Financing Disaster Risk Reduction and Climate Services in the Context of Africa's Development

By

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Introduction

In Africa, political commitment to Disaster Risk Reduction (DRR) is growing. The Hyogo Framework for Action (HFA) 2005-2015 endorsed by the United Nations General Assembly following the 2005 World Disaster Reduction Conference, provides a new vision to address disaster risks in a more proactive and preventive manner, as prevention is possible and often cost-effective, and investing in hydro meteorological infrastructure and services will have high return on investment (World Bank and United Nations, 2010).

The recent IPCC Fifth Assessment Report (AR5) concludes that despite progress recently achieved on managing risks from current climate variability and near-term climate change, this will not be sufficient to address long-term impacts of climate change, including the exacerbation of extreme weather and climate events.

This Paper seeks to assess the financing needs and flows for disaster risks and climate services in Africa over recent years, and further explore financing options to foster and scale up investments on DRR and climate services in Africa. But, before exploring financing needs, flows and options for Africa, the following section briefly provides an overview of the status of hydro meteorological hazards and related disasters in Africa.

Overview of hydro meteorological hazards and disasters in Africa

Africa, particularly Sub-Saharan African Africa (**Box 1**) is highly exposed to hydro meteorological hazards (principally drought and flood) which account for more than 80% of loss of life and 70% of economic losses. Drought is the greatest natural hazard in Africa and a major driver for overall international humanitarian aid to the region. For example, drought accounted for an average 36% of all United Nations World Food Programme (WFP) responses between 2002 and 2009 in sub-Saharan Africa. Since 1990, there have been 132 recorded droughts in sub-Saharan Africa, including the most recent events seen in the Horn of Africa and parts of the Sahel (ARC, 2012).

Box 1: Africa's high vulnerability to drought and flood

Drought: The most prolonged and widespread droughts occurred in 1973 and 1984, when almost all African countries were affected, and in 1992, when all southern African countries experienced extreme food shortages. In 1973 alone, drought killed 100,000 people in the Sahel.
Flooding: In 1998 many parts of East Africa experienced record rainfall (up to ten times the usual amount) and disastrous flooding. In Uganda alone more than 10,000 people were affected, directly or as a result of ensuing cholera epidemics; 40 percent of the main roads were destroyed.

Figure 1 illustrates the number of people affected by a number of natural disasters from 1971 to 2001 in Africa

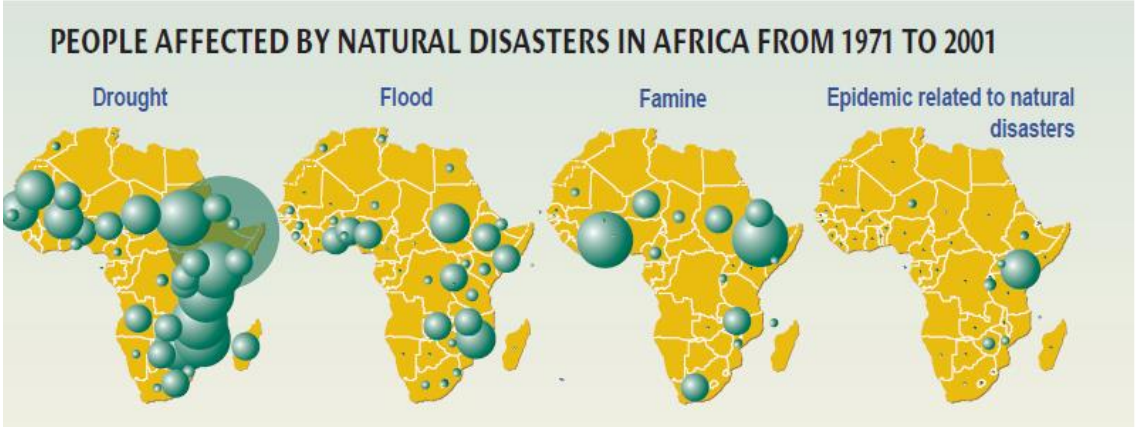
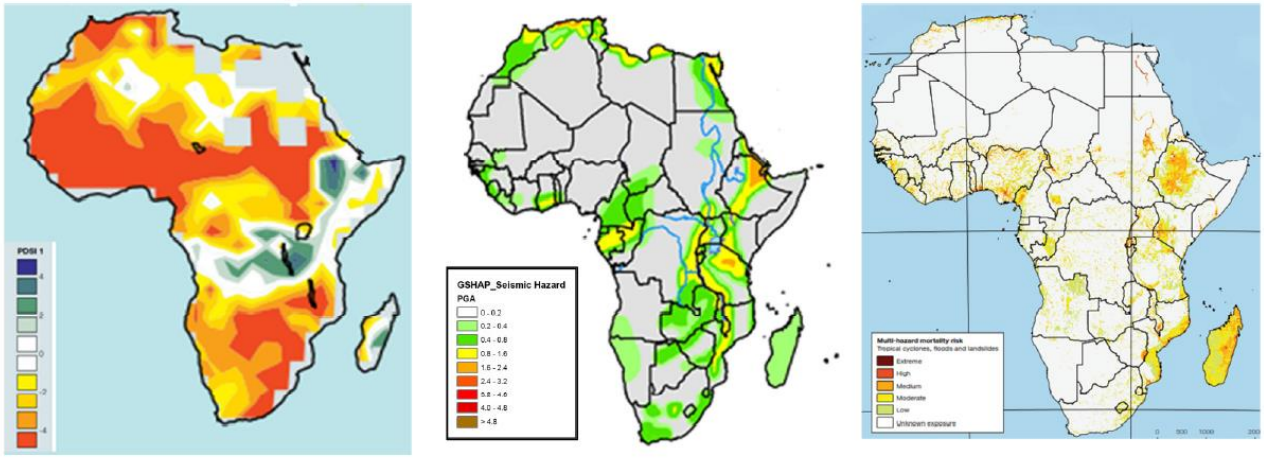


Figure 1: People affected by Natural Disasters in Africa from 1971 to 2001
Source: Office of US Foreign Disaster Assistance (OFDA); Centre for Research on the Epidemiology of Disasters (CRED); International Disaster Database; Université Catholique de Louvain, Brussels, Belgium.

The fragility of African countries to natural hazards is amplified by climate change, placing a heavy burden on Africa's economy, and putting pressure on African governments and partners to act reactively, with a focus on post-disaster response. Between 1975 and 2008, the continent experienced the highest loss of life resulting from disasters of any region worldwide. In addition, long-term development in the region has been hindered by the damage inflicted by disasters. Damage to assets from disasters have generated short- and long-term economic losses, increased pressure on fiscal budgets and diverted scarce financial resources from the development agenda (World Bank, 2012).

The regional overview of hydro meteorological disasters in Africa shows a great diversity of different African sub-regions in the face of disasters, with some similarities though, for example between Sub-Saharan Africa and North Africa. While drought is seen to be the major hydro meteorological hazard in Sub-Saharan Africa, floods have been recorded as the most frequent and devastating one in North Africa (although, North Africa is an arid area characterized by drought that has now become structural).



Drought risk (as Palmer Drought Severity Index)

Modelled Seismic hazard

Modelled weather-related mortality (flood, cyclones, landslides)

Figure 2: Distribution of disaster risk in Africa (World Bank, 2012)

Sub-Saharan Africa: As described above, almost all countries in Sub-Saharan Africa are exposed to one or more natural hazards. Drought is particularly prevalent in the Sahel, Horn of Africa and countries in Southern Africa. River flooding impacts a number of countries across the continent due to the extent of river basins such as the Congo, Niger, Nile and Zambezi. Flash flooding resulting from excess rainfall is also an issue across Southern Africa. Cyclone risk is limited to the South-Eastern coast of the Indian Ocean with Madagascar, Mozambique, and the Indian Ocean islands at risk. Geological hazards such as earthquakes and active volcanoes are prevalent along the East Africa rift, which stretches from Eritrea to Mozambique, although risk and exposure is significantly lower for geological hazards relative to weather-related disasters. The threat of tsunamis is present, but low, with Madagascar and other Indian Ocean islands identified as being at risk.

North Africa: While the absolute number of disasters around the world has almost doubled since the 1980s, the average number of natural disasters in Middle East and North Africa has almost tripled over the same period (World Bank, 2014). For the specific case of North Africa, the synergy of natural disasters, rapid urbanization, water scarcity, and climate change has emerged as a serious challenge by making the region's natural resource base fragile and extremely susceptible to a variety of internal and external factors.

In response to the rising trend of hydro meteorological disasters in Africa, appropriate and effective measures need to be taken, including the development of adequate capacities and services that can help reduce and prevent the risks of hydro meteorological disasters. This cannot happen without improving the current situation of hydro meteorological services within the continent.

A. Status of hydro meteorological services in Africa

In Africa, the density and coverage of existing observation networks have generally been described in many literatures as poor and sparse, giving a station density of one per 26,000

km^2, eight (8) times lower than the WMO minimum recommended level, leaving vast areas of Africa unmonitored, and giving the lowest data reporting rate of any region in the world. Washington, et al. (2003) concluded that many African countries have useful networks of secondary stations which do not report internationally, due to the fact that most of African countries are poorly developed, with poor basic climate services, sparse, inadequate and degraded observational networks (ACPC, 2011). As a result, most of the African continent is unmonitored, in particular the Guinea Highlands; the cover area from Nigeria to East Africa; and the Equatorial Africa. Further, in Africa, the regional observations networks are linked to each other and to the global system, the WMO Global Telecommunications System (WMO GTS) through key GTS hubs that have the responsibility for the collection of observational data from national meteorological and hydrological centres as well as centres with similar functions. These Regional Meteorological Telecommunication Hubs for Africa are: Algiers (Algeria), Brazzaville (Republic of Congo), Cairo (Egypt), Dakar (Senegal), Lusaka (Zambia), Nairobi (Kenya), Niamey (Niger) and Pretoria (South Africa). However, the telecommunication networks used by most of the National Meteorological and Hydrological Services in Africa are inadequate and obsolete, hampering the efficient flow of observations and products. Inefficient and unreliable telecommunication networks also limit the ability of the National Meteorological and Hydrological Services to provide and disseminate information, particularly to rural areas. Associated IT and telecommunication networks are characterized by widespread deficiencies in equipment, computing capacity and Internet access. Inadequate infrastructure is among the factors that limit the capacity of African National Meteorological and Hydrological Services to take full advantage of advances in available science and technology to improve their services. Not only is the equipment available inadequate and insufficient, many African National Meteorological and Hydrological Services have too few skilled staff to operate and maintain the telecommunications infrastructure.

In Africa, many stations part of the WMO Regional Basic Climate Network (RBCN) do not report climate data; the challenge being the inaccessibility of the surface, upper air and climate data from the existing regional networks monitored and coordinated by WMO Secretariat. According to the list of WMO regional station networks, the availability of synoptic (SYNOP), surface and upper air (TEMP) and climate (CLIMAT) reports received from the Regional Basic Synoptic Networks (RBSNs) and Regional Base Climatological Networks (RBCNs)[1] for Africa is very poor as compared to other regions. Evidence shows that although the global reception rates determined in the annual monitoring exercise of WMO have gradually improved, substantial regional differences persist, particularly in Africa. Major challenges remain: poor observation networks, high cost of equipment, lack of maintenance, limited skills-set and software problems. As a result, most of weather and climate stations in Africa do not properly report data to the existing regional networks.

Due to the poor status of the existing national observation networks and to other factors such as cost of equipment, lack of maintenance, limited skills-set and software problems, most of

1 The Regional Basic Synoptic Network (RBSN) defines those observing sites whose near real-time observations are necessary to capture the state of the atmosphere with sufficient accuracy to support weather forecasting. The Regional Basic Climate Network (RBCN) specifies those observing sites whose observations are needed to compile climate statistics for a region. In Africa, the regional networks comprise key centres that have the responsibility for the collection of observational data from national meteorological centres as well as centres with similar functions or island stations. These Regional Meteorological Telecommunication Centres for Africa are: Algiers (Algeria), Brazzaville (Republic of Congo), Cairo (Egypt), Dakar (Senegal), Lusaka (Zambia), Nairobi (Kenya), Niamey (Niger) and Pretoria (South Africa).

weather and climate stations in Africa do not properly report data to the existing global and regional systems.

In Africa, in addition to less number of stations, the data recording and transmission is a pressing challenge, as most of stations which are not recording (silent stations) or are recording less 50 % of the time are located in Africa. The Global Climate Observing System (GCOS) Surface Network (GSN) hosted by WMO reported that while data availability from the basic synoptic upper-air network of about 1300 upper-air meteorological stations worldwide within the WMO Global Observing System (GOS) was relatively satisfactory for the northern and eastern parts of Asia, North America, and many countries in Europe and the Pacific region, the low reception rates shown for Africa are a particular concern. Since 2001, the Inter-governmental Panel on Climate Change (IPCC) and Global Climate Observing System (GCOS) warned the United Nations Framework Convention on Climate Change (UNFCCC) that despite the improvements made in the past few years, current climate observational networks are declining in many parts of the world and that additional and sustained climate observations are required to improve the ability to detect, attribute and understand climate change and to project future climate changes.

Additionally, weather observations taken from aircraft seem to perform very low in Africa, making the issue of safety of air navigation in Africa a particular concern, as many countries in Africa do not yet comply with international standards including the Quality Management System (QMS) set by the International Civil Aviation Organization (ICAO) and the World Meteorological Organization (WMO). For instance, the coverage of the WMO Aircraft Meteorological Data Relay (AMDAR) Programme is poor in Africa given the size and population of the continent. Since the beginning of flight, weather observations taken from aircraft have made significant contribution towards understanding the current state of the atmosphere while weather information also contributes to the safety of the air navigation. Despite the efforts made to improve the provision of weather observations from aircraft, the coverage is still very problematic in Africa as well as in Asia Pacific, Caribbean and Central America, Middle East and Central Asia, and the former Soviet Union.

Though the Aircraft Meteorological Data Relay (AMDAR) Programme has grown dramatically as a highly successful and mutually beneficial collaboration between national meteorological services and commercial airlines and is now a core component of the WMO Integrated Global Observing System (WIGOS), the sounding, or vertical profile data, in Africa accounts for only 2.6% of the global total with the majority occurring in South Africa and 45% of the total occurring at Johannesburg alone; only 30 cities reporting soundings across the entire continent. There is therefore a need to further enhance collaboration between meteorological agencies and the Aviation Industry with the aim of facilitating a rapid, sustainable and widespread expansion and enhancement of the weather observations from aircraft. Moreover, most of African NMHSs do not recover costs from the meteorological services they provide to the civil aviation sector. Currently, out of 17 African countries members of the Agency for the Agency for the Safety of Air Navigation in Africa and Madagascar (ASECNA), only seven have recently undergone external audits and are working on the non-conformances that have been identified. Others have started the process and in total 11 members are certified with a number at advanced stage of the quality management system implementation. Many countries in Africa did not meet the deadline for compliance with requirements for competency assessment for personnel serving international air navigation which was 1 December 2013.

While current absence of cost recovery from the aviation sector in many countries is considered a lost opportunity to address the funding gaps of the NMHSs, it raises the issue of data commercialization with related implications such as sale and restricted access to weather and climate services considered to be global goods.

Economic assessment of hydro meteorological disasters in Africa

The recent Africa Economic Outlook 2014 by AfDB, OECD and UNDP suggests that Africa has maintained an average growth rate of about 4% and that this economic growth varies widely across the continent reflecting differences in stages of development, availability of natural resources, weather conditions, etc. The Outlook 2014 identifies weather conditions as major risks which may be worse than assumed and reduce harvests and cause food prices to rise, thereby compromising the economic growth in Africa. Moreover, the recent AfDB Tracking Africa's Progress Report highlights that in Africa the Official Development Assistance (ODA) remains the biggest financial inflow, followed by remittances and foreign direct investment. Countries like Liberia, Burundi, Sierra Leone, Democratic Republic of Congo, Mozambique, São Tomé and Príncipe, Guinea Bissau, Eritrea, Malawi, and Rwanda are all amongst the world's most aid-dependent countries (AfDB, 2014).

That said, it is important to note that hydro meteorological disasters are likely to compromise the positive economic growth being experienced by most of the African countries over the last 10 years.

The vulnerability of an economy to natural hazards is determined by a complex set of influences, with both severe short-term and long-term consequences for African economies. The degree of economic vulnerability is exhibited post-event by the magnitude and duration of the indirect follow-on effects, comprising business interruption costs to firms unable to access inputs from their suppliers or service their customers, income losses of households unable to get to work, or the deterioration of the fiscal stance post-disasters as less taxes are collected and significant public relief and reconstruction expenditure is required. At a macroeconomic level, adverse impacts include effects on gross domestic product (GDP), consumption, among others.

Recent research on financial vulnerability to disasters has hitherto focused on developing countries' financial vulnerability, looking into the ability of African countries to access domestic and foreign savings for financing post-disaster relief and reconstruction needs in order to quickly recover and avoid substantial adverse ripple effects. This has motivated many governments, as well as development institutions, NGOs, and other donor organizations, to consider pre-disaster financial instruments as an important component of disaster risk management (IPCC, 2012).

Overall, economic losses from weather- and climate-related disasters have increased, but with large spatial and inter-annual variability. IPCC (2012) reported that the economic losses associated with weather, climate, and geophysical events are higher in developed countries whereas the fatality rates and economic losses expressed as a proportion of gross domestic product (GDP) are higher in developing countries. IPCC (2012) also concluded with high confidence that increasing exposure of people and economic assets has been the major cause of long-term increases in economic losses from weather- and climate-related disasters.

World Bank (2012) suggests that although total economic losses caused by disasters appear low in Africa relative to other regions, when these are considered in the context of total GDP, the financial impact of disasters is extremely high. For instance, drought cost was estimated at 8-9% of GDP in Zimbabwe and Zambia in 1992, and 4-6% in Nigeria and Niger in 1984. The 2000 floods in Mozambique cost an estimated $550 million and lowered the GDP growth rate to 1.5 percent. A 2009 risk analysis for Malawi estimated average annual GDP contraction of 1.7% as a result of flood and drought.

We can therefore conclude that when economic impacts are compared in relation to the countries' Gross Domestic Product (GDP), it becomes clear that the burden for high-income countries is far lower than for middle and low-income countries, such as many small island states and land locked countries.

Disasters severely impact households and livelihoods, resulting in additional people falling into poverty. Poor people often settle in high risk areas (for example, inundation zones), rely on agricultural labor, reside in houses that cannot resist any disaster impact, and lose income opportunities, and are therefore particularly vulnerable to disasters. Following a disaster, the poor and vulnerable population often has only limited options to reconstruct according to disaster-resistant standards. Macroeconomic impact studies tend to underestimate the true effects of disasters, since most countries suffer from smaller and moderate, but frequently reoccurring disasters, particularly droughts and floods (World Bank, 2010).

The impact of hydro meteorological disasters on the economies of Africa is huge, affecting multiple sectors. In Africa, disaster economic impacts are mostly felt through the productive sector (agriculture, tourism, commerce and industry), infrastructure sector (housing, transportation, power, communication, sanitation and water supply), social sector (education, health, governance), and others.

An analysis made by the International Food Policy Research Institute (IFPRI) in 2012 based on the Africa RiskView[2] model and historical data between 1983 and 2011 estimated annual average response costs of between $US 26 million and $US 319 million for a set of six drought-exposed countries (Ethiopia, Kenya, Malawi, Mozambique, Niger and Senegal). The analysis also showed that drought in these countries is a high-frequency phenomenon, with risk concentrated in the shorter return periods.

In response to frequent and intense drought events in Africa, the African Risk Capacity (ARC) has been recently established under the auspices of the African Union. In 2012, the African Risk Capacity (ARC) reported that at national level, disasters worsen balance of payments, reduce income and impact economic growth. Furthermore, they divert public spending and lead to disruptions to other critical country programmes, as limited budget resources are often reallocated in emergency response before international assistance arrives. At the community level, households are often forced to adopt short-term survival strategies (e.g. migration to low land areas) that can undermine their long-term resilience and food security. It is now clear that early, planned, reliable and appropriate interventions in the event of weather-related emergencies could help reduce the negative impact of a disaster on the lives and livelihoods of the vulnerable, protecting human, social and economic development and reducing the short and the long-term costs of assistance. In addition, contingent funds linked to early warning systems and appropriate contingency plans offer the best solution for delivering more effective and

[2] Africa RiskView is the technical engine of the Africa Risk Capacity (ARC) risk pool, which combines existing operational rainfall-based early warning models on agricultural drought in Africa with data on vulnerable populations to form a standardized approach for estimating food insecurity response costs across the continent.

efficient responses to weather shocks in the short term and can facilitate longer-term investments in increasing food security, disaster risk reduction and climate resilience.

ARC estimates that pooling risk across the continent could save countries up to 50% in the cost related to emergency contingency funds, making ARC a potentially attractive financing mechanism in support of African food security and DRR that can complement other financing instruments such as adaptation finance.

Assessing adaptation financing for Africa

Africa is arguably the most vulnerable region in the world to the impacts of climate change which are assessed to be much higher in Africa than in any other region in the world. In Africa, as corroborated by the Regional Integrated model of Climate and the Economy (RICE)[3] model, it is estimated that climate damages, as a percentage of GDP, may be 10% higher than the next most exposed region (India) and more than twice as high as in the US, Russia, Europe, Asia and Latin America. This vulnerability, coupled with the continent's negligible contribution to current and/or historic emissions, means that adaptation spending is the continent's climate investment priority.

Current levels of climate finance directed to Africa are likely to be insufficient to meet the region's demonstrated need for adaptation finance, estimated by the World Bank to be at least USD 18 billion per year until 2050. So far, Africa has received a little portion of climate finance in general, and adaptation finance in particular. As seen above, the continent is least served by climate finance, despite its high level of vulnerability to climate change impacts in general, and hydro meteorological hazards in particular, in a moment of serious challenges in the delivery of finance for DRR and climate services. A significant barrier to investment is the transaction costs of the small-scale projects that are often required in the poorest areas, and the difficulty of designing and implementing such programs in ways that are financially viable and replicable. Moreover, the delivery of adaptation finance is globally hampered by the limited commitments from the international community to provide sufficient resources to adaptation as part of the so-called climate change principle of "Common but differentiated responsibilities", as well as the cumbersome conditionalities from the existing climate funds. Though the adaptation finance has a great potential to reduce the current gaps in DRR and climate services' financing, it is still not delivered in a manner that can help Africa comprehensively and effectively reduce the hydro meteorological disasters, as these do not seem to be a priority for these funds. The regional distribution of adaptation finance by UNEP in 2009 (**Figure 24)** shows that 60% of adaptation finance were directed to Asia, Middle East and North Africa, leaving a vast majority of Africa without adequate resources to adapt to the adverse impacts of climate change, especially extreme events of drought and flooding.

[3] RICE is a regional model part of he global Dynamic Integrated model for Climate and the Economy (DICE) used in a number of policy simulations to examine the distribution of adaptation costs and the interactions between adaptation and mitigation. Using the limited information available in current models, and calibrating to a specific damage level, so-called adaptation cost curves are estimated for the world.

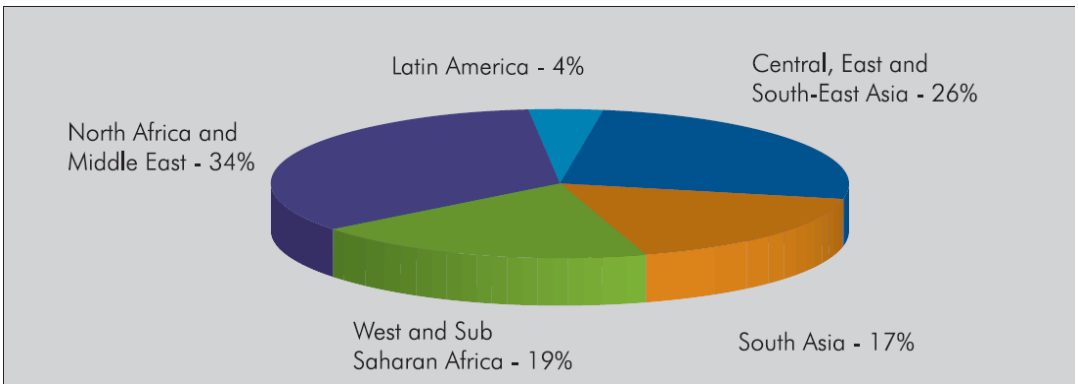


Figure 3: Regional distribution of adaptation finance in 2009 (Source: UNEP, 2010)

A wide number of estimates of the costs of adaptation in Africa have been made, using a variety of approaches. This generates considerable uncertainty with the full range of estimates spanning US$ 2 billion to US$ 60 billion per annum. However, AfDB (2011) estimated that adaptation costs in Africa are in a range of US$ 20-30 billion per annum over the next 10 to 20 years, and that this amount is on top of existing development and poverty alleviation needs, which could be in the order of US$ 70 billion to meet the Millennium Development Goals. To date, there has been approximately $350 million of adaptation funding approved for spending in Africa, of which only $132 million has been disbursed. This extremely weak funding has so far low impact in Africa, as this supports small-size and pilot projects, with more emphasis on capacity building activities that still need to demonstrate results and success.

Recently, as a major player of climate finance in Africa, the African Development Bank (AfDB) has significantly increased its support to climate-related interventions in Africa. As of November 2013, the Bank reported that its investments for the implementation of its Climate Change Action Plan (CCAP) 2011-2015 amounted to USD 3.4 billion. Out of this, about 70% (USD 2.4 billion) were allocated to climate change mitigation (low carbon development) and less than 30% (USD 996.74 million) for adaptation (climate-resilient development), as described in the below **Figure 4**.

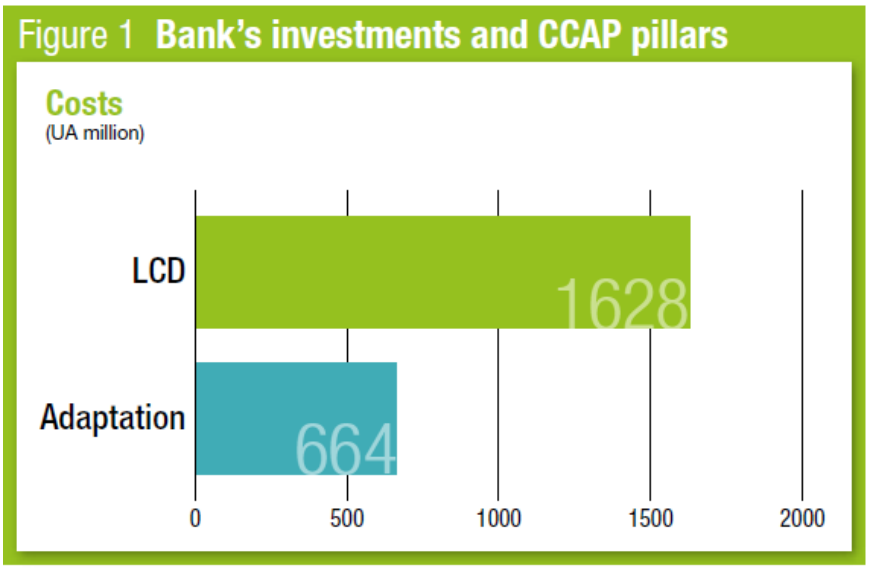


Figure 4: African Development Bank's investments through its Climate Change Action Plan (Source: AfDB, 2013)

From this funding, it is unclear how much the Bank has invested to support disaster risk reduction and climate services in Africa.

From the above, we can conclude that several challenges undermine Africa's access to climate finance, including:

- Weak capacity among governments to meet international standards and funds' eligibility requirements related to preparing project concept notes and full proposals;
- Lack of governance and coordination among relevant agencies to leverage existing climate change resources;
- Lack of appropriate regulatory reforms and policies and related national development plans and prioritization of investment;
- Lack of explicit support to climate change, combined with human resources challenges;
- Limited absorptive capacity of African countries to receive and manage funds at scale;
- Fragmentation of existing funding instruments further aggravates the situation.

AfDB (2011) concludes that in Africa, there is a pressing need to mobilize resources to address the continent's current limitations to deal with climate events, as well as resources to deal with future climate change, and that adaptation investments have the potential to substantially reduce the hardship from climate change in Africa.

Sources of financing for hydro meteorological disasters in Africa

The financing for hydro meteorological-related disasters in Africa derives from a variety of sources. World Bank (2012) distinguishes between ex-post and ex ante sources of finance for disasters in Africa.

A. Ex-post sources of finance

Ex post financing mechanisms of managing the impacts after event occurrence include tools such as international assistance, external credit, budget re-allocation, or tax increases.

International assistance

Dependence on international assistance is extremely high in Africa. For instance, the international donor financing for the 2011 Horn of Africa drought crisis was not mobilized until the crisis point was reached. This delay is largely attributed to the time it took to generate sufficient public attention through the media, following which donors significantly increased the funds available for response. Despite early indications of the drought event from early warning systems such as the Famine Early Warning Systems Network (FEWSNET)[4], the management of this drought that impacted more than 13 million people demonstrated the challenges that result from dependence on external aid for disaster response. An estimated 50,000 to 100,000 lives were lost as a result of this disaster, and according to multiple humanitarian agencies, the death toll was significantly increased by the delay in funding.

World Bank (2012) conclude that the international assistance will always play an important role in disaster response in Africa, but overdependence on this as a source of post-disaster financing is a danger that can slow recovery and inhibit the longer term development due to delays and uncertainty associated with external aid flows.

[4] FEWSNET is managed by the U.S. Agency for International Development (USAID) as an information system designed to identify problems in the food supply system that potentially lead to famine or other food-insecure conditions in sub-Saharan Africa, Afghanistan, Central America, and Haiti

External credit

Following severe disasters such as drought or flood, African governments tend now to borrow money. In some cases, external credit is a viable option to spread the cost of the disaster over time, but for countries with limited fiscal resources, this borrowing can come at a high future cost due to the burden of debt servicing and existing high levels of indebtedness (World Bank, 2012).

However, increasing external borrowing can potentially negatively impact public finances, through for example the appreciation of the country's exchange rate which can damage government revenues by affecting the export-import balance.

Emergency budget reallocation

To deal with disaster-related expenditure, African countries regularly make use of budget reallocation. For example, in Malawi, ministries regularly make use of their "Other Recurrent Transactions" line to deal with additional disaster-related expenditure.

In addition, in the event of a severe disaster, countries may need to free up resources from committed funds under the fiscal budget, including arrangements to defer debt-servicing to free up resources for disaster response. For example, in the aftermath of devastating floods in 2000 Mozambique, the World Bank and the International Monetary Fund (IMF) arranged 12 months of post-disaster debt servicing relief for the country in the context of the Heavily Indebted Poor Countries (HIPC) [5] initiative. Though emergency budget reallocation can be a quick and relatively cheap way to finance the cost of disasters, it carries a high opportunity cost for African countries with limited budgetary resources; diverting funds from the longer-term development agenda (World Bank, 2012).

Tax increases

Although most African countries do not have access to the wide and deep tax revenues of developed economies, tax increases have been used to finance part of the cost of post-disaster reconstruction. For example, in Zimbabwe a special 5% drought levy was introduced for individuals in the higher tax brackets following 1982/83 drought. The country also applied a 2.5% increase to corporate tax in the aftermath of the 1986/87 drought.

B. Ex ante sources of finance

Ex ante sources of finance refer to financial mechanisms that are used to manage the impacts of disasters prior to their occurrence, including the use of annual budget allocations and reserve funds, contingent financing, or insurance and alternative risk transfer.

Annual budget allocations and national reserve funds

The annual budget allocations and national reserve funds are critical elements for disaster risk reduction and disaster prevention in particular, in the context of Africa. Although some

[5] Launched at the G7 summit in Lyon, France in 1996 following a proposal from the World Bank and the International Monetary Fund (IMF), and enhanced in 1999, the HIPC Initiative is an international debt relief mechanism that provides special assistance to the world's poorest countries, placing debt relief in the framework of poverty reduction by aiming to ensure that essential restructuring and the development of a country is not compromised by servicing unsustainable debt burdens. The initiative is designed to help those countries that cannot reach a sustainable debt burden through traditional mechanisms of rescheduling and debt reduction alone, following IMF and World Bank-supported adjustment programmes.

countries have established such facilities for disaster-related expenditure, this is not common practice, and those contingent budget facilities that do exist are underfunded. Further, where these facilities are available, they are often used for other purposes, leaving nothing left for disasters when needed.

Contingent loans and grants

Many developing countries around the world including Sub-Saharan and North African countries are using contingent loans and grants to finance disaster risk reduction activities.

Sub-Saharan Africa: For a number of years, some Sub-Saharan African countries such as Ethiopia have utilized a contingent financing window (comprising grants from international donors) as a means of responding to droughts. For example, the World Bank's contingent credit facility for IBRD6 countries named as "Catastrophe Deferred Draw Down Option (CAT DDO)" allows countries to access a pre-established credit facility in amounts of up to US$500 million or 0.25% of GDP, whichever is less. The CAT DDO[7] was developed by the World Bank to respond to middle income countries' request for loans that better address their immediate funding needs in the aftermath of natural disasters. The overall development objective of the project is to enhance the government's capacity to implement its disaster risk management program for natural disasters. Funds can be drawn down upon the occurrence of a natural disaster resulting in the declaration of a state of emergency. Furthermore, with growing nexus between DRR and development assistance, more flexible development investment is arising, with built-in mechanisms to divert undisbursed development resources to DRR purpose in the event of a disaster during the project lifetime. Such contingency mechanisms are already widespread in development lending, and may become a standard feature in the near-term. This will facilitate the post-disaster portfolio restructuring by the International Financing Institutions (IFIs) in order to divert development resources to DRR activities (World Bank, 2012). Other global initiatives also exist such as the Natural Disaster Facility (NDF) jointly managed by the African, Caribbean and Pacific Group of States (ACP) and the European Union (EU) and that aims to provide comprehensive mechanisms to assist ACP States and Regions with: disaster risk reduction, preparedness and mitigation; response, recovery and long-term reconstruction and rehabilitation; and operating effective early warning systems that are people-focused, and completing vulnerability assessments and mapping. Another global initiative that is relevant is the Global Facility for Disaster Reduction and Recovery (GFDRR) that was established in 2006 as a partnership of 41 countries and 8 international organizations committed to helping developing countries reduce their vulnerability to natural hazards and adapt to climate change. 10 Sub-Saharan African countries are among the 20 GFDRR priority core countries.

North Africa: In North Africa, there are some funding provisions at national levels for disasters, but actual budgetary expenses on such events often end up being well in excess of budgeted amounts and result in reallocations or increasing country deficits through borrowing. In Morocco, for example, the government is contemplating a law to add a compulsory guarantee

[6] IBRD stands for International Bank for Reconstruction and Development, established in 1944 as the original institution of the World Bank Group. IBRD raises most of its funds on the world's financial markets and has become one of the most established borrowers since issuing its first bond in 1947, servicing middle-income and credit-worthy lower income countries. It complements the International Development Association (IDA), another arm of the World Bank Group that provides grants and lends money on concessional terms to 82 low-income countries currently eligible.

[7] Costa Rica, the second most exposed country too multiple natural hazards (Natural Disaster Hotspot 2005), was the first to have a CAT DDO approved in September 2008 for USD 65 million.

against catastrophe risk to property insurance policies. This law would use risk-based pricing to increase coverage of private assets against disasters, thus indirectly reducing government's contingent liability. This law would follow international best practices in which governments are working to reduce their contingent liabilities for natural disasters. Even though relevant, such contingency mechanisms are used for day-to-day disaster risk management activities and are not flexible enough to provide resources for disaster prevention activities that contribute to avoid the occurrence of the events (World Bank, 2014).

Insurance and alternative risk transfer

Insurance or alternative risk transfer mechanisms are appropriate financing mechanisms to address the gaps into the DRR and climate services' financing in Africa, but due their high cost of use and perceived high opportunity cost, such mechanisms are rarely used by African countries.

Despite the high cost and the low rate of insurance in Africa, transferring a portion of risk can be of huge benefit to countries that require quick liquidity post-disaster and are unable to otherwise get large amounts of funding required to deal with disasters.

Due to the large proportion of African population that depends on the agricultural sector for its livelihood and the widespread and severe impacts of drought, risk insurance products targeting the agricultural sector are likely to have a particularly large impact on disaster resilience.

Over recent years, new models for insurance provision have been piloted in Africa. However, due to a number of factors such as lack of demand, issues with index data provision or reliability, and lack of suitable distribution networks, these pilot experiences have yet to prove their scaling up potential. The weather-index insurance is growing in Africa providing innovative index-linked cover to farmers for extreme weather events. It has been in use by the government of Malawi for a number of years to transfer part of the cost of extreme drought events into the financial markets. The government of Malawi has received assistance in the payment of the associated premiums from donors.

Moreover, the development of micro insurance in Sub-Saharan Africa is also very low and slow, with more focus on life and health insurance as opposed to non-life. In Africa, it is estimated that only 2.6% of the target consumer group is using a micro insurance product, with very few households, farms and businesses having insurance in place to cover catastrophe risk.

World Bank (2012) examined micro insurance activity on the continent relative to microfinance activity and the size of the target consumer group (**Figure 26**) and concluded that the number of poor with less than USD 2 which have micro insurance cover is growing in East Africa (e.g. Ethiopia, Kenya, Uganda) and CIMA[8] countries as well as in Nigeria and South Africa.

[8] Conférence interafricaine des marchés d'assurance : Conference of Inter-African Insurance Market.

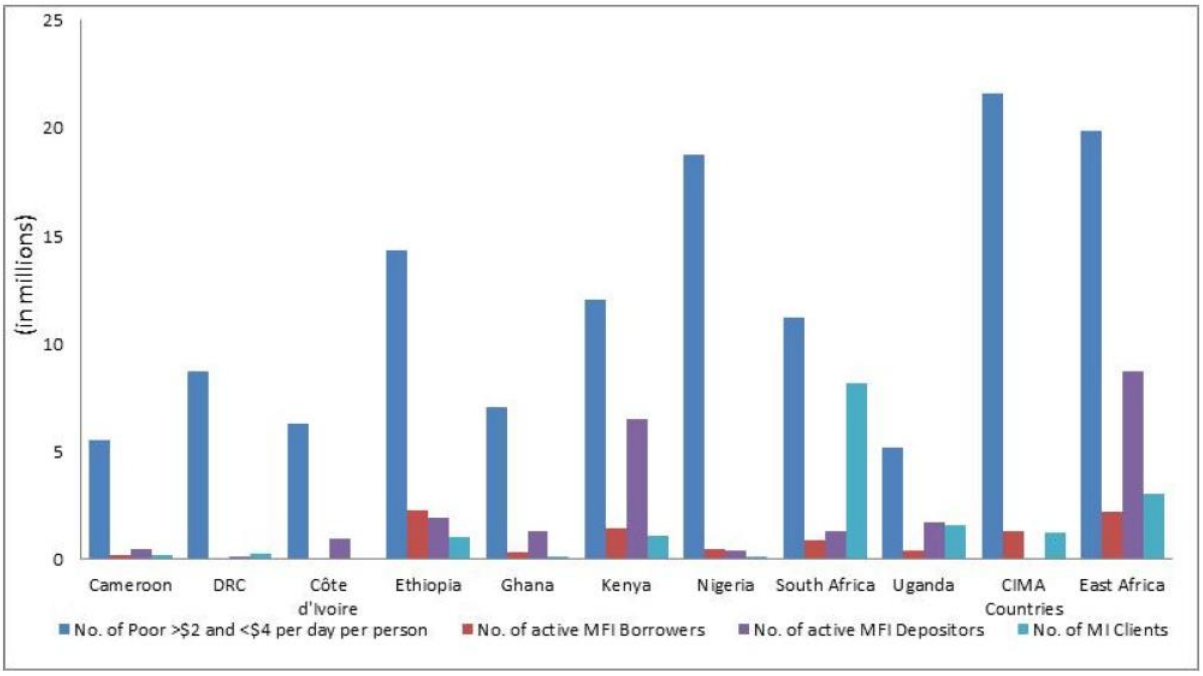


Figure 26: Micro insurance (MI) activity in relation to microfinance activity and target consumer group size in Africa (Source: World Bank, 2012)

Similarly, in North Africa, disaster risk financing and insurance instruments are not used, as the penetration of risk financing in the region has been relatively weak, and many North African countries are finding it increasingly difficult to finance disaster recovery and reconstruction from government budgets. A feasibility study to assess penetration potential of risk financing is being prepared for the region (World Bank, 2014).

Challenges related to DRR and climate services' financing in Africa

According to the most recent DRR progress report for Africa, the lack of effective institutionalization of DRR as a priority at the national and sub-national levels is a particular challenge. Where platforms or coordinating mechanisms are established, they are frequently limited. In addition, risk identification and assessment remains limited, particularly for vulnerability and exposure assessment, thereby limiting the political imperative to invest in disaster risk reduction (DRR). The lack of cross-sector and cross-institutional coordination underlined by low capacity and limited resources, is also an issue.

Of course, the greatest challenge is financing. Although Africa is the most vulnerable region to climate hazards, the financial flows to Africa remain very weak. While Africa is in a crucial need to tackle disaster risks and increase investments on weather and climate services, financing means to do so lack considerably, due to many factors including the lack of visibility of disaster risk reduction and climate services in Africa's development priorities, the focus on post-disaster, the recent international financial crisis, the significant reduction of ODA, the lack of robust and dedicated financing to properly address these issues at continent-wide level. Although financing is required, to attract resources and investments for Africa in this difficult context is not an easy matter.

For the specific case of Sub-Saharan Africa, the inadequate financing is coupled with challenges in the deployment of available funds. This is due to the low priority accorded to disaster risk reduction in budgeting at the national and local levels of government, the limited absorptive capacity and the lack of dedicated funding mechanisms for disaster risk reduction and limited insurance penetration restricting the contribution of the private sector to this agenda. There are some provisions for financing national disaster management plans of some African countries, but these are limited by the lack of ex-ante planning for the deployment of funds (e.g. contingency plans). Often, donors provide the bulk of DRR financing. Moreover, the current systems to respond to disasters are reactive, leaving only a small portion of international financial support directed to prevention and preparedness. Most often, this overdependence on donor financing has restricted the development of DRR financing instruments in Africa.

IPCC (2014) concludes with high confidence that in all regions in Africa, national governments are initiating governance systems for adaptation and responding to climate change, but evolving institutional frameworks cannot yet effectively co-ordinate the range of adaptation initiatives being implemented.

Need for a coherent policy and financing response for Africa

There is a need to create an enabling environment for a well-structured financing mechanism that works for Africa to address DRR and climate services' challenges, with resources coming from various sources. Collective effort, coordination and cooperation are needed to mobilizing resources and addressing DRR and climate services' financing needs in a more holistic and efficient way.

Towards an ex-ante approach: An ex-ante proactive approach towards disaster risk financing is much more needed now, with the potential to reduce human suffering and the overall cost of disaster response. Financing mechanisms that are established ex-ante allow for better contingency planning due to the predictability of resource flows and can therefore improve response execution.

Moreover, there is recognition that catastrophe risk insurance has the potential to increase household resilience to disaster shocks in Africa, but the penetration of such scheme remains extremely low, despite the implementation of a number of innovative insurance pilot projects. It is estimated that less than 9% of adults in South Africa have any insurance cover for their assets; and this figure is likely to be significantly lower for other Sub-Saharan African countries where insurance markets are less developed.

Implementing and sustaining the existing policy frameworks: Over the recent years, African countries and governments have demonstrated a great political commitment and interest to comprehensively address the challenges posed by the hydro meteorological hazards that frequently and intensely hit the continent. As a response, the Africa Regional Strategy for Disaster Risk Reduction and the Extended Programme of Action for the Implementation of the strategy (2006-2015) provide a comprehensive regional framework to strengthen preventive, monitoring, and mitigation measures as well as regional and sub-regional coordination to reduce disaster losses in the region. Under the leadership of the African Union (AU), and with the support of organizations such as the United Nations Inter-agency Secretariat for Disaster Reduction (UNISDR), the African Development Bank and the World Bank, the African Regional Strategy for Disaster Risk Reduction and its Extended Programme of Action (2006-2015) have been developed as a regional instrument to address DRR in Africa. The strategy was first adopted by the African Ministerial Conference and endorsed by the AU Assembly of Heads of State in 2004. Substantive revisions were later introduced to extend its timeframe to 2015 and

align it with the Hyogo Framework for Action. However, the implementation of this Strategy and its implementation programme have not yet achieved their expected results, due to many factors including financing, among others.

Most recently, African countries with support from the African Union Commission and the World Meteorological Organization have established the African Ministerial Conference on Meteorology (AMCOMET) and adopted the Integrated African Strategy on Meteorology (Weather and Climate Services).

Despite their ambitious objectives, the African Strategy on Disaster Risk Reduction and the Integrated African Strategy on Meteorology (Weather and Climate Services) are not being fully implemented due to financing challenges, including the lack of commitments from African countries to generate domestic resources and the limited commitments from the international community. Moreover, there are no clear and implicit provisions for a joint implementation of these two policy instruments, despite their several similarities. However, based on the political commitments shown by African leaders through these strategies, in establishing policy frameworks under the African Union, Africa must now seek to address the regional financing aspects that will greatly facilitate the implementation of the African Strategy on Disaster Risk Reduction and the African Integrated Strategy on Meteorology (Weather and Climate Services).

Important role of AfDB for disaster prevention and climate services: Given its important role to provide development assistance to Africa and to manage special funds, the African Development Bank has a great potential to help this financing gap in Africa, by establishing a well-structured regional financing mechanism on behalf of African countries, in partnership with the African Union Commission, the Regional Economic Communities (RECs). Instead of creating a new regional funding window, the Bank has an option to reactivate and expand its existing Special Relief Fund (SRF) created in 1974 for humanitarian purpose and move towards a comprehensive facility that would incorporate recent developments on disaster risk reduction and climate services. Since its creation in 1974 and its latest revision in 2008, the AfDB's Special Relief Fund (SRF) provides assistance to African countries in need of humanitarian relief. So, in the aftermath of a natural disaster, the response of the AfDB is guided by the Policy Guidelines and Procedures for Emergency Relief Assistance which identify the Special Relief Fund (SRF) as the source of funding for emergency relief, whereas rehabilitation and reconstruction operations have to be financed through regular financing instruments (Ordinary Capital Resources). The maximum amount of each grant amounts to US$ 1.0 million, and specialized agencies, such as UN agencies and NGOs, are responsible for the implementation of these grants. The SRF only approves two operations per country annually. Some examples of SRF support include Sudan where the AfDB approved in September 2010 an emergency relief assistance grant to help Khartoum State restore schools affected by heavy floods of 2009, and Somalia where during a severe drought in the Horn of Africa in 2011, the AfDB approved emergency relief assistance to contribute to Transitional Federal Government of Somalia and the UN's efforts in providing urgent food and water purification supplies to drought affected families in arid and semi-arid areas. Despite its importance as a humanitarian and disaster-response facility, the SRF needs clearly to now further consider supporting disaster prevention.

Moreover, in 2009, the AfDB has adopted the Climate Risk Management and Adaptation Strategy (CRMA) that recognizes the link between increased climate variability and natural disasters such as floods and droughts. The three core areas of intervention of the CRMA are: (i) promoting climate resilience through climate proofing of investments; (ii) policy, legal and regulatory reforms to ensure sustainability of efforts to build climate resilience; and (iii)

knowledge generation and capacity building to enhance the use of climate information and climate adaptation best practices. In order to implement the CRMA, the AfDB adopted the Climate Change Action Plan (CCAP) which achievements have been presented in the section on Climate Finance. The plan builds on three pillars: (i) adaptation and climate resilient development, (ii) low carbon development, and (iii) funding platform. In addition, in 2010, the AfDB launched, in partnership with the Commission of the African Union (AUC) and the United Nations Economic Commission for Africa (UNECA), the ClimDev-Africa Programme. The overarching objective of this multi-partner initiative is to build a solid foundation to respond to climate change, with the following three core areas: (i) widely available climate information, packaging and dissemination; (ii) quality analysis for decision support and management practice; (iii) and informed decision-making, awareness and advocacy. Through this programme, the Bank was requested to establish the ClimDev-Africa Special Fund (CDSF) that is not yet effective due to lack of resources. Nevertheless, and as a starting point, the Bank has provided, through the Institutional Support to African Climate Institutions Project (ISACIP) about US$ 30 million to strengthen 5 regional Climate Centers on the continent – African Center for Meteorological Applications and Development (ACMAD) based in Niamey, Niger; the Agriculture, Hydrologic and Meteorology (AGRHYMET) research center based in Niamey, Niger; the Southern African Development Community (SADC) Climate Service Center (CSC) in Gaborone, Botswana; and the Intergovernmental Authority on Development (IGAD) Climate Prediction and Applications Centre (ICPAC) in Nairobi, Kenya. Currently, despite their limited capacities, the Regional Climate Centers in Africa play an important role in coordinating regional climate initiatives, including the Regional Climate Outlook Forums (RCOFs) formally initiated by WMO in the various regions of Africa, with the aim at generating consensus forecasts and bringing together climate forecasters and users to discuss the interpretation and use of these forecasts. As a result, regular forums are now held in Africa including the Southern Africa Regional Climate Outlook Forum (SARCOF), the Greater Horn of Africa Climate Outlook Forum (GHACOF), the "Prévision Saisonnière en Afrique de l'Ouest" (PRESAO) in West Africa; the "Prévision Saisonnière en Afrique du Nord" (PRESANOR) for North Africa; and the Prévision Saisonnière en Afrique Centrale (PRESAC) in Central Africa.

Another option for addressing financing gaps for DRR and climate services in Africa is for the African Development Bank and its regional and national partners to provide a robust financial support to the recently-established Africa Risk Capacity (ARC) to become an instrument of choice to support DRR and climate services' operations in Africa.

Hence, there is a need for the African Development Bank to comprehensively support disaster risk reduction and climate services through a well-structured and dedicated financing mechanism. This will make the Bank become more proactive on issues related to DRR and climate services, in ensuring consistency with new DRR priorities promoted by the Post-HFA, with emphasis not only on humanitarian assistance, but especially on disaster prevention.

Despite the extremely low penetration of insurance for catastrophe risk in Africa due to issues on both the supply side (e.g. lack of infrastructure, unsuitable products) and the demand side (e.g. lack of awareness of the value of products, affordability issues), there are still options for facilitating the development of insurance schemes in Africa. As far as insurance is concerned, the suitability of insurance products needs to be carefully assessed in order to determine what types of insurance product may be appropriate, and whether insurance is the right tool when compared to other coping measures. A stock-taking exercise examining the successes and failures of existing catastrophe risk insurance pilots across the region would be a good starting point.

In Africa, the development of contingency no market-based schemes at both national and community levels is critical and needs to be a first priority at national level, as without national commitments by African countries to address disasters and climate services' challenges from domestic resources, it becomes difficult to save lives and properties when disasters arise. Therefore, the establishment by national governments of contingent budget facilities through national budget allocations would be an important step for financing disaster risk reduction and climate services in Africa. Such a sovereign mechanism will help countries take adequate measures to prevent and manage disasters as well as reducing the costs of disaster response. Funded through national budgets, such national facilities would further require external support, as part of common responsibilities to address global concerns caused by global warning.