-informed risk-management approach to precautionary planning and decisions on investment within the scope of a green economy. This should go hand in hand with efforts to instil in African society a culture that embraces climate-risk management. In the short term, climate uncertainties require better preparedness for disaster-risk management. In the longer term, uncertainties in climate projections demand that policymakers weigh the costs of investments against their benefits over a range of potential climate outcomes. This will not only complicate the management of development, but also increase the cost of adaptation.

B. How big is the problem? How much finance might Africa require?

10. While climate change presents humanity with its biggest challenge ever, the true scale of the problem remains unknown, partly because we continually aggravate it. Climate uncertainties, and by extension, the costs of climate adaptation, are expected to rise as global warming intensifies. For these reasons, we should have an ambitious target to reduce emissions. The "final" size depends on developed countries and emerging economies, and the rate at which they transform the global economy to low-carbon. Until then, there is a firm global agreement with urgent and total commitment to reduce emissions everywhere, the size and scope of the overall problem remains undefined – somewhere between manageable (<2˚C) and impossible (>4˚C).

11. **Adaptation:** Several recent assessments (for example by UNDP, World Bank and UNFCCC) estimate the cost to Africa of adapting to climate change at US$20 – US$40 billion per year by 2025. Early adaptation to climate change will be cost-effective. Delaying this, on the other hand, will ultimately lead to costly risk-management efforts. Both considerations demand an early, fair and robust global agreement, with resources for immediate implementation of "soft" and no-regret measures.

12. ***Mitigation:*** The potential costs of **mitigation** in Africa are less uncertain. So far, emissions from Africa have been relatively small – 3 or 4 per cent of global emissions. However, with economic take-off and rising living standards across the continent, future emissions could surge. Mitigation costs for Africa are estimated at around US$5 to US$10 billion a year by 2030 to meet the 2˚C stabilization target.

13. A combined low-carbon development pathway that is well adapted to a changing climate in Africa might therefore cost between US$25 to US$50 billion per year over the next 30, 40 or 100 years. These rough estimates provide a useful perspective. Nevertheless, the urgent need for solid, comprehensive and immediate action to mitigate climate change is more important than cost consideration.

C. How much finance might be available?

14. Africa is vastly unable to meet its own development investment needs using domestic resources, let alone cope with climate change. Fortunately, the "polluter pays" principle prevails and the developed economies have recognized their obligation to support African adaptation and mitigation, in addition to normal development flows. In Copenhagen, developed countries committed US$100 billion a year by 2020 to help poorer nations cope with the impacts of climate change, pledging $30 billion in funding by 2012.

15. Africa might expect 40 per cent of this global agreement. The African negotiating position is not unreasonable as this approximately doubles the existing $44 billion per year of development assistance. Paying for mitigation in Africa is less controversial: the world needs to reduce greenhouse gas emissions, and this is the basis for carbon trading in the CDM.

D. Governance and new financing mechanisms

16. Africa is seeking control over new funds so as to address climate change and development. To rip maximum benefit from available finance, Africa needs additional and predictable flows so it can schedule investments in sequence and deliver-effectively. While new

finance should not be provider-driven, the mechanisms and institutions involved (for example the AfDB) must be significantly more effective, efficient, and accountable than in the past. Developed countries are still wary of the manner in which new funds will be invested, hence their limited support for the UNFCCC Adaptation Fund. Institutions like the Africa Climate Policy Centre may have to serve as multilateral implementing entities for the fund to help raise implementation standards.

17. There is a need to reform existing **mitigation** financing mechanisms fundamentally to provide sufficient capital for Africa to develop in a low-carbon sustainable way. The CDM and World Bank Climate Investment Funds are inadequate. Carbon markets could hold promise, if reformed to take into account African interests. The reforms should: include the expansion of types of projects eligible for CDM; include improved methodologies for sectors with high potential in Africa; and integrate REDD actions, along with support for the concept of sectoral CDM.

E. Domestic and private sector investment in a green economy

18. The UN system should help mobilize sufficient resources to enable States to implement climate policies based on a clear timeframe. Meanwhile, African governments should be urged to mobilize adequate resources to ensure that they have clear budget lines that support the implementation of adaptation actions. They also need to put in place robust monitoring and evaluation mechanisms for easy tracking of progress over time.

19. African countries need to mobilize their private sectors to actively participate in financing climate change mitigation strategies, which would provide fresh resources. This might be achieved through fiscal incentives for contributions to such causes, along with industrial strategies that promote environmental stewardship in the product life cycle. All this would support mitigation initiatives. Further analysis is required to identify possible roles for the private sector either in the form of public-private partnerships or private sector initiatives. The continent requires policies that facilitate private sector participation, including foreign direct investments.

III. CONCLUSION

20. The world has declared war on pollution. It is preparing a campaign of economic and environmental transformation to help the earth maintain its heat balance, but hasn't yet completed a time-bound global strategy, or agreed exactly on who will provide the necessary funds. This uneasy peace is unsettling and leaves a policy vacuum. Continuing with business as usual is sure to lose the war. Yet coherent alternatives, such as a green economy, are still under development. What Africa must do is to roll up its sleeves and prepare itself. While current funding committed for adaptation to climate change is grossly insufficient, given the scale of the problem, it does exist and is significantly underutilized. We should be using the funds in a manner to reflect the urgency of a crisis that is threatening the future of the continent. We should be learning to optimize the impact of our efforts. Africa should also be planning to invest much larger financial resources likely to be available in the near future.

21. While politicians complain of inadequate finances to invest in development, donors bemoan the lack of adequate policies and programmes in which to invest. Now the world is changing. More financing will become available. Africa must refocus development policies, programmes and action plans on addressing climate change through low-carbon development in

a green economy if it wants to safeguard its people's future. The world has a clear and direct interest in helping Africa with such a programme, by providing it with finances, technology and capacity. Most importantly however, Africa now needs to help itself by getting organized, and showing total committed and preparedness. This forum, the ADF-VII, is a firm step in that direction.

IV. KEY QUESTIONS

A. Managing uncertainty

22. How best can a culture of climate-risk management be developed throughout Africa? Are climate services up to the task of providing the required baseline information? Can Africa afford not to invest in climate-change research and improved climate services to help manage future climate risks?

B. The problem is big and getting bigger

23. Are we doing everything we can to avoid runaway climate change? Is everyone aware of the risks of delay in reducing emissions and missing the <2˚C target – and the consequences to lives, livelihoods and financing adaptation? Why are existing climate funds underutilized?

C. How much finance might become available?

24. Are UNFCCC negotiations likely to result in sufficient resources for Africa to adapt to climate change by supporting the transformation to a green economy? Are the tabled commitments of about US$40 billion per year by 2020 likely to be sufficient? Can such sums be invested in ways that attract further foreign direct investments of the kind required?

D. Financial governance

25. How can Africa exercise more control over new climate funds for addressing its own climate change and development agenda? Can finance flows be made more predictable and longer term to ensure the effective scheduling and delivery of investments? Are adequate financial structures in place at the national levels? Are governance processes sufficient to ensure the best use of funds?

E. Reforming mitigation finance

26. What other changes are required in existing **mitigation** financing mechanisms to help provide resources for Africa to develop in a sustainable low-carbon way? How should carbon markets be adapted to make them more appropriate to Africa's interests?

F. Facilitating change

27. Is there a requirement for an annual African meeting to assess progress on climate change and the development of a green economy? Can we increase momentum for change by exchanging knowledge and ideas for scaling up best practices, and building trust between different stakeholders by brokering programmes and financing? Or do we need to wait until all the resources are lined up on the table before we consider disbursement?

8. Climate change and infrastructure development

Issues paper #8

I. OVERVIEW

1. Weak infrastructure is a critical bottleneck in Africa's development after decades of under-investment. Sound infrastructure would contribute significantly to the achievement of MDGs. Changes in climate will stress current infrastructure, aggravating existing weaknesses and necessitating major renovations and replacements that require heavy investments in terms of finances and technology and skilled workforces.

2. The three principal forces are:

(a) Development: New infrastructure is required for present and future generations who expect higher standards of living;

(b) Adaptation: there is a need to reinforce and adapt existing and planned infrastructure to cope with higher temperatures, greater and more frequent extreme events, rising sea levels, increased sand movements, and changing hydrology/precipitation regimes; and

(c) Mitigation: Investment in smart infrastructure and human capacities is required to mitigate emissions from energy, transport, agriculture and forestry sectors, among other things.

3. While investment is important in all sectors, abundant low-carbon energy is absolutely fundamental for mitigation and sustainable development. Similarly, appropriate water infrastructure is critical for adaptation and sustainable development. Overall access to water and energy provides many development benefits, such as reducing poverty, improving social and human development and opening economic opportunities in urban and rural areas.

4. The mitigation of emissions requires new technology, planning, capacity and finance for the provision of low-carbon energy technologies. Adaptation will be much more difficult without easy access to water and energy.

II. STAKEHOLDERS

A. General considerations for climate-proofed infrastructure

5. In making decisions today, for example, to create new or retrofit old infrastructure, African countries must ensure that the infrastructure is robust enough to cope with future climatic conditions, including changes in precipitation, temperature extremes. They

must also take into account the probability and severity of natural calamities, such as floods and droughts, and consider the following:

(a) The infrastructure deficit in Africa is vast. Most existing infrastructure was built with low-energy efficiency and based on historical climate information. The World Bank estimates that $US93 billion is needed to improve Africa's infrastructure; nearly half of it on power supply. Much higher amounts will be needed for new infrastructure that is: low-carbon; climate-proofed and:; developmentally sound and sustainable;

(b) Design and construction standards will need to be changed as a matter of priority. It is vital to integrate climate-change considerations into the design and planning processes of new infrastructure to ensure its future sustainability. It is equally important to develop guidelines for climate-risk assessment and better standards for the planning of energy, land and water use, and construction;

(c) Floods, rising sea levels and other climate-triggered events threaten the functioning of much of the existing infrastructure. This is particularly true of transport and of urban and industrial sites located in low lying and coastal areas;

(d) To implement mitigation initiatives, it is necessary to replace infrastructure used energy sector. Long-term planning has to address development and emission-reduction goals. This might involve change in practices in such areas as energy efficiency, new infrastructure, and an enabling environment to encourage behavioural change;

(e) The continent needs to upgrade much of its infrastructure to cope with growing human needs within an evolving climate regime. The upgrading should involve the energy sector, dams, urban water supply, sanitation, and transport, among others;

(f) There is a need for new low-carbon energy for economic and social development in line with improvements in wealth and quality of life for larger proportions of the population;

(g) It will be necessary to ensure that new technologies are more energy-efficient to minimize emissions by the construction industry and the operation of machinery. For instance, the production of cement accounts for some 5% of total global emissions;

(h) Agriculture-related infrastructure will need major overhauls to increase food production for an expanding population in less clement climates, and reduce emissions at the same time;

(i) Improved ICT has contributed to the transformation on the continent by easing access to finance, and enhancing the dynamism and efficiency of markets. However there is a need for further development in terms of distance learning, and for reduced travel;

(j) A strong and equitable global agreement is vital to minimizing the impact of future climate changes, reducing uncertainties, and thereby facilitating long-term planning. For instance, it is possible to accommodate known peak sea levels in planning; it would be a nightmare to plan, taking into account that sea levels will be rising sustainably over centuries;

(k) It will be necessary to review the functioning of railways, waterways, and mass-transit systems as well as of homes, offices, and factories in order to create much more sustainable cities; and

(l) Wise investment in infrastructural renewal will sustain growth and maintain employment.

B. Sectoral considerations in building resiliency into infrastructure systems

6. Since climate change will affect everyone and every sector in Africa, the sectors need to pay attention to infrastructure, given its role as a support. The particular sectors of interest include: energy; water and sanitation; transport and ICT; urban, industrial and coastal, and; rural infrastructure (in relation to land use, agriculture and forestry).

7. **Energy:** Energy use is closely linked to development, as guided by the MDGs and growth in GDP. Access to electricity is very low in Africa; less than 25 per cent of households have electricity. While Africa's potential for hydropower is huge, only 7 per cent of this is exploited. Furthermore, hydropower has a high share of total energy generation (40–45 per cent), but is affected by the vagaries of climate change. Projections predict a 10–20 per cent decline in rainfall by 2070 and a fall in river water levels of as much as 50 per cent by 2030, in various parts of Africa. For Africa, the generation, transmission and distribution of energy pose some of the biggest challenges, given that demand for it will escalate with economic and population growth in spite of the vulnerability of hydropower sector. Africa also needs to mitigate emissions from current and future energy use. The ideal is to expand energy availability, while reducing energy-related emissions. This is an essential part of low-carbon development, achievable through a much more expanded use of renewable energy, together with energy-efficiency measures.

8. **Urban and industrial energy:** African countries will need to extend and strengthen electric power grids to increase production capacity using diverse sources to reduce dependency on fossil fuels. Smart grids and regional production schemes, such as solar power in deserts, hydropower, offshore wind, wave and tidal energy technology, and geothermal technology could provide new and clean sources of energy. Access to modern technology is therefore critical and increased power pooling is inevitable.

9. **Rural energy:** Access to energy in rural areas is very low in Africa. In 2007, the continent had about 500,000 solar home systems in use, more than half of them in Kenya and South Africa. Developing off-grid decentralized, renewable energy supplies is a cost-effective way of increasing access to energy in rural areas. Off-grid options include solar photovoltaic, micro hydropower, biogas digesters, small wind turbines, and bio-fuels from non-food crop sources. These technologies could also improve adaptive capacity and reduce the risk of natural disasters. Renewable energies also promote gender equality by reducing the burden, on women, of collecting firewood and water and other necessities, for household chores and income generation. Cutting down the use of biomass for cooking and heating will significantly reduce deforestation, thereby lessening the risk of floods. Electricity can be used to improve access to clean water, to cool medical supplies in rural health centres, and for food preservation.

10. For mitigation purposes, the technologies most frequently required in Africa include renewable energy, energy-efficient appliances and buildings, efficient land management, and public transport. The energy sector requires a substantial transfer of environmentally-sustainable technologies, especially for energy generation. The most commonly identified technology needs for mitigation concern: solar energy, biomass energy (forest and communal bio-waste); large and small hydropower plants; efficient lighting and water heating; geothermal energy; water pumping; efficient and low-fuel consuming stoves and ovens, and; solar drying of agricultural products. Transport will need to convert from oil to bio-fuels, electricity or hydrogen, depending on circumstances.

11. **Water and sanitation**

It is estimated that 230 million Africans will face water shortages by 2025 as a result of declining water resources and increasing constraints on water resources, especially in hotter climates. Much of the water infrastructure will need upgrading to maintain adequate supplies, and thereby meet future demand. Such transformation could be achieved in harmony with the diversity of water uses, including for agricultural production, fishing, navigation, industrial production, domestic consumption, and sustaining the ecosystem.

12. The construction of new dams and upgrading of existing ones will become essential in sustaining urban water and hydropower supply as river-flow variations become and competition for water intensifies. Watersheds already need improved management (agro-forestry, erosion control and livestock management) to protect water resources. The management of rivers will require trained staff to minimize flood risks along bridges, culverts, and embankments.

13. Urban and rural water supplies will need to cope with a growing population and drought in many parts of Africa. In flood-prone areas, it is important to provide for flood-prevention infrastructure, such as drainage and reinforced riverbanks, as well as for the supply of clean water. Desalination infrastructure may be required for high-value water in coastal areas, depending on the fragility of local coastal ecosystems. The upgrading of urban sanitation is hugely important in many countries, and should include improved drainage systems to mitigate the heightened risks of urban floods. A process combining the collection of waste and its conversion into fuel or electric power provides win-win solutions.

14. **Transport**

As earlier stated, there are many threats to existing infrastructure (roads, railways, harbours, waterways, airports) from increased flood risk and rising sea levels. Coastal networks may need complete replacement with upgrades (new bridges, culverts, river management training) required elsewhere. The expected increase in the frequency of extreme events will aggravate damage to infrastructure, loss of life and financial burdens to governments. However, transport equipment also poses threats to climate change. New types of fuel (bio-fuels, hydrogen, electricity, solar energy) will be needed to replace petroleum/oil. There will also be a need to minimize the effect of transport infrastructure on the environment, especially forests, land stability and watercourses. It will be vital to use transport policy to ensure that transport is more sustainable.

15. **Information and communication technology**

Sustained investment in ICT infrastructure should be a high priority in all countries to improve communication, open up markets and provide access to finance, telemedicine and distance learning, especially in rural areas. The use of ICT reduces the need to travel. ICT infrastructure requires heightened protection, for example, from extreme events, including floods, and storms with high winds and lightning.

16. **Rural infrastructure land use: agriculture and forestry infrastructure**
Projections indicate that declining water sources will lead to serious food deficits in parts of Africa. Many African countries will revise their land-use practices, and thereby benefit from global carbon trading through major reductions in emissions. They will need to put considerable effort into strengthening their agricultural and forestry infrastructure, much of it in relatively remote regions. The setup of agro-forestry systems could help cope with heightened risk from changing climatic conditions. The benefits that agro-forestry brings, in terms of carbon trading, complement those obtained from the use of renewable sources of energy, such as solar, wind and biogas and increased energy efficiency.

17. **Urban, industrial and coastal infrastructure**
Improved planning, building regulations, flood-resistant design, water supply, sanitation and drainage are essential short-term solutions. Improved disaster-risk planning, preparedness and response will also help minimize the impacts of extreme weather events. Given that land issues compel the poorest urban residents to live in high-risk areas, such as flood plains, and it is important to resolve the issues.

18. The tendency to 'temporarily' protect lowland areas from rising sea levels by means of dykes and sea walls must be reconsidered in the light of: possible long-term sea-level rise of several metres compounded by; storm surges, such as Hurricane Katrina and its impact on New Orleans in 2005. Much coastal infrastructure in Africa will need to be relocated sooner or later if issue of sea-level rises is not addressed. Particularly vulnerable countries include Côte d'Ivoire, Egypt, the Gambia, Mozambique, and Nigeria. Shoreline defence structures could help protect vulnerable coastlines - for a while only - especially where they enhance coastal ecosystems as well as protect infrastructural assets. Cities located on river deltas are particularly vulnerable owing to land subsidence.

19. **While cement for making concrete** is in great demand for safe urban and industrial construction, cement production is a major source of emissions both during its production and use. Are alternatives a possibility in Africa? It is possible to partly switch to biomass-based fuel to replace heavy fuel oil and coal in cement factories, thus qualifying for CDM projects? Low-carbon cements are still at the research stage although several CDM projects have attempted to make improvements. Poorly designed buildings constructed with inadequate materials can consume up to 30 % more energy for lighting and cooling. Design and construction materials will have to be adapted to future climates.

III. CONCLUSION

20. Investment in new and existing infrastructure in Africa must be well resourced, planned and managed along a low-carbon and climate-resilient path. According to the AfDB, the continent needs to double current investments, which stand at $US45 billion per year. Needs exceed this figure by far, and they must be met if the continent is to carry out its future adaptation and mitigation initiatives and develop.

21. Infrastructural planning will have to incorporate concerns over new weather and climate risks. As advocated in the ClimDev-Africa programme, the entire continent will require capacity-building and much improved climate information, along with greater exchange of best practices.

Priority actions

22. These should include:

(a) The reform planning processes to include climate change information, with enforceable land- and water-use policies and practices, in harmony with regional circumstances;

(b) The reform of building regulations to support energy and resource efficiency in national processes, while maintaining regional coherence;

(c) Access to quality climate information and climate risk-management processes;

(d) Updating Africa's Infrastructure plan to accommodate climate change considerations;

(e) Support to regional hydropower and other clean energy sources;

(f) Integration of climate change considerations into contracts on infrastructure; and

(g) Learning more about the impact of climate change on infrastructure, given the uncertainty and broad range of expected changes in rainfalls and temperature.

IV. KEY QUESTIONS

23. These include:

(a) How can we exploit the opportunity for continental infrastructural development and renewal? Can regional harmonization help drive the process forward? Raise standards? Encourage cooperation? Assist national processes?

(b) Is there sufficient information on expected climate changes to facilitate adaptation of infrastructure design? What is the information gap relative to best design and construction practices in Africa? What levels of long-term rise in sea levels should be accommodated in new coastal infrastructure? Can existing ports and harbours be upgraded to cope with rising sea levels or will changing and eroding coastlines make them unusable? What should be done to improve information sharing in Africa on such matters?

(c) Is there an alternative to Integrated Water Resource Management as best practice for managing change in resource availability under conditions of increasing demand? Many urban and rural water supplies are extracted from groundwater. How can such supplies be made sustainable in areas of predicted decline in groundwater recharge?

(d) In the context of planning infrastructure development within ever-changing climate conditions:

(i) Can African countries absorb all the required major investment in infrastructure? What other sources of finance are available, and what financial governance structure is required to maximize such sources? How can existing planning and construction regulations be reformed, implemented and enforced effectively?

(ii) How can the low-carbon path be integrated into existing and future plans?

(iii) How can infrastructural investment be programmed to sustain growth and employment?

(e) Water harnessing and productivity are very low in Africa. How can they be improved, especially in areas of projected water stress?

(f) To what extent should current programmes, such as the AU Programme for Infrastructure Development in Africa be improved to take account of climate change?

9. Climate change and ecosystem sustainability

Issues paper #9

I. OVERVIEW

1. Our natural environment is in crisis – globally and in Africa. Both terrestrial and aquatic ecosystems, along with biodiversity, are being degraded rapidly under the present global economic system, which treats the environment as an externality. Our economic valuations overlook detrimental impacts on the environment. We are therefore squandering environmental 'capital' and losing ecosystem services, including those from terrestrial, coastal and aquatic ecosystems, that we should bequeath to future generations. This is emblematic of unsustainable development.

2. Now the entire planet is reacting to the multitude of local changes. Humankind has upset the planetary heat balance by burning vast amounts of fossil fuels, removing huge tracts of natural vegetation and depleting marine living resources. Climates are changing and will exert further pressure on our finite and already deeply distressed natural environment, resulting in extreme weather events, water scarcity, flooding and sea level rise. The impact on large swathes of population across national boundaries will be immediate and direct.

3. Africa's capacity to adapt to and mitigate the impacts of climate change is intricately linked to its ability to conserve its ecosystem base, its biodiversity and other environmental assets. The conservation would help sustain the livelihoods of millions of people who depend on the services that the ecosystems provide. The services include clean and healthy food obtained from terrestrial and aquatic ecosystems, water, and air as well as regulatory services, such as climate, weather, flood control, alleviation of droughts, and coastal erosion and disease control. The Millennium Ecosystem Assessment took an inventory of the many obvious and subtle services provided by ecosystems, and the *Green Economy Report 2010* addresses the way forward.

II. THE MAIN ISSUES AT STAKE

3. The main issues relating to climate change and ecosystem sustainability are:

(a) The establishment of a green, climate-resilient economy;

(b) Priority areas of action to ensure the sustainability of ecosystem services, including funding, regulation, support and cultural services;

(c) The roles that the conservation of biodiversity and management of ecosystems play in adaption and mitigation; payment for ecosystem services and financing ecosystem conservation and restoration; and

(d) Cooperation between the agriculture, environment, water and energy sectors in promoting ecosystems in order to manage land and marine resources.

A. The green economy initiative

5. A green economy incorporates the full value of ecosystem goods and services in all economic considerations. Such a change requires a complete overhaul of the way humans do business, consume, and consider their lives. Nature cannot be conquered, but should, instead, be cherished, managed and sustained. Humans are not at war with nature, rather they are an integral part of a living planet. In a green economy, communities should be paid for conserving nature rather than depleting or degrading it, and companies be given strict limits on what they can take from the environment. Governments should set up subsidies worth over $US1 trillion a year for industries like agriculture, fisheries, energy and transport. Businesses and governments must publish accounts on their use of natural and human capital. A few have started already by indicating their 'carbon footprint'. This 'carbon footprint' must, however, be comprehensive, covering all ecosystems, including terrestrial, coastal, and aquatic resources.

6. According to the Economics of Ecosystems and Biodiversity, investment in restoring or conserving biodiversity and ecosystems services can significantly enhance agricultural sustainability, especially in developing countries, improve freshwater supplies and reduce future insecurity. It can slash the effects of natural hazards and extreme weather events, improve skills and create decent jobs in poor communities.

B. Priority areas

7. Priority action to ensure the sustainability of ecosystems and their services include: integrated water resources management; combating land degradation, deforestation and desertification; and the conservation of biodiversity.

1. Integrated water resources management

8. Lack of water is a major constraint on development in Africa. Although Africa has rich water resources, with large rivers and lakes, it is the second driest continent in the world, after Australia. This dichotomy is due to the uneven spatial distribution of Africa's water resources relative to the demand from population centres for the commodity. Today some 300 million people in Africa endure water shortages owing to climate variability, increasing water demand and poor management of existing resources. About 75 per cent of Africa's population relies on groundwater as the primary source of drinking water. Current water usage is far from optimal - about 70 per cent of the water diverted is used for irrigated agriculture, but few developments have been designed to manage water resources sustainably. Most surface water in Africa is found in transboundary waterways, which complicates management. Water quality is also a major concern. Almost half the people in Africa suffer from major water-borne diseases.

9. Available water is a scarce and valuable but ill-managed resource. Climate change will severely aggravate water stress in arid, semi-arid and dry sub-humid areas. By 2025, nearly 50 per cent of Africa's predicted population of 1.45 billion people will face water stress or scarcity. Water policies must use water pricing or other means to address the growing scarcity and ensure: efficient use of water; the conservation of watersheds; and the availability of funds for further investment. Competition for water plays a primary role in environmental insecurity: climate change will make it even worse. One phenomenon that has silently crept

upon us concerns access to water for populations amassing in urban conglomerations and mega cities. These are forming mainly along Africa's coastal areas, major rivers and lakes. For these reasons, integrated management of riverine, coastal and marine areas is a must.

2. Combating land degradation, deforestation and desertification

10. Land degradation is a global problem manifested through, *inter alia,* the loss of biological diversity, deforestation, destruction of coastal habitats and mangroves, soil erosion by wind and water, coastal storm surges and rising sea levels. This phenomenon, coupled with climate change and variability, will intensify desertification, flooding and coastal erosion. Land degradation affects people differentially, depending on their economic, social and political circumstances. In Africa, about 65 per cent of agricultural lands are degraded, mainly by erosion. This forces farmers to continue working on less productive soil or migrate (mostly to urban areas along the coasts of Africa). It also affects hydrology: increasing flooding from excessive runoff, silting up of dams and waterways, increasing pollution and reducing dry-season flows. Similarly rising sea levels and storm surges are rapidly eroding coastal and marine habitats as rapid rural urban migration compels the population equilibrium to shift from inland terrestrial ecosystems to the large marine ecosystems.

11. Thirty-one per cent of the region's pasturelands are overgrazed and 19 per cent of its forests and woodlands are classified as degraded. Forests account for over 20 per cent of Africa's 30 million km^2 of land area, but are being destroyed and degraded by logging, conversion for agriculture, roads, and settlements and exploited for fuel. Africa is losing over four million hectares of forest every year, which is twice the world's average deforestation rate. Climate change and its impact on water scarcity aggravates the situation even further: reportedly, deforestation is a major concern in 35 African countries, while land degradation and threats to biodiversity are issues of concern in 32 and 34 countries respectively. Similarly, over-fishing and coastal degradation affects 23 African countries.

3. Biodiversity conservation

12. Africa is rich in biological diversity. It is home to about one quarter of the world's 4,700 mammal species, over 2,000 species of birds—one fifth of the world's total, and at least 2,000 species of fish. The African mainland has between 40,000 to 60,000 plant species: eight of the world's 34 biodiversity hotspots are in Africa. It is also the cradle of mankind, and African forests support more than 20 species of primates, often in small, vulnerable locations. Africa has over 3,000 protected areas. These include 198 marine protected areas, 50 biosphere reserves, and 80 wetlands of international importance. In spite of their recognized status, protected areas remain under threat of civil unrest and encroachment, as well as of the introduction of invasive alien species. Acidification and overexploitation, including depletion of living and non-living resources in the five large marine ecosystems, threaten the equilibrium of oceans and marine ecosystems that are important in terms of climate regulation. Fine-tuned mountain and freshwater ecosystems are also at risk due to glacier melting, invasive species and a more hostile climate.

13. In the context of biodiversity, climate change could pose the greatest challenge for the coming generation and is predicted to become the biggest force in the loss of biodiversity loss over the next 50–100 years, bigger than loss of habitat, over-exploitation and the introduction of invasive species. A large proportion of genetic resource that remains unexploited will be lost.

14. It is noteworthy that climate change, the mismanagement of watersheds, land degradation and the loss of biodiversity constitute an environmental nexus. Each problem is interlinked with the others and is difficult and expensive to address individually. Yet there are multiple and major benefits from concerted actions to address all dimensions together. The large marine ecosystem approach being promoted by the Global Environment Facility provides a framework for concerted efforts. The value to human society of saving "natural goods and services", such as pollination, medicines, fertile soils, clean air and water, will be even higher – between 10 and 100 times the cost of saving the habitats and species.

C. The role of ecosystems in mitigation and adaptation

15. In addition to the above-mentioned benefits, chances are high that the management of ecosystems along with conceptual approaches can help mitigate emissions and especially adapt to climate change in Africa. The role of natural ecosystems in mitigation is now strongly recognized globally. Clear evidence of this is REDD, which is under negotiation and it is hoped that the Sixteenth Conference of Parties (COP-16) to the UNFCCC in Cancun, Mexico will define a mechanism to support REDD+. While this is important for Africa, major hurdles prevail in terms of implementing REDD+ approaches. The hurdles include dealing with the issue of 'leakage', for instance: deforestation shifts to other locations; compensating countries with good conservation records as opposed to adopting current proposals, which channel most funding to countries with high recent deforestation; effective policy tools that ensure national-level REDD+ carbon targets; converting funding into local 'compensation' for carbon conservation, and; concerns that the growing focus on REDD+ approaches may reduce pressure on Northern countries to set and achieve ambitious carbon-reduction targets at home. Complex or ill-defined land tenure is often a significant constraint on practical action.

16. REDD+ action goes beyond trees: concerted actions can include simultaneous conservation of habitat, biodiversity and watersheds, along with the enhancement of carbon stocks and employment and livelihood support for local communities. Wetlands also can be significant sources or sinks for carbon; their conservation and management has the potential to mitigate emissions, nurture biodiversity, regulate river flows and protect coastal areas.

17. Adaptation initiatives that are based on ecosystems use biodiversity and ecosystem services to help people adapt to the adverse effects of climate change. These approaches can be cost-effective and generate social, economic and cultural co-benefits and contribute to the conservation of biodiversity. For example, the conservation of agro-biodiversity can provide specific gene pools for crop and livestock adaptation to climate change, while the maintenance and/or restoration of mangroves can reduce coastal flooding and coastal erosion in the face of extreme weather events.

18. The important role of aquatic ecosystems, particularly oceans, as carbon sinks needs to be recognized and harnessed.

D. Working together in a green economy

19. In 2009 African Heads of States and Government urged the AU and NEPAD to establish an inter-ministerial mechanism to bring together ministries of agriculture, the environment, and water to advance an inter-sectoral approach in addressing the climate-change agenda. The initiative built on the strengths of the Comprehensive Africa Agriculture Development Programme's Sustainable Land and Water Management (see Issues Paper 2).

This *three-pronged approach offers many benefits linked to* synergies in addressing common problems. For our actions to be coherent, we need consistency in our policies, including for rural energy. This inter-ministerial mechanism would be incomplete without ministries and departments of fisheries and aquaculture. The AU acknowledged this by creating the Committee of African Ministers of Fisheries and Aquaculture to complement the CAADP structure.

III. CONCLUSION

20. **Green is green with economic benefits**

Assuming that the pressing demands of climate change trigger global transformation in the immediate future – and national economies take into account the enormous value of goods and services inherent in nature – then green development, in a green low-carbon economy, would appear to be the most (if not the only) feasible way for sustaining ecosystems and their services for the long term benefit of Africa. Developing such a 'green economy' will be challenging, with widespread change in current practices. But, with its minimal investment in fossil energy and abundant land and aquatic resources, Africa is in a unique position to benefit from the experience. Africa stands to gain from multiple carbon sequestration and adaptation actions, mainly related to the management of its water resources. Many practical questions remain, such as the manner in which economic, social and cultural transformation will be achieved in practice, and whether the continent will conserve already degraded ecosystems and restore them as a crucial part of mitigation and adaptation initiatives. The loss of biodiversity, climate change and land and marine degradation are four problems linked by common solutions. It is essential to treat them in a coherent and integrated manner, using ecosystem approaches, such as the Large Marine Ecosystem Approach being applied in the large marine ecosystems in Canary Islands, Guinea, Benguela and Agulhas

IV. KEY QUESTIONS

Green development

21. Can Africa develop a green economy through a low-carbon growth pathway that prevents further damage to ecosystems? Is this a practical way to meet the needs of a rapidly growing population seeking higher living standards? Is there any practical alternative to a green economy for Africa? What are the major pathways to implement the adaptation agenda for alleviating the adverse effects of climate change within the African social, economic and cultural context?

Ecosystem services

22. Can a new culture be created in public and private sector governance that optimizes sustainability in the production and use of resources for terrestrial and aquatic ecosystems? How should incentives be changed to sustain a productive, good quality environment? Do we have appropriate tools for assessing and evaluating the sustainability of ecosystems?

Water scarcity

23. Is there any alternative to water pricing to ensure the best management of this increasingly scarce commodity? Do present policies and practices subsidize wasteful or non-sustainable use of water? Are MDG water and sanitation targets so poorly addressed because

they demand major investment in unsustainable practices based on unrealistic assessments of future water resources in a warmer climate, with no return on the investment? Beyond the MDGs, what steps can Africa take to attain the comprehensive Goals and Targets of the African Water Vision 2025, including the Framework of Action, which serves as the fundamental policy document of the AU /AMCOW, the UN Water Africa and the AfDB?

Multilateral Environmental Agreements

24. What is the best way to exploit the many opportunities for improving degraded terrestrial and aquatic ecosystems and their vital services? Would it be worthwhile to interlink the implementation of the three Rio Conventions that address climate change, desertification and loss of biodiversity, along with the marine goal of the World Summit on Sustainable Development? How can Africa ensure that UNFCCC processes recognize all potential sources of green income, such as the CDM?

Agriculture and environment

25. The CAADP Sustainable Land and Water Management programme is excellent for agriculture, but how well does it link with water (both fresh and marine), biodiversity and desertification? How can agriculture, the environment and water be managed together in an integrated and sustainable manner? What about rural and urban energy? Are there examples of best practices in integrated ecosystems approaches to the sustainable management of Africa's terrestrial and aquatic resources to ensure economic, social and environmental resilience?

Environmental monitoring

26. Do environmental monitoring mechanisms need to be strengthened? Would it be beneficial to integrate monitoring services, for example, those relating to climate, weather, water, land, marine and pollution, into human activities? In what ways should the various stakeholders, including local communities, the private sector, civil society, government actors, and international entities, participate in environmental monitoring?

10. Science, technology, innovation and capacity-building for addressing climate change

Issues paper #10

I. Overview

1. It is generally acknowledged that Africa's geographical location and low adaptive capacity leave it very exposed to the effects of climate change. The continent has a relatively warm climate, poor soils and high variability in rainfalls and floods. These variations, which are likely to increase with climate change, have major impacts on key sectors, such as agriculture, and on levels of poverty and disease. Science is indispensable for understanding and managing the full implications of climate change.

2. Climate change also presents many opportunities for Africa and could serve as a catalyst to build more efficient, low-carbon economies that would guarantee Africa's future development. To realize this goal, Africa may have to develop innovative policies for climate change to help design appropriate legal and regulatory frameworks. The policies will also ensure that the continent invests appropriate human, financial and technological resources in development, and acquires, adapts and promotes green technologies and products. In brief, Africa requires science, technology and innovative policy for climate change to build capacity and respond effectively to the numerous threats and opportunities of climate change.

II. The main issues at stake

A. Science for decision makers

3. Africa lacks the relevant scientific data and information for adequate understanding of its exposure to climate change and the related impact . Better information is required:

(a) To enlighten ongoing international negotiations that are critical for the future of Africa;

(b) To assist in the transformation to a low-carbon development pathway;

(c) To enlighten policy and programme responses from the continental to local levels;

(d) In the monitoring and evaluation of impacts and of the effectiveness of remedial measures; and

(e) In understanding the uncertainties and managing the associated risks.

4. Africa has few scientists, facilities and data sources. Its limited access to funding prevents it from monitoring every pertinent variable, acquiring key information and communicating promptly and effectively with all stakeholders. It has scanty expertise on climate change, given that most trained scientists work overseas. The continent needs to pay particular attention to future climate modelling, environment monitoring, climate-risk management to support farmers and several adaptation initiatives.

5. **Improving environment monitoring**: African countries need to address many key concerns over resources, such as water, land and biodiversity, in coherent and coordinated ways. To this end, they must: continuously observe and gain valuable and quality data; strengthen continent-wide environment monitoring networks and improve data sharing. For developing countries to incorporate REDD in their initiatives, they require independent monitoring and evaluation, which can be achieved by improving access to satellite data that are tailored to the size of the task.

6. **Support for decision makers:** Many difficult decisions will have to be made about adaptation. Decision makers at all levels must have access to reliable, up-to-date and understandable information on unfamiliar subjects. This is a major challenge, involving science and communication, and affects remote pastoral communities and finance ministers alike. Decision makers will have to cope with many unknowns. A culture of proactive climate-risk management with 'no regret strategies' must be instilled in all pertinent sectors and stakeholder groups.

7**. Diversity in action:** While there are a large number of ongoing adaptation initiatives in Africa, the total impact is still negligible in relation to the size of the problem. The ClimDev-Africa Programme and its Africa Climate Policy Centre are intended to bring greater harmony and promote the sharing of best practices. ACPC annual climate conferences should address the need to maximize the impact of ongoing actions and identify gaps.

8. **Funding :** There is an urgent need for special funding mechanisms to support climate-change adaptation and mitigation initiatives. The AfDB has developed a climate-risk management strategy and will make funds available for a broad range of such activities through the ClimDev-Africa programme. Other funding mechanisms in Africa need to follow suit. Through ClimDev-Africa and other relevant initiatives, the AfDB is ready to assist and lead the process. People should be informed of these possibilities and encouraged to participate in coordinated ways. New and improved funding, and appropriate governance can strengthen the science infrastructure in Africa and attract trained scientists back. Such mechanisms could attract multiple benefits by incorporating concerns about climate change into funding for: the alleviation of poverty; conservation and sustainable use of biodiversity, and; investment in infrastructure, among others.

B. The potential of technology

9. Globally, Africa invests the least in research and development and is the smallest importer and user of global technology. Some of the main barriers to the transfer of technology include limited information on technology, intellectual property rights protection, foreign direct investments, financial incentives and a low industrial and technology base. The barriers will severely curtail the creation and maintenance of low-carbon development pathways.

10. The Africa Partnership Forum (in a Special session on climate change, October 2009) suggested that Africa would benefit from:

(a) Accelerated technological development, promotion and transfer by intensifying efforts to build the capacity to develop and use new technologies;

(b) Technological focus on areas of particular relevance to Africa, such as forests and land, energy efficiency and renewable energy; and

(c) The mobilization of its trade policy to support the promotion of technology by eliminating or reducing tariff and non-tariff barriers to trade in environmental goods and services; the object is to encourage the use of cleaner low-carbon technologies.

11. **Innovative technology**

Africa is a relatively dry continent in dire need of improved water management to cope with climate change. It is necessary to consider innovative continent-wide approaches in monitoring transient water levels and improving technologies used for harvesting and saving water. Satellite technology can be used for the daily monitoring of river levels and soil moisture, and ensuring efficient water-resource management, especially in transboundary waterways. It may also be necessary to improve engineering technologies for harvesting and storing water, especially in drought-prone areas.

12. Intellectual property rights constitute a major divide in climate negotiations. African countries see them as a barrier to technology transfer while developed countries stress their role in promoting innovation. There should be a balance between rewarding innovators and greatly scaling up the propagation and transfer of technology. A classic example is WMO's data policy. Efforts to recover costs by selling weather and climate data only resulted in restricted access to data for development in Africa, and perpetuated the gulf between climate and development communities.

13. **Institutional arrangements**

Another fundamental issue is the institutional framework for technology transfer. Africa (as part of G-77) is seeking a new 'mechanism' to guide overall technology development and transfer activities under the UNFCCC. However, developed and developing countries have not yet agreed on the arrangements and mechanisms for supporting technology transfer, especially its funding.

C. Innovation

14. For African countries to understand climate change and make plans to adapt to it, they need innovation and innovative approaches that will enable them to take advantage of opportunities and reduce risks. Innovation will bring new products, processes and services that can improve and enhance adaptation and mitigation strategies. Innovation will determine Africa's ability to generate new and improved products and processes to meet the challenges of climate change.

15. Africa's technological and non-technological innovative potential remains untapped. Its ability to generate new opportunities and meet emerging challenges posed by climate variability and change is low. For example, community biofuel production could be a

supplementary income earner for a vast number of rural communities, particularly in years of surplus food production. There is also vast potential for solar power generation, in some parts of Africa, with the possibility of connecting into major markets for green energy in Europe. Overall, the introduction of greener innovation systems and initiatives will hinge on the availability of workers with the requisite skills to integrate cleaner technologies into existing and emerging systems in a sustainable manner. Technology Innovation Systems should also be developed to ensure interaction between industry, technologists and governments.

16. **Cultivating curiosity**

The continent is in need of an ever-curious cadre of scientists, technologists, policy makers and industrialists with problem-solving skills. The need could be met through education and by rewarding innovations in the public and private sectors. Traditional knowledge and new technologies can be combined for adaptation to climate change through "innovative partnerships" and "adaptive innovation". Africa could also learn from the experiences of others and from ongoing initiatives on the continent. Governments should strive to create policies and investment environments that are favourable for the promotion of the private sector engagement. It might be best to develop innovation centres in association with the Regional Economic Communities and regional development banks.

17. **Innovation and Africa's comparative advantage**

The continent has many comparative advantages in several areas, and can thus uniquely develop its own brand of innovation. For instance, by deploying second-generation technologies, the continent could become a leader in the production of the world's bio-energy by 2050. South Africa alone is expected to produce over 400 million litres of biofuel per year and an additional 25,000 jobs. To achieve this, countries need to acquire and develop new and emerging technologies.

18. **Investing in science and innovation**

Although over the last 30 years, African governments have made several pledges to invest more in science, technology and innovation few of the pledges have been implemented. The reality is that the continent's ability to innovate on climate adaptation and mitigation cannot be translated into concrete action without significant investment in science, technology and innovation, particularly by governments. Most sub-Saharan African countries spend an average of just 0.3 per cent of their GDP on science and technology — a far cry from the 1 per cent promised in 1980 and again in 2005. Research and development in climate change is one way of using science, technology and innovation to foster regional integration. Climate change research could be undertaken through concerted action in the different subregions of Africa, with assistance from the RECs and contribution from countries.

D. Capacity-building

19. Lack of adequately trained human resources is a constraint. It is due, in part, to brain drain, limited investment in education and lack of demand and opportunity for skilled individuals in Africa. We need to build capacities to empower researchers, industry, communities and individuals to tap into new and emerging opportunities in the green economy and meet the challenges of adaptation to climate change. Adaptation could also be an opportunity to pursue new development strategies, diverse economic activities and improve the efficiency and productivity of existing sectors, such as agriculture, energy, transport and water.

20. Capacity-building is required to:

(a) Negotiate a fair deal for Africa in international environmental fora;

(b) Develop and practice climate-risk management;

(c) Develop innovative policies for climate change, including institutional and legal frame-works;

(d) Integrate climate change into development strategies and policies from the continental to local level, and from demonstration or pilot to large scale projects;

(e) Integrate climate change into sectoral work plans and operational decisions;

(f) Establish safety nets in a changing climate for the most vulnerable communities;

(g) Accelerate the transfer of environmentally-sustainable technologies;

(h) Improve communication to receive and send prompt advisories, early warnings and development information, especially in rural communities;

(i) Provide next generation education and public awareness on climate and development issues and action plans; and

(j) Facilitate the transfer of relevant baseline data and environmental information within and between ministries and countries.

21. The manner in which capacity is used is particularly important in Africa. How do we ensure that existing institutions and trained personnel can express their full potential? For example, relationships between weather services and communities should be improved to ensure that meaningful information is applied to adaptation efforts. Given the increased variability in climate and the spate of disasters, it is essential to have better climate services attending to the needs of local stakeholders in long-term partnerships. It takes courage to reform underperforming institutions by reforming the governance. Good salaries and a productive working environment are extremely important for retaining valuable staff. Regional institutions supported by member States may be of service to the climate-change agenda. Some countries have already implemented programmes to acquire expertise by sharing key staff across government departments and ministries, developing long-term partnerships with academic institutions and maintaining expert databases.

22. **Education:** Raising the awareness of future generations on ways to cope with climate change is essential. Climate-change science should be introduced into school and college curricula, with a focus on practical skills for the management of climate risks. Online training should be developed to increase public awareness about ways in which to take immediate action. Many in the financial industry have already recognized business opportunities and are hiring top experts in CRM.

III. CONCLUSION

23. Clearly, while climate change is a major challenge for Africa, it also presents many opportunities. For the allied processes of mitigation, adaptation and development through climate change, Africa is in need of a continuous coordination process to:

(a) Create a broad, knowledgeable, well-resourced and connected scientific community;

(b) Develop a new innovation policy for climate change to nurture a culture of innovation, especially in low carbon and alternative technologies;

(c) Ensure access to current technological resources, tailored to Africa's needs;

(d) Set up a community of stakeholders capable of managing climate risks; and

(e) Create public awareness of climate change issues and interest in responding to them.

IV. KEY QUESTIONS

A. Science for decision makers

24. Can Africa be fully competent in: global negotiations; the transformation to a green economy with a low-carbon development pathway and; adaptation processes, without major investment in climate and environmental sciences in Africa?

25. Are international partnerships an effective way for nourishing African scientific skills? These may be appropriate for global climate modelling and satellite environmental monitoring, but what is the best way in which science (meaning climate -risk management) can support local governance to increase resilience among poor rural communities?

B. The potential of technology

26. What must Africa do to harness the full potential of technological advancements and innovations in order to develop low-carbon growth pathways? Will it be sufficient to enhance the transfer of technology and invest in future technological solutions and opportunities by broadening research and development?

C. Innovation

27. How can Africa promote Innovation in mitigation and adaptation processes? Is consensus more valued in African society than individual thinking? Does this stifle innovation or is there a lack of mechanisms for rewarding innovation? Would innovation centres help identify and disseminate best practices? Do development banks choose secure investments and avoid innovation? How do we strengthen adaptive and resilience capacities, especially among the most vulnerable countries and sectors or communities? How willing are African countries to invest in science, technology and innovation to meet the challenges of climate change?

D. Capacity-building

28. While human capacities need strengthening throughout Africa, what are the priorities for investment vis-à-vis climate change? Should this be organized centrally, or by region? Or should countries be left to fend for themselves? What needs to be done to reverse the brain drain and ensure that capacities are available in Africa in the long term?

E. Working together

29. Would the benefits of integrating the many existing adaptation initiatives and network of climate-in-development programmes justify the work involved? Would such a process allow best practices to be transferred elsewhere and scaled up more efficiently? Would it give Africa more control over its adaptation agenda? How can cooperation between programmes be enhanced without stifling creativity and innovation? When are regional initiatives appropriate? What actions are needed to strengthen international cooperation to promote dialogue, common awareness, shared analysis and understanding?

F. Ongoing initiatives in Africa

30. Has anyone mapped them? Are there more major ones?

(a) ECA-ICSU: Road Map development and Network of Academy of Sciences;

(b) World Climate Conference 3: Global Framework for Climate Services;

(c) UNDP Adaptive Learning Mechanism and African Adaptation Programme;

(d) Climate Risk Management through (IRI/NOAA), (ACMAD), (ICPAC), (DMC), RC4DC;

(e) CCAA: DFID-IDRC Research and Adaptation Capacity-Building programme;

(f) Community-Based Adaptation by IIED; GTZ Adaptation capacity-building;

(g) UNEP-SEI Climate Adaptation Collaborative Programme, UNEP-UNDP PEI ;

(h) ClimDev-Africa: AUC, AfDB, ECA, and other Partners (GCOS, UNEP, FAO);

(i) AUC-EC African Monitoring of Environment for Sustainable Development (AMESD) ESA-TIGER Integrated Water Resource Management, and many others;

(j) Africa Climate Policy Centre (ECA), IPCC, TERI ; and

(k) Regional and subregional efforts to build hydro-political resilience in Africa (AU, NEPAD, AMCOW, UNECA; ECOWAS, SADC, IGAD).

11. Private sector response to climate change

Issues paper #11

I. OVERVIEW

1. There is strong evidence from the scientific community that climate change will disproportionately affect on socio-economic development in Africa. The average cost of climate change to African economies could be equivalent to 1.5 – 3 per cent of GDP by 2030 and rising. Climate change is not only a threat to the achievement of sustainable development and the reduction of poverty on the continent; it has the potential to undo the modest gains achieved towards attaining the MDGs. Responding to climate change requires the participation of all stakeholders, including governments and the private sector. Recent reports show that climate change now ranks highly in executive decisions and plays a role in shaping investment design, including identifying and allocating risk, and ensuring sound procurement practices. However, most developing countries, especially in Africa, lack the resources and governance structures to implement mitigation and adaptation measures on a large scale.

2. To alleviate the detrimental impacts of climate change and maximize the potential opportunities it creates through low-carbon economic growth, countries require overall institutional and fiscal reform. Governments and the private sector also need to step up their financial commitments. Indeed, no entity can singlehandedly assume the financial obligations for mitigation and adaptation initiatives. UNEP and a global partnership of investors and insurance companies estimate that developing countries will require some $500 billion per annum[26] in investments to adapt to climate change and embark on a low-carbon development pathway. The bulk of the funds will come from the private sector, and can only be utilized efficiently if adequate public policies and governance structures are in place. According to UNFCCC[27] the private sector will account for 86 per cent of the financial flows required to address climate change mitigation and adaptation. There is growing recognition of partnerships with the private sector as a way of overcoming barriers to capital flows into sectors that support climate change mitigation and adaptation. This underlines the main ethos of the UNFCCC Private Sector Initiative, which calls for engagement in the wider adaptation community. The goal is to ensure support for mitigation and adaptation initiatives in a coherent and integrated manner.

II. Areas for private sector engagement

3. The two actions, as identified by UNFCCC, to respond to climate change are mitigation[28] and adaptation[29]. The implementation of these approaches has an impact on the way business is

[26] UNEP – Climate Neutral Network
[27] UNFCCC-Investment and Financial Flows to Address Climate Change
[28] Climate change mitigation refers to (1) the reduction of Greenhouse Gases (GHG) emissions from sources, such as power plants where fossil fuels are burned, and (2) the enhancement of "sinks and reservoirs" such as forests that store CO2.

done overall. For Africa especially, it is vital to integrate these in development projects and programmes to ensure that development on the continent is compatible with the climate.

4. The private sector is increasingly aware of climate change risks in general, and seeks to resolve them. Specific areas for intervention in Africa include prospects for innovation, market penetration, the transfer of technology and the building of capacity.

Mitigation

5. Greenhouse gas reduction opportunities in Africa are found in the sustainable management of land and forests, use and development of clean energy (such as for hydropower, geothermal, solar and wind)[30], and the creation of sustainable urban transport systems. Demand for energy and transportation is growing rapidly in many African countries. The investment that takes place in the next two decades could lock in very high emissions for the next half a century or present an opportunity to propel the continent onto a green growth trajectory. Investment in energy efficiency can reduce demand, and low-carbon technologies can further reduce the impact on climate change.

6. **Innovation and market penetration:** Application of newly developed climate-friendly technologies plays a key role in reducing the energy intensity of production in developed countries. Greater participation from the private sector is required for the technological innovations that will support a low-carbon growth path for Africa requires the private sector's greater involvement. There is need to harness homegrown technologies designed by Africans, specifically adapted to the unique conditions of the continent. Innovators who have passed the demonstration stage should be assisted through to the commercialization phase. There is also a need to increase research and development programmes alongside academia.

7. ***Technology transfer and capacity enhancement:*** The transfer of technology encompasses more than just physical movement of equipment. It also involves the transfer of requisite skills and know-how for operation and maintenance, and this includes knowledge, expertise and experience for generating further innovation. The private sector drives significant transfers of relevant technologies through markets, joint ventures and foreign direct investments, and within policy frameworks, such as the CDM. Joint ventures and licensing are common entry channels for investment in emerging markets. They are effective long-term avenues for introducing local African firms into the learning network of transnational companies.

8. **The carbon markets:** The carbon market has been identified as the main private sector financing source for mitigating climate change impacts. In spite financial crises, the global carbon market grew to $144 billion in 2009, an increase of 6 per cent compared to 2008. Africa can no longer afford to lag behind in this huge market. It still has opportunities to step up its involvement with carbon markets. Recently, the continent, which generally receives little carbon funding, increased its share from about 3–7 per cent by the end of 2009. Estimates based on the CDM pipeline in the first half of 2010 show that the number of CDM projects in Africa could reach around 245 by the end of 2012. It is also estimated that by 2012[31], and with the

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[29] Adaptation to climate change refers to reducing the vulnerability of people and the environment to climate change impacts. Adaptation measures are typically classified as "soft", .e.g., policies or "hard", e.g., actions to protect homes from hurricanes.

[30] The hydropower potential of the continent is estimated at 15 per cent of the world's total. However only about 7.6 per cent of the economically-feasible hydropower potential is currently being exploited. The geothermal energy potential is 9000MW, only 60MW of which has been exploited in Kenya and Ethiopia.

[31] UNEP – Carbon Markets in Africa Moving Forward

price of carbon at about $13 a tonne, the projects could be worth over $475 million. Today 122 CDM projects are registered in Africa, or awaiting validation or registration. This is an increase from 116 in 2009, 75 in 2008 and a mere 42 in 2007.

9. Thus far in Africa, private investments have surpassed public funding for project-based mechanisms in the carbon markets. Africa can increase its CDB projects by enhancing the capacities of local financial and banking sectors, potential investors and the private sector as a whole. However, there is political uncertainty surrounding the international climate negotiations about the exact nature of the post-2012 framework. As such, it is vital to give a strong impetus to the private sector to maintain the flow of funding for CDM projects. The EU Emissions Trading Scheme, which is the engine of the carbon markets and worth about $118.5 billion, provides some reprieve. Certified emission reductions generated in least developed countries, will be admissible for compliance within the Emissions Trading Scheme until 2020. Nevertheless, it is necessary to address the general market risk that comes with the uncertainty about the post-2012 framework. This will help maintain market momentum and keep potential investors interested, particularly in Africa. The relevant stakeholders should mobilize their efforts to attract the participation of public and private investors.

Adaptation

10. For most African countries, adaptation is fundamentally about sound, resilient development. Key focus areas include: disaster-risk reduction; sustainable land, water, and forest management; coastal and urban development; watershed management; increased agricultural productivity, and; health and social issues. For the agricultural sector, which is directly affected by weather, adaptation is clearly necessary. Likewise, industry, particularly if its infrastructure is worn, will be compelled to adapt to the effects of a changing climate. Today, little is known about adaptation options for the private sector, which makes further research imperative. While short-term options may remain limited, **the private sector can make play a pivotal role in shaping sector programmes and the research agenda** to help improve knowledge and analytical tools for businesses and investors. Some of the opportunities for interventions are stated below.

11. **Information services:** Investment in reliable information is fundamental to good natural resource management. It has been reported that flood warnings can help reduce damage by up to 35 per cent. Local data collection helps build the information necessary for robust decision-making. Africa is in dire need of better monitoring and forecasting systems. According to the WMO, the continent has only one weather station per 26,000 sq. km - one-eighth the recommended minimum. The ClimDev-Africa programme, jointly supported by the AfDB, the AUC and the ECA, is an initiative to address this problem. Early warning research currently provides the context for technological advances in areas, such as computer modelling, remote sensing, and decision support systems, that offer tremendous opportunities for business applications.

12. **Risk management:** This involves risk awareness, identification and decision-making analysis. A focus on disaster-risk reduction, rather than on response alone, is a significant shift in the bid to deal with the harmful impacts of a changing climate. The use of satellite-based systems to keep a close eye on potential hazards can create opportunities for the private sector to participate in risk management, by, inter alia, developing technologies. Overall, promoting climate-responsive risk management enhances special ways of doing business in the private sector. The aim is to foster risk-responsive business practices, including: the importance of

planning for business continuity and processing; adopting partnership approaches; and consolidating initiatives that involve corporate social responsibility, so as to give something back to communities.

13. **Insurance protection:** Several insurance companies are partnering with climate and development experts on insurance as a climate-change adaptation strategy to protect against energy, food and water shortages. Local-scale monitoring and research programmes provide highly valuable information for the creation of index-based insurance products. Given that threats to agriculture are often attributable to climate risks, the agricultural industry is a typical test arena for index-insurance products. Insurance against impacts of climate change in developing countries, especially in Africa, is still an untapped market for many insurance companies.

III. OPTIONS FOR SCALING UP PRIVATE SECTOR ENGAGEMENT

14. National action and international cooperation can support climate compatible development by creating an enabling environment for investment and using innovative financing instruments to leverage funding from the private sector.

15. **Improving the environment for investment:** A number of domestic barriers restrict investment in and the marketing of clean technologies in Africa. The scale of these barriers varies from country to country, depending on national income, the state of the financial sector, existing regulations and policy, and the availability of natural resources. Governments need to create an environment that is favourable for investment so as to spur private sector participation. Many African economies are already reforming their various sectors, introducing policies for sustainable transport and supporting national objectives for energy security and environmental protection. This is an integral part of a new climate change and development paradigm. In the past, African economies concentrated solely on supporting technology demonstration projects. Today they aim to establish a more favourable environment and institutional milieu that will allow the private sector to thrive and invest in clean technologies and practices.

16. South Africa is a case in point. It has established its Long Term Mitigating Scenarios plan and announced plans to cut emission growth to 34 per cent below current expected levels by 2020 and 42 per cent by 2025. These objectives are supported by a raft of policies, including the use of renewable energy feed-in tariffs which encourages private sector development in renewable energy and supports South Africa's goal of producing 4% of the country's electricity supply (about 10,000 GWh) from renewable energy sources by 2013[32]. It comes as no surprise that South Africa has the highest number of CDM projects on the continent. The CDM, as noted above, is an example of channel for private-sector participation in financing low-carbon technologies.

IV. ENHANCING THE ROLE OF PUBLIC FINANCE MECHANISMS TO SCALE UP PRIVATE INVESTMENT IN CLIMATE SOLUTIONS

17. A key challenge for governments is to design policies that leverage private capital and know-how to deliver modalities and instruments that will help address climate change adequately. The role of public finance mechanisms in this endeavour cannot be emphasized

[32] Eskom Renewable Energy Investment Project Concept Note – African Development Bank

enough. Altering the risk-reward balance of private sector investment through public financial commitments by way of grants, concessional finance and risk-mitigation instruments would: enhance the supply of private finance for low-carbon projects; and increase the demand for private finance in climate solutions. To allocate public and private sector resources in an optimal way, it is important to design public finance mechanisms using an in-depth analysis that reflects a balanced interplay between public and private investments in climate change solutions.

18. **Using innovative financing instruments:** There are various ways in which private finance can support mitigation and adaptation. Debt, in particular, can be used as an enabling instrument for publicly or privately initiated investments, and this include direct project lending and lines of credit to local finance institutions. However, to reach the poor in a more meaningful manner, financing needs to be delivered in new ways, including through microfinance and other innovative products.

19. **Guarantee instruments** enable local financial institutions to offer financing at sufficient maturities for clean energy and other climate-friendly investments. Examples include:

(a) *Partial Risk Guarantees* Cover against risk of a government (or State-owned entities) that fail to honour contractual obligations with respect to a private project.

(b) *A Multilateral Investment Guarantee Agency* is a member of the World Bank Group that provides guarantees against non-commercial risks and can be used to facilitate foreign direct investments in greener infrastructure projects in Africa. Risks covered include host-country political risks, such as regulatory decisions by government that might affect project operations. An example is the Bujagali hydropower project in Uganda. A Multilateral Investment Guarantee Agency was able to cover key investor risks, such as breach of contract, interconnection (Umeme), hydrology and *force majeure*, thus rendering the project bankable.

20. **Bonds** provide a secondary risk market. A few multilateral institutions have established green bonds as a means of raising private funds from capital markets. For example, the AfDB recently issued three "Clean Energy Bonds". The bonds target investors interested in supporting clean energy solutions in Africa, as stipulated by the continent's Clean Energy Investment Framework. Issued in the first quarter of 2010, the inaugural bond is denominated in New Zealand dollars – 109 million or. about US$ 77 million.

V. CONCLUSIONS AND RECOMMENDATIONS

21. Africa has invested immense effort in addressing the climate change challenge, and is achieving some progress. To speed this up further, African countries need to consolidate cooperation between the private and public sectors. They must develop policies to overcome major risks, and thereby cut capital costs for climate-friendly investments. Africa requires substantial effort, creativity, and capacity for carbon finance mechanisms, along with adequate policy and financial instruments, to address the climate challenge with the urgency and at the scale that it deserves.

22. The private sector requires scientific data from climate models that meet regional needs, and whose time scales influence decision-making for business. As such, Africa needs to address the issue of time scales. Information sets and tools designed for decision maker can help with private sector in its responses to climate change.

23. There is a need to raise awareness continuously of the private sector's vital role in addressing: the threats that climate change poses to investment; and the business opportunities that mitigation and adaptation present. Key public and private organizations and institutions should play a strategic role in sharing knowledge, experiences and expertise in this field.

12. Climate change economic growth and poverty reduction in Africa

Issues paper #12

I. OVERVIEW

1. Undeniably climate change is a critical issue for Africa and indeed, its greatest challenge in the 21st century, along with poverty. Overall African countries have undiversified economic structures, poor infrastructure, fragile governance structures and institutions, and poor human development. Most importantly, the majority of their people rely heavily on agriculture for their livelihood. Not surprisingly, climate change is likely to affect the continent's development trajectory disproportionately.

2. The threat to economic growth, which is central to development and poverty reduction, is among the principal effects of climate change. Climate change will cause: disruption in the availability of water; loss of biodiversity; decline or volatility in agricultural yields, climate-related humanitarian disasters (including floods and droughts); increased incidence and prevalence of vector-borne diseases, and; weakened infrastructure; political instability due to heightened conflict over resources, movement of people, and secondary effects of climate change. In short, climate change poses a direct threat to Africa's aspirations for growth and poverty reduction. The effects of climate change are more devastating for vulnerable and disempowered population groups, including women and children, who have the potential to make a meaningful contribution to development. A hostile climate will hike the cost of achieving development goals for African countries. Estimates put the external funding needed to achieve the MDGs in a hostile climate at 40 per cent higher than the external funding for the MDGs alone (table 1).

3. To shed light on the links between climate change and economic growth, poverty reduction and the challenges ahead, it is worth exploring two broad issues. The first concerns the channels through which climate change is affecting economic activity and poverty reduction, and the second, the challenges of managing the impact of climate change.

4. **Climate change is already having and will continue to have adverse economic effects on Africa.** It will also have a far-reaching impact on growth and poverty reduction. Although Africa is the continent least responsible for climate change, it is particularly vulnerable to its effects. Overall, some models suggest that an increase in temperature of about 1.5°C by 2040 could lead to a 1.7 per cent annual loss in Africa's GDP.[33]

5. Climate change affects Africa's growth and poverty rates in a variety of ways. These include adverse impacts on agriculture – the engine of growth and the mainstay of poor people in most of Africa. It also affects tourism, an important source of foreign currency, and

[33] PACJA (2009), Economic Cost of Climate Change. Nairobi, Kenya.

productive factors, such as land, labour, and capital. Confronting climate change will affect States' ability to sustain sound macroeconomic policies and make the necessary public investment in development. It will also make it harder for States to deliver services and invest in social initiatives to reduce poverty. Overall, climate change is likely to curtail capital flows, private investment and development funding.

6. The nature and extent of climate change are known to hamper human development and pose a major threat to human security and political stability. Mass migration spurred by climate change could spark violent conflicts over resources, such as land and water, complicating economic management and governance. According to a recent study, left unchecked, climate change could increase the likelihood of civil strife in Africa by 54 per cent in the coming two decades.[34]

7. To confront these challenges, Africa needs to integrate adaptation and mitigation strategies fully into national development frameworks. Nevertheless it would be impossible to implement the strategies without sufficient financial resources, bold structural reforms, adequate technological know-how, good governance and sufficient institutional capacity. The key questions for African countries to consider in this regard are:

(a) What are the most effective adaptation and mitigation measures adopted so far by countries to limit the impact of climate change on economic growth and poverty reduction?

(b) What are the existing innovative climate-change financing schemes and how effective are they?

(c) What reforms does the current governance system for climate-change funding require to ensure a transparent and equitable delivery of resources for adaptation and mitigation activities? What can be done to ensure that the resources are sufficient and predictable?

(d) What type of incentives, regulation and public investment are needed to enable African countries to fully unlock their green-economy potentials and accelerate economic diversification?

(e) How can African countries take advantage of flexibilities in the current legal and policy framework governing global property rights?

(f) What reforms does the current legal and policy framework governing global property rights need to encourage the transfer of environmentally friendly technologies?

(g) How can African countries incorporate mitigation and adaptation into their development plans appropriately?

[34] UC Berkeley Press Release (23 November 2009) quoting a study on "Climate change could boost incidence of civil war in Africa, conducted by researchers from UC Berkeley, Stanford University, New York University and Harvard University and published in the Journal Proceedings of the National Academy of Sciences (PNAS).

II. ADAPTING TO THE IMPACT OF CLIMATE CHANGE WILL BE COSTLY TO AFRICAN COUNTRIES

8. **Adaptation is projected to cost African countries billions of dollars a year**, increasing pressure on development budgets. Changing climatic conditions make it increasingly difficult to extrapolate the costs of adaptation from past practices. According to the recent IPCC report, the cost of adaptation in Africa could be as high as five to 10 per cent of the continent's GDP.[35] The Pan-African Climate Justice Alliance considers it important for Africa to take the costs into account in its adaptation funding needs. The costs are highly unreliable, ranging from a minimum estimate of US$ 10 billion a year to US$ 30 billion or more by 2030**.**

9. Besides financing, institutional innovations will be essential if adaptation measures are to be effective. The innovations include building or improving the capacity of households and communities to adjust to climate change by changing livelihood choices, asset allocation, location and technology. They also include the introduction or improvement of protective schemes, such as safety nets and risk-management instruments to reduce the vulnerabilities of households and communities. None of these innovations is achievable without solid government involvement at the local, national and regional levels, and of the international community. These stakeholders can greatly help communities adapt to climate change by providing support in areas, such as: impact assessment; disaster-risk management; enhancing understanding and strengthening institutional capacity; sharing of experiences; and planning and setting of priorities. Another critical institutional innovation that can support adaptation is public awareness and knowledge of ways to make development more climate-resilient. Much of the continent is lacking in this department.

10. Economic diversification is needed to reduce vulnerability to climate change. All the above institutional innovations should go hand in hand with fundamental changes in the production and export structures of African economies. In a way, such changes should reduce Africa's exposure to the impact of climate change. They should also steer the continent away from heavy reliance on static engines of growth, which have sustained the vicious cycle of weak and volatile economic growth and stubbornly high unemployment rates, and held back efforts to reduce poverty.

11. If there is ever a time in the history of African development that effective industrial policy is needed, it is now, and it should address the dual challenge of economic transformation and climate change. Industrial policy and structural reforms are essential in promoting dynamic engines of long-term growth, supported by the accumulation of productive resources, including physical and human capital. These engines should be driven by: highly productivity sectors, and; investment in agricultural value chains and manufacturing with major spillovers on the rest of the economy.

[35] IPCC (2007). Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability - Summary for Policymakers. Contribution of Working Group II to the *Fourth Assessment Report* of the IPCC. Geneva.

III. ADDRESSING AFRICA'S ENERGY NEEDS AND ECONOMIC TRANSFORMATION WITHOUT COMPROMISING THE CLIMATE

12. Although Africa accounts for a relatively marginal share of global green gas emissions, its participation in global mitigation efforts does not always contradict the continent's quest for development. It is true that the continent faces the urgent challenge of expanding energy infrastructure and coverage, which are essential for rapid economic and social transformation. Yet, achieving low-carbon growth is possible and in fact, an opportunity for Africa's development. Clearly, there is enormous potential for this, including through the development of Africa's huge hydropower resources. African countries should take advantage of these opportunities. Promoting a green economy involves investing in such sectors as energy-efficient technologies, renewable energy, public transport, sustainable agriculture, environmentally-friendly tourism and sustainable management of natural resources. This can create dynamic new industries, employment and higher incomes, while ensuring mitigation to climate change.

13. It is also in the wider global interest for Africa to take full part in global mitigation efforts. Its active participation in global mitigation initiatives, particularly through sustainable forest management, is essential to the success of worldwide efforts that seek to reduce GHG emissions. A number of African countries have already received support to formulate and implement their programmes for the REDD. Such assistance should be extended to most African countries.

14. The development, propagation, and transfer of technology are key in successfully deploying mitigation and adaptation activities. Climate change-related technologies help households, firms and countries to reduce their greenhouse gas emissions. They also enable them to withstand permanent climatic shocks relatively well. Trade and foreign direct investments are the essential channel for the delivery of these technologies.

15. The Agreement on Trade-related Aspects of Intellectual Property Rights and the way in which it is implemented hampers the introduction and diffusion of climate change-related technology through trade and foreign direct investments. Although the Agreement on Trade-related Aspects of Intellectual Property Rights is meant to encourage innovation by protecting new technologies and providing incentives to innovators, there are drawbacks: limited competition and high prices. This impedes access to these resources for African and other developing countries. In spite of the restrictive nature of the Agreement, it contains certain technology transfer-friendly principles and provisions. Several of them explicitly support the attainment of some developmental goals. Africa should fully exploit the opportunities that such flexibility offers.

16. It is essential for countries to identify their needs in technology and their existing capacities to ensure rapid deployment and adoption of new technologies. Given some of the similarities between Africa and other developing regions in terms of challenges, South-South cooperation could be a conduit for experience sharing and peer-learning.

IV. NATIONAL DEVELOPMENT PLANS MUST INTEGRATE ADAPTATION, MITIGATION AND DEVELOPMENT

17. The consequences of climate change are multidimensional and interrelated. Therefore, rolling out adaptation and mitigation activities demands a holistic perspective, which can be achieved only by incorporating adaptation and mitigation measures into wider development planning and budget processes. The success of an integrated adaptation and development framework hinges on several key actions.

18. The actions include raising awareness and enhancing the capacity to integrate adaptation, mitigation and development. Integrating adaptation initiatives must start with raising awareness of the expected increase in climate variability and intensification in climatic conditions. Additionally, it is important to first encourage policy reforms to reflect the changing climate. Governments should give special consideration to the ramifications of climate change for vulnerable and disempowered groups, such as women, children, migrants and people with disabilities. Africa needs to facilitate the integration of National Adaptation Programmes of Action into national development plans and poverty reduction strategies. To this purpose, it must raise the awareness of development advisers and others of climate change. It must also support their training, and thereby strengthen their ability to respond adequately. Proposing coherent national action plans as a means to implement adaptation, mitigation and development measures will also help to secure adequate domestic funding as well as the required additional external funding in the short and long term.

19. **Integrating climate-risk management into development practice**

While agriculture has traditionally been the focus of attention on the impact of climate change, nearly every sector is sensitive to climate change and will need to adapt to future conditions. Adaptation must be approached as a cross-sectoral issue and should no longer be perceived as the sole responsibility of the ministry of the environment. Involving the ministries of planning and finance is crucial if budgets are to reflect adaptation efforts. Efforts should be made to increase coordination across ministries and sectors and to push climate change higher on the political and policy agendas

20. **Learning from good experiences in Africa and elsewhere**

Africa does have examples of development decisions that incorporate climate information appropriately. They include early warning systems in Ethiopia, the exemplary meteorological information dissemination system in Mali and innovative private sector efforts for managing climate-related risks in Malawi. Used appropriately, peer- earning among African countries will propagate best practices and accumulated knowledge.

V. CONCLUSION

21. Climate change will have a dramatic social and economic impact on Africa, tax, individuals, firms and governments. It will reduce growth by drawing resources away from development. Even if global carbon emissions were reduced tomorrow, Africa would still be faced with the massive challenge of adapting to climate change while promoting faster economic and social development. Based on existing evidence of the extent of climate change on the continent, greater and more frequent climatic shocks may affect economic growth further and lock many African countries in poverty traps.

22. To achieve sustainable growth, fight poverty and attain other development goals, African countries will have to expand their energy, transport and urban systems and agricultural and industrial production. The big questions are: "How can this be done in a way that promotes development needs without exacerbating the problem of climate change?" "How do African countries pursue growth and prosperity without affecting climate change?" The world must recognize that Africa will see emissions grow for some time (while contributing marginally global emissions). However, a high-carbon growth path is unsustainable. Adapting requires robust decision-making, long-term planning, considering a broad range of climate and socio-economic scenarios and adopting climate-smart policies that enhance development, reduce vulnerability and finance the transition to low-carbon growth paths.[36]

23. Lastly, regional institutions should play a leading role in helping Africa meet the challenges of climate change. This role must include coordination and capacity-building for adequate representation of the continent in climate change negotiations and global governance mechanisms.

Table 1: Estimated impact of climate change on the cost of achieving the MDGs and adaptation needs in Africa, 2010-2020 (US$ billion per year)

MDG costs by sector ($Bn p.a. for 2010-20)	ODA needs for MDGs		External public funding needs for adaptation	Adaptation needs	
	Cost 2010-20	of which ODA*		Low cost scenario	High cost scenario
Agriculture & nutrition (inputs, irrigation, rural infrastructure and	11.4	8.0	1.6-2.7	1.6	2.7
Nutrition & school feeding	5.7	4.0	0.0	0.0	0.0
Education (primary and secondary)	11.9	8.3	0.0	0.0	0.0
Health (AIDS, TB, NTDS, malaria, health system and family planning)	40.0	28.0	1.2-2.3	1.2	2.3
Infrastructure (energy, transport, water and sanitation, regional ICT and trade facilitation)	43.3	23.7	4.2-8.4	4.2	8.4
Sub-total: MDG cost (including statistical errors)	112.3	72.0	7.0-13.4	N/A	N/A
Additional interventions (capacity-building, disaster response etc.)	9.8	9.8	3.8 – 7.1	0.9	3.7
GRAND TOTAL	122.5	82.1	10.8-20.5		

Source: Fankhauser, S and Schemdit-Traub, G. (2010) "From adaptation to climate-resilient development: the cost of climate proofing the Millennium Development Goals in Africa. Grantham Research Institute. London, UK, tables 1 and 2 (summary); N/A = not applicable.

[36] See World Bank, *World Development Report 2010: Development and Climate Change. Washington, D.C, USA*

Annex 4: ADF-VII Programme of work

PRE-ADF EVENTS

Day 1 Sunday, 10 October 2010	
	Registration for ADF and pre-ADF activities (Registration for ADF open all day) Venue: Delegates Registration Building Media Training on 'Getting it Right: Reporting Climate Change for Sustainable Development in Africa' (8-10 October 2010)
Day 2 Monday, 11 October 2010	
08:00 hours	**Registration for ADF and pre-ADF activities** (Registration for ADF open all day) Venue: Delegates Registration Building
09:00 hours	**Opening of ADF-VII exhibition** Venue: UNCC exhibition area

10:00-17:30 hours	**Parallel Meetings/workshops** 1. African Climate Change and Environment Security (ACCES) Meeting on Climate Change and Security 2. Economic Commission for Africa (ECA)/InWENT (Capacity Building International) Experts Meeting on Climate Change Measurement 3. UN RCM Social and Human Development Cluster meeting on Climate Change and Population, Health, Gender and Youth 4. Rights and Resources Initiative (RRI) Africa Regional Dialogue on Forests, Governance and Climate Change 5. African Union (AU)/ NEPAD Planning and Coordinating Agency (NPCA) /ECA/World Wildlife Fund (WWF) Meeting on Climate Change, Agriculture and Rural Development 6. Consultation on United Nations Environment Programme -Stockholm Environment Institute (SEI) Climate Adaptation Collaborative Programme 7. The Sixth UN Science and Technology Cluster meeting (ECA-UNESCO)
Day 3 Tuesday, 12 October 2010	

10:00-17:00 hours	**Parallel Meetings/workshops (continued)** 1. Global Climate Change Alliance(GCCA) Africa Regional Consultation 2. ECA/InWENT Experts Meeting on Climate Change Measurement 3. UN RCM Social and Human Development Cluster meeting on Climate Change and Population, Health, Gender and Youth 4. Rights and Resources Initiative (RRI) Africa Regional Dialogue on Forests, Governance and Climate Change 5. UNEP-ECA-AUC High Level Seminar on Environmental Diplomacy 6. African Development Bank Consultations on the Proposed Africa Green Fund 7. World Bank-ESMAP-ECA Meeting on Energy and Climate for Development
17:00-18:00 hours	**Opening session** **Moderator: Ambassador Peter Robleh** Venue: Conference Room 1 Welcome remarks by **Mr. Abdoulie Janneh,** United Nations Under-Secretary-General and Executive Secretary of the Economic Commission for Africa Message by **Ms. Esther Agbarakwe**, African Regional Coordinator UN Commission on Sustainable Development (UNCSD) and Coordinator and Co-Founder of Nigerian Youth of Nigerian Youth Climate Coalition (NYCC) Welcome remarks by **Mr. Jean Ping**, Chairperson of the African Union Commission Goodwill message from the President of Nigeria, **His Excellency Jonathan Goodluck** Opening Statement by **His Excellency Girma Wolde-Giorgis,** President of the Federal Democratic Republic of Ethiopia

ADF EVENTS

DAY 4 Wednesday, 13 October 2010	
09:30-12:00 hours	**Plenary session 1** **High Level Leadership Dialogue on** Governance and Leadership Response to Climate Change **Chair: H.E. Mr. Jean Ping, Chairperson of the African Union Commission** **Moderator: Mr. Achim Steiner, Executive Director of the United Nations Environment Programme** **Venue: Conference Room 1** **H.E. Mr. Donald Kaberuka, President of the African development Bank** **H.E. Mr. Jens Stoltenberg, Prime Minister of Norway** **H.E. Mr. Meles Zenawi, Prime Minister of the Federal Democratic Republic of Ethiopia**
12:00-12:30 hours	**COFFEE BREAK** Visit of exhibition by VIPs
12:30-14:00 hours	**Plenary session 2** **Theme: Evidence and impact of climate change** **Moderator: Mr. Jeff Koinange,** Chief Anchor, Capital Talk Show Host, K24 Venue: Conference Room 1 **Panelists:** **Mr. Johan Rockström,** Executive Director, Stockholm Environment Institute (SEI) **Dr. Abdalah Mokssit,** Vice President of IPCC Working GROUP I **H.E. Mr. Brice Lalonde, Former Minister of Environment and current Ambassador for Climate Change Negotiations for the government of France**
14:00-14:45 hours	**LUNCH**

14:45-16:30 hours	**Plenary session 3** **Theme:** Climate change adaptation and mitigation: Challenges and opportunities, **Moderator: Mr. Ben Dotsei Malor, Chief Executive Producer, UN Radio** Venue: Conference Room 1 **Panelists:** **Mr. Andrew Steer,** Climate Change Envoy, World Bank **H. R. H. The Prince of Wales (by video)** Launch of ClimDev-Africa Programme and Tree Planting Colonel Matar Cisse, Director General, National Agency of the Great Green Wall, Senegal Mr. Jaako Olavi Nuottokari, International Development Projects, Finnish Meteorological Institute
16:00 -16:30 hours	**COFFEE BREAK**
16:30-18:00 hours	**Plenary session 3** **Theme: Climate change adaptation and mitigation: The Green Economy** **Moderator: Ms. Madeleine Mukamabano, Former Chief Anchor and Producer of the RFI "African Debate" programme** Venue: Conference Room 1 **Lead Speaker: Mr. Achim Steiner, Executive Director, United Nations Environment Programme** **Panelists:** **Mr. Janos Pasztor, Head,** Global Sustainability Panel Secretariat **Mr. Benoit Lebot, Regional Technical Advisor, climate change and energy, UNDP** **Mr. Lucas Assunção, Head, Trade, Environment, Climate Change as Sustainable Development Branch, UNCTAD** **H.E. Mr. Brice Lalonde, Former Minister of Environment and current Ambassador for Climate Change Negotiations for the government of France.(TBC)** **Mr. Henri Djombo, Minister of Sustainable Development, Forest Economy and Environment, Democratic Republic of Congo**
18:00-20:00 hours	Reception

DAY 5 Thursday, 14 October 2010	
09:00-10:30 hours	**Plenary session 4** **Theme:** Africa and the international climate change negotiations: Africa's concerns and expectations for a post-2012 international climate change regime **Chair: Ms. Tumusiime Rhoda Peace,** Commissioner of Rural Economy and Agriculture, AUC **Mr. Fred Jachan Omach,** Minister of State for Finance, Planning and Economic Development in charge of Planning, Uganda (TBC) Venue: Conference Room 1 **Mr. José E.B. Endundo,** Minster of Environment, Nature Conservation and Tourism, Democratic Republic of Congo **Dr Augustin B. Njamnshi,** Executive Secretary, Bioresources Development and Conservation Programme and National Coordinator, The Access Initiative Cameroon **Mr. Dan Bondi Ogolla,** Chief Legal Adviser, UNFCCC Secretariat
10:30-11:00 hours	**COFFEE BREAK**

11:00-13:00 hours	**Parallel Focus Break-out Session** **Thematic cluster 1: Climate change, food security and economic development** **Co-Chairs: Ms. Tumusiime Rhoda Peace,** Commissioner for Rural Economy and Agriculture, AUC **H.E. Mr. Fred Jachan Omach,** Minister of State for Finance, Planning and Economic Development in charge of Planning, Uganda Venue: Conference Room 3 **1.1 Climate change, agriculture and food security** Lead Speakers: Dr Namanga Ngongi, President, Alliance for Green Revolution in Africa Ms. Sheila Sisulu, Deputy Executive Director, World Food Programme Discussants: Ms. Lindiwe Majele Sibanda, CEO, Food, Agriculture and Natural Resources Policy Analysis Network Mr. Martin Bwalya, AU/NPCA/CAADP Mr. Aly Abou Sabaa, Director Agriculture and Agro-Industry Department, AfDB Spokesperson from the African Conference on Agriculture, Food Security and Climate Change Mr. Louis Bockel, Policy Assistane Support Officer, FAO Mr. Johan Rockström, Executive Director, Stockholm Environment Institute, SEI **Thematic cluster 2: Climate change, human development, security and ecosystem sustainability** **Chair: Mr. Eugene Owusu, UN Regional Coordinator and Resident Representative for Ethiopia, UNDP** Venue: Conference Room 4 **2.1 Climate change and human development (health, education, employment, gender and youth)** Lead Speakers: Mr. Bunmi Makinwa, Regional Director-Africa, UNFPA Discussants: Mr. Patrick Noack, Scenario Development, HIV/AIDS and Human Development Mr. Abdelkader Bacha, Associate Director, Global Alliance Services, Mr. Cheick Tidiane Tall, Executive Director, AfriCASO Ms. Esther Agbarakwe, African Regional Coordinator UN Commission on Sustainable Development d Coordinator and Co-Founder of Nigerian Youth of Nigerian Youth Climate Coalition **Thematic cluster 3: Harnessing means of response to climate change** Chair: H.E. Mr. Festus Mogae, Former president of Botswana, & Chairperson, Governing Board, Coalition for Dialogue on Africa Venue: Conference Room 5 **3.1 Climate risk management: Monitoring, Assessment, Early warning and Disaster Risk Reduction** Lead Speakers : Mr. Stephen E. Zebiak, Director-General, International Research Institute for climate and society (IRI) Discussants: Mr. William Westmeyer , Deputy Director, Global Climate Observing Systems Secretariat Mr. Mounkaila Goumandakoye, Regional Director for Africa, UNEP Mr. Alhassane Diallo, Director General, ACMAD

13:00-14:00 hours	**LUNCH**
14:00-15:30 hours	**Parallel Focus Break-out Session (cont'd)** **Thematic cluster 1: Climate change, food security and economic development** **Co-Chairs: Ms. Tumusiime Rhoda Peace,** Commissioner of Rural Economy and Agriculture, AUC **Mr. Fred Jachan Omach,** Minister of State for Finance, Planning and Economic Development in charge of Planning, Uganda **1.2 Climate change, trade and industrial development** Lead Speaker: Discussant: Mr. Stephen Karingi, RITD/ECA Mr. Alhaji Bamanga Tukur, Executive President, African Business Roundtable (TBC) Mr. Ivan Mbirimi, Research Associate, South African Institute of International Affairs (SAIIA) Dr. Nitya Nanda, Centre for Global Agreements, Legislation and Trade Resources, TERI **Thematic cluster 2: Climate change, human development, security and ecosystem sustainability** **Chair: Mr. Eugene Owusu, UN Regional Coordinator and Resident Representative for Ethiopia, UNDP** **2.2 Climate change, governance, peace and security** Lead Speakers: Mr. **Jacobus Cilliers**, Executive Director, Institute Security Studies Discussants: Mr. John Odey, Minister of Environment, Nigeria Mr. Jose Endundo, Minister of Nature Conservation, DRC Mr. Mersie Ejigu Paes, President and CEO, Partnership for African Environmental Sustainability Mr. Churchill Monono, Cabinet, Cameroon Thematic cluster 3: Harnessing means of response to climate change Chair: H.E. Mr. Festus Mogae, Former president of Botswana, & Chairperson, Governing Board, Coalition for Dialogue on Africa Venue: Conference Room 5 **3.2 Financing climate change adaptation and mitigation actions** **Lead Speakers**: Mr. Anthony Nyong, Manager, Compliance and Safeguards Division, AfDB **Discussants:** Ms. Sinazo Sibisi , Divisional Executive, Development Planning , DBSA Mr. George Awudi, Pan African Climate Justice Alliance Mr. Raffaello Cervigni, Regional Coordinator for Climate Change, World Bank
15:30-16:00 hours	**COFFEE BREAK**

16:00-18:00 hours	**Parallel Focus Break-out Session (cont'd)** **Thematic cluster 1: Climate change, food security and economic development** **Co-Chairs: Ms. Tumusiime Rhoda Peace,** Commissioner of Rural Economy and Agriculture, AUC **Mr. Fred Jachan Omach,** Minister of State for Finance, Planning and Economic Development in charge of Planning, Uganda (TBC) **1.3 Climate change and infrastructure development (energy, water, transport and ICT)** Lead Speakers: **Mr. Kandeh Yumkella, Director General Of UNIDO and Chair UN-Energy** (Video message) Mr. Bai-Maas Taal, Executive Secretary, AMCOW **Discussants:** **Mr Bruno Richard Itoua, Minister of Energy, Congo and Former AMCOW Chair** **Mr. Nzabanita Emmanuel, Chief Power Engineer, AfDB** Mr. Amadou Diallo, West Africa Power Pool (WAPP) Mr. Simon Thuo, Regional Coordinator, Nile Basin Initiative Secretariat **Ms. Jane Ebinger, Senior Energy Specialist, World Bank (TBC)** **Thematic cluster 2: Climate change, human development, security and ecosystem sustainability** **Chair: Mr. Eugene Owusu, UN Regional Coordinator and Resident Representative for Ethiopia, UNDP** **2.3 Climate change and ecosystem sustainability** Lead Speakers: H.E Mr. Henri Djombo, Minister of Forest Economy, Sustainable Development and Environment, Republic of Congo Discussants: Colonel Matar Cisse, Director General, National Agency of the Great Green Wall, Senegal Mr. Thomas Staal, Mission Director, USAID Africa Bureau Mr Soumitri Das, Forestry and Biodiversity Area, TERI Kossivi Ayikoe, Minister of Environment and Forestry, Togo Thematic cluster 3: Harnessing means of response to climate change Chair: H.E. Mr. Festus Mogae, Former president of Botswana, & Chairperson, Governing Board, Coalition for Dialogue on Africa 3.3 **Science, technology, innovation capacity building for adaptation and mitigation** Lead Speakers: Prof. Bruce Hewitson, Head, Climate Science Applications Group, University of Cape Town Discussants: Prof. Sospeter Muhongo, Professor of Geology, University of Dar Es Salaam, Mr. Kevin Urama, Executive Director, African Technology Policy Studies Network Ms. Susan Burns ,CEO, Global Footprint Network Dr. Jabavu Clifford Nkomo, CCAA Programme, IDRC, Senegal

DAY 6 Friday, 15 October 2010	
09:00-11:00 hours	Plenary Session 5 **Private Sector Response to Climate Change** Chair**: Ms. Abiola Dosumu, Chairperson, Emerging Markets Oil and Gas Ltd, African Business Roundtable** Lead Speaker: **Ms. Hela Cheikrouhou, Director, Department of Energy, Environment and Climate Change, African Development Bank** Panelist: **Mr. Llyod Chingambo, Chairman, Africa Carbon Credit Exchange** **Dr. Simon Young, Chief Executive Officer, Caribbean Catastrophe Risk Insurance Facility** **Ms. Angela Kallhague, Senior Advisor, Climate Change Section, Market Development Department, Swedish Energy Agency** **Mr Shadreck Mapfumo, Vice President, Crop Insurance for Africa and Asia, Micro Insurance Agency** **Mr. Dotun Ajayi, Regional Manager, West Africa, African Business Roundtable**
11:00-11:30 hours	**COFFEE BREAK**
11:30-13:00 hours	**Plenary Session 6** **Open ended discussion on the Draft Consensus Statement** **Chair: Mr. Erastus Mwencha, Deputy Chairperson, African Union Commission** **Mr. Aly Abou Sabaa,** Director Agriculture and Agro-Industry Department, AfDB **Rapporteurs General: Mr. Josue Dione, ECA** Mr. Anthony Nyong, AfDB Dr. Abebe Haile Gabriel, AUC
13:00-14:00 hours	**LUNCH**
14:00-16:00 hours	**Informal Consultations and Bilateral meetings**
16:00-16:30 hours	**Plenary Session 7** **Consideration and Adoption of the Draft Consensus Statement** **Chair: Mr. Erastus Mwencha, Deputy Chairperson, African Union Commission** **Mr. Aly Abou Sabaa,** Director Agriculture and Agro-Industry Department, AfDB **Rapporteurs General: Mr. Josue Dione, ECA** Mr. Anthony Nyong, AfDB Dr. Abebe Haile Gabriel, AUC
16:30-17:00 hours	**Closing Session** **Chair: AUC, AfDB, ECA** **Venue: Conference Room 1**
17:00-17:30 hours	**Press Conference**
18:30-	**Climate Change Awareness Concert**

Annex 5. ADF-VII consensus statement

Preamble

We, *the* participants in the Seventh African Development Forum (ADF-VII):

Representing stakeholders from across the African continent, including governments, civil society, and the private sector met in Addis Ababa, Ethiopia from 10 to 15 October 2010, on the theme 'Acting on climate change for sustainable development in Africa' at the invitation of the African Union Commission, the United Nations Economic Commission for Africa and the African Development Bank, supported by the United Nations Family and development partners as observers;

Aware that climate change is a serious, urgent and compelling issue and that Africa, which contributes a negligible amount of greenhouse gas emissions (less than 4 per cent, is particularly vulnerable to climate variability and change;

Noting that the impacts of climate change have far-reaching implications for Africa's growth, social, human and economic development, environmental sustainability, governance, peace and security and on sustainable development as a whole and that the negative impacts are particularly high for Least Developed Countries, Small Island Developing States and the poor, mostly women and children, who tend to live in environments that are most susceptible to droughts, floods, desertification and other extreme climatic events;

Recognizing that, depending on policy choices, climate change can severely undermine progress towards achieving sustainable development, including the targets set out in the Millennium Development Goals. Yet, climate change provides the opportunity to pursue an equitable and sustainable development path;

Expressing appreciation to the African Union Summit for its endorsement of climate-related continental programmes and initiatives, such as the Climate for Development in Africa Programme, the Great Green Wall of the Sahel and Sahara and the African Monitoring of the Environment for Sustainable Development (AMESD) Programme;

Welcoming the endorsement of the common African negotiating position on climate change by the African Union Heads of State and Government Summit to enable the continent to effectively engage with the international community and to clearly articulate, speaking with one voice on agreed upon issues, its concerns, and priorities. This is in order to ensure that Africa's concerns are adequately reflected in a post-2012 international climate change regime;

Further welcoming the launch at this Forum, of the ClimDev-Africa Programme by AUC, ECA and AfDB; *and requesting African Governments and their development partners, to provide adequate support* for its effective implementation and the full operationalization of its Special Fund, Africa Climate Policy Centre, and the Climate Change and Desertification Unit;

Commending the decision by the Management of the African Development Bank to establish the Africa Green Fund to receive and manage Africa's allocation of climate change resources as pledged in the Copenhagen Accord and requested by Africa's leadership at COP 15 in Copenhagen, Denmark;

Noting with appreciation the establishment by the United Nations Secretary-General, of a High-Level Advisory Group on Climate Change Financing, co-chaired by H.E. Prime Minister Meles Zenawi of Ethiopia and H.E. Mr. Jens Stoltenberg of Norway to deliberate on sources of funding and the delivery of the financial pledges contained in the Copenhagen Accord;

Mindful that the magnitude of the climate change challenge calls for concerted efforts by all concerned, within and outside the continent, to effectively integrate climate change concerns into development policies, strategies and programmes in Africa, and recognize the important roles of all stakeholders, including the public and private sectors, civil society, women, children, and the youth to effectively tackle this challenge.

Adopt this consensus statement as follows:

I. KEY CHALLENGES AND OPPORTUNITIES

A Challenges

1. ***Economic:*** Climate change poses serious challenges to Africa's growth prospects, social and economic development because of its geographical location, high incidence of poverty, reliance on ecological resources, exacerbated by existing pressure on health care facilities and limited technical and financial resources, as well as inadequate institutional and human capacities. Climate change also poses serious threats to rural livelihoods, which depend on environmental resources that are highly susceptible to extreme climatic events, including droughts and floods. This underscores the need to strike a balance between climate-related initiatives and meeting immediate development imperatives.

2. ***Financing climate change***: Allocating new, additional, adequate, predictable, accessible and reliable resources to Africa to enable it to undertake adequate climate change adaptation and nationally appropriate mitigation actions remains a challenge. Furthermore, the little funding available is not well targeted. This point to the need for resource provisions in line with relevant **UNFCCC** principles underpinned by a simple and efficient delivery mechanism. There is also a need to devise innovative financing mechanisms, including appropriate carbon pricing, in order to enhance resource mobilization.

3. ***Governance and leadership***: Challenging as it might be, it is vital to ensure coordinated and coherent support to the African Common Position on Climate Change in the ongoing international climate-change negotiations. Equally important is the need to overcome leadership challenges that limit efforts to deal with the effects of climate change, in developing and developed countries alike.

4. ***Participation***: Parliamentarians, the private sector and marginalized groups, such as women, indigenous peoples, and local communities, are inadequately involved and represented in the ongoing climate change negotiations. There is a need to support the participation of all

relevant stakeholders in order to strengthen the African Common Position on Climate Change, and to undertake effective climate-change actions.

5. ***Peace and Security***: Most African conflicts, including climate-related ones, are aggravated by heavy dependence on natural resources*, inter alia*, forest, mineral, agro-pastoral and water resources. This calls for rational and judicious use of environmental resources, among other things, by protecting ecosystems to prevent ecological destruction, which aggravates the impact of climate change and threatens peace and security.

B Opportunities

6. ***Policy integration***: Adapting to the adverse effects of climate change provides opportunities for capacity-building to integrate climate-resilient strategies into development planning, and funding and the transfer of technology transfer, which makes it possible to undertake necessary actions.

7. ***Green Economy***: Addressing climate change presents opportunities for low-carbon growth and job-creating green economy. This is made possible by the pursuit of an informed, sustainable development path that improves growth and leads to sustainable social and economic development.

8. ***Funding***: The UNFCCC Process, which embraces multilateralism, provides an important opportunity for leveraging financial resources. It provides the framework for mobilizing the resources needed for adaptation and mitigation actions in a transparent and inclusive setting. Another opportunity is the ongoing work of the High-Level Advisory Group on Climate Change Financing, co-chaired by Prime Ministers Meles Zenawi of Ethiopia and Jens Stoltenberg of Norway. The Group's task is to deliberate on sources of funding. The delivery mechanism of financial commitments contained in the Copenhagen Accord is also recognized as a possible prime opportunity for Africa.

9. ***Solving Africa's energy problems***: Addressing the climate-change challenge provides an opportunity for African countries to adopt energy efficient and clean energy development paths, while solving the continent's lingering energy deficits. This includes ensuring that the region is adequately integrated into the existing CDM and voluntary carbon markets.

10. ***International cooperation***: Climate change provides an opportunity to improve international cooperation among African countries, and between them and other regions of the world, to help steer the continent towards the path of sustainable development.

II. HARNESSING MEANS OF RESPONSE TO CLIMATE CHANGE

A Global actions

11. Governance and leadership

(a) African leaders should strengthen institutional governance for climate change. To this purpose, they should strive to increase institutional links and coordination across ministries and sectors at all levels of government. This will help foster holistic and integrated approaches to planning and addressing the climate change challenge.

(b) Leaders of developed countries should strive to educate their public on the impacts of climate change in Africa. This will enhance understanding and garner the support in meeting commitments to climate change. It will also clear the misconception between aid and developed countries' obligation to finance climate change initiatives in developing countries.

African governments and their development partners should:

(a) strongly support the Conference of African Heads of State and Government on Climate Change to build its capacity to mobilize political commitment and provide political leadership in regional and international climate change processes; and

(b) demonstrate leadership by taking bold decisions on innovative climate-change funding mechanisms, including proper carbon pricing, to complement funding that should be provided under the UNFCCC process.

12. Africa and the international climate change negotiations

African countries should:

(a) Engage all relevant stakeholders, including parliamentarians, local communities, indigenous people, the private sector, CSOs and in particular, women and the youth, in the ongoing international climate negotiations and relevant decision-making processes;

(b) Support the implementation of the decisions and resolutions of the AU, the AMCEN and relevant continental bodies on the international climate change negotiations to ensure that Africa pushes forward its climate change and development agenda;

(c) Ensure that Africa has well coordinated, coherent and effective representation at all levels in the negotiations under the UNFCCC and its Kyoto Protocol; this way the continent will be able to speak with one voice and improve its bargaining strength; and

(d) Strengthen Africa's capacity to improve its negotiating power and position in the present international climate change negotiations to adequately reflect its concerns and priorities in a post-2012 international climate change regime.

13. Private sector response to climate change

African governments should:

(a) Create an enabling policy environment to encourage the private sector to harness its expertise, resources and creativity and collaborate with the public sector and CSOs to accelerate the response to the climate change challenge on the continent; to this purpose, governments should draw up policies that help overcome key risks, thereby creating incentives for climate-friendly investments;

(b) Establish minimum standards for local and foreign direct investments that promote climate sensitive investments and business decisions in the region;

(c) Develop a pan-African risk pool by aggregating small markets to bigger ones in order to spread risks and lower costs; to this end, countries should borrow the example of other

nations, such as Japan, in developing policies to support the informal sector, and or the Caribbean, in pooling risks related to climate change;

(d) Encourage the private sector to collaborate with key public organizations and institutions to share and disseminate knowledge, experiences and expertise; promote awareness of the private sector's significant role in investment and in creating business opportunities that address climate change mitigation and adaptation; and

(e) Work with the private sector to encourage research and development that will create Africa-specific technological solutions to climate change challenges, and support low carbon technologies, taking into account Africa's rich indigenous knowledge systems.

14. Financing climate change adaptation and mitigation actions

(a) African countries, while rightly demanding developed countries to meet their financial obligations under the UNFCCC, should use available funds, including those generated domestically, in an efficient and transparent manner to finance pressing climate change adaptation actions.

African countries and their development partners should:

(b) Support ongoing efforts to reform the governance system for climate change funding, including existing arrangements for CDM, to ease access to much needed funds;

(c) Immediately identify a clear pathway for raising and disbursing fast-track funding resources to benefit Africa;

(d) Work closely with the private sector, including through Public-Private Partnerships, to scale up resources and develop policies that reduce transaction costs for climate-friendly investments; strengthen the capacity for carbon finance mechanisms, along with access to other available policy and finance instruments; and

(e) Offer solid support in the creation of the Africa Green Fund hosted by the AfDB, anchored on the UNFCCC, that is aligned with the continent's needs and priorities and has a governing structure that is simple and flexible, to provide direct access to African countries.

15. Capacity- Building

Supported their development partners, African countries should:

(a) Build the capacity of relevant institutions to undertake research and development activities, including the creation of regional and national climate change observatories and centres of excellence;

(b) Strengthen public institutions to adequately manage climate-related funds to boost the confidence of development partners, who are increasingly linking finance to results;

(c) Strengthen climate-related regional and subregional institutions, including centres of excellence, and make them accessible to all stakeholders;

(d) Boost **the capacity of policy makers and institutions** for **climate-risk management**, particularly in relation to investing in adaptation, and to **the green economy;**

(e) Build **the capacity of the youth by investing more in education systems, accelerating the introduction of education for sustainable development and implementing programmes that enhance intergenerational partnerships;**

(f) Reinforce the capacity of vulnerable groups, especially women, children and the youth, by equipping them with the tools and skills necessary to withstand climate change impacts; and

(g) Foster South-South cooperation to address Africa's priorities in relation to climate change mitigation and adaptation.

16. Climate risk management: monitoring, assessment, early warning and disaster-risk reduction

African countries should:

(a) P**romote collaboration between early-warning systems and disaster-risk and relief organizations in planning logistics and formulating contingency plans ahead of time, to cope effectively with natural disasters**; **obtain information from end users to improve future prediction, forecasting and warning;**

(b) Offer solid **support** to **strengthen regional and subregional ecological surveillance and monitoring systems**; ensure that the shaping and implementation of the Global Framework for Climate Services **take**s **into account** the continent's;

(c) D**isseminate best practices and demonstrate the viability of index insurance in different settings and scales under conditions of varying aridity;**

(d) I**nclude climate-risk management in education curricula at all levels in order to engage children and** the **youth in addressing the impacts of climate change; and**

(e) Integrate **climate-risk management in planning processes.**

17. Climate data and information

African governments should:

(a) Work with the support of international partners to reinforce the relevant national institutions and agencies that generate and use climate data, relevant official statistics, and geographic information to ensure that such data and information are available in a timely manner and accessible to all end-users at all levels of government and society to ensure informed decision-making on climate change;

(b) Coordinate activities to avoid overlapping or ambiguous responsibilities, duplication of data collection, gaps in information, conflicting information, deficiencies in data quality, and ensure the integration of relevant information; develop national climate information plans as an integral part of national strategies for the development of statistics; and

(c) Facilitate the exchange of data and information among research institutions and centres of excellence in Africa, as well as between sectors and across metrological communities.

18. Science, technology and innovation

African countries should:

(a) Work with the support of their partners, to build a climate-change knowledge repository, based on reliable data and scientific evidence;

(b) Support the development and implementation of regional and national climate-change science plans;

(c) Support the intelligent management of climate risks and the development of policies and systems at subregional and national levels that accord top priority to disaster-risk management and the development of safety nets for vulnerable communities, including the wider use of index insurance;

(d) Collaborate with national and regional development institutions, including banks, to promote early-warning hazard advisory climate services, and to increase investment in the improvement of preventive capacities at the subregional, national and local levels;

(e) Invest adequately in climate and development science and research in Africa – from global modeling to supporting poor rural communities with initiatives at the continental, regional, national and local levels;

(f) Pursue, as part of the international climate change negotiations, the development, transfer and diffusion of technology, including in relation to low-carbon technologies, particularly renewable sources of energy, and advocate a global partnership in that regard; and

(g) Strengthen universities, research and technological development institutions to help Africa boost its competitiveness in the global market by carrying out research that takes into account the realities on the continent.

B. Sector-specific actions

19. Climate change, governance, peace and security

African countries should:

(a) Use preventive diplomacy to address issues of climate change for peace and security by identifying potential flashpoints and best practices for reducing tensions before conflicts break out ;

(b) Work with the support of ECA, AUC, AfDB and other partners, through the ClimDev-Africa Programme, to address the link between climate change and peace and security;

(c) Examine programmes to expand and extend African peacekeeping and conflict-reduction capacity in light of present and future climate insecurity, and implement

the African Regional Strategy for Disaster Risk Reduction urgently and fully, emphasizing enhanced regional preparedness and a more efficient response system supported by properly resourced national systems and norms for allocating government budgets for risk mitigation; and

(d) Amend the AU Peace and Security Council protocol to take into account security issues related to climate change, and expand the early warning system to include issues of peace and security arising from climate change, such as migration caused by forced displacement.

20. Climate change and ecosystem sustainability

African governments should:

(a) Make the green economy a priority and promote it as a way of addressing the challenges climate change poses for the sustainability of the ecosystem; promote the green economy as a way of harnessing the opportunities provided by Africa's vast and diverse ecosystems and natural resources, including water bodies, biodiversity, forests and other land resources; take into account the green economy's potential to create employment opportunities, eradicate poverty and sustain development; promote Payment for Ecosystem Services and pay proportionate attention to countries with poor endowment of ecosystem, including low forest cover;

(b) Adopt and promote human-centred ecosystem based management as being vital for enhancing ecosystem goods and services to help improve the livelihoods of local communities, and thereby support mitigation and adaption; create a favourable environment, including policy, institutional and governance mechanisms, and monitoring systems, and enhance coordination to ensure optimal and sustainable management of the ecosystem;

(c) Encourage the development and implementation of REDD+ initiatives that take into consideration the goal of poverty eradication and the needs of local communities, particularly the vulnerable; put in place an independent international auditing system based on established safeguards to monitor and evaluate REDD+ programmes and funding;

(d) Adopt a holistic and integrated approach to ecosystem management across sectors and landscape; build upon sound initiatives, such as the Guinea Current Project and the Great Green Wall for the Sahel; and

(e) Implement the three Rio Conventions on biodiversity, climate change and desertification in a synergistic manner to promote coherent management of the environment and enhance the role of ecosystems in addressing climate change, while upholding the rights of local communities, ensuring that financing mechanisms create the right incentives, and enhancing the capacity of countries to deal with climate change.

21. Climate change, social and human development

African governments should:

(a) Incorporate social and human development considerations into climate change mitigation and adaptation policies, strategies and programmes by treating such development as a human rights issue to give the needs of the most vulnerable groups top priority;

(b) Strengthen the incorporation of population dynamics into Africa's response to climate change, ensuring that population programming is not limited to sexual and reproductive health, but also includes intersectoral investments, to take advantage of the youthful age structure of the population;

(c) Evaluate existing infrastructure, interventions and human resource capacity of the health sector, particularly in surveillance, monitoring and data collection, for use in environmental-risk assessments and response systems; ensure that equity-based health care financing is included in climate-change funding mechanisms and internal resource mobilization;

(d) Incorporate gender perspectives in national development processes, strategies, programmes and practices in climate change; strengthen alliances, coalition building and networking efforts to implement gender and sustainable development commitments in mitigation and adaptation measures at all levels;

(e) Ensure public-private partnerships through education policy reforms that enable the local production of eco-friendly pedagogical materials and dissemination of eco-friendly knowledge, skills and attitudes to children from an early age to tertiary-level education; and

(f) Promote youth-led solution-oriented adaptation and mitigation in climate change issues and processes and accelerate the implementation of existing legal instruments and policies, such as the AU's African Youth Charter, and the African Charter on the Rights and the Welfare of the Child, and Convention on the Rights of the Child.

22. Climate change, agriculture and food security

African governments should:

(a) Call for a holistic approach in addressing agriculture, food security, nutrition, and climate change issues, including access to land, extension services, markets, technologies, finance, social protection mechanisms and natural resources;

(b) Create favourable common policies at the regional, subregional, and national levels for agriculture-food security and climate change, including by up-scaling existing best practices and technologies;

(c) Work with their climate-change negotiators to secure a solid agreement with comprehensive and fair payment systems in the agriculture sector, including capacity building, technology, knowledge and information; create synergies between adaptation and mitigation;

(d) Scale up weather index-based insurance schemes and productive safety nets; promote innovative financing mechanisms for agriculture and food security, including carbon markets; and

(e) Accelerate the implementation of the Africa Fertilizer Financing Mechanism, Water Business Plan and Agriculture Sector Strategy in order to reduce the continent's dependence on rain-fed farming while enhancing agricultural productivity.

The AUC, NEPAD Planning and Coordinating Agency (NPCA), and partners should:

(f) Climate proof the CAADP, particularly in water and sustainable land management and elaborate ways to integrate agriculture into the green economy; work with RECs to develop regional agricultural strategies in support of climate change mitigation and adaptation, and food security.

23. Climate change, trade and industrial development

The international community should:

(a) Develop new trade and industrial opportunities in the green economy and promote them widely in order to guide future investment strategies;

The AU, RECs and African governments should:

(a) Work together to incorporate climate change considerations into the AU Programme for Acceleration of Africa's Industrialization, and other industrial development frameworks;

(b) Modify as feasible, national and regional power plans to meet the rising demand for a low-carbon development path, especially in the face of greater hydro-meteorological extremes;

(c) Take advantage of the trade opportunities presented by organic production and the development of efficient energy sources to gain increased access to international markets; integrate climate change adequately into trade, industry and agriculture strategies.

24. Climate change and infrastructure development

RECs should:

(a) Lead subregional and national reviews of current and future energy supply and demand; and promote appropriate energy-sector reforms, to ensure that long-term plans contain strategies to broaden access to sustainable sources of energy, while mitigating emissions; and

(b) Work with national governments and other stakeholders to review sectoral infrastructure and equipment-renewal plans, focusing on low-carbon transport modes and land-use patterns, and adopting specific priorities for local circumstances.

African countries should:

(c) Climate-proof their water infrastructure and re-shape demand patterns in response to climate change; integrate their actions, including, climate-proofing existing and new water supply and sanitation infrastructure, implementation new water supply solutions that save energy, increasing water-harnessing infrastructure, improving national water-management capacities, and improving cooperation among riparian States;

(d) Adopt a holistic approach and develop appropriate policy tools that promote the diversification of energy sources and use of energy mix that mainly focus on low-carbon technology; and

(e) Support the Programme for Infrastructure Development in Africa, jointly implemented by the AUC, the NPCA and the AfDB, with the support of ECA and other UN agencies for the development of priority regional and continental infrastructure in the transport, energy, trans-boundary water and ICT sectors.

III. Call for action

25. Within the purview of global climate change governance, we call upon African governments and all stakeholders, supported by their development partners, to ensure the effective implementation of all global and sector-specific actions contained in this consensus statement.

26. Furthermore, we call for:

(a) The *up-scaling of support* to the ClimDev-Africa Programme by Africa's development partners and in this context, acknowledge the assistance provided so far by the governments of Norway, Sweden and the United Kingdom, Sweden;

(b) *The channelling* of development partners' allocation of climate change funds to the continent, through the Africa Green Fund;

(c) *The incorporation of* climate change concerns into development policies, strategies, programmes and activities on the continent, and *urge* the joint annual meeting of the African Union Conference of Ministers of Economy and Finance and the United Nations Economic Commission for Africa Conference of African Ministers of Finance, Planning and Economic Development to spearhead specific actions to ensure this;

(d) *The development and implementation of* climate-change adaptation and mitigation programmes that embody a gender and child-focused, ecosystem-based approach; and the preparation of action plans that cover immediate-, short-, medium- and long-term needs, integrating the developmental dimensions of climate change adaptation and mitigation and the need for effective coordination and cooperation for adaptation actions, especially where trans-boundary effects occur;

(e) *The implementation* of the regional initiative on the green economy in Africa by the UNEP, in collaboration with the AUC, the ECA and the AfDB and other regional bodies, to support national initiatives on the green economy and the regional

preparatory process towards the United Nations Conference on Sustainable Development (Rio+20) to be held in Rio de Janeiro, Brazil, in 2010; and

(f) *The strengthening* of the Joint Secretariat of the AUC, the ECA and the AfDB to enable it to support Africa's participation in the international climate change negotiations, as well as address the challenges posed by this phenomenon, and through regional integration, enhance Africa's capacity and capability to meet the continent's developmental challenges arising from climate change.

Finally:

27. We agree that this **Consensus** s**tatement should feed into** the **relevant international processes towards Cancun and beyond**, **and further inform Africa's common negotiating position on climate change. It should also form the basis for the preparation of an** a**ction** p**lan on** c**limate** c**hange that will be prepared and implemented** jointly **by** the **AUC,** the **ECA and** the **AfDB, with UNEP as a strategic partner, and in collaboration with all stakeholders and other partners at regional, subregional, national and local levels.**

IV. Vote of thanks

28. We commend the African Union Commission, the Economic Commission for Africa and the African Development Bank for successfully convening the Forum, and all partners for contributing to this resounding success.

29. We are truly grateful to H.E. Ato Girma Wolde Giorgis, President of the Federal Democratic Republic of Ethiopia, H.E. Ato Meles Zenawi Prime Minister of the Federal Democratic Republic of Ethiopia, and H.E. Jens Stoltenberg, Prime Minister of Norway, for their excellent leadership during our deliberations.

30. We are also grateful to HRH The Prince of Wales, H.E. Dr. Goodluck Jonathan, President of the Federal Republic of Nigeria, and President Barack Obama of the United States of America for their goodwill messages.

31. Finally, we express our profound gratitude to the people of the Federal Democratic Republic of Ethiopia for their generosity and warm hospitality during our stay in Addis Ababa.

Annex 6: List of participants

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Annex 7: Indicative action plan

Priorities for action identified by ADF VII

Memorable quotations from the Forum:

(a) "Climate change is a global security issue and takes precedence over all the other challenges the world is facing";

(b) "With global climate change we are forced to think ahead, otherwise we may be locked into current development paths";

(c) "Recognizing the time has come to mainstream climate change in every decision made in Africa";

(d) "Illiteracy is the worst enemy to the environment"; and

(e) "For any of this to take place there is need for enhanced and greater energy access".

I. Introduction

With ClimDevAfrica[37] and the ADF-VII[38], Africa is committed to organizing its collective knowledge and resources to address the monumental challenge of 'development in a more hostile climate'.

This indicative action plan, emerging from the Forum and its many sessions, addresses the need for Africa to accelerate preparatory activities and scale-up response actions to the many threats from climate change, and to start working on opportunities for sustainable development in a 'green economy[39]'.

Overall the action plan seeks to *make best use of knowledge to strengthen capacity of African stakeholders to address the many diverse climate change challenges and to leverage the related, significant opportunities.* As such it is an important step towards the preparation of a continental strategy and master plan for a more resilient Africa, pursuing a more equitable and sustainable development path. Because climate change will affect so many aspects of life in Africa, taking charge of its own climate change agenda gives Africa the opportunity to take more control over its whole development agenda.

Context: Climate change is the biggest challenge for the future of Africa, and the world. Since, ultimately, the future of civilization on planet earth is at stake, the issues must be addressed comprehensively through a global partnership. In the absence of a strong global response to the challenge, there is relatively little that Africa can do on its own to adapt to all the expected impacts of a changing climate. Business-as-usual holds a highly problematic future for Africa as a whole. Current development pathways are simply not sustainable: the damage to people, their livelihoods, their environment and society is, in general, overwhelming. The green economy offers the promise of a better way forward through climate change, with opportunities for everyone. Nevertheless, it is critically dependent on a strong global agreement for transforming the way we treat the planet (see for example UN WESS 2010 Retooling Global Development http://www.un.org/esa/policy/wess/).

UNFCCC: Current negotiations under the UNFCCC are absolutely vital for the future of the continent, and a better world. Africa must continue every effort to obtain a strong and fair global agreement. While Africa has contributed the least to global warming, it will suffer the most from the impacts of climate change. Yet it has the potential to lock up significant quantities of atmospheric carbon relatively cheaply and quickly through the re-vegetation of degraded land. As such it has a unique and important catalytic role to play in climate change negotiations, encouraging developed and emerging economies towards a clean, green agreement that is in everyone's longer-term interest.

In rural Africa there is much concern about the impact of already changing local climates and the extreme vulnerability of so many communities faced with a more hostile climate. It is imperative that Africa's leadership take up the challenge of improving climate resilience now. Countries in the arid regions of Africa are being forced into "reactive adaptation", which is more expensive and less effective than planned adaptation.

[37] See http://www.afdb.org/en/topics-sectors/initiatives-partnerships/climate-for-development-in-africa-climdev-africa-initiative/ or http://www.uneca.org/csd/csd6/ClimateDevAfrica-ExecutiveSummary.pdf
[38] See http://www.uneca.org/adfvii/ for programme and all documentation
[39] See http://www.unep.org/greeneconomy/

At present, Africa is under-prepared for adapting to climate change. Leaders do not have access to the resources and technology needed to address yet another complex, macro-constraint to development that requires difficult and costly changes. Too few people and institutions have taken ownership of climate change issues and made them their own challenge. Visionary leadership and political ownership are absolutely essential. There is much preparatory work and many preliminary actions to be undertaken while global agreements with adequate finance and appropriate mechanisms are negotiated.

Preparation and implementation of the action plan

The Consensus Statement from ADF-VII recommended that the follow-up action plan should be jointly prepared and implemented by the **AUC,** the **ECA and** the **AfDB with UNEP as a strategic partner, and executed in collaboration with all stakeholders and partners at regional, subregional, national and local levels. It should address** immediate-, short- medium- and long-term needs**.**

This indicative version of the action plan is *'a draft document for consultation'*. Once Forum participants and other stakeholders have expressed their views, then the Joint Secretariat will proceed with further development towards agreement and then implementation of their action plan. It will report back to stakeholders on the progress and impact of annual ClimDevAfrica Climate Change and Development in Africa meetings.

Actions here are primarily designed within the scope and spirit of ClimDevAfrica, to be implemented in harmony with, and building on the numerous on-going and planned activities of the many other actors and partners in development. Most of the project actions proposed comprise priorities for better knowledge management as identified in the Forum Consensus Statement and ClimDevAfrica Programme. Some are preparatory – organizing knowledge and information to develop strategies for the implementation of infrastructure renewal - for example. All are necessary.

II Action programmes

The Forum demonstrated that climate change has the potential to affect all people of all walks of life in Africa. Thus there are many ways of 'stratifying' the threats and opportunities. For the purpose of producing a manageable action plan, the many recommendations in the Consensus statement have been concentrated into 10 Action programmes, five of which are generic, while the other five address more specific sectoral concerns. The action programmes are not mutually exclusive and there are inevitably many overlaps and complementarities.

A. Five generic programmes

1. Leadership: **Africa and the International Climate Change Negotiations:** common negotiating position, financing adaptation: and mitigation (CDM)

2. Governance and Leadership in Prioritizing and Implementing Adaptation Actions: Coherence: integrating climate change concerns into development policies, strategies and programmes in Africa,

3. Capacity Development: Strengthening institutions, organizations, communities and individuals with Knowledge especially Climate Risk Management: Disaster Risk Reduction: Climate Data and Information:

4. Science, Technology and Innovation: tools necessary to help address this unique, complex and uncertain problem.

5. Partnerships and Private Sector: Combining complementary knowledge and skills for more effective action (from global mitigation to community adaptation)

B. Five 'Sectoral' Programmes

6. Peace and Security, without which development is not sustainable

7. Natural Resource Management including: Agriculture and Food Security Environment and ecosystem sustainability: environmental security ,.Water resources, Biodiversity, Land use change, Forestry REDD+, Desertification

8. Social and human development: Health, population, education, security, employment, inclusion of vulnerable groups: engagement of youth

9. Economic development, trade and industrial development, access to optimal technology; Potential of the Green Economy

10. Infrastructure development: Energy, Water, ICTs, Transport, Urban, Industrial, Coastal: *towards solving Africa's water and energy problems*:

III. List of proposed programmes and projects

The list of actions – programmes and projects - below is derived from the Forum Report, the Consensus Statement, and Issues papers.

1. Leadership: Africa and International Climate Change Negotiations

1.1 Support the African Negotiating Team at UNFCCC (short term)
1.2 Expanding opportunity for Africa in Carbon Markets and the CDM
1.3 Improving Access to Technology for Mitigation, Adaptation and Development
1.4 Broad Engagement/Understanding of Africa's Common Negotiating position
1.5 Long Term Support for Climate Change Negotiations
1.6 Financing Adaptation: Preparation of an African Strategy

2. Governance and Leadership in Prioritization, Financing and Implementation of Adaptation and Mitigation Actions:

2.1 Top Level Political, Economic and Financial Coherence and Coordination:
2.2 Improved Economic and Financial Management
2.3 Consolidation of Democracy with Greater Political Inclusiveness
2.4 Hot Spots: Supporting States Most Vulnerable to Climate Change (SIDS, LDCs fragile States)

3. Capacity Development:

3.1: Strengthening Institutions vis-à-vis Climate Change
3.2 Awareness Raising and Building Capacities to Promote Adaptation
3.3 Climate Risk Management for All
3.4 Making Best Use of Climate Services (and existing Data and Information)
3.5 Enhancing Production and Availability of Climate Data and Information
3.6 Strengthening Early Warning Systems and Improving Disaster Risk Reduction
3.7 Environmental Monitoring for Climate Change Impact Assessment in Africa:

4. Science, Technology and Innovation

4.1 Climate Change Science: Research Knowledge for Development Decisions
4.2 The Potential of Technology
4.4 Innovation: Cultivating Curiosity to Benefit from Change
4.5 Better utilization of Science and Technology Institutions (and Reversing the Brain Drain)

5. Partnerships and Private Sector

5.1 All Africa Partnership: Strengthening Leadership in the Joint Secretariat
5.2 Private Sector: Investment, Risk and the Insurance Market
5.3 Private Sector and the Green Economy
5.4 A Maturing Relationship with Donors and other Partners in Development.
5.5 Integrated Government: Inter-sectoral Partnerships
5.6 Government, Civil Society and the Media working together

6. (Governance) Peace and Security: *sine qua non*

6.1 Strengthening Peacekeeping
6.2 Reducing Future Risk – including Management of Population and Migration

7. Natural Resource Management

7.1 Integrated Natural Resource Management
7.2 Agriculture and Long-Term Food Security: Green Growth
7.3 Improving Near-Term Food Security
7.4. Environment and Ecosystem Sustainability:
7.5 Changing Land Use: Revegetating degraded/desertified dry-lands through CDM
7.6 Water Resources (see also Infrastructure)
7.7 Trans-boundary Water Resources (see also Infrastructure)

8. Social and human development

8.1 Education for a Life with Climate Change
8.2 Adapting Health Systems to cope in a Changed Climate
8.3 Population Management for a Viable Future
8.4 Inclusion: Opportunities and Employment for Youth and other Groups
8.5 Inclusion: Addressing Vulnerability of Women and other Social Groups
8.6 Inclusion: Managing Rural and Urban interests together

9. Economic Development

9.1 Economic Development
9.2 Evaluation of Opportunities from a Green Economy in Africa
9.3 Climate Change, trade and industrial development:

10. Infrastructure development

10.1 Generic Approach to Infrastructural Renewal
10.2 Energy Infrastructure – an Opportunity to address Africa's Energy Deficit
10.3 Upgrading Water and Sanitation Infrastructure
10.4 Encouraging Information and Communication Technologies
10.5 Climate Change and Transport Infrastructure
10.6 Urban, Industrial and Coastal Infrastructure in a changing climate

IV. Possible priority actions for early implementation

All the projects are top priority in one way or another. How too decide which actions take priority for an early launch?

Possible criteria for setting priorities include (a) urgency, (b) the fundamental importance to Africa, (c) the potential spinoffs and opportunities, (d) the possibility of commencing actions during 2011, and (e) the appropriateness for immediate funding through ClimDevAfrica.

Priority number one and two: The top priorities for immediate implementation, as measured by debate and comments in the Forum, are (a) to raise the capacity of institutions and organizations across the continent to incorporate climate-risk management practices into their on-going and future work, and (b) to encourage the spread of Index Insurance as a rural safety net. *Projects 3.2 and 5.2*

Priority number three: Supporting the African negotiators in the UNFCCC towards a strong and fair global agreement is very urgent and has major potential impact for the whole continent. *Project 1.1, and the rest of the programme*

Priority number four: Integrating adaptation and mitigation in national and regional development strategies, policies and plans is also urgent and likely to have major impact, where it hasn't been done already. *Project 2.1*

And priority number five Raising awareness, strengthening capacities and building partnerships to promote adaptation. *Projects 3.2, 5.2 and 5.5.*

Of the five key opportunities for Africa within the climate-change agenda that were identified at the Forum by Mr. Andrew Steer, Climate Change Ambassador of the World Bank, four predominantly concerned knowledge management:

1. Integrating climate-resilient actions and strategies into development planning (project 2.1)
2. Tapping into carbon-market markets, which are yet to be fully harnessed by the continent (1.2)
3. Expanding access to electricity, particularly clean and renewable energy (10.2)
4. Improving trans-border cooperation among African countries, particularly in areas of critical to long-term development (e.g. 7.7 and 10.2)
5. Making the UNFCCC COP 17 in Durban a triumph for the continent and steering the continent towards a path of sustainable development (1.1).

V. Approach to programme and project delivery

The approach outlined here is derived from the Forum Report and the Consensus Statement, both of which emphasize integration in approach and action and inclusion of all stakeholders. This should be possible if all concerned adhere to good knowledge management practices.

Programmes and projects should be prepared and implemented, bearing in mind the following requirements:

(a) participation, inclusion and gender-focused, with differentiated roles of stakeholders, including the public and private sectors, civil society, women and the youth;

(b) greater cohesion, coordination and cooperation, with integrated mitigation, adaptation and development programmes (a holistic ecosystem-based approach);

(c) the need for advocacy (on behalf of disadvantaged population groups) and promotion of fundamental behavioural change among many stakeholders; and

(d) international cooperation, especially with regard to trans-boundary issues and opportunities.

Integrated approach

Climate change is a serious multi-sectoral problem that will be around for a long time. It is not a 'development fashion' that will be replaced by other concerns in the near future. Addressing the many related issues requires the integration of policies and actions between countries, sectors, stakeholders and timescales - if development is to be sustainable. In particular there is fundamental need for effective integration of policies and actions for mitigation, adaptation and development. The best integrator available today appears to be the 'green economy'. It incorporates an essential ethical element and social conscience, with much stronger and more urgent 'care' for the environment, into the 'eroded' concept of sustainable development. This is the integration of Mitigation, Adaptation and Development processes into a Green Economy – which might be referred to as MADGE or GEMAD.

For example, *Africa should develop and implement adaptation and mitigation programmes that take into account gender, children and ecosystem, and draw up action plans covering immediate-, short-, and medium- and long-term needs. The plans should integrate the development aspects of adaptation and mitigation. They should also take into consideration the coordination and cooperation required for adaptation initiatives, especially in trans-boundary regions affected by climate change.* Is particularly important to '*Extend national coordinating mechanisms to the local level so as to ensure meaningful participation of CSOs and mutual accountability'*.

Participation should include all stakeholders with crosscutting and priority actions for different groups including:

(a) the Joint Secretariat (AUC, AfDB and UN-ECA) and RECs;
(b) regional and sub-regional Institutions across the board;
(c) national government initiatives/sectoral ministries;
(d) the private sector;
(e) universities and research institutes;

(f) governance and administration institutes;
(g) climate, development, environmental institutions;
(h) CSOs, various types of non-governmental development organizations;
(i) women, youth groups and other disadvantaged or marginalized stakeholders, and;
(j) partners in development.

Note also the need for good management of the ClimDevAfrica Framework Programme, including:

1. The monitoring of progress and evaluation of the impact of all actions;
2. The implementing of actions on schedule, and reporting;
3. Eligibility criteria for global resources and programmes, which are open to global evaluation;
4. Institutional and programme mapping (dynamic for updates and improvement of process delivery);
5. Regular feedback on best practices concerning the Forum and climate-risk management, and scaling up of the best practices through interaction among the different stakeholders and beneficiaries.

VII. Interim conclusions and next steps for early action

ClimDevAfrica, ADF-VII and this (developing) action plan are important steps by Africa towards a continental strategy and master plan for developing greater resilience in the face of climate change. Africa is organizing itself and its knowledge to withstand the threats of a more hostile climate, and to make best use of diverse opportunities in the evolving new and greener global development paradigm. Africa is taking charge of its own destiny.
It is important for the Joint Secretariat to complete the action plan in a form that can be used for integrating and maximizing the impact of the numerous on-going and future adaptation and mitigation initiatives related to development in Africa. The Joint Secretariat needs to be able to: strengthen and harmonize the activities of the diverse stakeholders in order to ensure greater total impact; create priority programmes to fill big gaps, and; identify and scale up best practices for continent-wide implementation - as envisaged in ClimDev-Africa.

Quote: *'Within the purview of global climate change governance, we call upon African governments and all stakeholders, supported by their development partners, to ensure the effective implementation of all global and sector-specific actions contained in this Consensus Statement'*.