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## Africa and Climate Change: Impacts, Policies and Stance Ahead of Cancún (ARI)

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**Theme:** <sup>1</sup>: This analysis reviews the effects of climate change in Africa, the response measures undertaken in the continent and the expected position of African countries at the meeting at Cancún, Mexico.<sup>2</sup>

**Summary:** The analysis first provides an overview of climate change impacts in Africa. It begins with a brief review of general climate projections for Africa, with their overall impacts. Later, it moves on to assess specific climate impacts of the continent's climate zones. The paper uses a sample of African countries to provide specific details of vulnerability in accordance with national circumstances. Secondly, the analysis looks at the policies implemented so far, or foreseen, in Africa, to respond to the climate threats previously reviewed. The analytical framework proposed is in line with the approach followed in the Bali Action Plan, which was established ahead of last year's Copenhagen summit. That is, it reviews measures undertaken to respond to climate change in terms of mitigation actions, adaptation responses, technology interventions and finance provisions. This section briefly concludes with an overview of the contributions of Spain and the EU to these measures, before and after Copenhagen. Against this background, the third section of the analysis looks at the negotiating position of Africa in the aftermath of COP-15. Namely, it looks at the demands of the Africa Group and other relevant alliances within the continent, for consideration in Cancún.

### Analysis:

#### *Main Consequences of Climate Impacts in Africa: Strategic Interests and Regional Threats*

Science has become more unequivocal about global climate-related events. In Africa, average annual temperatures have been rising steadily and during the 20th century the continent saw increases of around 0.5°C. Meanwhile, countries in the Nile Basin had an increase of around 0.2°C to 0.3°C per decade during the second half of the century, while in Rwanda temperatures increased by 0.7°C to 0.9°C. Climate models project that across the entire continent and for all seasons, the median temperature increase by the end of this century will be between 3°C and 4°C, roughly 1.5 times the global mean response.

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<sup>1</sup> The views expressed in this paper are those of the author and do not necessarily represent those of the United Nations, including UNDP, or their Member States.

<sup>2</sup> Sixteenth session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) and Sixth session of the COP serving as the Meeting of the Parties (MOP) to the Kyoto Protocol.

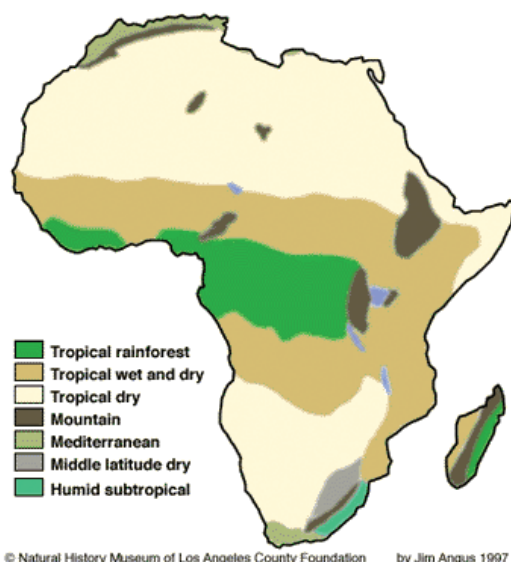
Future warming is likely to be greatest over the interior of semi-arid margins of the Sahara and central southern Africa.

In this regard, vulnerability to external factors continues to threaten the region's ability to make progress towards the Millennium Development Goals (MDGs). Food price volatility has become a critical challenge for Africa to achieve food security for all. Coupled with the current global financial and economic crisis, these factors continue to negatively impact African economies. Therefore, the following key impacts of climate change threaten the sustainability of the gains that have been achieved in terms of MDG attainment,<sup>3</sup> including:<sup>4</sup>

- A drop in agricultural yields of up to 50% in some countries, with the consequent effects on agricultural output, food security and nutrition.
- An increase in the number of people (from 75 to 250 million) at risk from water stress.
- An increase in the exposure to malaria.
- An increase of between 5% and 8% in the surface area of arid and semiarid land.
- Rising sea levels that could severely affect mangrove forests as well as coastal fisheries, and lead to increased severe flooding, with a potential cost of 5% to 10% of annual PIB.

Many of the predictions for the continent were summarised by the IPCC (Intergovernmental Panel on Climate Change), along with the potential implications for international climate negotiations.<sup>5</sup> However, climate change impacts in Africa vary across the continent owing to its sheer size and diversity. Scientists distinguish at least seven climate zones in Africa (Figure 1), with varying geographical conditions:<sup>6</sup>

**Figure 1. Africa's climate zones**



<sup>3</sup> MDG Report 2010: Assessing Progress in Africa toward the MDGs. UNECA, AU, AfDB and UNDP.

<sup>4</sup> See IPCC (2007), Boko *et al.* (2007) and UNCCD *et al.* (2009).

<sup>5</sup> See Lázaro (2010)

<sup>6</sup> Eriksen *et al.* (2008).

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A case study selection of one country from each climatic zone, adding an island state and a mixed region, is shown in Annex 1 to provide an overview of Africa's climatic diversity.

#### *Policies Implemented in Africa or Foreseen for the Near Future*

Africa's responses to climate change impacts can now be better understood against the backdrop of the preceding case study in various climatic zones of the continent (see Annex 1). A suggested approach to reviewing climate policy development in Africa is to look at the measures adopted in the four areas constituting the building blocks of the Bali Action Plan:<sup>7</sup> (1) mitigation; (2) adaptation; (3) technology; and (4) finance. Reference will be made to interventions in some of the countries studied in Annex 1. In addition, it may be relevant to review other activities and initiatives that might have a policy or regulatory impact when addressing climate change.

(1) Mitigation: it is important to note that the main sources of global emissions are key sectors relevant to the attainment of the Millennium Development Goals (MDGs). These key sectors include electricity and heat (29%), agriculture (14%) and land-use change and forestry (12%),<sup>8</sup> with the remainder having a comparatively less direct impact on MDG attainment.

Consequently, emission reductions in these sectors require transformation of economies that should be well informed. Indeed, any actions to be undertaken in Africa should be informed by the diverse range of national priorities of its countries, particularly for poverty reduction (see Box 1, for a sample of mitigation efforts in this regard):

#### **Box 1. Africa's Climate Change Mitigation Actions at a Glance**

- **Namibia and Nigeria:** preparation of the Second National Communications (SNC) to the UNFCCC, including studies on measures to reduce emissions in the main polluting sectors, including forestry, and actions undertaken in this regard.
- **Namibia:** the Barrier Removal to Namibia's Renewable Energy (NAMREP) and Namibia's Energy Efficiency Programme in Buildings (NEEP) projects, both executed by the Ministry of Mines and Energy, are being implemented to expand access to energy services to the poor and to promote the adoption of energy-efficient practices. In addition to climate change mitigation, the removal of policy, financing and cultural barriers to the use of solar energy technologies (eg, solar water heaters, solar water pumps and other solar home systems) is contributing to poverty reduction in rural areas that might not be connected to the grid. Meanwhile, more efficient energy demand-side management practices in urban areas are expected to address escalating energy prices and reduce the high dependence on energy imports.
- **Nigeria:** a consultative and multi-stakeholder approach was taken in the development of the Nationally Appropriate Mitigation Action (NAMA), encouraging similar highly participatory and consensus-based processes. Nigeria has now been granted observer status in the UN-REDD process, with a roadmap being developed by the government to fast track designation as a full blown REDD+ pilot country and taking steps to establishing a National REDD Task Team.

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Source: UNDP ([www.undp.org](http://www.undp.org)).

(2) Adaptation: one of the main objectives of adaptation is to improve climate resilience, particularly as it impacts existing development assistance. The main purpose is to strengthen the capacity of national institutions to incorporate adaptive planning and management into development policy in an iterative manner. The focus is on anticipatory

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<sup>7</sup> The Bali Action Plan (BAP) or Bali Roadmap emerged from the Thirteenth session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC)/Third session of the COP serving as the Meeting of the Parties (MOP) to the Kyoto Protocol held in December 2007 in Bali (Indonesia).

<sup>8</sup> United Nations Development Programme (UNDP, [www.undp.org](http://www.undp.org)).

and deliberate measures. Examples of support to Africa in this area are the Africa Adaptation Programme (see Box 2), the Adaptation Learning Mechanism and the Community-based Adaptation project.

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#### Box 2. Africa's Climate Change Adaptation Responses at a Glance

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- **Africa Adaptation Programme (AAP):** there has been a sustained effort to improve the alignment of adaptation programmes with national strategies and priorities in Africa. AAP funded by the Government of Japan has been instrumental in supporting a comprehensive and integrated national approach towards climate change adaptation. AAP is helping 20 countries in Africa to develop their capability to design and implement holistic climate adaptation and disaster risk-reduction programmes that are aligned with their national development priorities. It is a US\$92 million programme, started in 2009 and to be completed in December 2011. The donor recipient countries are: Burkina Faso, Cameroon, Republic of the Congo, Ethiopia, Gabon, Ghana, Kenya, **Lesotho**, Malawi, **Mauritius**, Morocco, **Mozambique**, **Namibia**, Niger, **Nigeria**, Rwanda, Sao Tome and Principe, Senegal, **Tanzania** and **Tunisia**.<sup>9</sup>
- **Nigeria:** preparation of a National Adaptation Plan of Action (NAPA) and a National Adaptation Strategy, as well as the development of a Climate Change Policy and a National Response strategy. A consultative and multi-stakeholder approach was taken in the development of the NAPA, encouraging similar highly participatory and consensus-based processes.

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Source: UNDP ([www.undp.org](http://www.undp.org)).

(3) Technology: technology transfer and capacity development need to take place effectively for African countries to pursue climate change mitigation actions that at the same time contribute to their economic development. The installation of additional technological capacity not only requires significant investment but also capacity development and technical assistance in order to support the ensuing economic transformation and reap the expected poverty dividends. A sample of efforts in this regard is summarised in Box 3.

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#### Box 3. Africa's Climate Change Technology Transfer and Capacity Development Interventions at a Glance

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- **Namibia:** the Concentrated Solar Power Technology Transfer for Electricity Generation (CSP TT NAM) project, executed by the Ministry of Mines and Energy, and implemented through the Renewable Energy and Energy Efficiency Institute (REEEI) at the Polytechnic of Namibia, aims to increase the renewable share of the country's on-grid energy mix. Beyond the obvious mitigation impact, the technology transfer component will seek to attain this goal through a pre-commercial demonstration pilot plan, which should allow the promotion of domestic manufacturing, development of an in-country national skill-set and overall contribution to local content in the process.
- **Congo DR:** several technology capacity reinforcement projects are in the pipeline for the country, as already identified and reported in the country's Second National Communication to the UNFCCC:
  - Pilot Electrification Project for Five Agglomerations by Solar Means in Kinshasa (US\$4 million).
  - Pilot Development Installation for 50 Micro Hydroelectric Power Stations (US\$361 million).
  - Firewood Plantation in Kinshasa, Lubumbashi and Mbuji - Mayi (US\$22 million).

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Source: UNDP ([www.undp.org](http://www.undp.org)).

(4) Finance: a key challenge for the transformation of African economies towards low-carbon and climate-resilient development is accessing sustainable financing to support the process. The challenge is at institutional, regulatory and policy development levels, which are required for investment to take place. It is also crucial to ensure that any financing mobilised actually contributes to the development of the national priorities of African countries.

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<sup>9</sup> Countries included in the case study selection of the preceding section are shown in bold type.

Any success in furthering this approach will significantly contribute to poverty reduction and MDG achievement. Access to sustainable finance should allow Africa to control and direct financing consistent with the low-emission climate-resilient development strategies (LECRDS) of its countries. This is particularly so, considering that international climate financing is largely unpredictable and currently provides little guarantee of long-term sustainability.

For instance, the fast-start finance proposed in the aftermath of last year's Copenhagen climate talks (US\$30 billion for 2010-12) and the US\$100 billion per annum envisaged from 2020 onwards do not provide any assurance on the funding allocation approach or eligibility criteria. Meanwhile, financial mechanisms such as the Global Environment Facility (GEF) are co-funding a range of initiatives (see Box 4) to attain global environmental benefits.

#### **Box 4. Africa's Climate Change Financing Actions at a Glance: the GEF**

The Global Environmental Facility (GEF) is a financial mechanism under the UNFCCC established to mobilise financing to address environmental sustainability and climate:

- **Congo DR:** the GEF has been funding enabling activities to support the fulfilment of the country's obligations to the UNFCCC. In addition, it is funding a NAPA, a capacity-building project for global environmental management, as well as a climate-change project in the agriculture sector focusing on food production security.
- **Namibia:** GEF is funding adaptation (eg, pilot crops and livestock farming practices), mitigation (barrier removal to access off-grid renewable energy technologies, energy efficiency in buildings) and technology transfer (concentrated solar power for on-grid electricity generation) projects. These interventions are in addition to supporting enabling activities for UNFCCC commitments (eg, Second National Communication).

Source: GEF ([www.thegef.org](http://www.thegef.org)).

It is important to note that GEF has become a significant instrument to support African countries on the climate change and environment agenda.

Indeed, using a project approach to bring about change from business-as-usual scenarios, the GEF has positioned itself as a catalytic co-financier of environmental projects.<sup>10</sup>

However, in addition to mechanism-driven approaches, other countries are using country-driven approaches to ensure national ownership and direct access to financing. Some of these are briefly explained in Box 5.

#### **Box 5. Africa's Country-Driven Approaches to Climate Financing**

- **Namibia:** as part of UNDP's global project towards the 'Capacity Development for Policy Makers to Address Climate Change', the country is currently finalising its assessment of the investment and financial flows (I&FF) needed to meet national adaptation and mitigation costs. The I&FF process is contributing to a better understanding of the magnitude of funds needed to tackle climate change now and in the long term. The process followed relies on a multi-stakeholder approach to ensure national ownership.

Source: UNDP ([www.undp.org](http://www.undp.org)).

<sup>10</sup> GEF's catalytic co-financing approach means that its funding portion is normally around 10% of total project funding (not a fixed share, as it may vary depending on the size of the project and its global importance), with the majority of financing coming from donors, private sector, government, project partners, development banks or other relevant stakeholders. The main thrust behind GEF's approach is financing the portion of the projects which will support interventions geared towards accruing incremental net benefits (for instance, from a business-as-usual or baseline scenario to an adaptation/mitigation scenario).



(5) The role of Spain and the EU: Spain has been one of the most active players in international development assistance in recent years. The establishment of the Millennium Development Goal Achievement Fund (MDG-F) between Spain and the UNDP in December 2006 has been a landmark instrument for bilateral contribution and joint programming. The MDG-F is supporting, through the UN development system, over 140 initiatives to promote the attainment of MDGs in 49 countries to the tune of €528 million, with an additional €90-million contribution received in 2008.

Several of these initiatives (around €68 million) are supporting countries to co-ordinate efforts towards environmental sustainability and climate change, with some pilot initiatives taking place in Africa. For instance, in Mozambique, the MDG-F is supporting processes for environmental mainstreaming and climate change adaptation in rural and coastal zones (a €6-million joint programme).

Therefore, Spain is an active partner in development assistance for addressing climate change and broader environmental concerns, and has continued to do so during its Presidency of the EU. The latter earmarked €7.2 billion for 2010-12 (with €2.4 billion available for 2010). Meanwhile, in April 2010 Spain became the first country to make a voluntary contribution to the Adaptation Fund, with €45 million disbursed for 2010.<sup>11</sup>

*The Negotiating Position in Cancún:*<sup>12</sup> *Alliances, Demands and Institutional Arrangements* Considering Africa's size and diversity, it is quite a complex task to summarise and simplify the negotiating position of the whole continent. An easy starting point is the positions advanced by the Africa Group, within the Group of 77+China, in the various negotiating areas. This would also serve as the point of departure from which various alliances are being formed. In turn, this would help us better understand the range of demands and preferred institutional arrangements by Africa, including the red lines the region will not cross if it is to agree on a legally-binding post-2012 regime.

(1) Regional alliances: Africa has been playing a significant role in the climate-change negotiation process. The African Group, with its 53 member states, is the largest regional group (28% of all UN members).<sup>13</sup> However, the group's main challenge given its size has been defending positions suitable to its variety of members. Consistent with the preceding sections, which have underscored the range of climate-change impacts in Africa, and measures adopted to increase resilience in the continent, there is also a diversity of negotiating positions, in accordance with the major alliances noted in Box 6:

<sup>11</sup> MMA (2010).

<sup>12</sup> Sixteenth session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) and Sixth session of the COP serving as the Meeting of the Parties (MOP) to the Kyoto Protocol.

<sup>13</sup> The Africa Group is only matched by the Asian Group, with the same number of member states.

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#### Box 6. Africa Regional Alliances

- **Africa** (Africa Group): Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo DR, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, São Tomé & Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Togo, Tunisia, Uganda, Tanzania, Zambia and Zimbabwe. Africa Group members also exert significant influence within the Group of 77 (eg., South Africa, Nigeria and Egypt).
  - **LDCs** (Least Developed Countries), currently incorporating 33 African countries: Angola, Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Congo DR, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, São Tomé & Príncipe, Senegal, Sierra Leone, Somalia, Sudan, Togo, Uganda, Tanzania and Zambia.
  - **APPA** (African Petroleum Producers Association), including OPEC countries (Algeria, Angola, Libya and Nigeria) alongside 12 other African countries (Benin, Cameroon, Chad, Congo DR, Egypt, Equatorial Guinea, Gabon, Ivory Coast, Mauritania, Republic of the Congo, South Africa and Sudan).
  - **SADC** (Southern African Development Community), with 15 member states that are trying to exert influence of their own within the African Group (Angola, Botswana, Congo DR, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe). Several member countries are currently negotiating for SADC to form another negotiating group within Africa at the UNFCCC. Similar moves are currently unknown from other existing regional alliances (eg, ECOWAS, CEMAC, EAC).
  - **COMIFAC** (Central African Forest Commission): at present including 10 forested nations in Africa (Burundi, Cameroon, Central African Republic, Chad, Republic of the Congo, Congo DR, Equatorial Guinea, Gabon, Rwanda and São Tomé & Príncipe).
  - **SIDS** (Small Island Development States): at present including six African countries (Cape Verde, Comoros, Guinea-Bissau, Mauritius, São Tomé & Príncipe and Seychelles).
  - **BASIC** (ie, Brazil, India and China plus South Africa).
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Both LDCs and SIDS can be considered the most vulnerable, whereas South Africa, Nigeria and Egypt (all part of APPA) are the continent's economic powerhouses. However, the level of power and influence of these alliances depends on the negotiating demand or issue at stake, with COMIFAC countries playing a progressively responsible role in issues such as mitigation actions related to forests and land use, and SADC countries seeking to exert more strategic influence in the overall African group position. However, it should be noted that the diversity of positions was not as marked prior to the Bali road map to Copenhagen.

(2) Main African demands: the proposed framework for analysis of African demands is in line with the main areas of the Bali Action Plan (mitigation, adaptation, technology and finance), and the shared vision for long-term cooperation action. It is within these areas that issues such as commitments by African countries vis-à-vis developed economies, positions on land use, land-use planning, conservation and forestry (LULUCF), sectoral and market mechanisms, capacity building and other response measures can be better understood. Overall, there is agreement that these demands might not be met in Cancun. Meanwhile, Africa will push for a deal to be agreed on African soil (COP-17/MOP7 in South Africa);<sup>14</sup> however, significant progress will be required during and after Mexico, so that a package with advances in all areas may be agreed upon.

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<sup>14</sup> Seventeenth session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC)/Seventh session of the COP serving as the Meeting of the Parties (MOP) to the Kyoto Protocol.

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**Mitigation:** the Copenhagen Accord provided for quantified economy-wide emissions targets for 2020 by developed countries.<sup>15</sup> The vision was to further strengthen the emissions reductions initiated by the Protocol. Meanwhile, developing countries would undertake national appropriate mitigation actions (NAMAs) in the context of their sustainable development, with LDCs and SIDS allowed to undertake voluntary actions on the basis of external financial support. The African group has clearly said that mitigation commitments by developed countries must be resolved urgently. Progress in other negotiating areas will be rendered insufficient if a legally-binding outcome does not emerge from the negotiating sessions with a clear post-2012 regime in terms of commitments.

While developed countries acknowledge that greater ambition is needed on their part, disagreement remains on the form of commitments (eg, relative reductions, baseline years); the role of offset mechanisms, including Land Use, Land Use Change and Forestry (LULUCF), towards commitments; and the inclusion of Annex I parties not currently subject to the Kyoto Protocol (eg, the US). In the meantime, further technical guidance is required for other mitigation actions relevant to Africa, ie, REDD+ (eg, particularly for COMIFAC member states). For instance, there is a consensus on the need to provide social and environmental safeguards for forest-dependent communities (including indigenous people) for REDD+ to succeed.

**Adaptation:** the African group demands that developed countries assume their historical responsibilities by prioritising adaptation actions for the most vulnerable. Africa's main contention is that it has contributed the least to climate change, following decades of greenhouse gas concentrations caused by industrialised nations. However, the continent is the most vulnerable to its consequences and has the least capacity to adapt.

Meanwhile, mechanisms to address revenue losses have been demanded by APPA countries, opposed to by SIDS. Namely, oil exporters (such as Nigeria from the case study selection) call for the inclusion of compensation for economic losses within any adaptation support. Again, the demand relates to expected mitigation actions in developed countries (ie, a reduced reliance on fossil fuels and a transition to non-fossil or renewable energies). However, island states like Mauritius (also in the case study selection) demand that any economic compensation be primarily devoted to support adaptation.

**Technology:** as a cross-cutting element of the negotiations, Africa is placing great emphasis on progress in climate-change technology transfer and capacity building. Current negotiations are mostly engaged in the institutional arrangements required for an international technology framework to play an effective role in addressing climate change. Beyond that, Africa and most developing countries are concerned with the issue of intellectual property rights (IPR).

Effective technology transfer, particularly in a North-South context, requires the building of IPR provisions into any proposed technology mechanism. While developed countries refuse such a proposal, Africa's counterargument is that mitigation actions in developing countries are unlikely to take place without an increase in the installed technological capacity of its economies. Apart from infrastructure capacity, the processes of knowledge

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<sup>15</sup> See Lázaro (2010) for a summary of commitments and agreed individual and joint reductions by various countries resulting from the Accord.



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sharing, skills development and overall human resource strengthening are crucial for Africa to benefit from any investment flows to address climate change in its economies.

**Finance:** One of the landmark outcomes of COP-15 in Copenhagen was the pledge of US\$30 billion for developing countries for 2010-12. While the pledge may address some of the Africa Group demands, the fast-start finance proposal still does not provide financing arrangements for a post-Kyoto regime beyond 2012. Another test for this pledge is to prove that any sources of climate financing put forward are actually new and additional to existing development assistance.

The incentives arising from carbon credits are creating an enabling environment for the establishment of promising linkages between the private and the public sector. These should now move on from their current seemingly “piloting and testing” stage, to another where market mechanisms are enhanced and improved under the UNFCCC convention. However, Africa demands that this transition is accompanied with significant pledges on emission reductions by developed countries first. Indeed, other developing countries<sup>16</sup> have expressed their caution about private sector funds altogether replacing public climate financing.

(3) Institutional arrangements: the UNFCCC is undergoing significant pressure to convince all its parties that it is the adequate platform to negotiate a deal. As the new UNFCCC Executive Secretary Christiana Figueres emphasised throughout the year, there is a ‘need to prevent multilateralism from being seen as *an endless road*’. While all parties seem to agree in principle with the multilateral approach, there is widespread disagreement on the acceptance of the instruments from the Convention.

Africa is pushing for a continuation of the Kyoto Protocol into a second commitment period. In terms of mitigation by developed countries, the African group sees the Kyoto Protocol as the best model to reach a legally-binding agreement and to hold industrialised economies accountable for their past and future GHG emissions. LDCs have stressed that the Protocol has established the institutional and governance structures that ‘are and must remain at the heart of the climate regime’.<sup>17</sup>

Regarding adaptation, further guidance is required on how adaptation funding will be allocated and disbursed. Africa (particularly LDCs and SIDS) argue for priority access based on the continent’s vulnerability. With regards to technology, a three-part technology mechanism under the Convention has been proposed.<sup>18</sup> The question remains as to how any technology institutional frameworks would be supported and resources, given the lack of clarity on climate financing mechanisms. The institutional arrangements for climate financing will largely depend on final agreement reached in terms mitigation, adaptation and technology.

Africa is demanding additional flexibility in these instruments so that low-emitting or carbon-neutral nations can still benefit from them. For example, South Africa, as the continent’s biggest emitter, has been able to tap into the CDM market easily owing to its great emission reduction capacity. However, the current CDM methodology does not

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<sup>16</sup> For example, the ALBA group (Venezuela, Bolivia, Ecuador, Nicaragua and Antigua & Barbuda).

<sup>17</sup> IISD (2010), ‘Summary of the Tianjin Climate Change Talks: 4-9 October 2010’, *Earth Negotiations Bulletin*.

<sup>18</sup> This includes: (a) a Technology Executive Committee; (b) a Climate Technology Centre; and (c) a global Technology Network.

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account for the fact that the country's coal-based electricity supply is also exported to other countries in the SADC region. As a result, energy importers such as Namibia, Zimbabwe and Lesotho are not eligible to cash-in on emission reductions from their neighbour, even though they are contributing to South Africa's growing global carbon footprint.

(4) Africa's red lines: the African group has clearly stated that mitigation commitments by developed countries must be resolved urgently. Progress in other negotiating areas will be rendered insufficient if a legally-binding outcome does not emerge from the negotiating sessions with a clear post-2012 regime.

The African demands noted above on the way to Cancun are fairly comprehensive, with common areas of agreement with the position of other developing countries. There are certain lines Africa will not cross and paths the continent will not follow, if it is to agree to a legally-binding agreement.

In line with the G77+China, Africa has a firm position on resisting any mitigation action commitments imposed on developing countries by Annex I parties. This approach is informed by the principle of 'common but differentiated responsibilities'.<sup>19</sup> It is important to underscore that progress in other negotiating areas will be rendered insufficient if a legally-binding outcome does not emerge from the negotiating sessions with a clear post-2012 regime. Meanwhile, the continent agrees to the development of mitigation strategies that include NAMAs in a way that effectively capture and follow the national priorities of each of the countries, particularly poverty reduction and the attainment of the MDGs.

Discussions around the requirement by developed countries for developing countries to follow international measurement, reporting and verification (MRV) procedures for internationally-supported NAMAs will not be entertained until developed-country commitments are undertaken. Africa underscores the need for international MRV requirements to respect national sovereignty of its countries. Most critically, Africa requires that Annex I countries determine an overall numeric target both in the current AWG-LCA and AWG-KP negotiation texts. This is due to the insufficient level of ambition, or willingness to comply, shown by Annex I countries in the Copenhagen Accord.

The Accord shifts the emphasis from legally-binding commitments to voluntary emission pledges. Recently, South Africa noted that the long-term global goal for emission reductions is more than just a number, but also nothing without a number.<sup>20</sup> Also, Africa will not pursue NAMAs unless this is accompanied with intellectual property-right sharing provisions to support them. The process of economic transformation to a low-carbon intensive path is costly in the short term for any country. Therefore, Africa feels less compelled to make any efforts in this regard, particularly in the current economic context.

**Conclusion:** This paper has attempted to provide a detailed understanding of climate impacts in Africa. Indeed, reduced rainfall may have adverse effects in dry regions (eg, land degradation in northern Nigeria), but have a positive impact in humid or flood-plain areas (eg, a reduced incidence of malaria in Mozambique). Therefore, climate policy-making in Africa should not only respond to general climate risks (eg, coastal

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<sup>19</sup> Principle 7 of the *Rio Declaration* emerging from the 1992 UNCED 'Earth Summit'.

<sup>20</sup> IISD (2010): South Africa, for the Africa Group, offered a proposal to insert a collective mid-term goal and then agree on a process to negotiate pledges reducing emissions by at least 40% by 2020.

infrastructure development against sea-level rise around Africa), but also reap the specific opportunities brought about by climate mitigation (eg, carbon markets for REDD+ initiatives in Congo DR). In the same light, the EU, and particularly Spain, should not only identify interventions requiring donor assistance in Africa (eg, support for crop-switching initiatives in rural Lesotho) but also developments making business sense (solar or wind technology investment in Namibia). Taking this detailed approach has also contributed to a better understanding of the nuances in national negotiating positions across the continent. Nonetheless, Africa's overall approach to Cancún shows its focus on the next step in the road to a post-Kyoto climate regime (COP-17 in South Africa). It considers the little room provided in Mexico for a global outcome that bypasses the red lines Africa will not cross.

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## Annex 1. Africa's Climate Zones: Case Study Selection

<b>(1) Tropical Rainforest</b> <i>Congo DR</i>	<b>(2) Tropical Wet and Dry</b> <i>Nigeria</i>	<b>(3) Tropical Dry</b> <i>Namibia</i>
<b>(4) Mountain</b> <i>Tanzania</i>	<b>(5) Mediterranean</b> <i>Tunisia</i>	<b>(6) Middle Latitude Dry</b> <i>Lesotho</i>
<b>(7) Humid Subtropical</b> <i>Mozambique</i>	<b>(8) Island</b> <i>Mauritius</i>	<b>(9) Mixed</b> <i>South Africa</i>

### (1) Tropical Rainforest: Congo DR<sup>21</sup>

The impacts of climate change are already noticeable throughout the country. Particularly, there is a persistence of excessive heat waves, violent rain, soil degradation (especially by furrowing erosion), a prolongation of the dry season and an increase of the drought sequences during the rainy seasons, as well as floods. Figure 2 shows an overall summary of the range of projected variations for temperature, precipitation and atmospheric pressure.

**Figure 2. Congo DR: Climatic Parameter Variation<sup>22</sup>**

Parameter	2010	2025	2050	2100
Temperature (°C)	0.45 to 0.52	0.91 to 1.03	1.72 to 2.08	2.69 to 3.22
Precipitation (%)	0.3 to 2.5	0.4 to 4.2	0.3 to 7.5	0.8 to 11.4
Atmospheric pressure (hPa)	- 0.08 - 0.006	to - 0.16 to - 0.13	- 0.29 to - 0.25	- 0.5 to - 0.39

Source: UNFCCC (2009) DRC's SNC.

Climate impacts on agriculture, among other land-use, land-use change and forestry (LULUCF) activities, are expected to have a direct incidence on the population's food security. Indeed, the LULUCF sector is DRC's most carbon intensive (see Table B below for GHG assessment). Its greenhouse gas inventory shows Congo DR's insignificant contribution to global emissions and significant carbon capture/sequestration potential:

**Figure 3. Congo DR: CO<sub>2</sub> Emission/Sequestration Sectoral Assessment**

Emissions (sectoral %)	1999	2000	2001	2002	2003
CO <sub>2</sub> emissions (Gg)	553,188	330,351	196,796	370,944	428,233
Land use and forestry	501,889 (91%)	280,345 (85%)	147,418 (75%)	321,786 (87%)	378,708 (88%)
Other sectors	51,299 (9%)	50,006 (15%)	49,378 (25%)	49,158 (13%)	49,525 (12%)
CO <sub>2</sub> Absorption/Sequestration (Gg)					
Land use and forestry	- 548,068	- 562,679	- 500,357	- 496,999	- 495,334
Net assessment	5,120	- 232,328	- 303,561	- 126,055	- 67,101

Source: UNFCCC (2009) DRC's SNC.

<sup>21</sup> UNFCCC (2009) Democratic Republic of Congo's Second National Communication to the UNFCCC (DRC's SNC).

<sup>22</sup> These climate projections are based on the MAGICC-SCENGEN global circulation models, proposed by default by the IPCC for this part of the world.

### (2) Tropical Wet and Dry: Nigeria<sup>23</sup>

The IPCC's Second Assessment Report of 1995 established a general trend of 0.2°C-0.3°C rise in temperature in West Africa per decade. Nigeria's large size and geographical location affords the country both wet and dry climates. The Niger Delta, the Lagos, Calabar and Ondo regions, belonging to the southern humid tropical zone, expect an increase in both precipitation and temperature.

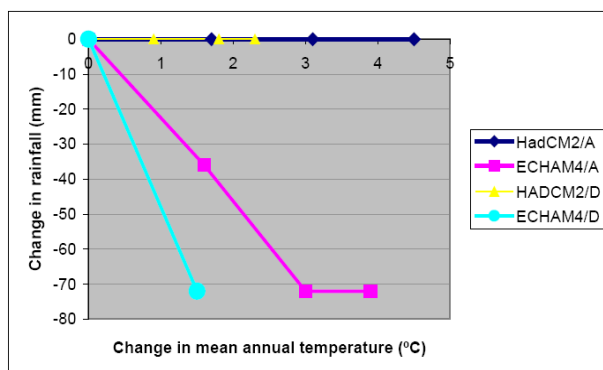
Expected climate impacts include shift of optimal crop conditions for Nigeria's most common produce (eg, millet, sorghum, sugar and maize) to less used crops (eg, wheat, rice and potatoes). Meanwhile, the Sudan-Sahel zone, or northern savannah area, expects drought persistence leading to reduced soil moisture and a further desertification processes, with a negative impact on the country's large livestock numbers (eg, reduced pastureland and declining water resources).

Finally, as the continent's largest oil exporter, a sea level rise is projected to have adverse effects on offshore oil and gas production facilities, as well as along the coastal areas, both in terms of equipment and infrastructure maintenance. Meanwhile, electricity production in the north, through the Kainji hydroelectric power station on the River Niger, will suffer from reduced rainfall due to an expected decrease in river flow.

### (3) Tropical Dry: Namibia<sup>24</sup>

Namibia is one of the driest countries in the world, with low and highly variable annual rainfall, and with water scarcity in a large piece of land, the least densely populated in the continent.<sup>25</sup> Climate scenarios project mean annual temperature increases (depending on region) ranging from 2°C to 6°C above the 1961-90 mean temperature, coupled with decreases in rainfall (see Figure 4).

**Figure 4. Namibia: Climate Change Projections in Windhoek in Various Climate Scenarios**



Source: UNFCCC (2002) Namibia's INC.

With lack of water as the key limiting factor for the country's development, already high solar radiation, low humidity and high temperatures is expected to lead to higher evaporation rates, extreme climatic conditions will directly impact 70% of Namibia's

<sup>23</sup> UNFCCC (2003a) Nigeria's First National Communication under the UNFCCC (Nigeria's INC).

<sup>24</sup> UNFCCC (2002) Namibia's Initial National Communication to the UNFCCC (Namibia's INC).

<sup>25</sup> Namibia, with a total land area of 824,268 km<sup>2</sup> (the size of France and Germany put together) is the second least-densely populated country in the world after Mongolia with an approximate population of 2 million inhabitants.



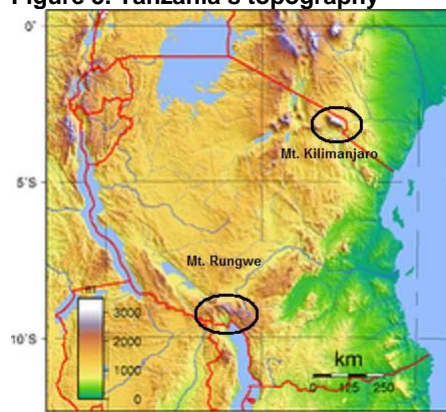
population, who practise subsistence crop farming and agro-pastoralism on communal land. Climate change is also projected to have an adverse impact on the country's energy-intensive and key mining sector (diamonds, uranium).

Namibia's own electricity production is primarily concentrated in the northern border with Angola. The Ruacana hydroelectric power plant significantly depends on the flow of the Kunene River,<sup>26</sup> expected to become drier, thereby leading to curtailed electricity generation. Meanwhile, sea level rise and warming-up of its Benguela current system can negatively impact Namibia's fishing sector, ie, its second foreign-currency earner (after mining), and with the third-largest output (after both mining and agriculture). Apart from the impact on the coastal infrastructure and declines in pilchard stocks, the effects might be extended to other marine resources.

#### *(4) Mountain: Tanzania<sup>27</sup>*

Climate-change projections for Tanzania point to rises in temperature and increases in rainfall in high altitude areas (with decreases in other areas). The impact of these changes will be noticeable in vulnerable sectors of the economy (agriculture, water resources, forestry and livestock). The severity of the impact will depend on the area, with the focus on the mountain climate of the highlands, eg, Mount Kilimanjaro and Mount Rungwe (see Figure 5).

**Figure 5. Tanzania's topography**



Source: Wikipedia.<sup>28</sup>

High-altitude zones may suffer an increase in the occurrence of diseases and pests as a result of higher temperatures and increased rainfall. Maize yields are expected to be reduced by 33% around the country. In the meantime, areas getting less rainfall than normal (in the plateau zone) will require a switch to drought-resistant crop varieties due to evapo-transpiration.

#### *(5) Mediterranean: Tunisia<sup>29</sup>*

Tunisia's location at the junction of the West and East Mediterranean sea, and north of the Sahara, gives the country a mixture of Mediterranean, semi-arid and desert-arid

<sup>26</sup> Namibia's electricity demand roughly doubles its in-country generating capacity –Ruacana (249 MW capacity), Van Eck (120 MW) and Paratus (46 MW)–, thus also relying on imports (mainly from South Africa).

<sup>27</sup> UNFCCC (2003b) United Republic of Tanzania's Initial National Communication to the UNFCCC.

<sup>28</sup> Tanzania's Topography ([http://en.wikipedia.org/wiki/File:Tanzania\\_Topography.png](http://en.wikipedia.org/wiki/File:Tanzania_Topography.png)).

<sup>29</sup> UNFCCC (2001) Tunisia's Initial National Communication to the UNFCCC.

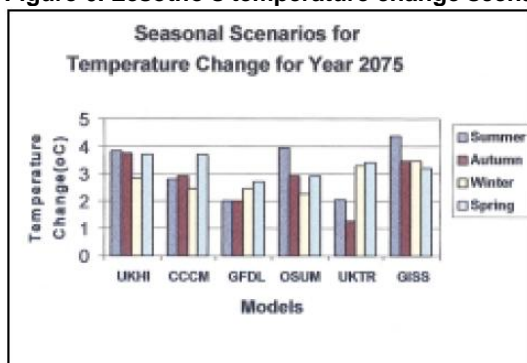
climates. The main focus of the present case study selection is on the former, characterised by a hot and dry summer, and a relatively mild and rainy winter.

An accelerated sea-level rise poses the biggest threat to the economic development of the country, with potential adverse effects on any sector related to the sea or the coast. On the basis of the six climate scenarios from the IPCC, an elevation of the sea level from 38 to 55 cm will occur, thereby affecting the coastal natural and fitted infrastructure of the country's 1,300 km-long coast.

#### (6) *Middle Latitude Dry: Lesotho*<sup>30</sup>

Lesotho is a small landlocked country that experiences harsh climatic conditions. With a resource-poor economy and high levels of environmental degradation, including soil erosion, the growing season for many crops is very limited. Climate scenarios predict a warmer temperature (Figure 6) and lower precipitation, with a drastic water stress and scarcity prospects.

**Figure 6. Lesotho's temperature change scenarios**



Source: UNFCCC (2000a) Lesotho's FNC.

These conditions will have a severe impact on households and livestock, given the rain-dependent crop yields and the country's heavy dependence on food imports to satisfy local demand. Meanwhile, Lesotho's freedom from climate-related diseases, such as those in the tropics (eg, malaria), is projected to shift given drier conditions, with an increased incidence of respiratory infections (eg, tuberculosis).

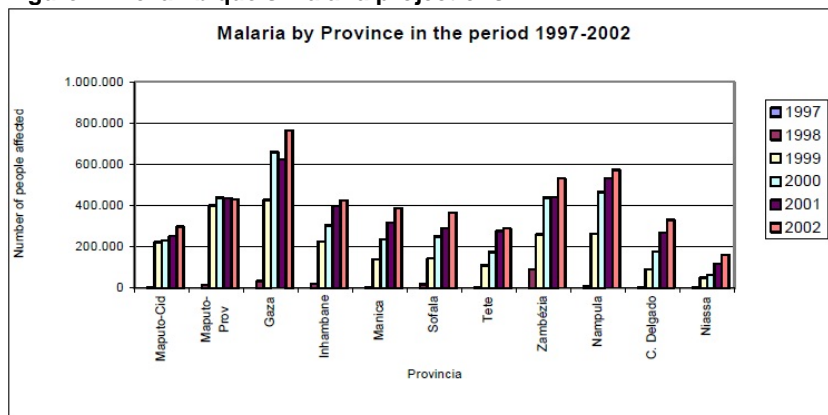
#### (7) *Humid Subtropical: Mozambique*<sup>31</sup>

Mozambique's tropical climate is characterised by two main seasons: one hot and rainy (October-April) and the other cold and dry (May-September). Extreme events (floods, droughts and tropical cyclones) around the country and sea-level rises on its 2,515 km-long coast line (the third largest in Africa) pose serious threats to the country (eg, flooding of low coastal areas, aggravation of coastal erosion, soil erosion, reduction of agricultural production and a decrease of nutritional value of plants impacting livestock). In addition to the economic impact, longer lasting floods will increase the incidence of malaria, amongst other health issues (Figure D).

<sup>30</sup> UNFCCC (2000a) Lesotho's First National Communication to the UNFCCC (Lesotho's FNC).

<sup>31</sup> UNFCCC (2003c) Mozambique's Initial National Communication to the UNFCCC (Mozambique's INC).

**Figure 7. Mozambique's malaria projections**



Source: UNFCCC (2003c) Mozambique's INC.

### (8) Island: Mauritius<sup>32</sup>

Small island states are highly vulnerable to climate change, particularly to sea-level rise. In addition to the natural catastrophic effects, the economic impact on sectors dependant on coastal and water resources is significant.

Mauritius is no exception to these impacts. The effects will be pronounced due to natural phenomena (ie, tropical cyclones and tidal waves) or human-induced (anthropogenic) activities (eg, infrastructure development, sand removal, hazardous construction and poorly designed jetties and harbour facilities).

According to the IPCC, an accelerated sea-level rise is expected to worsen these problems with sea level expected to rise between 15-95 cm (some scenarios in Mauritius project rises from 50 cm to 2m). Apart from the expected land loss, beaches will be eroded (with adverse impacts on the country's tourism industry), coral reefs will become degraded and wetlands be lost.

### (9) Mixed: South Africa<sup>33</sup>

South Africa represents a mixture of at least five climate zones (see Figure 1): (1) humid subtropical; (2) tropical dry; (3) middle latitude dry; (4) mountain; and (5) Mediterranean. Overall climate projections for the country in the next 50 years predict 1°C-3°C temperature increases from current levels, broad reductions of 5%-10% of current rainfall (though with regional variations depending on the zone) and a general extension of summer season characteristics.

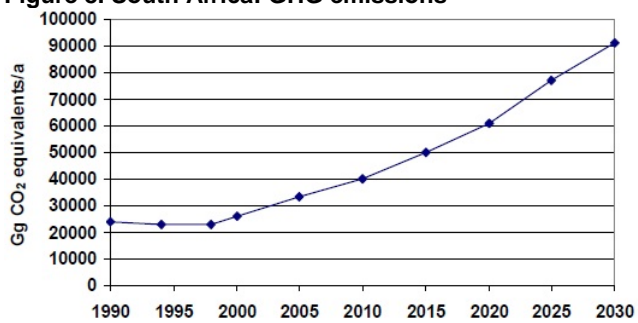
The impact of the expected climatic conditions also varies depending on location. However, general predictions point to an increase in the occurrence of respiratory and skin-related illnesses (eg, strokes, dehydration, skin rashes and non-melanoma skin cancers). In addition, the extension of summer months is expected to result in the increase of malaria-prone areas and periods, particularly on the humid coastal regions of the Indian Ocean. Furthermore, the overall expected reduction in the amount or reliability of rainfall, coupled with an increase in evaporation from increasing warming, is expected to exacerbate South Africa's water availability concerns. Water scarcity will directly impact on the country's maize production.

<sup>32</sup> UNFCCC (1999) Mauritius Initial National Communication to UNFCCC.

<sup>33</sup> UNFCCC (2000b) South Africa's Initial National Communication to the UNFCCC (South Africa's INC).

Meanwhile, global climate change concerns, as well as responses to it, will have an incidence on South Africa's mineral exports (eg, coal, diamonds and uranium). The implementation of mitigation measures in industrialised countries may be, on the one hand, positive (with the shift from fossil-fuel energy production from the North to the South), and negative (with a decrease of energy imports from these same countries). South Africa needs to carefully manage the expected increase of greenhouse gas emissions fuelling its growth (see Figure 8).

**Figure 8. South Africa: GHG emissions**



Source: UNFCCC (2000b) South Africa's INC.