Building Disaster Resilience in Sub-Saharan Africa

An initiative of the African, Caribbean and Pacific Group of States funded by the European Union

UNDRR
UN Office for Disaster Risk Reduction

cima RESEARCH FOUNDATION

Building Disaster Resilience to Natural Hazards in
Sub-Saharan African Regions, Countries and Communities

USING RISK INFORMATION TO IMPROVE DISASTER RISK MANAGEMENT

L'UTILISATION DE L'INFORMATION SUR LE RISQUE POUR AMÉLIORER LA GESTION DES RISQUES DE CATASTROPHE

A multi-country risk profiling workshop

Atelier multi-pays de profilage des risques de catastrophe

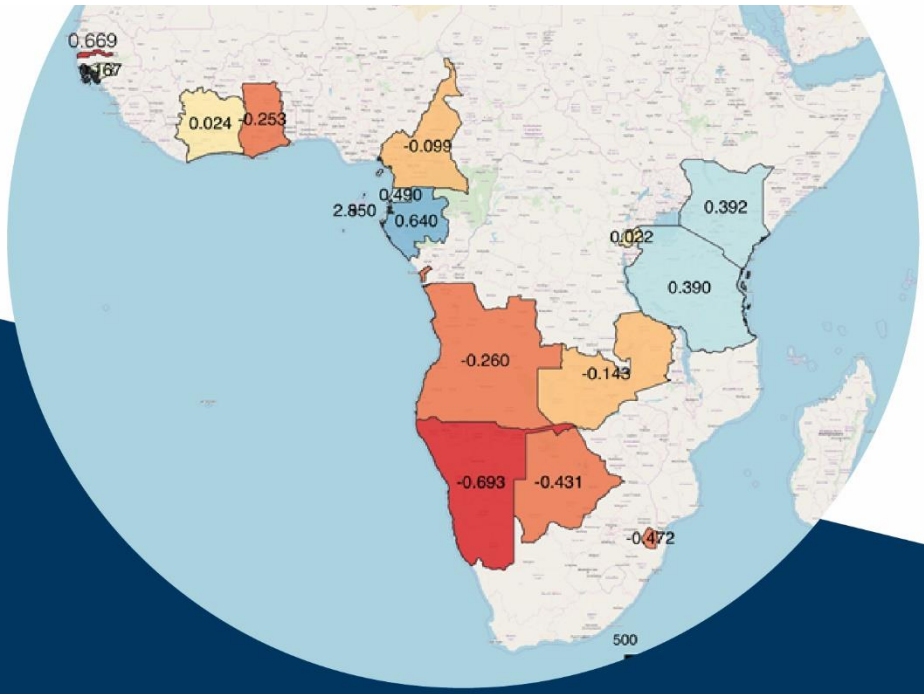
12-14 November | Nairobi, Kenya

Participating Countries:

Angola, Botswana, Cameroon, Equatorial Guinea, Gabon, Gambia (Republic of The), Ghana, Guinea Bissau, Kenya, Eswatini (Kingdom of), Côte d'Ivoire, Namibia, Rwanda, São Tomé and Príncipe, Tanzania (United Republic of), and Zambia

together with:

IGAD, SADC, ECCAS, ECOWAS, EAC and AUC



Flood Average Annual Total Economic Direct Loss [C1] rate of change relative terms


Concept Note

The Sendai Framework for Disaster Risk Reduction 2015 – 2030 emphasises the need to manage risk, not disasters. Disaster risk evolves according to changes in Its underlying and interconnected components: hazard, exposure, and vulnerability. The Sendai Framework has four priorities for disaster risk reduction: understanding disaster risk, strengthening disaster risk governance to manage disaster risk, investing in disaster risk reduction for resilience, and enhancing disaster preparedness for effective response, recovery, rehabilitation and reconstruction. Responding to these priorities with effective policy and planning decisions requires a quantification of present and future risks which brings into focus the role of disaster risk assessments. Understanding the wide scope of application of disaster risk assessments is therefore key in the professional development of disaster risk reduction specialists.

The workshop will focus on the translation of risk information into policy. The participants will consider the contribution of distinct tools in the development of national strategies, planning and risk-informed public investment. Among these tools are probabilistic risk assessments, economic assessments of disaster risk reduction and disaster loss inventories/databases.

Over the past years, as part of the "*Building Disaster Resilience to Natural Hazards in Sub-Saharan African Regions, Countries and Communities*" Programme funded by the European Union, UNDRR (formerly UNISDR) supported the National Disaster Management Agencies in 16 countries in the development of their national disaster loss inventories (DesInventar) and in elaborating risk-sensitive budget reviews aiming to Identify opportunities for DRR mainstreaming. As part of the same programme, in collaboration with the CIMA Research Foundation, country level risk profiles for the assessment of flood and drought related disaster risk were developed for the 16 countries.

Between 2016 and 2018, UNDRR and National Disaster Management Agencies organised national training workshops to endow DRM professionals from multiple sectors with skills required for the development and maintenance of national disaster loss inventories. The practical tool allows to systematically record loss and analyse loss data to understand disaster trends and loss patterns. Furthermore, national disaster loss databases, including those using the DesInventar system, have been essential for countries to account for losses and to monitor progress against the Sendai Targets. This has been particularly the case in relation to Targets A-D which refer to the imperative of reducing disaster losses and impacts.

In 2018 and early 2019, the respective National Disaster Management Authorities convened country-level multi-stakeholder risk profiling workshops. The aim of each of the workshops was twofold: firstly, to review the results of the first draft reports of the national probabilistic risk profiles, which were produced by the scientific-technical partner, the CIMA Research Foundation. The risk profiles and associated workshops contributed a more complete picture of the likelihood and impact of floods and droughts and expanded the stakeholders' understanding of risk as well as enhanced internal coordination among stakeholders. The second aim of the workshops was to exchanged on the science behind the risk profiling methodology, hence promoting integration of scientific risk information into decision-making processes.

The national risk profiling workshops convened in 2018, indicated a need for an improvement of the national risk profiles through integration of local data and knowledge on hazard and exposure. Furthermore, in multiple countries, national stakeholders pointed to a possible use of risk assessments in the development of national Disaster Risk Reduction strategies. The three-day workshop responds to these priorities and will focus on the use of risk information to improve disaster risk management.

The workshop

The three-day workshop will focus on the use of risk information to improve disaster risk management. A participatory approach will be used to stimulate a dialogue among national stakeholders, UNDRR, the CIMA Research Foundation and other technical-scientific partners.

The aim of the workshop is to increase the understanding of the role of risk knowledge in the development strategic documents and increase the use of risk information in strategy development, planning and public investment. The objectives of the workshop are:

- To exchange across countries on the use of risk information in strategic planning and for risk-Informed investment.
- To examine the value of distinct tools in informing strategy and planning
- To consider the value of creating working groups in support of the promotion of the application of risk knowledge in national planning processes

The above will be achieved through focus on the following tools and their usage:

Country level disaster risk assessment

Country-level probabilistic risk profiles have been updated using data and information made available during the national risk profiling seminars (www.riskprofilesundrr.org). A recalibration and a validation of the full scientific model has been performed with new data and considering additional evidence provided during the national risk profiling workshops by the national stakeholders. The present workshop will provide an opportunity to discuss the value of integrating different types of data and involvement of diverse stakeholders into national disaster risk profiling processes. A *Guidelines on the usability of risk profiles in DRR/CCA and sustainable development policies, strategies and planning* will be presented and reviewed by the participants. The aim of the Guideline is to translate scientific evidence into concrete, applicable development strategies and policy suggestions both for the medium and for the long term. It details the advantages of the probabilistic risk assessment methodology employed in the development of the nation disaster risk profiles and puts It forward in a language used by decision makers. It elaborates on ways to extrapolate risk information from risk profiles so as to formulate targets and objectives for strategic plans and to prioritize DRR measures and investment based on the results of risk profiles. [see annex 1 and 2]

Economic analysis of disaster risk reduction investment options

A cost-benefit analysis has been performed for select types of risk reduction interventions in four of the 16 countries. Such an analysis demonstrates a practical use of the risk profiling methodology, namely the possibility of using risk information in prioritising options for public investment. Furthermore, additional indirect benefits of select risk reducing investment can be assessed with respect to their macro-economic implications. Marco-economic assessment of the indirect benefits of DRR will be presented through examples in several countries. [see annex 3]

Disaster loss accounting

Disaster loss databases (DLDBs) are essential for countries to account for losses and monitor progress against the Sendai Targets. UNDRR is promoting a global initiative to build national disaster databases with an open source methodology and a software (DesInventar, www.desinventar.net), which allows for a homogeneous capture, analysis and graphic representation of information on disaster occurrence and losses. Over the past years, UNDRR provided support for the in the development of national disaster loss databases in the 16 countries. The workshop will provide an opportunity to understand the role of DLDBs in a country's focus on maximising its use of risk information. Of interest will be to discuss the value of registering not only large-scale events but also small-scale yet frequent events (understanding extensive risk) and understanding disaster trends and loss patterns. [see annex 4]

Workshop logistics

The workshop will take place in Nairobi, 12-14 November 2019.

English is the working language of the workshop.

Participants

The workshop will gather approximately 40 participants from Disaster Risk Management Authorities and line-Ministries of the 16 Countries, representatives from the RECs and from the AUC.

Member States are invited to nominate two participants. National DRR Focal points are requested to identify candidates for the Workshops based on a combination of the following criteria (in no order of preference):

- Subject matter knowledge in an area relevant to DRR (risk assessment, economic analysis of DRR, loss & damage accounting; having participated at the 2018 risk profiling workshop)
- Appropriate experience (5 years +) in the professional DRR sector or related sectors.
- Encourage participation of female professionals
- Experience in the development of strategic and planning tools
- Representing institutions which are involved in the development of DRR strategies and sustainable development plans
- Fluency in English

Contact persons: UNDRR Regional Office for Africa

Katarina Mouakkid Soltesova (Ms),
Programme Officer - Risk Knowledge
katarina.mouakkidsoltesova@un.org
T: +254 20 76 25704 | M/WhatsApp: +254 780 502 337

Roberto Schiano Lomoriello
Associate expert - DRR Economics and Risk Knowledge
roberto.schianolomoriello@un.org

Multi-Country Workshop on the Application of Risk Profiles
To Improve Disaster Risk Management

Agenda

Nairobi, 12-14 November 2019

Day 1	
9.00 - 9.30	Participant registration
09.30 – 11.00	**Opening session** o Welcome o Context of the workshop - UNDRR's activities in risk knowledge o Presentation of the participants and partners
11.00 -11.30	**Coffee break**
11.30 – 13.00	**Refreshing risk profiles** o Responding to the countries' requirement and need to update country-level risk profiles; presentation of the main results of risk profiles 2019 revision o Exercise: reading risk profiles and extrapolating results
13.00 -14.00	**Lunch**
14.00 – 15.30	**Guidelines on the use of risk profile for improved DRM** o Rationale for a guidance document on the use of risk profiles in DRM o Methodology of the Guideline o Applications
15.30 -16.00	**Coffee break**
16.00 – 17.30	**Risk-sensitive budget review and economic analysis of disaster risk** Presentation of key findings of 16 risk-sensitive budget reviews. Special focus on the DRR and CCA budget marker methodologies; understanding the budgetary engagements of line Ministries in implementing DRR investments.
Day 2	
09.00 -9.30	Morning Review
09.30 – 11.00	**Applications of risk profiles** o supporting the development of DRR Strategies o informing risk awareness actions and advocacy o prioritizing resources for DRR investments
11.00 -11.30	**Coffee break**

11.30 – 13.00	Applications of risk profiles (cont.) o Group 1 – Deriving risk metrics to support the development of DRR Strategies o Group 2 – Developing risk awareness campaigns o Group 3 – Conducting cost benefit analyses of specific DRR investments
13.00 -14.00	Lunch
14.00 – 15.30	Group presentations (15 minutes each)
15.30 -16.00	Coffee break
16.00 – 17.30	Disaster loss data and inventories o Current status of data on www.desinventar.net o Analysis and use of loss information: presentation of case studies o Plenary discussion on data collection, updating of the database and use of loss information
Day 3	
9.00 -9.30	Morning Review
09.30 – 11.00	Disaster loss accounting o Session based on subjects highlighted during the plenary discussion; o technical aspects of DLDBs
11.00 -11.30	Coffee break
11.30 – 13.00	Using risk information to improve National Development Plans o Role play
13.00 -14.00	Lunch
14.00 -15.00	Plenary discussion and experience sharing on the role of risk information in the development of strategic documents and in support of planning Conclusions

ANNEX 1

www.riskprofilesundrr.org

PROBABILISTIC RISK PROFILE: METHODOLOGY

PROBABILISTIC RISK ASSESSMENT

Understanding disaster risk is essential for sustainable development. Many different and complementary methods and tools are available for analysing risk. These range from qualitative to semi-quantitative and quantitative methods: probabilistic risk analysis, deterministic or scenario analysis, historical analysis, and expert elicitation.

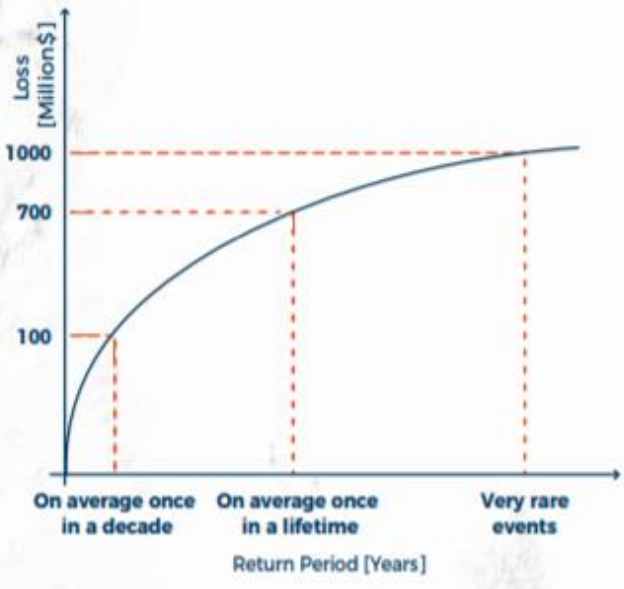
This disaster risk profile for floods and droughts is based on probabilistic risk assessment. Awareness of possible perils that may threaten human lives primarily derives from experience of past events. In theory, series of historical loss data long enough to be representative of all possible disastrous events that occurred in a portion of territory would provide all of the necessary information for assessing future loss potential. Unfortunately, the availability of national historical information on catastrophic natural hazard events is limited, and data on the economic consequences is even less common.

In the absence of extensive historical data, a modelling approach is needed to best predict possible present and future scenarios, taking into consideration the spatial and temporal uncertainties involved in the analysed process.
This profile simulates a realistic set of all possible hazardous events (scenarios) that may occur in a given region, including very rare, catastrophic events. Potential impacts were computed for each event, taking into consideration associated economic losses or the number of people and assets affected. Publicly available information on hazard, exposure, and vulnerability was used in the analysis. Finally, statistics of losses were computed and summarised through proper quantitative economic risk metrics, namely Annual Average Loss (AAL) and Probable Maximum Loss (PML).
In computing the final metrics (PML, AAL), the uncertainties that permeate the different steps of the computations have been explicitly quantified and taken into account: uncertainties in hazard forcing, uncertainties in exposure values and their vulnerabilities.

Average Annual Loss (AAL) is the expected loss per year, averaged over many years. While there may actually be little or no loss over a short period of time, AAL also accounts for much larger losses that occur less frequently. As such, AAL represents the funds which are required annually in order to cumulatively cover the average disaster loss over time.

Probable Maximum Loss (PML) describes the loss which could be expected corresponding to a given likelihood. It is expressed in terms of annual probability of exceedance or its reciprocal, the return period. For instance, in the figure below, the likelihood of a US$ 100 million loss is on average once in a decade, a loss of US$ 1 billion is considered a very rare event. Typically, PML is relevant to define the size of reserves which, insurance companies or a government should have available to manage losses.

The methodology is also used to simulate the impact of climate change [SMHI-RCA4 model, grid spacing 0.44° - about 50 km - driven by ICHEC-EC-EARTH model, RCP 8.5, 2006-2100 and, future projections of population and GDP growth (SSP2, OECD Env-Growth model from IIASA SSP Database)].
Results are disaggregated by different sectors, using the categories of Sendai Framework indicators: direct economic loss (C1), agricultural sector (C2), productive asset and service sector (C3), housing sector (C4), critical infrastructures and transportation (C5).



Building Disaster Resilience in Sub-Saharan Africa
UNDRR UN Office for Disaster Risk Reduction
This project is funded by the European Union

Annex 2

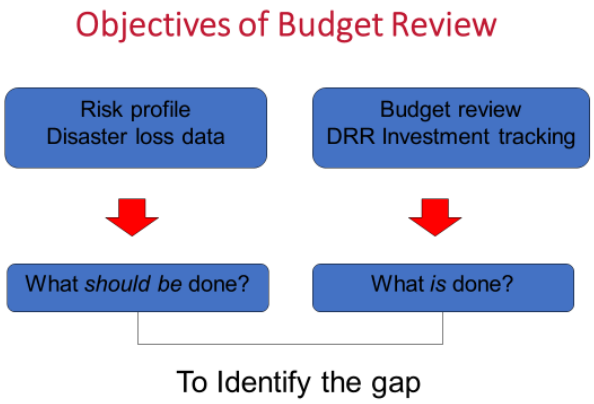
Table of Contents (Draft)

Guidelines on the usability of risk profiles in DRR/CCA, sustainable development policies, strategy development and planning

ANNEX 3

Risk-Sensitive Budget Reviews

As part of the EU funded programme "Building disaster resilience to natural hazards in Sub-Saharan African countries and communities", UNDRR developed 16 Probabilistic Risk Profiles for floods and droughts as well as DRR-sensitive Budget Reviews. These included Angola, Botswana, Cameroun, Côte d'Ivoire, Equatorial Guinea, Gabon, The Gambia, Ghana, Guinea Bissau, Kenya, The Kingdom of Eswatini, Namibia, Rwanda, Sao Tome and Principe, Tanzania and Zambia.



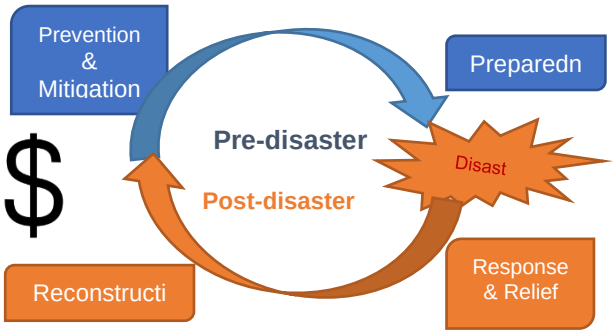
Whereas probabilistic risk profiles provide estimates on the potential loss and damages caused by disasters, the risk-sensitive budget review provide information on current efforts of the Government to invest in DRR interventions.

The risk-sensitive budget review analysis uses a DRR policy marker (OECD-DAC DRR policy marker) developed by the Organisation for Economic Co-operation and Development (OECD) – Development Assistance Committee (DAC). The methodology has been used widely to provide information about DRR mainstreaming in Official Development Assistance. Nevertheless, it can be used to track planned expenditures in country-level budgetary documents. Actual expenditures related to DRR is a domain still in evolution and there is not yet a commonly agreed methodology to track and monitor them.

The Risk Sensitive Budget Reviews (RSBR) aim at informing relevant stakeholders (governments, donors, DRR partners) on the DRR planned expenditures. A companion methodological guidance note was also developed to equip stakeholders with a systematic methodology to review budgetary documents.

RSBR provide information on public investment planning by sector and a picture of the distribution of expenditures along the DRM cycle.

A first draft analysis was presented and discussed in 2018, during a series of 16 country-level workshops. Additional feedback and input from country experts was sought to improve the analysis.



ANNEX 4

Disaster loss and damage accounting

Building global coverage from the bottom up – the DesInventar approach & methodology.

The United Nations Office for Disaster Risk Reduction is promoting a global initiative to build national disaster databases with an open source methodology and a software, which allows for a homogeneous capture, analysis and graphic representation of information on disaster occurrence and losses.

Disaster loss databases, such as **DesInventar**, are essential for countries to account for losses and monitor progress against the Sendai Targets. This is particularly so in relation to the first four out of seven targets, which refer to the imperative of reducing disaster losses and impacts.

The coverage of this initiative is increasing rapidly, covering all continents. As of April 2019, 88 countries, of which 25 countries in Sub-Saharan Africa have official data on disaster loss and damage published in the publicly available DesInventar database accessible online at **www.desinventar.net**. National disaster management agencies, local governments and civil society organisations are using these disaster databases as an input for risk analysis, risk mitigation, formulation of early warning systems, as well as inputs to monitor the their risk reduction plans.

The database broadens the scope of Disaster Risk Management research by registering not only large-scale events but also small-scale yet frequent events. The tool has a range of analysis options, allowing national and sub-national authorities as well as DRR practitioners to systematically record and understand disaster trends and loss patterns. With increased understanding of disaster trends and their impacts, better prevention, mitigation and preparedness measures can be planned to reduce the impact of disasters on communities.

The **DesInventar methodology** allows for a systematic collection of detailed and comparable data at multiple scales. The five pillars of UNDRR's disaster loss data collection methodology are:

1. a standard definition of hazards and its impacts
2. a standard set of common indicators (16 quantitative, 12 qualitative) + unlimited custom indicators
3. a wide coverage of disasters regardless of scales
4. data disaggregation down to sub-national administrative units
5. data collection and validation done locally within the country.

DesInventar is a Free Open Source Software (FOSS), it supports many standards (OGC, XML, Glide, Google API etc…) and languages. It can be customized and adapted to any needs.