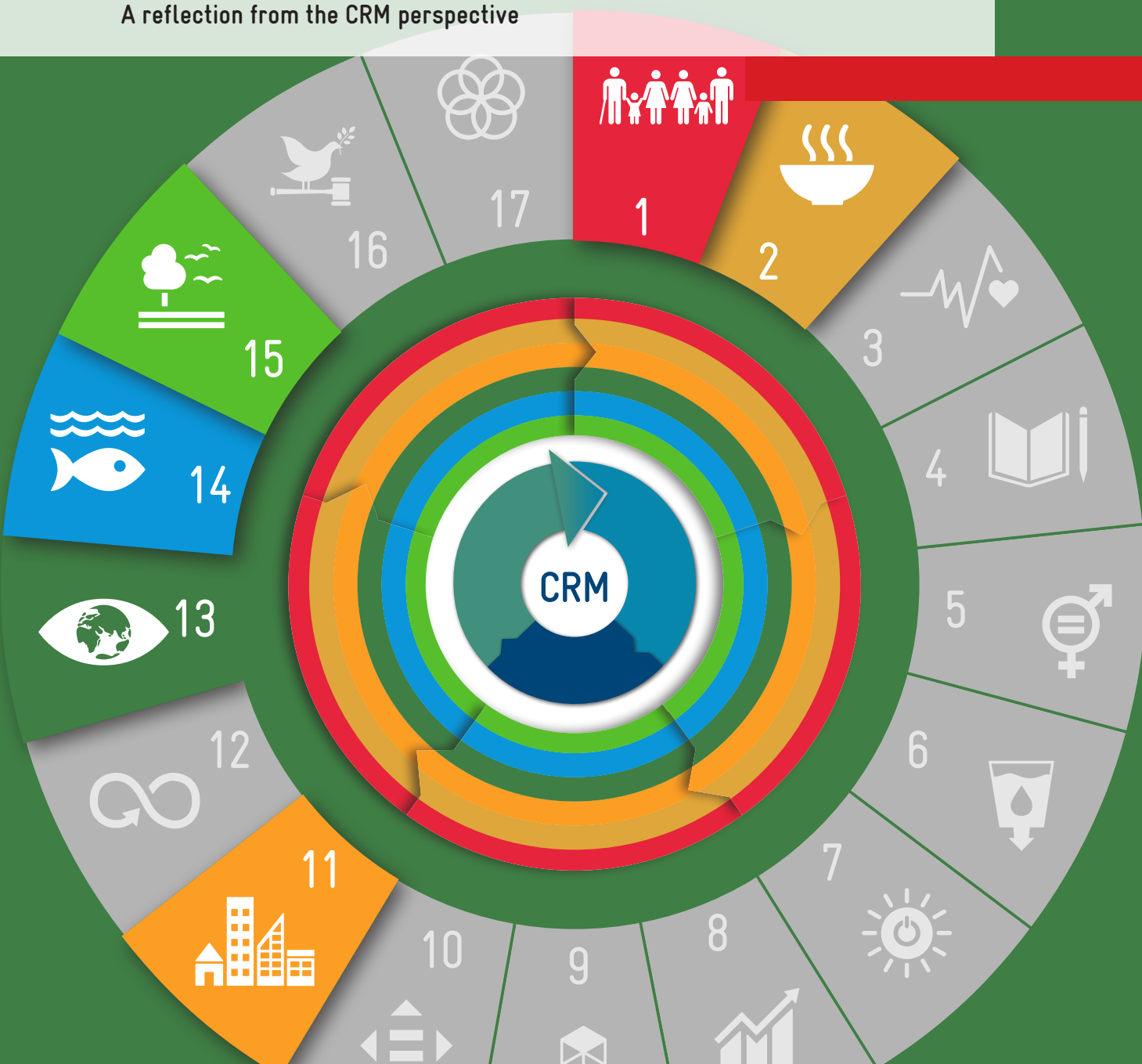


Towards achieving the SDGs through Climate Risk Management

A reflection from the CRM perspective



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The contents and findings of this report are based on an assessment that was carried out from a climate risk management (CRM) perspective, using open-access project information and literature. The assessment reflected on synergies between CRM and the Sustainable Development Goals (SDGs) as part of the 2030 Agenda. The assessment does not claim to be all-encompassing. The projects, initiatives, and programmes that are presented are not categorised as best practices but understood as good practice and partly tried-and-tested examples. The measures and instruments discussed are considered suitable in the context of CRM and are being regularly applied in CRM projects and strategies; however, the origins of the measures, instruments, and tools do not necessarily lie in traditional climate change adaptation or disaster risk management.

On behalf of
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As at:
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Abbreviations

ASP	Adaptive Social Protection
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BMZ	Federal Ministry for Economic Cooperation and Development
CoM SSA	Covenant of Mayors in Sub-Saharan Africa
COP	Conference of the Parties
CREWS	Climate Risk and Early Warning
CRM	Climate Risk Management
CSA	Climate Smart Agriculture
EbA	Ecosystem-based Adaptation
GHG	Greenhouse Gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
EWS	Early Warning System
ICLEI	Local Governments for Sustainability
ICZM	Integrated Coastal Zone Management
IGP	InsuResilience Global Partnership
IPCC	Intergovernmental Panel on Climate Change
NAP	National Adaptation Plan
NDC(P)	Nationally Determined Contribution (Partnership)
R4	R4 Rural Risk Resilience Initiative
SASPP	Sahel Adaptive Social Protection Program
SDG	Sustainable Development Goal
SFDRR	Sendai Framework for Disaster Risk Reduction
SOP	Slow Onset Process
UNFCCC	United Nations Framework Convention on Climate Change



Summary

Post-2015 policy agendas including the 2030 Agenda for Sustainable Development, Paris Agreement, and Sendai Framework for Disaster Risk Reduction (SFDRR) all build on objectives to enable sustainable development by increasing resilience, strengthening adaptive capacity, and reducing vulnerabilities, offering great potential for alignment. In addition to climate action as its own Sustainable Development Goal (SDG 13), 12 out of 17 SDGs directly involve the need to tackle impacts of climate change. Urgent and ambitious climate action is indispensable to achieve sustainable development and prevent climate change from threatening the gains achieved.

Capitalising on and enhancing synergies between the post-2015 policy agendas and dialogues is, therefore, important to benefit from resources and capture co-benefits between sustainable development and climate change action and adaptation.

In this context, Climate Risk Management (CRM) offers entry points for synergising sustainable development and the management of climate risks. CRM is a comprehensive framework for managing impacts of climate change along the entire spectrum of hazards, from short-term extreme weather events to long-term gradual changes, that trigger

risks. The approach is promoted by German development cooperation as it combines a smart mix of innovative and proven instruments from climate change mitigation, adaptation, and disaster risk management. However, little work has been conducted on the potential and actual contributions of existing CRM strategies and measures to the achievement of the 2030 Agenda, or how such synergies can be enhanced in practice, from the national to the local level.

This reflection paper is certainly not the first to contemplate coherence between climate action and sustainable development, or specifically CRM and the goals of the 2030 Agenda. Yet, building on existing literature, investigations, and available project information, it attempts a better understanding of how a comprehensive CRM can positively contribute to specific SDGs, adding value to ongoing discussions by examining both existing and potential synergies between CRM measures and the SDGs.

Since risks are aggravated by unsustainable development leading to increased exposure and vulnerability, all SDGs contribute to resilience-building efforts. Beyond that, CRM as a holistic framework (even if only implemented partially) can contribute to the achievement of selected SDGs. CRM measures that have shown synergies with several SDGs include risk transfer mechanisms such as social protection and climate risk insurance, ecosystem-based adaptation measures, capacity development and awareness raising strategies, and planning/management approaches.

The presented CRM framework developed by the Global Programme on Risk Assessment and Management for Adaptation to Climate Change (Loss & Damage) allows for consideration of a number of aspects highlighted in this reflection paper.

Central reflections derived in this paper include:

- A **combination of measures and approaches** is recommended to avert, minimise and address residual climate risk and at the same time contribute to sustainable development. Approaches that simultaneously address root causes of vulnerability and complement conventional adaptation (e. g. with approaches to diversify livelihoods or transformative adaptation) are being developed and piloted. The presented CRM framework strives to assess each context holistically and identify the most suitable approach which may include consideration of co-benefits and synergies.
- **Positive synergies between CRM measures and SDGs are more effective when guided by the “leave no one behind” principle** and people-centred approaches. As acknowledged by GIZ’s CRM framework, knowledge exchange between involved actors, science and communities is a vital step towards reducing misinformation and strengthening acceptance as well as effectivity. It has been designed to support the most vulnerable in dealing with the severe impacts of climate change.
- **Mainstreaming CRM into current and future processes** holds potentials for formalising the exploitation of synergies with SDGs. Processes and plans that form entry points include Nationally Determined Contributions, National Adaptation Plans as well as disaster risk management plans. Climate risk assessments could serve as basis for mainstreaming climate risks into relevant processes and policies at the national and sub-national level.
- For the design of an approach, a **pre-analysis of potential unintended impacts and trade-offs** is paramount. This is also the case when integrating CRM with a SDG to avoid impeding impacts. Frameworks for holistically understanding the positive synergies as well as possible trade-offs is yet to be developed.

To sum up, this reflection paper identifies multiple synergies between CRM and the SDGs that shall be subject to further investigation. While CRM aims at fostering a holistic understanding and consideration of past and future climate change impacts in all affected sectors as well as needs and opportunities to manage possible losses and damages, sustainable development itself contributes to strengthened climate resilience. Integrated with objectives and country goals that target the SDGs, CRM strategies can thus contribute to the achievement of the 2030 Agenda.



1. Fostering climate-resilient development in the face of changing conditions

Humanity has faced climate risks and related losses and damages throughout history. Nevertheless, just recently the Intergovernmental Panel on Climate Change (IPCC) has again confirmed that anthropogenic climate change is increasing the variability, frequency, and intensity of extreme weather events (IPCC, 2021), which is having and will have further implications for socio-economic development and human lives (UNDESA and UNFCCC, 2019). Every year, extreme events cause around 70,000 deaths and drive 26 million people into poverty (CRED & UNISDR, 2018). Additionally, slow onset climatic processes (SOP)¹ like rising sea levels and desertification could lead to internal displacements of up to 143 million people in South Asia, sub-Saharan Africa, and Latin America by 2050 (Kumari Rigaud et al., 2018). Furthermore, Aleksandrova and Costella (2021: 121) state that “SO[P] will likely undermine poverty reduction efforts [...]”. In combination with rapid environmental, demographic, social, technological, and other challenges, climate change is highly likely to increase the potential occurrence of multiple hazards, systemic risks, and cascading effects.

Vulnerable countries – including the least developed countries, landlocked developing countries, small island developing states, and countries facing humanitarian crises – have limited capacity to adapt, prepare, and respond (BMZ, 2018).

Through these and other impacts, climate change is threatening recent development gains and slowing progress towards the Sustainable Development Goals (SDGs) (Denton et al. 2014). Integrating Climate Risk Management (CRM) measures into the implementation of policies and strategies aimed at achieving the SDGs is required to promote social, environmental, and economic sustainability, while partly averting, minimising, and addressing losses and damages from climate change. While the need for climate-resilient development has been well acknowledged (Roberts & Pelling, 2018), there are limited examples of what it looks like, and there is limited expertise in achieving it at the national or local level (Dazé et al., 2018). In this context, policies to address climate-related losses and damages have been characterised as potential entry points for synergising sustainable development and climate and disaster management (Roberts et al., 2015).

¹ In this paper, rapid onset events are referred to as extreme weather events. While extreme weather events can have dramatic impacts in a relatively short amount of time, slow onset events lead to long-term changes of current natural systems (GIZ & IIASA, forthcoming).



2. Climate Risk Management to achieve and secure the 2030 Agenda

The 2030 Agenda for Sustainable Development encapsulates a global commitment to end poverty and promote social and economic development while ensuring healthy ecosystems and addressing climate change. It also includes a key pledge by UN member states to ‘leave no one behind’ – a commitment to not only ensure that the SDGs are achieved by all countries on a national level, but also to reach population groups within countries who are vulnerable due to geography, gender, socio-economic forces, age, or status as minorities or indigenous peoples (UN, 2015). To monitor and support progress across so many dimensions, the 17 SDGs are connected to 169 targets and 231 indicators (UN, 2015).

Building on existing literature, investigations, and available project information, this report follows the overarching objective of better understanding the synergies between these 17 SDGs and the CRM framework. It aims to identify opportunities for integrated climate action and sustainable development by:

- 1 Identifying those SDGs with strong CRM synergies
- 2 Highlighting the CRM strategies and measures that can be used effectively to support the achievement of the 2030 Agenda overall, and specifically of selected SDGs and their targets
- 3 Presenting examples of how CRM strategies and measures contribute to achievement of the SDGs, and discussing the potential to further advance or scale up such strategies and practices.

The report features projects, initiatives, and programmes that highlight how CRM measures are being implemented in vulnerable countries, including the least developed countries and small island developing states. It highlights lessons learnt and good practices, as well as opportunities and challenges.

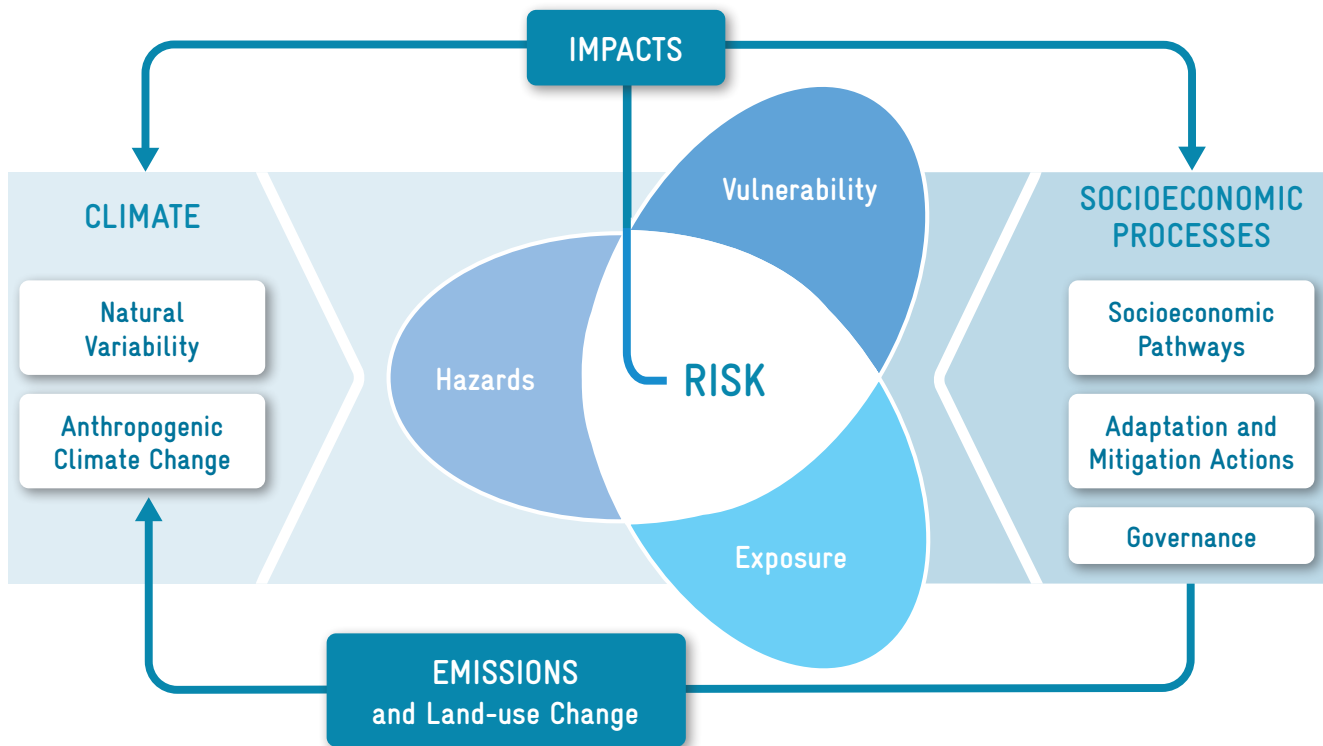


Figure 1: IPCC (2015) Risk Concept

2.1 The need for a CRM framework

Climate risk has long been an important consideration in thinking around climate change. The IPCC built on key concepts from the disaster risk reduction discourse and introduced the concept of climate risk in its Fifth Assessment Report (*IPCC, 2014*). This concept has broadened the perspective on climate-related impacts triggered by extreme events and gradual changes by describing climate risk as a function of hazard, exposure, and vulnerability. By embracing the risk concept, the IPCC contributed to an integration of the two research areas of climate change adaptation and disaster risk reduction.

The identification of key risks and impacts on people, assets, and ecosystems can help to allocate resources accordingly, in order to design adaptation policies and projects for reducing vulnerability and risk. Nonetheless, there is a growing consensus that despite ongoing climate action and policy efforts, some degree of residual risk of climate change remains in all countries for all plausible scenarios. Even with ambitious adaptation and mitigation actions, it will not be cost-effective or even technically feasible to eliminate

all economic and non-economic losses and damages caused by climate risks; instead, human and natural systems could be affected severely.

In line with the current political momentum, the GIZ Global Programme on Risk Assessment and Management for Adaptation to Climate Change (Loss and Damage) has developed a comprehensive and risk-based framework to manage losses and damages. CRM is a systematic framework that seeks to anticipate, avoid, and prevent all types of climate risks as well as to absorb remaining impacts from extreme weather events, such as storms and floods, and slow onset changes including sea level rise and desertification.² The framework understands measures related to mitigation, climate change adaptation, disaster risk reduction, and risk finance and insurance to be 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.

² For further information see [Climate Risk Management: Promising pathways to avert, minimise and address Loss and Damage](#).

Climate risk assessment lays the foundation for a successful selection of CRM measures and is a key component towards resilient communities and sustainable development. By identifying risks and evaluating the magnitude of impacts on people, assets, value chains, critical infrastructure, settlements, and ecosystems, assessing climate risks helps to identify the costs and benefits of the most promising measures. Understanding the organisational and socio-economic context is a fundamental pre-requisite for sustainable management of climate risks. In contrast to most other CRM approaches, the GIZ (2021) framework considers the entire spectrum of climate-related hazards and triggered risks. It responds to risk from hazards related to extreme events as well as those related to slow onset processes, and takes into account the connections between these and the fact that both can occur at the same time. To effectively respond to the entire spectrum of risk, the diverse set of measures, instruments, and tools need to be understood as complementary pieces of a puzzle, and longstanding tools need to be linked with more innovative ones. Due to the inherent uncertainty of climate change, measures of an incremental nature may not always be sufficient. To appropriately manage current and future climate-related risk, instruments for risk transfer, measures of a more transformational character, and fundamental changes are increasingly being considered.

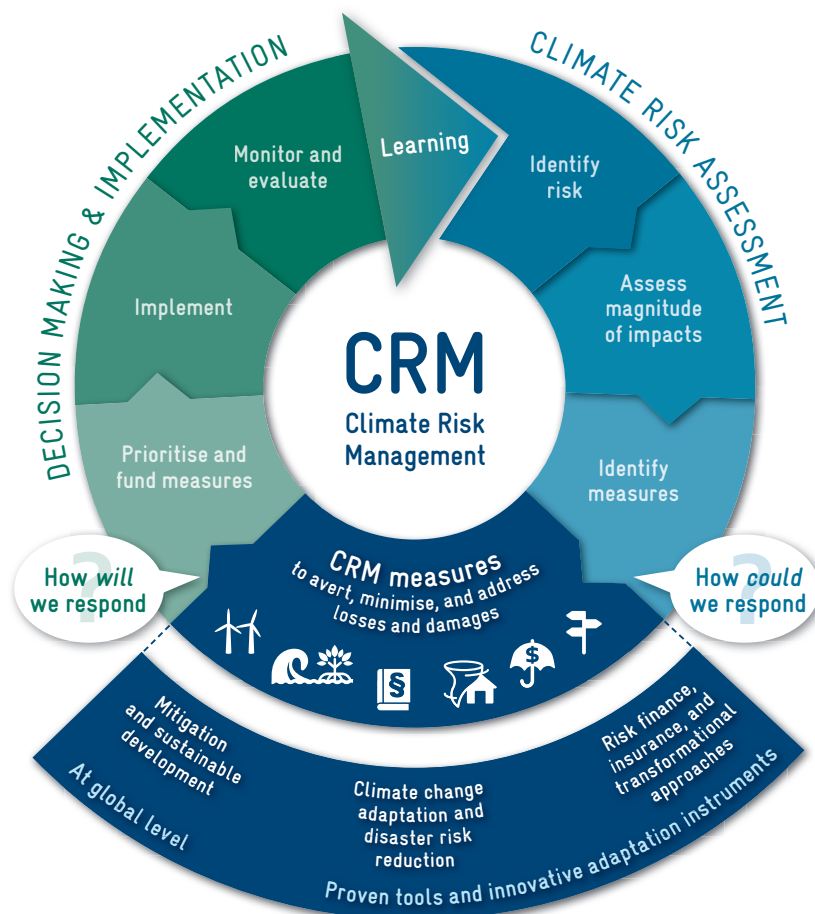


Figure 2: Climate Risk Management framework (GIZ, 2021)

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

Effective CRM requires that all sectors factor risks into plans, including how risks may affect action across sectors. An important goal of the GIZ (2021) 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 disaster risk reduction 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 2030 Agenda, Paris Agreement, and SFDRR.

Sustainable Development itself can play a role in averting losses and damages that is not to be underestimated. While mitigation measures such as low-carbon strategies are concretely useful in reducing global warming, sustainable development can substantially contribute to reductions in exposure and vulnerability.

2.2 Diversity and potentials of CRM

Managing climate risks comprehensively and sustainably can be achieved through the implementation of a context-specific CRM strategy. CRM measures can be broadly separated into three different categories, although some will cut across more than one category.



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 creates hazards such as flooding or changing rainfall patterns, and the magnitude and frequency of such hazards will depend largely on global emissions pathways in the coming years. Limiting global warming to well below 2°C, preferably to 1.5°C, is of paramount importance to keep climate risks manageable. While the intensity and frequency of climate-related hazards can be reduced through climate change mitigation, exposure, and vulnerability can be influenced by sustainable development. This includes risk-informed land use and development planning, as well as enabling access to renewable electricity and environmentally sustainable transportation. Most climate change adaptation measures also contribute to reducing vulnerability and/or exposure.



Minimising losses and damages through adaptation and disaster risk preparedness

The second set of CRM measures aims at minimising those losses and damages that could not be (fully) avoided through mitigation or sustainable development. This set

of measures combines tools from climate change adaptation and disaster risk preparedness that have proven to be effective in the past. For example, it might be too late to avert glacier melting through mitigation action; however, an adaptive measure would be to build dams to prevent flooding from glacial lakes. In the case of the increased frequency and intensity of extreme weather events due to climate change, losses and damages could be minimised through the effective use of disaster preparedness measures such as early warning systems and civil protection plans.



Addressing losses and damages through risk finance and transformational approaches

Depending on the context, prevention or minimisation of all losses and damages is not always possible. The third set of CRM measures addresses residual losses and damages which could not be avoided or minimised through the measures introduced earlier. This requires new, innovative ways of managing risk. 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. As a co-benefit, they also contribute to minimising losses and damages by providing certainty for weather-affected public and private investments, and by easing disaster-related poverty, which reduces exposure and vulnerability.

In addition to risk finance, transformational approaches are a promising pathway 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: protecting vulnerable groups from the impacts of climate change by helping them migrate, either temporarily (through seasonal labour migration) or permanently. In individual cases, it can also mean supporting planned, voluntary resettlement schemes. Migration (and, as a last resort, planned resettlement) can be a way of diversifying income sources and enabling alternative livelihoods, as well as a precautionary strategy to avoid climate-induced displacement (GIZ, 2020).

3. CRM in action: Synergising effects on selected SDGs

Out of the total of 17 SDGs, six goals have especially strong potential for synergies with CRM. The strongest synergies are expected in the case of SDG 13, which focuses on climate action. While SDG 13 recognises the role of the UNFCCC in achieving climate action, it also points to the necessity of including specific climate action measures into policies and planning, and of strengthening resilience and adaptive capacity, not only to climate-related hazards but also to disaster risks. In this sense, SDG 13 has directed research interest towards a better understanding of how the three global policy agendas – the 2030 Agenda, the SFDRR, and the Paris Agreement – can be integrated in a comprehensive way to achieve the global goals inscribed in the latter (UNFCCC, 2017).

Since SDG 13 is highly connected to the other SDGs, it is expected that CRM measures will also show synergies with progress towards additional goals. Based on literature and available evidence, the five other SDGs highlighted in Figure 3 were identified as potentially highly synergetic with CRM.



3.1 SDG 1: No poverty

Climate change represents a significant challenge in sustained efforts to achieve SDG 1 – ‘ending poverty in all its forms’. Projections of the concrete impact of climate change on people – especially those most vulnerable – vary depending on the data, the pathways, and each context. Hallegatte and Rozenberg (2017) state that in the absence of climate-informed development, climate change could result in an additional 100 million people living in extreme poverty by 2030. Since poverty can increase both exposure and vulnerability to climate-related hazards as well as limit capacities to cope and respond, developing countries and vulnerable groups face disproportionate risks from climate change (Hallegatte & Rozenberg, 2017). Therefore, considerations of poverty are critical to prevent a vicious cycle of rising vulnerability and inequality and ultimately to build resilience to climate change (UNDESA, 2020).

Slow onset processes including desertification, the decline of ecosystems, and rising sea levels impact poverty multidimensionally³ and can lead to further social marginalisation (*Aleksandrova & Costella, 2021*). Poor communities often have a high dependence on natural resources and work in associated sectors that are very sensitive to climate change such as fishing, forestry, and agriculture. This is reinforced by the fact that many poor communities, especially in the tropics and sub-tropics, live in areas that face more intense and severe climate hazards and impacts (*Hallegatte et al., 2016*). Consequently, they often suffer from relatively higher losses and damages, not only due to higher exposure to risk but also due to a lack of resources needed to cope with and recover from major losses. Several CRM measures make specific contributions to efforts to end poverty both directly and indirectly.

CRM MEASURE: (Adaptive) social protection schemes

Social protection can be an important CRM tool to support the most vulnerable and the critically poor, especially if instruments are designed to increase coping, adaptive, and transformative capacities (*Aleksandrova, 2019*). Social protection policies aim to address poverty and vulnerability: by ensuring basic needs are met social protection can prevent households from falling further into poverty and can help build their resilience in the long-term (*Ulrichs and Slater, 2016*). At the same time, the need to establish national social protection systems for basic needs is emphasised through SDG 1 (target 1.3).⁴ From an integrative CRM perspective, sectoral protection schemes in agriculture, water management, or city development will only succeed in reducing poverty if climate change is considered (*Davies et al., 2008*), and this is key to achieving target 1.b.⁵

Adaptive social protection further integrates social protection, disaster risk management, and climate adaptation to help build the resilience of poor and vulnerable households in the face of multiple interacting risks, including from natural hazards, poverty, economic crises, pandemics, climate change, and conflicts (*Davies, et al. 2008; UNU-EHS, n.d.*).

There are numerous examples of social protection schemes integrated into development initiatives with due consideration of climate change resilience, including the Sahel Adaptive Social Protection Program (SASPP). This World Bank-initiated programme supports the design and implementation of adaptive social protection measures in Burkina Faso, Chad, Mali, Mauritania, Niger, and Senegal. It aims to establish links between climate information and early warning systems, with a focus on vulnerable populations.⁶



CASE STUDY: Indonesia's social protection system

Climate change poses a significant threat to the most vulnerable groups in Indonesia who rely on the country's social protection system. GIZ is working on an adaptive social protection component to the existing system, which takes into consideration risks from extreme weather events and adverse impacts from climate change. In cooperation with partner organisations, an analysis of risks, prevention, and reduction plans and mechanisms for risk transfer are some of the intended outputs of this work.⁷

³ Multidimensional poverty goes beyond the international monetary definition of USD 1.90 per day and considers three equally weighted dimensions: health, education, and standard of living (*UNDP & OPHI, 2020*).

⁴ Target 1.3: Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable.

⁵ Target 1.b: Create sound policy frameworks at the national, regional, and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions.

⁶ More information on SASPP can be found at worldbank.org/en/programs/sahel-adaptive-social-protection-program-trust-fund.

⁷ More information on the Social Protection Programme in Indonesia can be found at www.giz.de/en/worldwide/16688.html.

CRM MEASURE: Climate risk insurance

There is evidence that climate risk insurance, as part of an integrated CRM strategy, is an effective solution to enable poor and vulnerable communities to respond more quickly and effectively to climate-related hazards (*InsuResilience, 2020*). Climate risk insurance can enable more resilient economic development and strengthen disaster preparedness, rapid response, and recovery from climate shocks. For poor communities, insurance can work as a safety net. Schäfer et al. (2019: 327) synthesise that individuals can benefit from insurance in terms of maintaining food security and basic needs and addressing losses and damages provided pay-outs are “*timely and reliable [...]*”. This can prevent individuals from slipping into poverty. Moreover, insurance and other risk financing instruments can support the long-term fiscal stability of a country.⁸

There has been political momentum towards climate risk insurance targeting vulnerable groups, which was explicitly mentioned in Article 8 of the Paris Agreement (*UNFCCC, 2015*) as a mechanism to address climate risk. Several programmes and initiatives are making use of an insurance component, such as the Rural Resilience Initiative (R4), which aims to help poor households in African countries improve their income and food security as well as diversify their livelihoods to strengthen resilience against climatic variability. R4 incorporates four integrated risk management strategies, placing risk transfer – i.e. climate risk insurance – alongside risk reduction, prudent risk taking, and risk reserves.⁹



CASE STUDY: InsuResilience Global Partnership

The InsuResilience Global Partnership (IGP) is an international alliance supporting financial resilience to climate risks. It aims at protecting the lives and livelihoods of poor and vulnerable people through Climate and Disaster Risk Finance and Insurance (CDRFI) solutions. IGP grew out of the 2015 G7 InsuResilience initiative. A group of industrialised countries and members of the V20 group of vulnerable countries launched IGP in 2017 at the UNFCCC COP23. IGP works within the international resilience community for mobilizing action, raising ambition and fostering coherence of CDRFI contributions across a diverse range of partners. It brings together over 110 members from different stakeholder groups (countries, private sector, multilateral organisations, development banks, civil society, academia). Guided by its Vision 2025, IGP promotes a shift from reactive crisis management to proactive risk management. One of its main targets is to cover 500 million poor and vulnerable people annually by 2025. In 2020, 137 million people in more than 100 countries were reached through 22 implementing programmes under the Partnership. Finally, IGP seeks to amplify the impact of ongoing climate risk finance initiatives, including regional catastrophe risk pools.¹⁰

⁸ For further information please see [Integrating Risk Finance into National Resilience and Adaptation Efforts – InsuResilience](#)

⁹ More information on R4 can be found at wfp.org/r4-rural-resilience-initiative.

¹⁰ For further information see [BMZ-rural-development-en.pdf](#)



3.2 SDG 2: Zero hunger

811 million people – more than 10 per cent of the world's population – face food insecurity (WFP, 2021). In 2021, the World Food Programme categorized 41 million people in 43 countries in the 'emergency' phase of food insecurity and close to the declaration of famine, as seen in many conflict-prone countries in sub-Saharan Africa (WFP, 2021). While there has been significant progress in efforts to reach zero hunger since 2000, this number has increased again in recent years in light of conflicts, climate change and the COVID-19 pandemic (FAO, 2021a). The challenges of rising temperatures, changing precipitation patterns, and an increasing frequency of extreme weather events have only begun affecting food security, as stated by the IPCC (Hoegh-Guldberg et al., 2019).

Hunger and poverty are closely tied to one another and to the risks facing agriculture. Globally, two-thirds of those living in extreme poverty are employed in the agricultural sector (UN, 2019b), a sector where in many developing regions and countries a great share of the food is being produced (Lowder et al., 2019). This is particularly important in Africa where agriculture employs 70 per cent of the population, with two-thirds of this workforce being women (AfDB, 2015). Ensuring that agriculture is resilient to climate change is, therefore, fundamental to achieving food security and ending hunger. There are a number of CRM measures that are proving essential for increasing and securing yields and for contributing to food security, especially when threatened by climate change.

CRM MEASURE: Climate smart agriculture (CSA)

Among those are smart approaches from CSA, which builds a bridge between climate action and the achievement of SDG 2. According to FAO (2021b), CSA has a particular focus on building resilience, with multiple CSA measures strongly relating to adaptation. Under the heading of climate change and rural development, the BMZ lays a specific focus on adapting agriculture and food producing sectors to changing climatic conditions.¹¹



CASE STUDY: Adaptation of agricultural value chains to climate change (PrAda)

PrAda operates in three of the poorest regions in the south and southeast of Madagascar: Anosy and Androy, affected mainly by droughts, and Atsimo-Atsinanana, affected predominantly by floods and cyclones. The project aims to increase the efficiency and climate resilience of selected agricultural value chains through a systematic integration of climate change adaptation into a value chain approach. The selected agricultural value chains are coastal fishing, ginger, ground-nuts, honey, onions, and a cluster consisting of coffee, cloves, pepper and vanilla. The project addresses both disaster risks and climate-related risks from EWE and SOP, and operates in three main intervention areas: i) improving the access of value chain actors to climate and meteorological advisory services; ii) supporting the development and adaptation to climate change of value chains; and iii) supporting the introduction of climate risk insurance to enhance risk transfer.¹²

¹¹ For further information see [BMZ-rural-development-en.pdf](#) (accessed May 2021).

¹² More information on the PrAda project can be found at [Adapting agriculture to climate change \(giz.de\)](#)

CRM MEASURE: Capacity building and awareness raising

Achieving ‘zero hunger’ requires increased capacity to withstand shocks and to adapt to challenging conditions at the institutional and individual level. This involves numerous actors, from smallholder farmers to public administrations. Building capacity to assess risks and implement the right measures to manage risks is essential to CRM, especially in complex contexts such as food security.



CASE STUDY: Adaptation in the Comprehensive Africa Agriculture Development Programme (CAADP)

In 2003, the African Union responded to the increased risk of climate change-induced food insecurity and growing populations by initiating CAADP, which has developed into a broad agenda for climate change adaptation. GIZ, through its project “CAADP: Adaptation of agriculture to climate change in Africa”, has supported the African Union Commission and the New Partnership for Africa’s Development in establishing the necessary climate-aware framework for African Union member states to develop National Agricultural Investment Plans. The programme has resulted in more than 15 African countries including adaptation to climate change in their Plans, ensuring that investments will help farmers cope with climate risks and apply climate-smart agricultural methods.¹³

¹³ More information on “CAADP: Adaptation of agriculture to climate change in Africa” can be found at giz.de/en/worldwide/15891.html.

Raising awareness about the potential impacts of climate change on the agricultural sector is an important starting point, which is why most CRM programmes are equipped with a capacity development component.



3.3 SDG 11: Sustainable cities and communities

Cities have a pivotal role in addressing climate risks. Cities are home to more than half of the world’s population and this number is expected to grow to 70 per cent by 2050 (*100 Resilient Cities*, 2018). They are “hubs of innovation, employment and wealth generation” representing around 85 per cent of global GDP (*Vaidya and Chatterji* 2020, p. 173). Yet the rapid process of urbanisation has created complex challenges including pollution, high greenhouse gas emissions, a lack of adequate living, and profound social inequalities. Moreover, the majority of cities globally are particularly exposed to climate change, with many being located on coastlines, deltas, and islands (*Hughes et al.*, 2021). Informal settlements are often located in hazard-exposed areas such as on steep slopes (*Satterthwaite et al.*, 2018). Urban infrastructure and its operating systems are closely connected, which bears the risk of multiplying damage, as seen in cases of electricity networks and public transport (*Boland et al.*, 2021).

Disaster trends show that many urban areas have sustained heavy losses due to disasters, disproportionately affecting poor and disadvantaged populations, and that municipal governments are often unprepared in their response (*UNDRR*, 2019). Hence, ensuring that cities and human settlements increase their resilience to climate change is critical to achieving SDG 11 and the aims of the New Urban Agenda (2015).¹⁴ Increasing resilience of cities towards climate risks while lowering emissions can create multiple co-benefits for inclusion and better social and economic opportunities for citizens. This puts urban planners and city governments in the unique position to implement far-reaching CRM measures such as building climate-resilient infrastructure and implementing early warning systems (EWS).

¹⁴ The New Urban Agenda was adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in 2015. Learn more about the New Urban Agenda at habitat3.org/wp-content/uploads/NUA-English.pdf.

CRM MEASURE: Sub-national adaptation planning

For SDG 11 to be achieved in cities, adaptation planning should take place at both national and sub-national levels. Sub-national adaptation planning helps to promote participatory processes and to ensure measures are adapted to local contexts. Involving relevant stakeholders in planning processes lays the foundation for innovative solutions and cross-level representation, which in turn can have a positive impact on local acceptance of CRM measures.

Integrating climate change into urban policies and plans has become increasingly important over the past decade. This can be seen in sub-national fora such as ICLEI – Local Governments for Sustainability, a global network of 1,759 local and regional governments that have committed to ensuring sustainable urban development.¹⁵ The Covenant of Mayors in Sub-Saharan Africa (CoM SSA),¹⁶ meanwhile, is helping individual African cities to address climate change and sustainable energy access. Under the CoM SSA, financially supported by the European Union, Germany, and Spain, local authorities are committing to Sustainable Energy Access and Climate Action Plans in cooperation with ICLEI Africa and other technical partners.



CASE STUDY: Climate Resilient Inclusive Smart Cities (CRISC)

Bangladesh is one of the countries most vulnerable to the impacts of climate change, with its coastal exposure and high socio-economic vulnerability. Recent years have already shown an increased intensity of monsoon and dry seasons – resulting in droughts, river erosion, and flooding. On top of this, rapid and informal urban expansion has increased the risk of disasters due to risen exposure and vulnerability. The country's government initiated the CRISC programme in 2019, with support from BMZ and implemented by GIZ to develop technical capacity, disaster preparedness, and adaptation. The programme aims to strengthen the inclusion of local stakeholders in urban planning processes, especially taking into account the needs of the most vulnerable groups. Following pilot projects, context-adjusted guidelines and frameworks for climate resilience are being developed for nationwide roll-out in cities across Bangladesh. Open-access learning platforms are being established through national authorities to make the lessons learnt available to all.¹⁷

¹⁵ More information on ICLEI can be found at [iclei.org](https://www.iclei.org).

¹⁶ More information on the CoM SSA can be found at comssa.org/en.

¹⁷ More information on CRISC can be found at giz.de/en/worldwide/87295.html.

CRM MEASURE: Early warning systems

EWS can be included as one element of a city's climate risk preparedness strategy. They can help city governments, civil protection teams and those at risk to use the time available before a disaster strikes to take appropriate life-saving precautions (e.g. in the case of flooding or storms). EWS consist of three elements: prediction, warning, and response. Prominently, the Climate Risk and Early Warning Systems (CREWS) mechanism works directly with Least Developed Countries to increase the availability of and access to EWS.¹⁸



CASE STUDY: AylluDamos Early Warning System

The Peruvian city of Trujillo is regularly hit by floods, causing damage of infrastructure and housing while putting people's lives at risk. The smartphone app AylluDamos combines data from meteorological stations in the mountains near the city with georeferenced satellite data to inform about the flood situation. It helps the city's administration send updates to its users, locate citizens, and provide supplies where they are needed the most. Beyond that, city planners use the collected data from AylluDamos to develop climate-resilient urban planning.¹⁹

¹⁸ More information on CREWS can be found at www.crews-initiative.org/en.

¹⁹ More information on AylluDamos can be found at www.international-climate-initiative.com/en/infotheque/publications/publication/article/aylludamos-citizen-centered-innovation-for-climate-proofing-urban-infrastructure?iki_lang=en.



3.4 SDG 14: Life below water

SDG 14 focuses on conservation and sustainable use of the ocean, seas, and marine resources. The ocean is ecologically, economically, and culturally crucial for billions of people around the world. It is home to most of the life on earth and is the world's largest carbon sink; it has absorbed about 30 per cent of CO₂ emissions from human activity in the industrial age (*IPCC, 2013*).

The majority of the world's population live in coastal zones, with several megacities (including Dakar, Luanda, Manila, and Jakarta) located in close proximity to the coast or large deltas (*UN Habitat, 2021*). Currently, around 650 million people live less than 10 metres above sea level (*IPCC, 2019b*). Climate change poses an immediate threat to these communities, as well as infrastructure and ocean ecosystems. There is a growing risk of losses and damages in developing countries, particularly to sectors such as small-scale fisheries and tourism, which many communities rely on for their livelihoods.

CRM MEASURE: Ecosystem-based adaptation in coastal areas

Ecosystem-based adaptation relates to the benefits communities obtain from ecosystem services and biodiversity, such as storm protection and erosion regulation. In coastal environments, common ecosystem-based measures include mangrove restoration, coral reef rehabilitation, and the preservation of marshes and wetlands. Besides benefitting from and conserving the adaptive capacity of natural systems, coastal ecosystem-based measures also facilitate carbon sequestration, biodiversity conservation, habitat provision, protection of natural resources, water quality improvement, and increased recreational value²⁰ (*Environmental and Energy Study Institute, 2019*). Ecosystem-based adaptation can support adaptation at multiple geographic scales through sectoral or multi-sectoral approaches supplying various co-benefits while providing great potential to avert and minimise losses and damages in the long term. Numerous initiatives make use of the potential that ecosystem-based adaptation, alongside other nature-based solutions, provides to coastal areas. For example, GIZ is supporting adaptation

²⁰ For further information on ecosystem-based adaptation refer to [IUCN \(2017\)](https://www.iucn.org/).

in the tourism sector in three regions in Mexico with the aim of reducing the risk of climate change to the economy while protecting ecosystems and the services they provide.²¹ This initiative is based on public-private cooperation to ensure that relevant stakeholders within the tourism sector and broader society (such as civil society organisations, communities, and academic and research institutions) participate in the process – and that ecosystem-based adaptation is included in tourism investment decisions and projects.



CASE STUDY: Caribbean Aqua-Terrestrial Solutions (CATS)

The CATS programme has implemented several ecosystem-based adaptation and capacity building measures focused on its three focal countries, and with shared knowledge to eight countries of the Caribbean Community to improve the management of marine and coastal protected areas in order to prevent negative impacts of climate change. With measures such as coral reef restoration in Saint Lucia; good fishery and marine management practices in Dominica and Grenada have been implemented. CATS is directly and indirectly contributing to SDG 14 and its targets 14.1, 14.2, 14.4, 14.5 and 14.7. The activities targeted youth, females, and traditional male fishers within the focus areas, as well as the various marine protected area agencies in the respective focal countries.²²

CRM MEASURE:

Integrated coastal zone management (ICZM)

Following the European Environment Agency, ICZM is a multidisciplinary and dynamic process for the sustainable planning and management of coastal zones.²³ A successful ICZM programme is built on the informed participation and cooperation of all stakeholders, while considering the full range of temporal and spatial scales.

Various coastal challenges from climate change such as sea level rise, inundation of land, sediment flow reduction, storms, and droughts as well as pollution can be addressed through ICZM, and the approach can be oriented towards most of the targets of SDG 14, depending on the design. An example of ICZM is the Integrated Climate Change Adaptation Strategies (ICCAS) project in Grenada, which has focused on improving the planning, management, and efficient use of resources in water and coastal zones through the establishment of integrated water resource management approaches and the formulation of coastal zone management policies.²⁴

21 More information on the GIZ project "Ecosystem-based adaptation to climate change with the private sector in Mexico" can be found at www.giz.de/en/worldwide/66805.html.

22 Target 14.1: By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.

Target 14.2: By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.

Target 14.7: By 2030, increase the economic benefits to small island developing states and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.

23 Compare [integrated coastal zone management – European Environment Agency \(europa.eu\)](http://integrated-coastal-zone-management-european-environment-agency.europa.eu/).

24 More information on ICCAS in Grenada can be found at www.giz.de/en/worldwide/27030.html.



CASE STUDY: Mekong Delta Climate Resilience Programme (MCRP)

Targeting climate resilience and sustainable development of the Mekong Delta Region, the MCRP is being implemented by GIZ and Viet Nam's Disaster Management Authority within the Ministry of Agriculture and Rural Development. Through a holistic regional approach, climate change has been factored into natural resource management in order to strengthen resilience to the impacts of climate change in the region. Furthermore, the regional coordination of investment planning, testing technologies and solutions to coastal protection and sustainable land and water management and facilitating a base for climate-smart decision-making are implemented by the programme. All 13 provinces of the Mekong Delta are considered, and the programme is consistent with the government's holistic approach of managing the Mekong Delta in an integrated and sustainable manner.²⁵



3.5 SDG 15: Life on land

SDG 15 emphasises the need for protecting, restoring, and promoting the sustainable use of terrestrial ecosystems as a foundation of sustainable development. Sustainable management of forests, combating desertification, reversing land degradation, and halting biodiversity loss will be key in securing ecosystem services that are directly connected to human well-being, especially in resource-dependent communities in developing countries. Yet billions of hectares of land – one-fifth of the world's surface – have already been degraded, affecting the livelihood generation of resource-dependent communities and driving species to extinction (*FAO, 2017*).

The IPCC (*2019a*) has highlighted the fundamental links between land and climate change mitigation and adaptation, estimating that 23 per cent of total anthropogenic greenhouse gas emissions derive from agriculture, forestry, and other land use. As major carbon sinks, forests, soil, and wetlands are often incorporated in climate change mitigation strategies. Many biodiversity-rich countries have placed the reduction of emissions from deforestation and forest degradation under their Nationally Determined Contributions (NDCs) to the UNFCCC. At the same time, climate change is also degrading terrestrial ecosystems, as seen in cases of desertification and biodiversity loss.

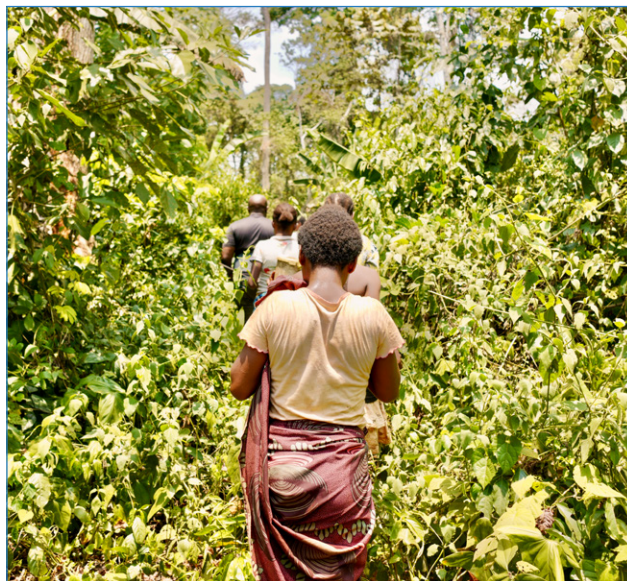
CRM measures can contribute to protecting, restoring, and promoting the sustainable use of terrestrial ecosystems while achieving risk management objectives. These CRM measures include sustainable resource management and the integration of a spectrum of adaptation measures into development and sectoral policies and plans. There is also a role for livelihood diversification in ensuring that human societies can coexist with healthy ecosystems. Synergies with SDG 15 will be even greater if ecosystem-based approaches are integrated with CRM frameworks, including ecosystem-based adaptation.

²⁵ More information on MCRP can be found at www.giz.de/en/worldwide/73408.html.

CRM MEASURE: Sustainable resource management

In many developing countries, particularly in rural areas, livelihoods depend on natural resources. Extreme weather events damage natural resources – and already degraded ecosystems are more vulnerable to the adverse effects of climate change (*Francis & Wadhwa, 2015*). In the aftermath of extreme weather events there can be further land degradation such as deforestation, overgrazing, or ineffective watershed management (*UNCCD, 2020*).

Sustainable resource management, as a CRM instrument, can help to mitigate these hazards by increasing the coping capacity of natural resources and building local capacity for resilience (*IPCC, 2019b*). In this way, sustainable resource management builds a bridge between CRM and SDG 14. An example of this is the GIZ-supported Transboundary Biosphere Reserve in the Mono Delta in Benin and Togo, where populations rely heavily on natural resources that are under increasing threat from climate change.²⁶ In order to prevent the degradation of livelihoods, the project supported the creation of local management associations which received the mandate to monitor the management and harvesting rules for natural resources.



CASE STUDY: Climate resilience and management of natural resources in the Southern African Development Community (SADC)

This GIZ-supported project focuses on climate-compatible cross-border management of natural resources in the SADC region. At a regional level, the project analyses the risks of climate change and of mitigation measures and supports access to funding. Locally, the project works with municipalities to implement climate smart agriculture and resource management measures in selected Transfrontier Conservation Areas. Beyond this, the project promotes knowledge sharing and climate-sensitive resource management locally, regionally, and nationally.²⁷

²⁶ More information on the project "Transboundary Biosphere Reserve in the Mono Delta" can be found at www.giz.de/en/worldwide/27427.html.

²⁷ More information on the project "Transboundary use and protection of natural resources in the SADC region" can be found at www.giz.de/en/worldwide/15903.html.

4. Towards strengthened synergies: Opportunities and trade-offs in integrated action



CRM is a holistic framework that can contribute to achieving the 2030 Agenda and the SDGs. CRM presents a range of opportunities, but potential trade-offs must be considered. It is important to identify how synergies can be fostered, integrated into development planning, and eventually contribute to climate-resilient sustainable development. Measures that have shown synergies with the SDGs include risk transfer mechanisms such as social protection and climate risk insurance schemes, ecosystem-based adaptation measures, capacity development and awareness raising strategies, and planning/management approaches. While the previous section elaborated on technical opportunities, here the reflection focuses in on institutional opportunities for strengthened synergies.

4.1 Maximising synergies

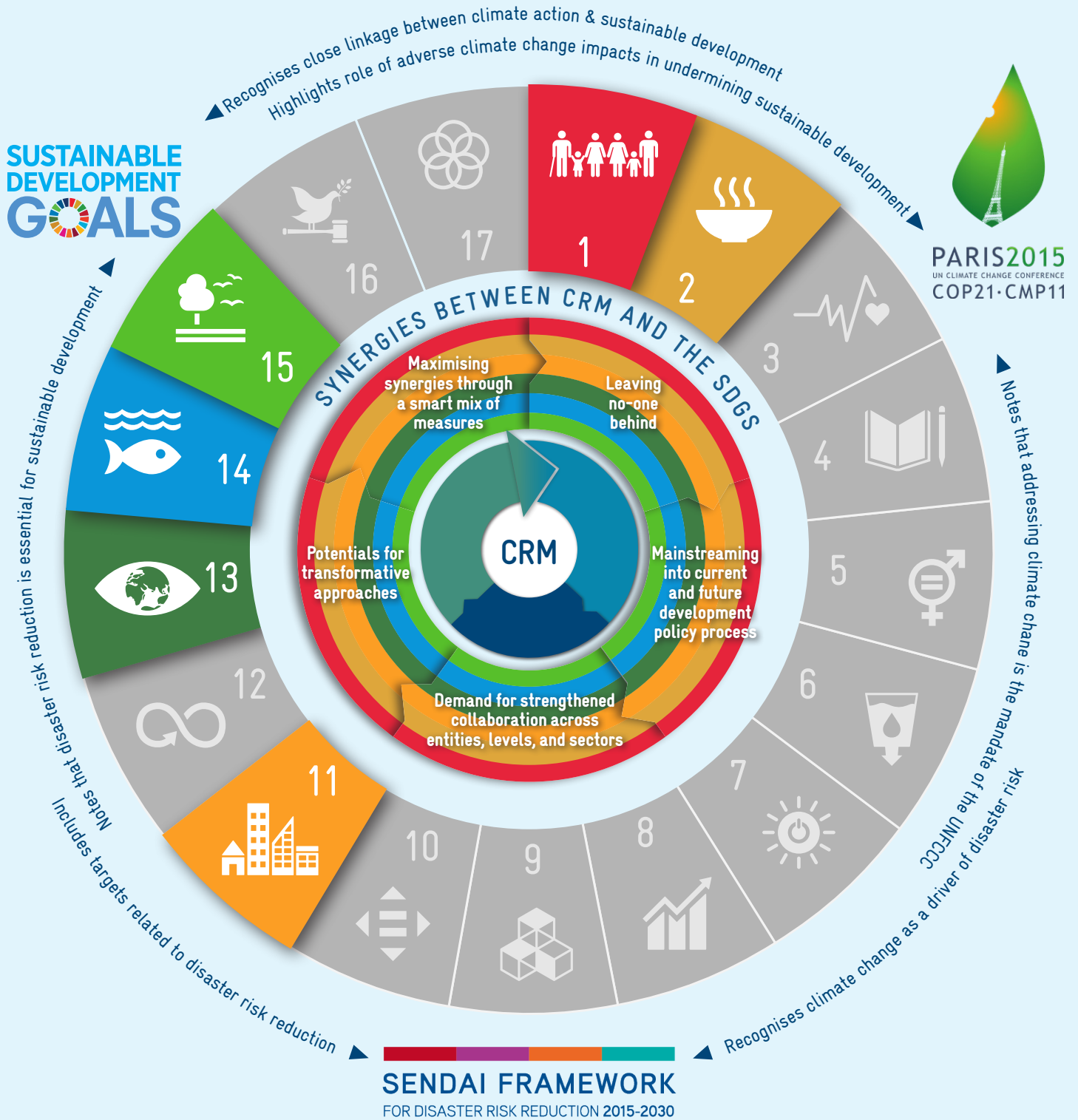
This reflection argues that when implemented together as part of a holistic framework, CRM can function as a vehicle for both addressing climate change and promoting sustain-

able development, thereby contributing to the achievement of the SDGs (*e.g. Roberts & Pelling, 2018*). Three concrete examples follow of how synergies could be maximised.

Integrating entire approaches: The case of adaptive social protection

Social protection measures have the potential to provide greater stability for individuals and households; strategies beyond that can be designed climate responsive and complemented with further measures. Going beyond that, adaptive social protection is a promising strategy that enables greater synergies between CRM and the SDGs. Not only does adaptive social protection address the structural root causes of poverty and simultaneously factor in changing climatic conditions and related impacts, but it is also based on the assumption that extreme weather events and gradual changes impede the elimination of poverty and inequalities – the main drivers of vulnerability to climate change (*Aleksandrova & Costella, 2021; Aleksandrova, 2019; Davies et al., 2008*).

Opportunities for strengthening synergies between CRM and the SDGs



A smart mix of measures

Selecting an effective combination of CRM measures enables a maximisation of synergies and co-benefits between CRM and efforts to achieve the SDGs. This can, in part, be explained through the many synergies that exist between the SDGs themselves, which release the potential to maximise co-benefits. The most effective and efficient mix of CRM measures depends on geographical and socio-economic conditions – and the type, magnitude, and frequency of climate hazards being experienced (UNFCCC, 2012; Zommers *et al.*, 2016). Depending on the overall objective, some measures can be considered as setting an initial baseline upon which further CRM measures can be built that are targeted to maximise synergies with other SDGs. For example, adaptive social protection, by supporting climate-resilient livelihood strategies and protecting vulnerable ecosystems when combined with ecosystem-based adaptation, can help avoid and minimise losses and damages. Further, through the support of livelihood diversification, or in combination with climate risk insurance schemes, residual risks can be managed comprehensively while structural root causes of poverty are being addressed (*e.g.* Aleksandrova, 2019).

Operationalizing synergies among SDGs: The case of SDG 2

In addition to implementing a smart mix of measures, exploiting synergies between SDGs can lead to enhanced impacts. SDG 2 is one of the basic SDGs and its achievement constitutes a prerequisite for the achievement of other SDGs; moreover, its targets 2.3 and 2.4 have been identified as two out of the six targets with most synergies to other SDGs (Zhou and Moinuddin, 2017).²⁸ SDG 2 is not only inextricably linked to poverty reduction (SDG 1); reducing malnutrition also helps reduce the global burden of disease (SDG 3) and support women due to their key roles in food production, preparation and child-care (SDG 5).²⁹ Further goals interlinked with SDG 2 include SDGs 6, 13, and 15,

which will require sustainable agricultural practices, while agricultural production can also play a role in achieving affordable, reliable, and sustainable energy (SDG 7). Regarded from the CRM perspective, financial protection and risk transfer measures not only directly contribute to the achievement of SDG 2 but can also have co-benefits with SDG 12 when supporting sustainable management of natural resources (Coopmann *et al.*, 2016), as well as with SDGs 5, 8, and 10 when targeting the poorest and most vulnerable, including smallholder farmers and women.

4.2 Broadening the impact of CRM measures on sustainable development through mainstreaming into current and future processes

Institutional integration is crucial for mainstreaming CRM and Loss and Damage considerations into new and existing development and adaptation planning and budgeting processes, within all relevant institutions and sectors. At present, strategies to include CRM considerations into national policy rely on their strong linkage to, and possible integration into, current processes such as NDCs, National Adaptation Plans (NAPs), development plans, and disaster risk reduction and management policies, as well as the reorientation of national policies towards sustainable development. As governments currently face the challenge of translating their NDC commitments into national policies and budgets, NDCs and NAPs provide a formal and systematic vehicle to operationalise the synergies between CRM, disaster risk reduction, and the SDGs in decision-making (GIZ, 2017).

Two initiatives that support the implementation of NDCs and development of NAPs, while promoting ambitious climate action in alignment with the SDGs, are the NAP Global Network and NAP Global Support Programme (IISD, 2020). These initiatives argue that NAPs and NDCs can provide a strong basis for aligning climate action, disaster risk reduction, and the SDGs in three areas. First, NAP processes can establish an enabling environment by promoting institutional collaboration mechanisms that provide a platform for dialogue and capacity building efforts – such as the trainings, dialogues, technical support, and awareness raising offered by the NAP Global Network and Support Programme. Second, alignment can be strengthened by mapping synergies between SDG

28 Target 2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.

Target 2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

29 In many countries, significant socio-economic inequalities between men and women still restrict women's ownership and control of land, access to agricultural technologies, decision-making opportunities and financial resources.

and NDC targets and financing opportunities in order to efficiently allocate resources and avoid duplication of efforts. Third, progress on all agendas can be tracked in integrated monitoring and evaluation systems (*Terton et al., 2019; UNDP, 2017*).

INFOBOX: NDC Partnership, CRM, and SDGs

In this context, the NDC Partnership highlighted that delivering on NDCs – including strengthening the adaptation component – will facilitate progress on the SDGs, while achieving the SDGs will support countries' strategies to mitigate and adapt to climate change. Initiated by the BMZ, BMU, the Moroccan government, and the World Resources Institute, this global coalition of developing and developed countries as well as international institutions, multilateral banks and NGOs was launched at COP22 based on the principle that effective cooperation can fast-track the achievement of both climate and sustainable development targets. Some countries are taking a "development first" approach to adaptation planning, whereby the implementation of the 2030 Agenda is determining the development objectives that the NDCs and NAPs should be strengthening. Through a process of "nationalising" the NDCs, countries identify priority goals, set nationally relevant targets, bring climate and sustainable development together and integrate them into development plans and strategies (*Hammill & Price-Kelly, 2017; NDC Partnership, 2020*). Developing country members of the partnership are supported by technical assistance and capacity building, information provision through knowledge products, financial support, as well as peer-to-peer learning (*BMZ, 2020*). With respect to adaptation planning, countries are requesting technical assistance to study climate risks (including modeling and scenarios), assess vulnerabilities, and increase data accessibility (*NDC Partnership, 2020*).

Integrating synergies between CRM and the SDGs into the NAPs and NDCs has the potential to bring climate-resilient sustainable development into national policies and public budgets (*GIZ, 2017*). This approach could also increase support for adaptation beyond those decision-makers involved in the UNFCCC process by underlining the contribution of climate adaptation to a country's overall development goals and livelihoods (*Hammill & Price-Kelly, 2017*).

4.3 Leaving no one behind

People who are socially, economically, culturally, geographically, or politically marginalised often have limited capacities to anticipate, adapt, or respond to the impacts of climate change, and are therefore more vulnerable to current and future climate risks (*Manuel et al., 2018*). In order to prevent disasters and climate change from exacerbating social inequalities, there is a strong need to explore how the 2030 Agenda's core principle, 'leave no one behind', can be targeted further through CRM measures.

The principle builds on the understanding that sustainable development is only possible if everyone is included. It attaches great importance to actions for those furthest behind through people-centred, gender-sensitive, and human rights-based approaches to promote a more equitable distribution of power and resources, and to promote more equal opportunities.

In 2018, the UN Committee for Development Policy prepared a brief on the status of leaving no one behind, stating that significant advances are possible in a short time frame but that these will require a transformation of economic and political systems, governance structures, and business models that promote the unequal distribution of wealth (*UNCDP, 2018*). Within GIZ's work, the principle has been leading efforts to promote equal opportunities, putting the poorest and most marginalised groups at the centre of cooperation efforts (*BMZ, 2018*). Further, strategies that empower the most vulnerable are being considered and integrated into measures and approaches already providing examples from practice (*e.g. see Schäfer & Waters, 2016*). Ecosystem-based adaptation has been highlighted as a CRM measure which is considered effective in addressing the needs of poor and marginalised groups when responding to climate change and building adaptive capacity. As those groups often directly depend on ecosystem services for their livelihoods and these livelihoods

are most vulnerable to climate change, social benefits are seen as a distinct feature of ecosystem-based adaptation.

Overall, CRM frameworks should be designed as multi-stakeholder approaches including participatory elements, e.g. for the conducting of climate risk assessments or the selection of suitable measures to capture the respective spectrum of hazards and vulnerabilities and reach high levels of awareness and acceptance. At the same time, knowledge exchange and participatory approaches are vital steps towards disavowing misinformation and maladaptation.

4.4 Potential of transformational approaches

The assessments in this reflection paper have shown that (conventional) climate risk management approaches are indispensable to address climate change impacts while contributing to sustainable development. Now, as risks become increasingly more threatening, conventional measures may no longer suffice (*Deubelli & Mechler, 2021*). This reflection therefore argues that it is increasingly required to complement tried-and-tested conventional adaptation with transformational approaches.

In light of the SDGs presented in this study, transformative adaptation could include livelihood transformations to reach food security (SDG 2) and increase income (SDG 1); the relocation of settlements (e.g. coastal cities) that are exposed to floods and rising sea levels (SDG 11) to avert non-economic losses; or a large-scale implementation of ecosystem-based adaptation in natural resource management for a transition towards a bio-based economy (SDG 15). The greatest potential of transformative adaptation for sustainable development perhaps lays in the underlying logic of enabling a shift from responding to climate-related risks as an externality to addressing the root causes of risk in society (*Kuhl et al., 2021*).

It cannot be neglected that transformational changes in the core functions of a system still hold great uncertainties. For instance, relocation entails unforeseeable outcomes related to building new social networks and adjusting to new cultures. These future factors can lead to improved livelihood outcomes but also new risks and trade-offs. Thus, an awareness of uncertainty and different possible outcomes is particularly important when making transformative decisions (*Birkmann, 2011*). Until now, such uncertainties of transformational adaptation to create positive and just

change are reinforced by a lack of implementation experience and a gap between theory and practice (*Deubelli & Mechler, 2021*).

Ultimately, transformation needs to be forward-looking and guided by the leave no one behind principle to build a bridge between CRM and the SDGs. Scholars emphasise the role of transformational approaches for extending soft adaptation – understood as actions that focus on fundamental system changes and that address the root causes of risk – so that a breaching of limits is prevented or at least postponed (*Fedele et al., 2019*).

4.5 Possible trade-offs between CRM and the SDGs and remaining challenges

Holistic views and implementation require the pre-analysis of potentially possible trade-offs and negative impacts. Whereas the risk of negative impacts is assessed during a project planning phase, and thus can ideally be avoided during project implementation. As stated by the IPCC (2014), potential trade-offs and conflicts between climate change mitigation actions and CRM measures exist. Also, there are clues to some of the possible trade-offs between CRM and the SDGs in the well-recognised trade-offs between SDGs themselves, where some measures could impede other efforts. The expansion or diversification of agriculture to increase agricultural productivity (SDG 2), for example, could impede the protection and sustainable use of terrestrial, coastal, marine, and ocean ecosystems (SDGs 14 and 15) and have negative effects on responsible production and consumption (SDG 12). Ensuring healthy coastal, marine, and ocean systems (SDG 14) could impede access to resources and ecosystem services which are needed to alleviate poverty and ensure food security (SDGs 1 and 2) (*Coopmann et al., 2016; ICSU, 2017*). Lastly, trade-offs could emerge between efforts to expand agriculture and increase food security (SDG 2) and efforts to end poverty and reduce inequality (SDGs 1 and 10) if strategies are not aligned with efforts to target the most vulnerable.

Frameworks to assess and mitigate potential negative interlinkages and trade-offs exist but are not yet mainstreamed into all processes. Strategies for aligning CRM with the SDGs need to be designed holistically by integrating sustainability concerns while being compliant with principles such as leave no one behind in order to avoid trade-offs.

Continued development, piloting, and enhancement of measures and instruments in various contexts and under plausible scenarios remains pivotal to ensure smart and effective sets of measures are at hand. Other challenges remain that are not restricted to trade-offs and the integration of CRM strategies. Just three of these follow.

Demand for strengthened collaboration across entities, levels, and sectors

Integrating CRM and the SDGs will challenge stakeholders to think beyond traditionally isolated agendas and sectors, and ultimately adopt comprehensive approaches that systematically involve a broad range of actors across different sectors and focus on co-benefits (UNDESA and UNFCCC, 2019). A major challenge to policy alignment is that the implementation of CRM and efforts to achieve the SDGs involve a number of ministries and sectors, potentially creating administrative and capacity barriers (*Dazé et al., 2018*). Capitalising on synergies between CRM and the SDGs will therefore require a significant level of inter-ministerial cooperation, which is lacking in many countries. Beyond that, the strength and direction of collaboration is partially dependent on political circumstances and the resources available, and thus not necessarily subject to flexibility (*e.g. v. Soest et al., 2019*).

Transboundary action

Transboundary adaptation recognises the transboundary nature of risk and the interconnectedness of societies, economies, and ecosystems in a globalised world; hence, the cooperation of nation states is an integral component (*Benzie et al., 2018*). Transboundary adaptation can enable more efficient and effective adaptation by pooling available data, models, scenarios, and resources and enlarging the planning space for locating adaptation measures. Yet transboundary action for climate change confronts many challenges, as it requires strong cooperation between countries and across all government levels, sectors, and institutions as well as diverse stakeholder involvement. All of these tend to have conflicting and competing needs across multiple physical, political, and jurisdictional boundaries.

Remaining lack of capacities

Capacities that are required to maximise synergies between CRM and the SDGs include knowledge, not just of one specific but multiple distinct fields, international processes, and commitments; facilitation capacities for coordination; technical capacities; as well as human resources – and all are lacking in many developing countries (*e.g. Dazé et al., 2019*). A lack of knowledge on the relevant steps of CRM measures, and the need for deepened understanding of the potential impacts of the measures themselves, complicate effective progress as each measure and instrument comes with a pre-defined set of potentials as well as limitations. The suitable mix of measures to identify can vary greatly depending on the given context and system of interest, the scope and objective of the risk assessment, and the available resources. One example of a knowledge exchange platform is RISK TALK which has been established by the IGP in cooperation with UNFCCC and which enables stakeholders to exchange on key questions related to CRM.³⁰

30 More information can be found at www.insurresilience.org.

Annex: Progress on the synergies between CRM and the SDGs

2015

Disaster Risk Reduction and Resilience in the 2030 Agenda for Sustainable Development (UNISDR, now UNDRR)

This report outlines why reducing disaster risk through the Sendai Framework for DRR will be integral for achieving the SDGs (UNISDR, 2015). Specific strategies are proposed for enhancing synergies between DRR and specific SDG targets for each goal. Livelihood enhancement programmes integrated into social safety nets are proposed as one means to build the resilience of both households and communities to disasters. Furthermore, a spectrum of measures is outlined to promote climate-resilient agriculture as part of a broader effort to integrate both DRR and adaptation into planning and investments in the agricultural sector.

2017

Opportunities and options for integrating climate change adaptation with the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction (UNFCCC)

This report explores opportunities and lessons learnt for aligning climate change adaptation with the SDGs and the SFDRR, in particular through the lenses of resilience and ecosystems. The Global Goal on Adaptation (GGA) established in the Paris Agreement to build resilience, enhance adaptive capacity, and reduce vulnerability was proposed to provide a framework for the integration of the three policy agendas. In order to facilitate policy coherence across multiple scales and sectors, it highlights the need to clarify responsibilities, encourage partnerships, improve data management and availability for more informed policy making, access to finance and technology and capacity building. Moreover, it calls for effective bottom-up, locally-driven strategies that contribute to various policy outcomes simultaneously.

2018

The Global Compact on Migration

In 2016, the New York Declaration for Refugees and Migrants was adopted by the UN General Assembly with the intention to address large movements of migrants and refugees (UN, 2016). The declaration established a consultation process through which the Global Compact on Migration was established in 2018. In the declaration, the 193 member states agreed to invest in programmes that accelerate the achievement of the SDGs with the aim of eliminating the drivers of migration including through poverty eradication, ensuring food security and promoting resilience, disaster risk reduction and climate change adaptation and mitigation – among other measures (UN, 2019b). The Global Compact on Migration, established in 2018, commits to supporting programmes that accelerate the achievement of the SDGs with the aim of minimising the drivers that compel people to leave their country of origin. Strategies include promoting resilience, disaster risk reduction and climate change adaptation and mitigation (UN, 2019b).

2019

Global Sustainable Development Report: The Future is Now: Science for Achieving Sustainable Development

Unlike the SDG progress reports, the fourth edition of the Global Sustainable Development Report does not track progress on indicators, targets and goals, but synthesises evidence to strengthen the science-policy interface by identifying concrete entry points for rapid, transformational change. It acknowledges that making use of positive synergies with other SDG targets while preventing trade-offs is crucial to achieve the SDGs. Furthermore, it argues that the success of the Agenda 2030 depends on cooperation between governments, institutions, agencies, the private sector and

the civil society across sectors, scales and locations.

2019

Global Conference on Strengthening Synergies between the Paris Agreement on Climate Change and the 2030 Agenda for Sustainable Development Report (UNDESA and UNFCCC)

This report builds on discussions that were held during the conference. It outlines specific examples where synergies have been capitalised upon as well as opportunities for scaling up and replicating existing initiatives. The importance of a decentralised approach that engages sub-national governments, local communities, and indigenous peoples is acknowledged along with the need to enhance interministerial collaboration and cooperation across sectors.

2019

Tackling climate change and accelerate sustainable development (UNDESA and UNFCCC)

This article co-authored by the Executive Secretary of the UNFCCC and the Under-Secretary General of UNDESA emphasises climate change as a threat multiplier and stresses the urgency of addressing climate change to ensure progress in achieving sustainable development worldwide.

2020

Progress towards the Sustainable Development Goals (UN)

This is the annual report prepared by the UN Secretary-General on the progress towards implementing the SDGs. While the 2020 report pays particular attention on how the COVID-19 pandemic is impeding development and emphasises the importance of resilient recovery, all reports highlight both the gaps and opportunities in progress towards achieving the SDGs and also recognises the importance of a holistic approach to building resilience.

2020

United Nations Comprehensive Response to COVID-19: Saving Lives, Protecting Societies, Recovering Better

Building on best practises and lessons learnt in early 2020, this report outlines the three-point UN response for a comprehensive response to and recovery from COVID-19. Leaving no one behind and addressing the root causes of vulnerability, the UN's whole-of-society and whole-of-government approach does not only include a health response. It also points out how to support the most vulnerable people by tackling the socioeconomic, humanitarian and human rights aspects of the crisis. Moreover, guided by the Agenda 2030, it regards the pandemic as an opportunity to building resilience to future climate risks by overcoming persisting inequalities, exclusion and gaps in social protection systems.

2020

Common grounds OECD

This report complements previous work that investigates the role of climate action, and to a certain extent disaster risk management, in supporting the achievement of the SDGs by providing an overview based on several research strands. It is based on the introduced CRM framework and follows a holistic perspective in its investigation of the synergies with the SDGs.

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