

# Development Planning, Disaster Risk Reduction and Climate Change

---

## ***Introduction***

Africa is building.

Only 20% of global disasters happen in Africa but 60% of disaster related deaths happen in this region. Growing urban populations in Africa cities are becoming death traps in disaster times. Common disasters are epidemics, floods, droughts and fire. Prevailing conditions often increase disaster impacts manifold.

Environmental degradation, poverty, poor infrastructural planning and ecosystems degradation, institutional and political failure, involuntary migration of persons and urbanization increase regions vulnerability to disaster. Rapid urbanization and economic development in Africa requires now more than ever disaster risk reduction.

***“Of nine climate-related key regional risks identified for Africa, eight pose medium or higher risk even with highly adapted systems, while only one key risk assessed can be potentially reduced with high adaptation to below a medium risk level, for the end of the 21st century under 2°C global mean temperature increase above preindustrial levels (medium confidence).” (IPCC AR5).***

Resources discovery, extraction, utilization, exploitation is high. Infrastructure, technology and industrialization is gaining momentum, MDG's targets have shown significant strides, GDP growth and projections encouraging but the house is leaking; the walls are not strong enough to withstand the storms of present and future climate threat. Africa entire economic structure is threatened by climate change. Strides made risk reversal. Africa is a vulnerability hotspot with limited adaptive capacity and multiple stressors. Disaster preparedness is inadequate to counter the threat posed by climate extremes. Policy framework and disaster responsiveness is currently weak.

IPCC Africa risk projections under climate change:

- ✚ Land temperature in Africa will rise higher than global land average
- ✚ Reduction in precipitation especially in North Africa and Southern Africa while Sub Sahara predictions remain uncertain.

- ✦ Ecosystems range shift due to CO<sub>2</sub> and warming while future shifts will be significantly high
- ✦ Amplified water stress
- ✦ Disruption of agriculture systems especially in semi-arid lands
- ✦ Increased food insecurity
- ✦ Increased risks to water vector and waterborne diseases
- ✦ Adverse effects on livestock
- ✦ Triggering migration
- ✦ Climate change will also exacerbate/multiply existing threats to human security such as food insecurity, food, health, etc.

The residual impact in a 2°C at the close of the 21<sup>st</sup> century suggests that even under high levels of adaptation there would be very high risks for the region.

- ❖ Adaptation gap in Africa is huge. As indicated by various studies; the present institutional framework is insufficient to effectively coordinate the various adaptation initiatives being rolled out.
- ❖ The sociopolitical, environmental, economic and technology factors limit adaptation and resilience capacity in the region.
- ❖ IPCC identifies conservation agriculture as sustainable means to building adaptation and resilient capacity in agro ecosystems and livelihoods.
- ❖ Large data and research gap hinders informed decision making process to increase resilience, implementation of adaptation strategies and reduce vulnerability in light of climate change risks in Africa. Flow of scientific climate information from the source to national, county level to village levels or where county governments are responsible for policy formulation and development projects planning usually lack the necessary information tools on how to utilize climate change information in planning and implementation of such projects. Most of climate change information is left on paper and scarcely used except by metrological departments where farmers are warned on little or increased rainfalls in certain seasons. Beyond this, climate information is rarely factored into county/national planning.

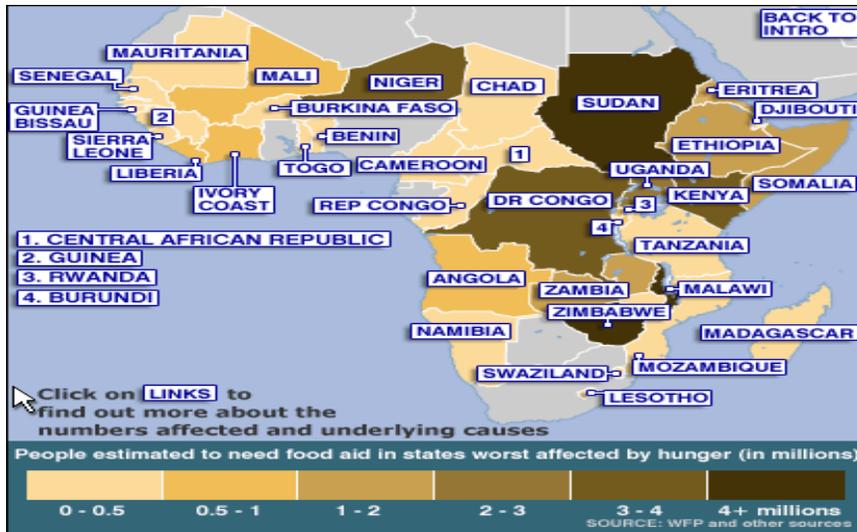
**World Bank (2015) in regard to Africa PIDA programme notes:**

*“Proper integration of climate change in infrastructure investment needs to properly address the challenge posed by the large and persistent uncertainty surrounding climate projections. If it were known in advance that a wet future would materialize, it would make sense to expand generation capacity to produce more hydropower; in a dry future, it is preferable to reduce generation capacity to avoid sinking capital in equipment that will end up being underutilized. But the climate of the future is not known in advance. While ignoring climate change entails serious risks of planning and designing infrastructure that is not suited for the climate of the future, there is also a risk of adapting to climate change in the wrong way, which could be as significant as the risk of incurring damages when not adapting. A wrong adaptation decision takes place, for example, when it is based on the expectation that the future will be drier, when in fact, it turns out to be wetter. The solution to this dilemma is to identify an adaptation strategy that balances the risk of inaction with the risk of wrong action, taking into account the preferences of decision makers and attitudes toward risks.”*

### **Agriculture**

Agriculture, forestry, and land use emit approximately 10-12GT of CO<sub>2</sub> annually which accounts for a ¼ of global CO<sub>2</sub> emissions. Africa agricultural, forestry degradation, and land use is growing at 1-2% annually (Africa Progress Report 2015).

Adaptation strategies developed by Africa farmers stretched to breaking points by climate change and future impacts. Compromised access to food due to strained production and increased food insecurity.



Source: [BBC](#)

Food insecurity in Africa has previously been perceived a result of natural disasters primarily but in recent past studies by FAO have shown poor governance and HIV/AIDS as some of the man-made causes in the region.

*“Drought affected more than one billion people between 1994 and 2013, or 25% of the global total. This is despite the fact that droughts accounted for just 5% of disaster events in this period. Some 41% of drought disasters were in Africa, indicating that lower-income countries are still being overwhelmed by drought despite effective early warnings being in place.” (CRED 2015).*

## Water

**‘Climate change will aggravate the water stress currently faced by some countries, while some countries that currently do not experience water stress will become at risk of water stress (very high confidence).’ (AR4;IPCC 2007)**

Climate change notwithstanding, northern Africa countries by 2025 will have exceeded their economically usable land based water resources.

At the global levels, Africa Progress Report (2015) observation,

***“Despite the known threats, far too many countries are failing to take decisive action. Several countries including Australia and Canada appear to have withdrawn entirely from constructive international engagement on climate. Others have adopted contradictory policy stances. The US\$88 billion spent by G20 countries on subsidies for the discovery and exploitation of new fossil fuels is one example. To avoid catastrophic climate change, two-thirds of existing reserves have to be left in the ground, begging the question of why taxpayers’ money is being used to discover new reserves of “unburnable” hydrocarbons.”***

Disasters have claimed more than one million lives and affected more than 2 Billion lives with economic cost of 1 Trillion dollars since 2000 but only 1% of international aid money had been directed to reduce disaster impacts.

### **Disasters and development**

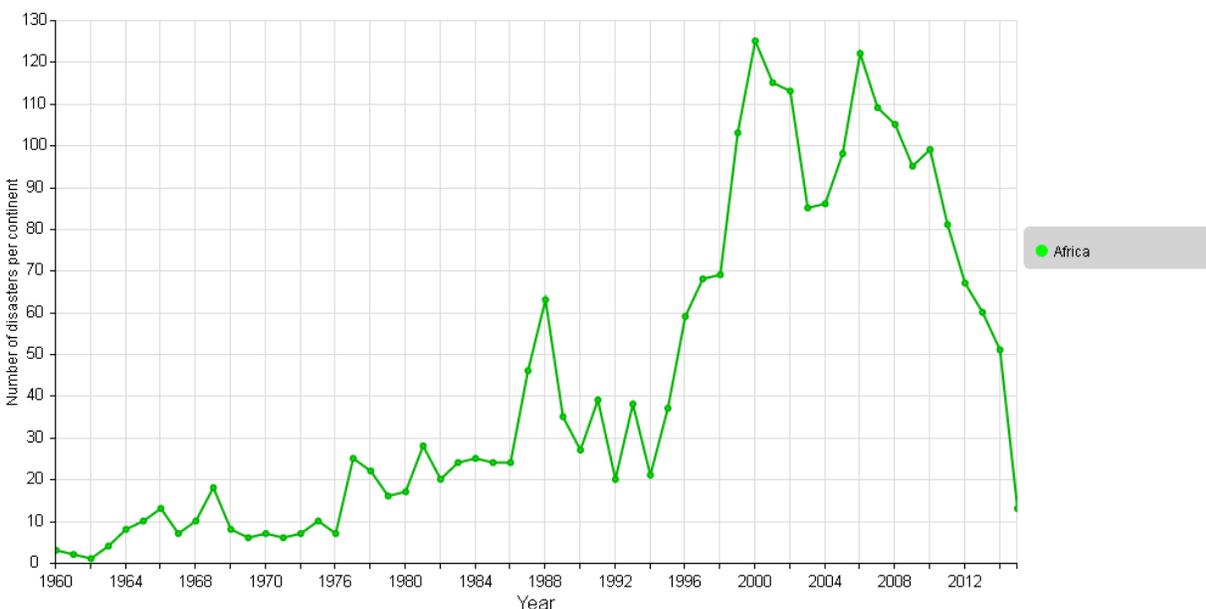
***Figuring out how exactly infrastructure development should be modified to take climate change into account is difficult, because of the large uncertainty in climate projections. First-generation analyses of adaptation have implicitly tended to adopt the assumption of “perfect foresight,” entailing the ability of decision makers to predict whether a “dry” or a “wet” climate future would materialize, and thus to determine the appropriate adaptation response accordingly. However, climate change projections are highly uncertain. The disagreement among climate models is such that for several regions in Africa it is not even possible to determine whether rainfall will decrease or increase in the future (World Bank 2015).***

Climate change increases intensity and frequency of climate-related disasters (UNEP 2009). Floods , droughts, fires disasters as well as ecosystems degradation rates have since risen. Depleted ecosystems increase disaster risks and impacts. Destruction of mangrove forests exacerbates coastal vulnerability to storm surges and ocean level rise. Disaster risk management in Africa has faced huge challenges owing to institutional, policy, funding gaps. Climate change disaster related risks will require more drastic disaster risk management systems such as early warning systems, preparedness and response to return to status quo.

**“From a disasters analysis point of view, population growth and patterns of economic development are more important than climate change or cyclical variations in weather when explaining this upward trend.” (CRED 2015)**

The last 20 years has seen the number of people affected by disasters decline but total deaths from disasters have increased revealing heightened community vulnerability to disaster risks. Death toll in low income countries is higher than rich countries. Disaster mitigation strategies in such countries need scaling up.

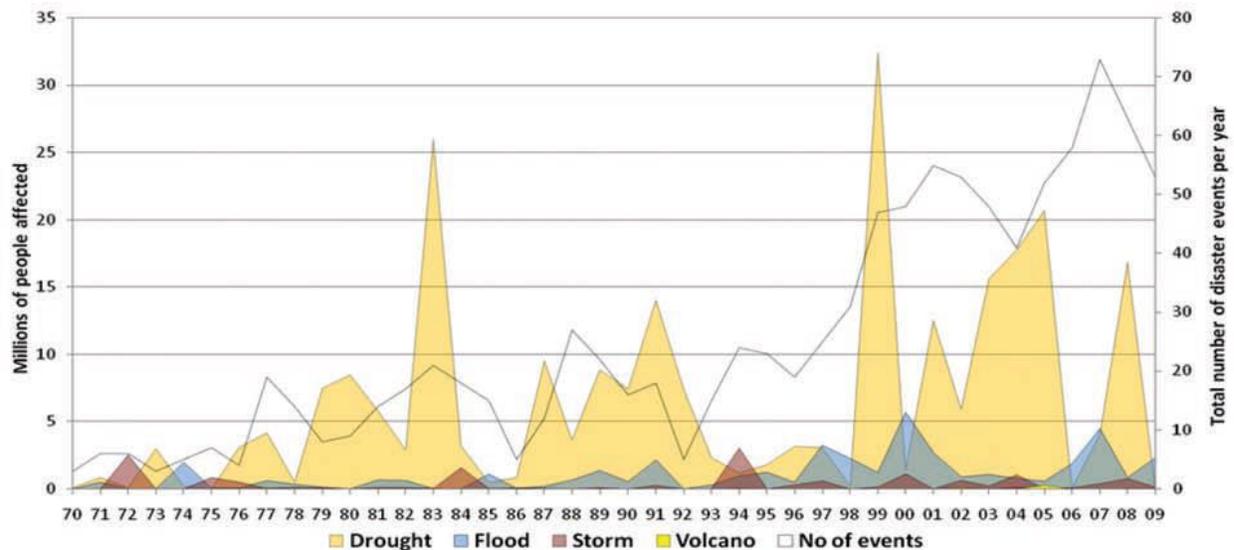
### **Total Number of reported natural disasters between 1960 and 2015 in Africa**



*Source: D. Guha-Sapir, R. Below, Ph. Hoyois - EM-DAT: International Disaster Database – [www.emdat.be](http://www.emdat.be) – Université Catholique de Louvain – Brussels – Belgium.*

- Available data though scanty shows evidence of GDP loss as a result of disasters in Africa especially drought
- Institutional capacity and financing limit integration of DRR into poverty reduction and economic development planning strategies.

- Climate change adaptation and mitigation planning in Africa region remains low in Africa (UNDSR 2011).



Source: EMDAT, (2010)

### **Building Low Emissions Development and Climate Resilient Economy in Kenya**

Kenya is among the countries benefiting from USAID LEDS funding totaling up to \$7 million. The fund is intended to enhance and strengthen existing national strategies on low emissions development strategies, establish national greenhouse gas inventory, enable the country to prepare bi-annual reports such as Third National Communication to the UNFCCC, support development of county and national decision support tools by training Kenya School of Government to train climate change modelers to mainstream climate change into national and county level midterm and long term development plans (USAID 2014).

The challenge is linking mitigation alongside adaptation strategy, need not to start from scratch but build on already existing structures and national development planning.

Kenya has experienced increased vulnerability to disaster risk in the last 2 decades (UNDP). Hazards often turn to disasters with serious disruptions of livelihoods exceeding capacity to cope at community or household level. Disaster risk management demands

proactive actions to reduce impacts of extreme events before and during and after they occur with strong preventive measures and poverty reduction and vulnerability reduction. Kenya has faced persistent drought with intensity and frequency increasing in recent decades.

Kenya is one of the most water scarce country in Africa (UNDP 2012). Water availability per person is projected to decrease drastically per person by 2020.

### **Disaster impacts in Africa**

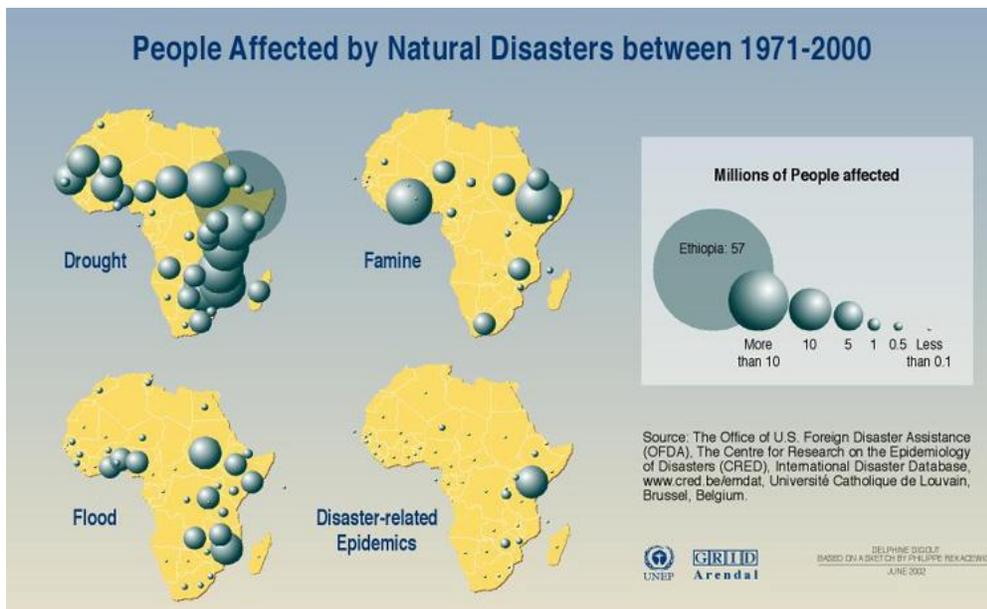
Natural hazard, particularly agricultural droughts puts Africa's GDP at high threat. Country specific efforts to face anticipated natural hazards remain vague and poorly coordinated, insufficiently considered in climate adaptation strategies hence lowest funding rates. Data on economic losses as a result of information gap and poor documentation prevents real environmental/economic and social cost of natural disasters in the region

*The relatively low level of economic impact is probably due to the fact that Africa has less infrastructure and other assets exposed to disasters as well as the fact that a number of impacts, such as loss of human lives, cultural heritage, and ecosystem services, are insufficiently measured or reported and thus they are poorly reflected in estimates of losses. It is widely believed that in Africa the impacts of natural hazards on the informal or undocumented economy may be important in some areas and sectors, but these impacts are not generally counted in reported estimates of losses. United Nations (2011).*

- I. In the period 2000-2008, Africa accounted for over 20% of all the weather and climate-related disasters that occurred globally while the economic set-back was only 0.6% of global economic losses (UNISDR, 2011).
- II. Mortality rates as a result of drought highest in Africa. Sub- Sahara Africa has experienced 7/10 worst droughts in the last 30 years (UN 2011).
- III. The number of people exposed to floods in the region grew from 500,000 per year in 1970 to almost 2 million people per year in 2010.

- IV. Cyclones mainly affect Madagascar, Mozambique, and some of the Indian Ocean islands (World Bank 2009).
- V. Sea level rise, coastal erosion, and storm surges are a growing threat for low-lying coastal areas in Africa.
- VI. Disasters have displaced 3 times more people than war in 2013

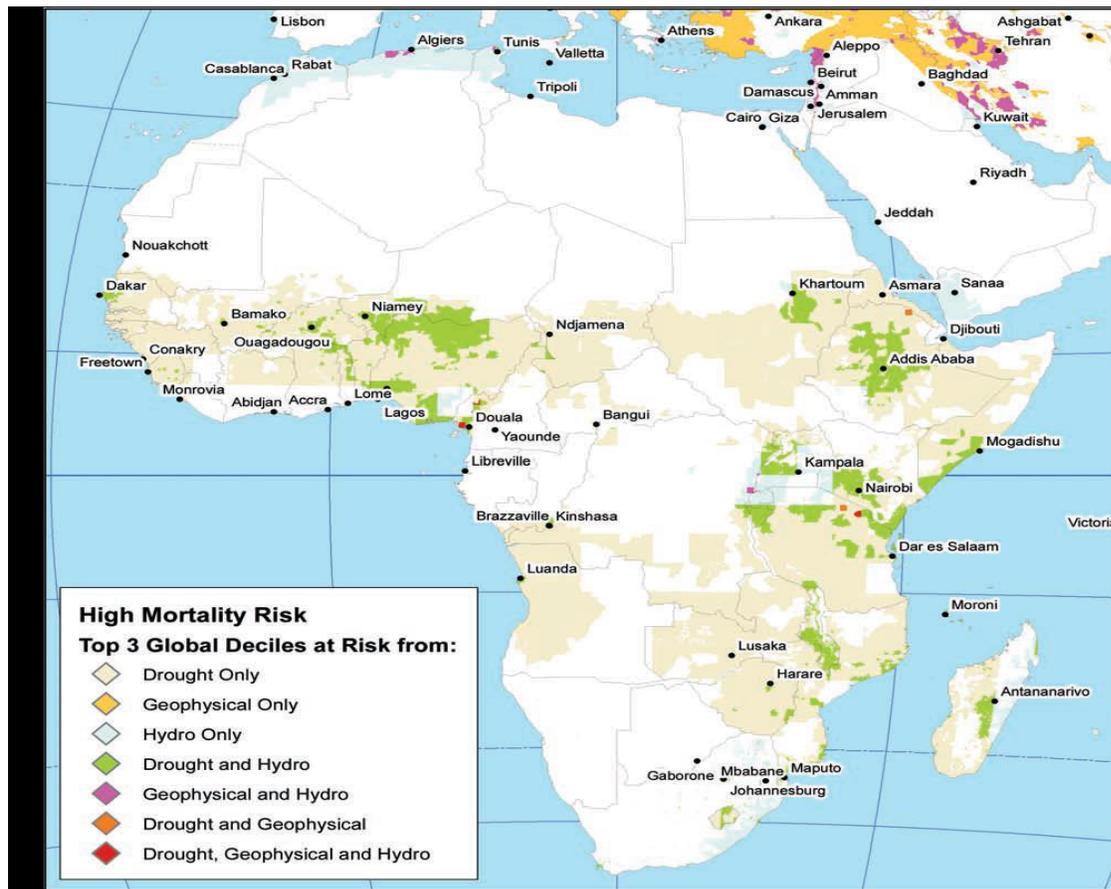
A 2009 World Bank study of Malawi, using an economy-wide general equilibrium model, found that droughts and floods reduce total GDP by an average 1.7 percent per year and that GDP declines by at least 9 percent during a severe 1-in-20 year drought thereby establishing a strong case for investment in risk reduction in that country (UN, 2011).



Source: GRID-ARENDAL

IPCC (2011) observes the greatest vulnerability of agricultural sector to extreme weather events while pointing out transportation and infrastructure. Kenya, Burkina Faso, and Ethiopia rate as the most drought vulnerable countries in the region.

## Distribution of high mortality risk from different types of hazards in Sub-Saharan Africa



Source: Diley et al., (2005)

The world bank (2010) identifies four key causes of disaster vulnerability as:

- Limited fiscal space and options to access financing to invest in risk reduction and recovery
- An economic foundation based on rain-fed agriculture
- Weak infrastructure to manage resources and recover from disasters
- Weak governance structures and institutional capacities
- A limited knowledge base to forecast and respond to natural disasters

Environmental degradation worsens the situation further and climate change risk is expected to exacerbate disaster risk in the region.

Disasters affect households leading to increased poverty

Disaster impacts cuts across all sectors: education agriculture, tourism, transport, power, communication, sanitation and water supply. This can be in form of infrastructure destruction, lower crop produce, power blackouts, destruction of transport and communication systems etc.

## **Requirements**

- ✓ Capacity development
- ✓ Climate observations and regional modeling centers and training of personnel in data collection and use for policy and planning purposes
- ✓ Build strong and effective policy framework for guidelines on infrastructural development and house constructions for resilience to climate risks and disaster risks.
- ✓ Assessment of risk and vulnerability, clear early warning systems, contingency planning, and funding
- ✓ Urban development and land use patterns need address in light of emerging climate risks in disaster risk management in Africa
- ✓ Disaster risk reduction should be national and local priorities coupled with responsive institutions for implementation (ISDR 2008).
- ✓ Protection of water towers and infrastructure, water harvesting, flood controls, intelligent irrigation practices,

Building adaptation and resilience to climate change key priority areas are usually identified for Africa

1. planning and infrastructural development that factors in resilience and builds adaptation to climate change.
2. Allocation of fund and resources for adaptation building and development
3. Flexible and effective policy and institutional framework that is responsive to climate challenges and risks
4. Research development, information availability across all sectors and levels

## 5. Technology and capacity development

Infrastructure development and economic development in Africa should incorporate disaster risk management and climate resilience to safeguard loss of lives and livelihood, environmental damage and loss of property. Poverty reduction efforts and disaster proof strategies, contingencies in the region scaling up in consideration of climate risks and integration of community resilience strategies in the region can minimize disaster impacts.

Early warning systems and disaster responses remain poor in Africa; international humanitarian organizations often respond faster than national governments which are overwhelmed during disasters.

Gradual global warming is anticipated to lead to human migration at a higher rate than natural disasters (Princeton University 2014). Climate tipping points can push hazards into devastating consequences (University of Exeter 2011).

## References

Princeton University. (2014, June 30). With climate change, heat more than natural disasters will drive people away. *ScienceDaily*. Retrieved July 19, 2015 from [www.sciencedaily.com/releases/2014/06/140630164512.htm](http://www.sciencedaily.com/releases/2014/06/140630164512.htm)

University of Exeter. "Climate change disasters can be predicted, study suggests." *ScienceDaily*. ScienceDaily, 19 June 2011. [www.sciencedaily.com/releases/2011/06/110619133517.htm](http://www.sciencedaily.com/releases/2011/06/110619133517.htm)

ISDR (2008) Climate change and disaster risk reduction, briefing note 01, Geneva, Switzerland.

UNDSR (2011) Effective measures to build resilience in Africa to adopt to climate change, briefing note 04, Geneva Switzerland

Climate and Development Knowledge Network (2012) Managing climate extremes and disasters in Africa: Lessons from the SREX report. CDKN, available online at [www.cdkn.org/srex](http://www.cdkn.org/srex).

CRED (2015) Human Cost of disasters; global perspective, Geneva Switzerland.

Lavell, A., M. Oppenheimer, C. Diop, J. Hess, R. Lempert, J. Li, R. Muir-Wood, and S. Myeong, 2012: Climate change: new dimensions in disaster risk, exposure, vulnerability, and resilience. In: *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 25-64.

WHO (2012) Adaptation to climate change in Africa plan of action for the health sector 2012-2016, ROA, Brazzaville.

Cervigni, Raff aello, Rikard Liden, James E. Neumann, and Kenneth M. Strzepek. 2015. *Enhancing the Climate Resilience of Africa's Infrastructure: Th e Power and Water Sectors*.

Overview booklet. World Bank, Washington, DC. License: Creative Commons Attribution CC BY 3.0 IGO