

Climate Risk Management

Promising pathways to avert, minimise, and address losses and damages

Impacts of climate change – a growing challenge for sustainable development

The increasingly severe impacts of anthropogenic climate change are undermining progress on the 2030 Agenda for Sustainable Development. Extreme weather events (EWE) such as cyclones, heatwaves, and floods are becoming more intense and frequent. Simultaneously, slow-onset processes¹ (SOP) like sea level rise, desertification, and glacial retreat are transforming our very living conditions, but have received less attention in the realm of climate policy. Both trends substantially impact livelihoods, ecosystems, and economic performance, and will have even more serious impacts in the future. They jeopardise the achievements of the Sustainable Development Goals and hinder the

¹ Alternative terminologies exist to describe ongoing climate-induced changes of natural systems. The IPCC and UNFCCC refer to "slow onset events", however the term "event" might be misleading as these changes do not necessarily have a clear time frame. Hence, throughout this publication the term "slow onset processes" is used.

enjoyment of human rights, particularly for poor and vulnerable people in developing countries. Adverse impacts on public health, manifested for example in excess mortality during heat waves, and on ecosystems, seen in the loss of biodiversity, are of particular concern and require urgent attention.

"Climate-change impacts are projected to slow down economic growth, make poverty reduction more difficult, further erode food security, and prolong existing and create new poverty traps".

IPCC, 2014

In addition, the impacts of climate change influence decision-making in private sector investments, ranging from the large-scale value chains of huge enterprises to micro, small and medium enterprises (MSME) in developing countries. They also influence the governance of settlements, from small villages to mega cities.



Published by

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

Loss and Damage – the international policy discourse

Impacts from climate change are reflected in international policy agendas as part of the Paris Agreement (United Nations Framework Convention on Climate Change, UNFCCC), the Sendai Framework for Disaster Risk Reduction (United Nations Office for Disaster Risk Reduction, UNDRR) and the 2030 Agenda for Sustainable Development. Under the UNFCCC, the topic of Loss and Damage (L&D) has been increasingly highlighted, and led to the establishment of the Warsaw International Mechanism for Loss and Damage (WIM) in 2013. The aim of the WIM is to “address loss and damage associated with impacts of climate change, including extreme events and slow onset events in developing countries that are particularly vulnerable to the adverse effects of climate change” (UNFCCC, 2014). In 2015, the Paris Agreement emphasised the topic’s importance by introducing L&D as a standalone article, recognizing the importance of averting, minimizing and addressing loss and damage associated with the adverse effects of climate change. In 2019, the WIM established the Santiago Network to catalyse technical assistance, as well as five thematic expert groups, which have broadened the scope of its work significantly.

“Parties recognize the importance of averting, minimizing and addressing loss and damage associated with the adverse effects of climate change”.

Article 8, Paris Agreement

The international policy discourse is informed by growing scientific consensus on the impacts of climate change. The latest findings of the Intergovernmental Panel on Climate Change (IPCC), in particular those contained in the Special Reports on Global Warming of 1.5°C (SR1.5), on Climate Change and Land (SRCCL), and on the Ocean and Cryosphere in a Changing Climate (SROCC), underline the need to act urgently. The reports confirm that climate change has contributed to changes in many land and ocean ecosystems as well as to impacts on natural and human systems. The SR1.5 shows that impacts at 2°C of warming are likely to be much more serious than previously anticipated, and that keeping global warming to 1.5°C could potentially spare hundreds of millions of people from slipping (back) into poverty.

A risk-based approach – GIZ’s climate risk management framework

Irrespective of ongoing climate policy efforts, residual risk from climate change impacts remains in all countries for all plausible scenarios and could result in losses and damages. Climate change impacts are already being observed, and atmospheric greenhouse gas concentrations from past emissions will inevitably lead to a certain level of additional impacts. In response to this risk, GIZ’s Global Programme on Risk Assessment and Management for Adaptation to Climate Change (Loss and Damage) (GP L&D) has developed a climate risk management (CRM) framework to avert, minimise, and address losses and damages.

“Residual risk: The risk that remains following adaptation and risk reduction efforts”.

IPCC, 2019



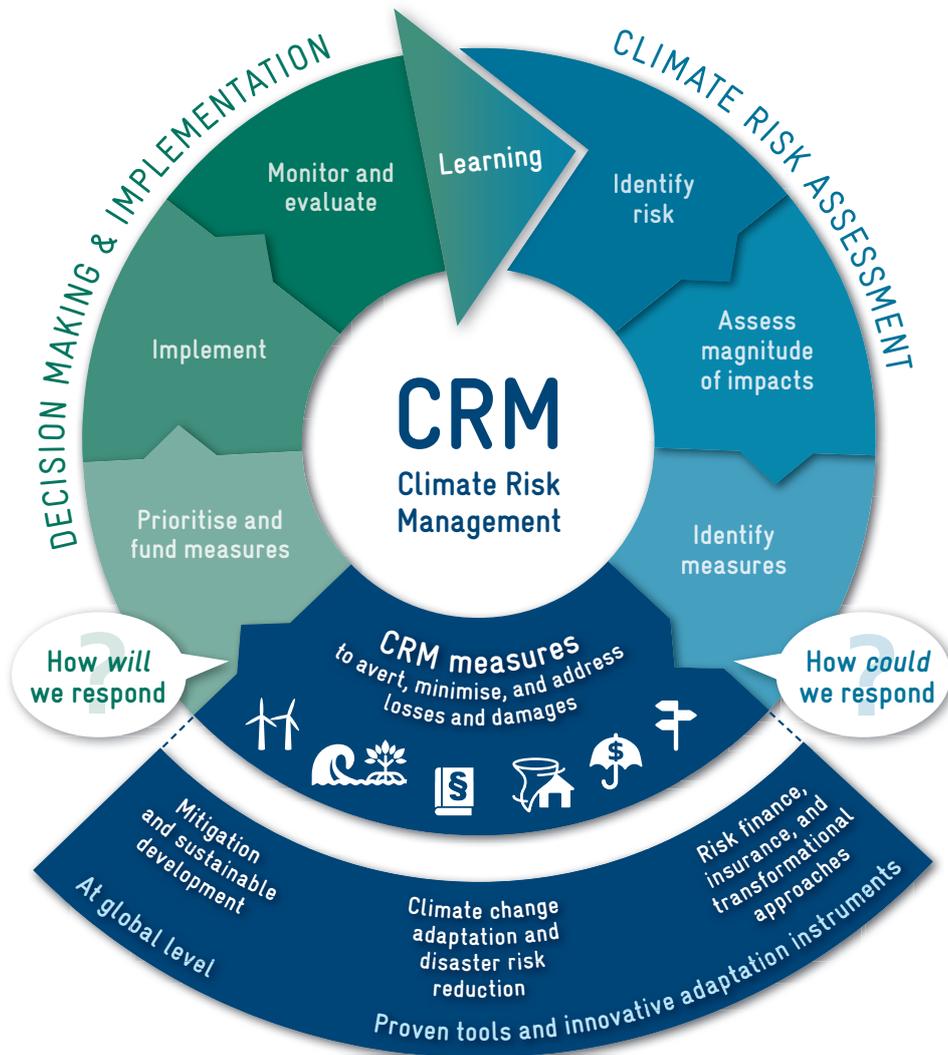


Figure 1: GP L&D model for CRM framework.

Source: © GIZ/Global Programme on Risk Assessment and Management for Adaptation to Climate Change (Loss and Damage)

The GP L&D's CRM framework (see Figure 1) is a risk-based, iterative approach to managing climate-related risks, taking into consideration social, economic, non-economic, institutional, biophysical and environmental

aspects. It understands measures related to mitigation, climate change adaptation (CCA), disaster risk reduction (DRR), and risk finance and insurance as complementary parts of the same toolbox. In order to attain the smartest mix of measures for a given situation, it links tried-and-tested measures with innovative instruments and transformational approaches in a comprehensive and integrated way.

In addition, when a disaster strikes, it is important that countries have systems in place to deal with immediate needs (e.g. humanitarian aid, emergency relief, contingency funds) and to restore livelihoods in a risk-informed way (e.g. preventive reconstruction)².



² Climate risk management is considered in [BMZ's Comprehensive Risk Management Approach](#)

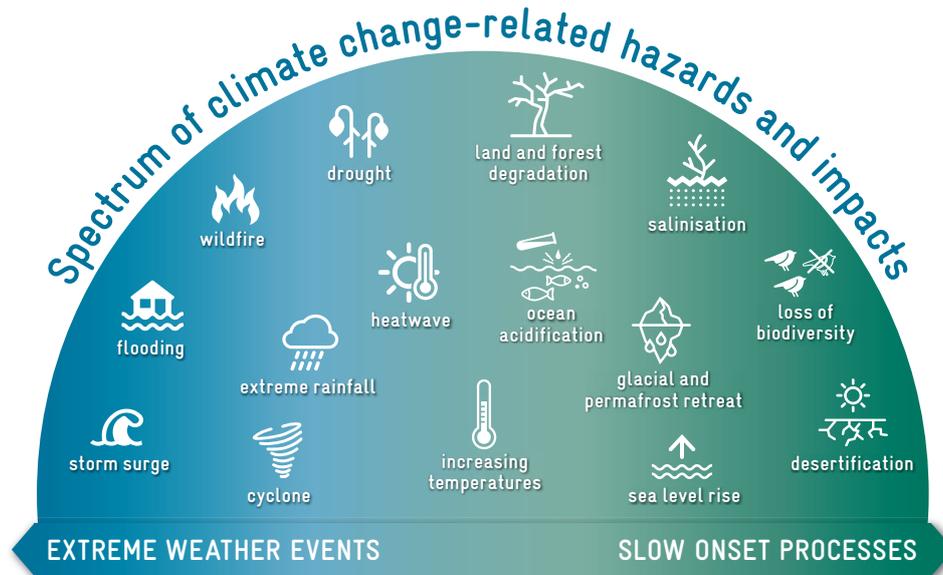


Figure 2: Spectrum of climate change-related hazards and impacts

Source: © GIZ/Global Programme on Risk Assessment and Management for Adaptation to Climate Change (Loss and Damage)

In contrast to most other CRM approaches, the GP L&D's framework considers the entire spectrum of climate-related hazards and triggered risks (see Figure 2). It responds to risk from hazards related to short-term EWE such as storms and floods as well as to risk from hazards related to long-term SOP such as sea level rise and desertification. Moreover, it takes into account the interdependencies between EWE and SOP, and the fact that both can occur at the same time.

The CRM framework addresses decision-makers from national to local government levels, the private sector (especially MSME), and (re)insurance companies. It comprises interrelated elements that are central to CRM including climate risk assessment, the identification of

suitable CRM measures, decision-making and implementation, and monitoring and evaluation.

Climate-related risks alter with changing climatic conditions and need to be continuously analysed and addressed. The CRM framework operationalises CRM at scale within a dynamic learning framework, allowing for the updating of decisions over time. The outcomes of each individual step feed into succeeding steps, contributing to the development of a comprehensive CRM framework for the country or region concerned. This allows decision-makers to take account of fresh evidence and insights, newly available data, as well as lessons learnt from monitoring and evaluation. This flexibility is fundamental, especially for integrating innovative and transformative instruments and approaches.



A 6-step methodology – climate risk assessment as part of the CRM framework

Climate risk assessment (CRA) builds the foundations for successful CRM. As part of its CRM framework, the GP L&D has developed a [6-step methodology](#) to assess climate-related risks. By identifying risk and assessing the magnitude of impacts on people, assets, value chains, (critical) infrastructure, settlements, and ecosystems, this methodology offers options for action and answers the question: How *could* we respond? The assessment shows how climate-related hazards (see Figure 3) interact with socio-economic factors. The interaction of these factors determines the overall risk for the affected population. The assessment includes evaluating the magnitude of the expected impacts and identifying the costs and benefits of the most promising risk management options. This integrated evaluation demonstrates effective measures for dealing with risks and forms the basis for the integration of climate policy measures into public budgets and national policies. Opportunity costs show that anticipatory planning pays off. However, this is often a political challenge for decision-makers.

The 6-step methodology provides helpful guidance that highlights the following important aspects in the context of losses and damages:

- stakeholder involvement;
- consideration of socio-economic trends;
- evaluation of risk tolerance and identification of risk levels;
- identification of feasible and relevant measures.

The methodology has been tested in two partner countries:

- in Tanzania, 6-step risk assessment and management has been applied at national and local levels (at Lake Rukwa) to ensure integrated water resources management is climate resilient in the face of increasing drought risk;
- in India, the risks from drought, extreme heat, and water stress (SOP) and floods, landslides, and cyclones (EWE) in coastal and mountain hotspot areas have been assessed with a focus on rural livelihoods and critical infrastructure to inform state-level CRM practitioners about CCA and DRR measures.

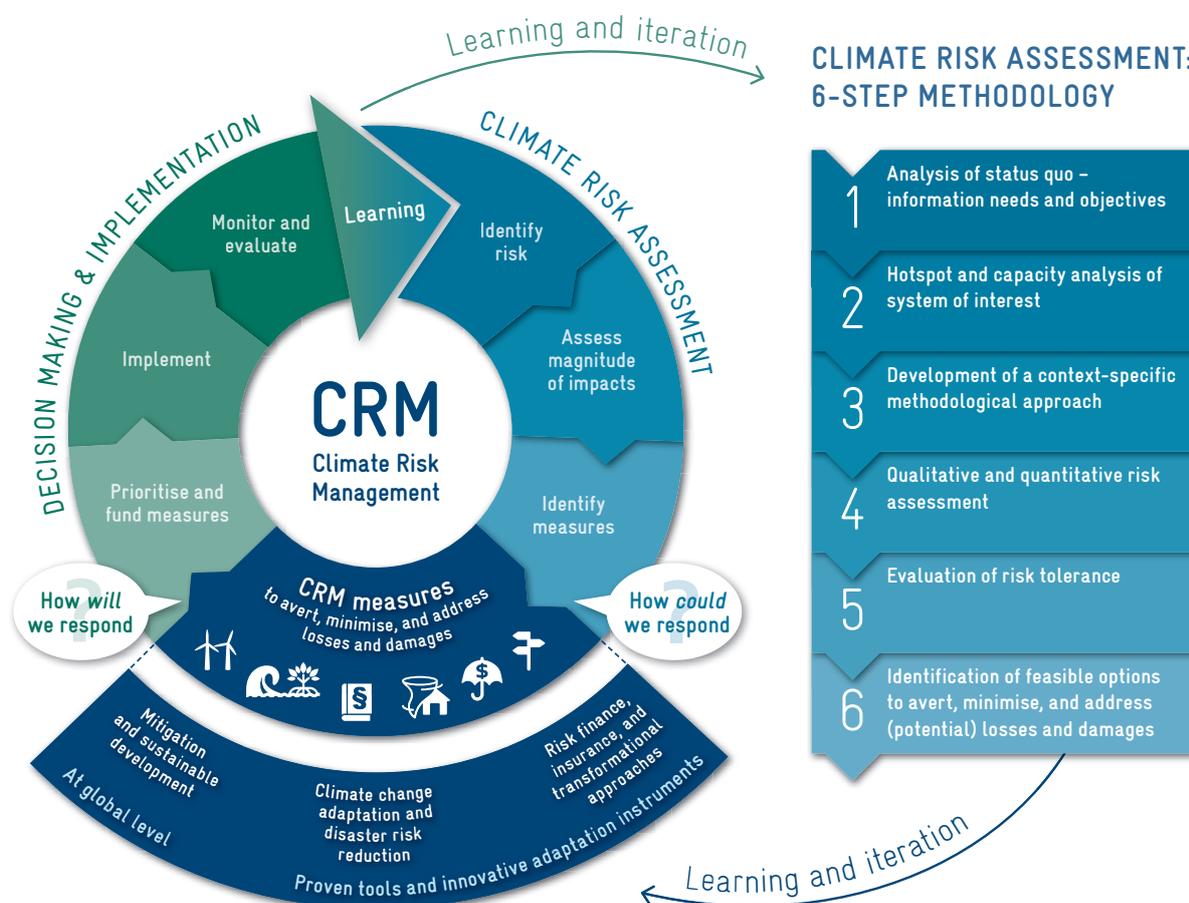


Figure 3: 6-step methodology to assess climate-related risks

Source: © GIZ/Global Programme on Risk Assessment and Management for Adaptation to Climate Change (Loss and Damage)

Further resources in relation to CRA developed by the GP L&D:

- [Database of comprehensive climate risk assessment methods \(CRAMSE\)](#)
- [Scoping Study: comparing climate risk assessment methods to support informed decision making](#)
- [Technical Guide on Action-Oriented Comprehensive Risk Assessment and Planning in the Context of Climate Change](#) (jointly developed by UNDRR and GIZ)

Toolbox of CRM measures to avert, minimise, and address losses and damages

CRM relies on the strong participation of stakeholders from different sectors and at different levels. It proposes a diverse set of measures that stakeholders can choose from, enabling them to take timely action to enhance preparedness for climate change-related EWE and to strengthen overall resilience, including to SOP. The final step of the GP L&D's 6-step methodology for CRA is to support stakeholders in identifying feasible options from the portfolio in their particular context. The language of averting, minimising, and addressing losses and damages from climate impacts emerged from political negotiations on the topic under the UNFCCC. CRM measures can be broadly assigned to the three different categories, although some measures take effect in more than one category, making them even more effective.



Averting losses and damages through mitigation and sustainable development

The first set of CRM measures aims at averting the very emergence of losses and damages. Climate change exacerbates hazards such as flooding or changing rainfall patterns. The intensity, frequency, and/or duration of future climate-related hazards depend largely on the global emissions pathway of the coming years and decades. Limiting global warming to well below 2°C, and preferably to 1.5°C, compared to pre-industrial levels is of paramount importance in keeping climate-related risks manageable. Risk results from the interaction of vulnerability, exposure, and hazard. While the occurrence of anthropogenic climate change-induced hazards can be reduced through climate change mitigation measures, the exposure and vulnerability of people and assets are mainly linked to sustainable development indicators and CRM. While humanity will benefit from mitigation measures in

terms of reduced climate risks only in the mid to long-term, exposure and vulnerability can be reduced comparatively quickly, for example through risk-informed development that calls for risk analysis and wise management.



Minimising losses and damages through CCA and DRR

The second set of CRM measures aims at minimising those losses and damages that are not (fully) avoided through mitigation and sustainable development. This set of measures combines approaches from CCA and DRR (in particular disaster preparedness measures) that have proven effective. For example, it might be too late to fully avert glacier melt and its various impacts, but we can build dams at growing glacier lakes as an adaptation measure and thereby avert losses and damages from possible glacier lake outburst floods. Since EWE are already increasing in intensity and frequency, we must make effective use of disaster preparedness measures such as early warning systems and civil protection plans to minimise losses and damages from storms or floods.



Addressing losses and damages through risk finance and transformational approaches

The third set of CRM measures addresses residual losses and damages that are not avoided or minimised. This requires new, innovative ways of thinking. One way of addressing residual losses and damages is through risk finance mechanisms such as climate risk insurance, contingency funds, and social protection schemes. These mechanisms provide security against the loss of assets, livelihoods, and lives, and ensure reliable and dignified post-disaster relief. Climate risk insurance as one means of risk transfer can enable more resilient economic development and strengthen disaster preparedness, and rapid response to and recovery from climate shocks. Combined with other measures under the paradigm of comprehensive CRM, it can be even more effective, altering insurability and lowering premiums. In addition to risk finance, transformational approaches are needed to effectively address residual losses and damages. Such approaches include the diversification of livelihoods, flexible and participatory decision-making, and adaptive management approaches. A concrete example of this is human mobility: migration (and, as a last resort, planned relocation) can be a way of diversifying income sources and enabling alternative livelihoods, as well as a precautionary strategy to avoid the third form of climate-induced human mobility, displacement.



Decision-making, implementation, and learning

To identify the smartest mix of CRM measures for a given context, it is crucial to understand the organisational and economic ability of countries, communities, and the private sector to adapt and respond to risk. These factors are key in the prioritisation of CRM measures that can ensure climate-resilient development pathways. Due to the partly subjective nature of risk assessment, it is not possible to identify the most appropriate CRM measures in each context solely through cost-benefit analysis. Many important aspects cannot be quantified and/or monetised but might have a significant impact, especially on vulnerable groups. Prioritised CRM measures must be context-specific and sustainable, and they must engage affected and marginalised populations through stakeholder participation. Decision-makers from the public and private sector are thus enabled to better prioritise, fund, and implement options (How *will* we respond?). Monitoring and evaluation of implemented measures leads to continuous learning that feeds into the CRM cycle and informs future decisions.

Effective CRM requires that all sectors factor risks into plans, including how risks may affect action across sectors. First approaches to include CRM in national policy rely on their strong linkage to and possible integration into current processes such as national adaptation planning, development planning, existing DRR policy, as well as the (re)orientation of national policies towards sustainable development. Institutional integration is crucial for mainstreaming CRM considerations into new and existing

development planning and budgeting processes, within all relevant institutions and sectors, and at all levels.

An important goal of the GP L&D's CRM framework is to mainstream climate risks into relevant processes and policies at the national and sub-national level, aiming at (1) fostering a holistic consideration of climate change impacts and DRR in affected sectors and pointing out the need to manage losses and damages as well as the possibilities for achieving this; (2) strengthening inter-ministerial coordination; and (3) filling identified gaps to effectively assess and manage losses and damages (e.g. through the development of specific instruments, specific data collection, appropriate human and financial resources, and institutional rearrangements).

Mainstreaming CRM into national and sub-national development planning responds to the three big post-2015 agendas – the Sendai Framework, the Paris Agreement, and Agenda 2030. Implementing CRM with these grand agendas in mind can then translate synergies from the international level to the national or sub-national levels. Currently, viable formats for CRM to be included are National Adaptation Plans, Nationally Determined Contributions, and reporting for the Sendai Framework.

In order to support decision-making and dialogue, the GP L&D has developed numerous resources as well as the training course [Dealing with Climate-related Loss and Damage within Climate Risk Management](#) – self-paced learning modules on selected topics will soon be available.

Key facts

2020 was one of the three **warmest years** on record. The global average temperature was about 1.2°C above the pre-industrial (1850–1900) level.

WMO, 2021

Disasters triggered nearly **3/4** of the new displacements recorded worldwide in 2019, accounting for **24.9 million people**.

iDMC, 2020

Weather-related events caused losses of **USD 180 billion** in 2020.

Swiss Re, 2021

97 million people were affected by floods, droughts, wildfires, storms, and extreme temperature in 2020.

CRED, UNDRR & UCLouvain, 2021

The proportion of disasters attributable to climate and EWE, such as floods, storms, and heatwaves, has continued to rise, **from 76%** during the 2000s **to 83%** in the 2010s.

IFRC, 2020

The countries most negatively impacted by climate change are often those with the **fewest resources** to adapt to and mitigate the effect of rising global temperatures.

Swiss Re, 2021

Climate-related disasters 2011 – June 2021

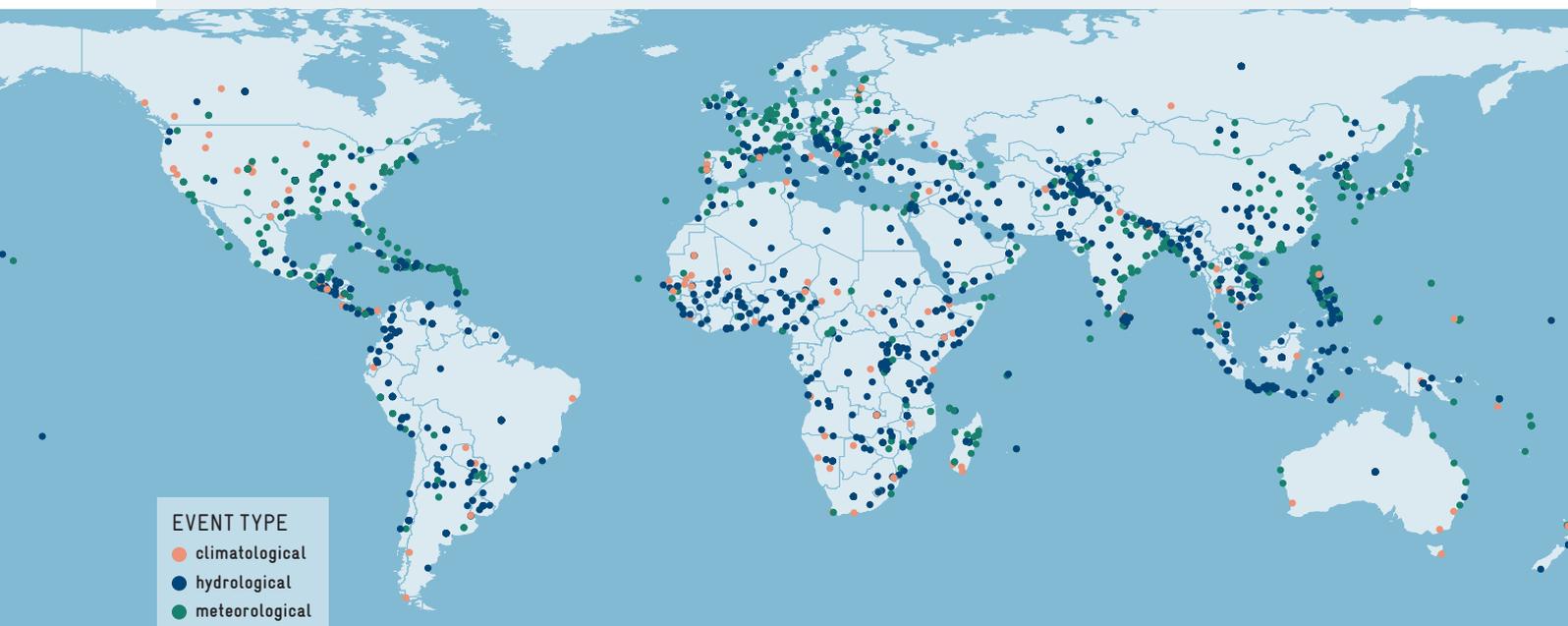


Figure 5: Climate-related disasters 2011 – June 2021. Source: Based on CRED, 2021; CC by World Bank Official Boundaries by Worldbank

Recommendations to foster a comprehensive approach to CRM

1 Foster dialogue and raise awareness about losses and damages as well as comprehensive CRM approaches, e.g. through programmes offering capacity development and dialogue facilitation, involving relevant institutions at national and sub-national levels.

2 Strengthen dialogue and cooperation between the DRR and CCA communities of practice.

3 Raise awareness about the benefits of risk-informed behaviour and management within the public and private sectors, e.g. with respect to climate risk-informed investments, infrastructure, and value chains.

4 Support a holistic and adaptive approach that links communities, local authorities, the private sector and national action.

5 Partner with multiple stakeholders, adopting a whole-of-society and whole-of-government approach (public, private, communities, knowledge centres, media, etc.) and **strengthen the involvement of populations at risk** and decision-makers in order to increase buy-in and facilitate implementation.

6 Improve existing approaches and methodologies to assess actual and future climate-related risk based on existing methodologies from the field of

CCA and DRR (e.g. risk assessments and post-disaster needs assessments), keeping in mind that CRM is context-specific: there is no universal solution.

7 Improve the data for CRA, make it publicly available, and translate it for all levels and relevant stakeholders.

8 Identify gaps and expand the portfolio of effective CRM measures, e.g. with approaches that address non-economic losses and losses and damages from SOP with innovative instruments to finance CRM measures, including risk finance, contingency planning, and risk insurance.

9 Promote CRM measures that offer multiple co-benefits, e.g. nature-based solutions and early warning systems.

10 Generate experience and good practices through concrete design, piloting and implementation of activities and projects.

11 Implement robust monitoring, evaluation, and learning frameworks that feed back into an iterative integration process to flexibly adjust implementation of CRM measures and to inform future decisions and resource allocations.



Key messages

- The effects of climate change are already visible today in the form of melting glaciers, desertification, and more frequent and intense storms and heat waves. Over 80 % of total economic damage from disasters was climate and weather related in 2020 (*Swiss Re, 2020*). Adverse impacts on public health and ecosystems are particularly serious.
- The growing importance of climate change as a driver of risks triggered by natural hazards is reflected in international policy agendas, in particular the United Nations Framework Convention on Climate Change (UNFCCC). This led to the establishment of the Warsaw International Mechanism for Loss and Damage associated with Climate Change Impacts (WIM) in 2013. In 2015, a standalone article on Loss and Damage was introduced in the Paris Agreement highlighting the importance of the topic for many Parties.
- Climate risk management (CRM) aims to manage risk and potential impacts related to natural and climate-induced hazards. It considers short-term extreme weather events (EWE) as well as long-term slow-onset processes (SOP).
- To avert losses and damages, mitigating climate change globally and progress on the sustainable development agenda is paramount. To minimise losses and damages, CRM combines a smart mix of tried-and-tested approaches from climate change adaptation (CCA) and disaster risk reduction (DRR). To address residual losses and damages, these are complemented by more innovative adaptation tools such as risk finance and insurance, and transformational approaches such as livelihood diversification.



Published by:
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn, Germany

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Design and layout:
Katrin Straßburger/W4 Büro für Gestaltung, Frankfurt

On behalf of
German Federal Ministry for Economic Cooperation and Development (BMZ)

As at:
Bonn, October 2021

On behalf of



Federal Ministry
for Economic Cooperation
and Development