

Climate change and small-scale fisheries

The comprehensive climate risk management perspective

Climate change threatens small-scale fisheries

The fisheries sector contributes significantly to income and food security for hundreds of millions of people, particularly in Small Island Developing States (SIDS) and coastal Least Developed Countries (LDCs).

Climate change presents key challenges for small-scale fisheries and mariculture and is projected to have significant impacts on the lives and livelihoods of people dependent on this sector.

Future shifts in fish distribution, decreases in fish abundance and impacts on fisheries assets due to climate change are projected to affect income, livelihoods, and food security of marine resource-dependent communities as stated in the recent IPCC Special Report on Oceans and the Cryosphere (SROCC 2019).

The precise magnitude of future impacts of climate change on fisheries – in particular small-scale fisheries – are still poorly understood, since they involve numerous interactions with fragile and complex ecosystems that are often already affected by other stressors such as overfishing or pollution (see figure 2).

Impacts of climate change on small-scale fisheries and mariculture in the Caribbean, the South Pacific and West Africa

While the impacts of climate change on small-scale fisheries are complex, there are notable similarities and interlinkages within

and between the countries of the Caribbean, the South Pacific and West Africa. The information given in the following is based on three regional case studies.

- In the **Caribbean region**, the increasing frequency and magnitude of extreme weather events will further exacerbate damages to fishing boats, mariculture, port facilities and infrastructure. Rising sea surface temperatures will cause more coral bleaching, algal blooms and increased ciguatera, i.e. a serious illness caused by eating reef fish whose flesh is contaminated with toxins found in certain microalgae.

Marine heatwaves will further increase in frequency, duration, spatial extent and intensity under future global warming pushing some marine organisms, fisheries and ecosystems beyond the limits of their resilience, with cascading impacts on economies and societies (SROCC 2019).

- In the **South Pacific Islands and Territories**, climate change will not only result in the loss of certain fish species and changes in the migration patterns of commercially-important tuna-like species, but also aggravate the influence of regional climate cycles such as El Niño. The region will suffer a significant decline in productivity and forced changes in fishing practices.

The projected redistribution of marine resources and reduction in their abundance will increase the risk of conflicts among fishers, authorities and communities. Challenges to fisheries governance are widespread under RCP8.5 with regional hotspots such as the tropical Pacific Ocean (SROCC 2019).



- For national economies in **West Africa**, more intense tropical storms and increased risk of tidal waves are likely to cause further loss of fishing gear and therefore increase operational costs. Declines in fish stocks induced by climate change and overfishing are now considered to be one of the causes of human migration and displacement.

Decreases in seafood availability are projected to increase risks to food security and nutritional health in some communities, in particular those in West Africa and Small Island Developing States that are highly dependent on seafood (SROCC 2019).

People in these regions that are dependent on small-scale fisheries will be profoundly affected by climate change. The impacts will have consequences for the livelihoods of fisherfolk, as well as local and regional food security, employment in the fisheries sector and patterns of human displacement and migration. The projected changes will also threaten the traditional values, cultural identities and social wellbeing of many coastal communities.

Although fishers will be able to adapt to some of these impacts by changing fishing grounds, gear or target species, or by adopting dynamic management policies, the scope for adaptation to some major stressors, such as ocean acidification, is limited. Moreover, the negative impacts of climate change on fisheries are extremely difficult to separate from other anthropogenic threats like overfishing and pollution.

Against this backdrop it is clear that individual efforts to deal with the impacts of climate change in the concerned regions will not be sufficient. **The magnitude and interrelatedness of the risks described above highlight the need for a comprehensive climate risk management approach to identify answers for the small-scale fisheries sector.**

Addressing loss and damage in the fisheries sector requires a comprehensive climate risk management approach

Comprehensive Climate Risk Management (CRM) is an approach shaped and promoted by the Global Programme on “Risk Assessment and Management for Adaptation to Climate Change (Loss & Damage)” of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. CRM aims to manage risk along the entire risk continuum – caused by both extreme weather events and slow-onset changes such as sea level rise and ocean acidification.

CRM-mainstreaming is crucial for strengthening the resilience of small-scale fisheries and mariculture against climate-related risks. To further enhance the resilience of the fisheries sector, an ecosystem-based management approach could be presented as

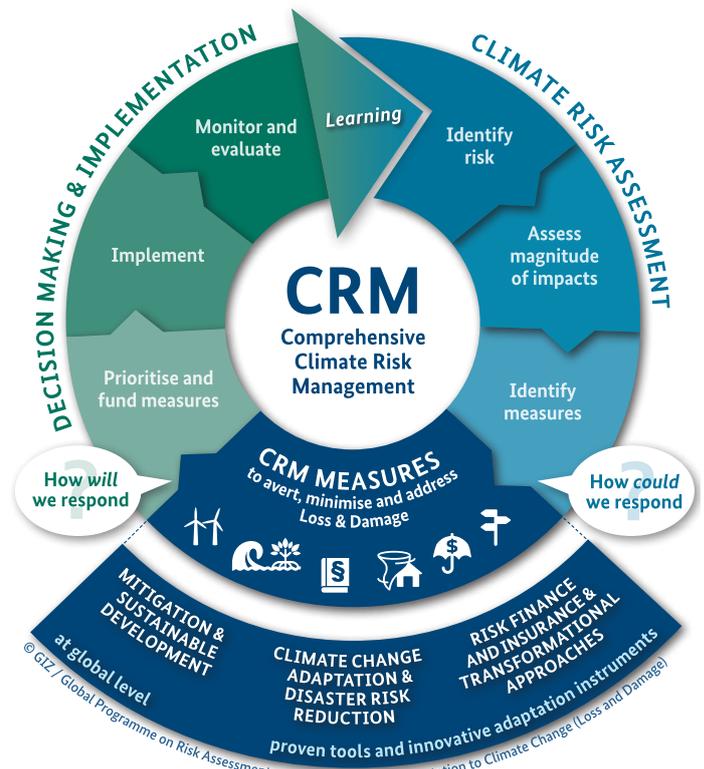


Figure 1: Comprehensive Climate Risk Management Cycle

one solution; in addition, preparedness is an essential to transform change into opportunities and to avoid inefficient adaptation measures.

From a general point of view, four fields of action are particularly relevant to ensure successful CRM:

- **Capacity development at all levels:** It is vital to strengthen capacities at all levels and enable cooperation and dialogue between local communities and the organisations responsible for managing and monitoring the sector. The establishment of networks and platforms will help to facilitate knowledge exchange and implementation of good practice.
- **Closing data gaps impeding CRM:** Improving data acquisition, storage and communication will significantly contribute to monitoring, assessing and predicting the impacts of climate change on fisheries and marine ecosystems. This knowledge can serve to inform decision-making processes and to implement new measures.
- **Developing instruments and tools:** Another focus should be placed on identifying and using innovative instruments such as insurance schemes and financing mechanisms to better manage climate-related risks. Ecosystem-based management (EBM) should be promoted as one possible best practice-approach to restore, maintain and enhance the resilience of small-scale fisheries and mariculture against external factors, including climate change.

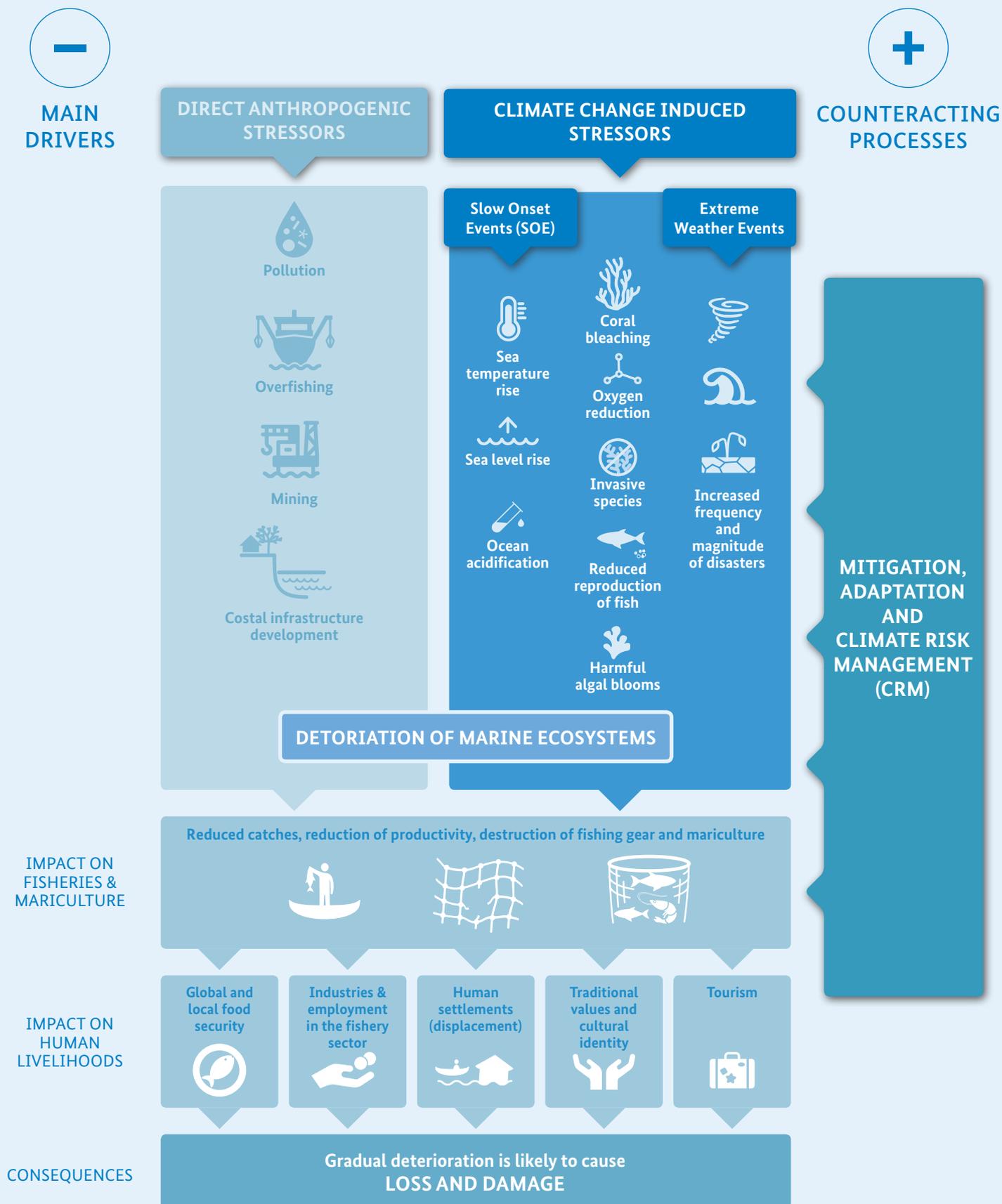


Figure 2: Impacts on the fisheries and mariculture sector in the era of climate change



- **Promoting scientific cooperation:** Finally, multi-disciplinary scientific cooperation focused on key challenges facing this sector should be promoted so that interlinkages between the socio-economic, ecological and physical impacts of climate change can be integrated in a more thorough and comprehensive climate risk management approach.

Besides these general recommendations, the reviews and consultations undertaken during the three case studies identified the following specific actions:

Caribbean

- Support adoption and transfer of the Caribbean Community Common Fisheries Policy (CCCFP) into national fisheries management plans aligned to national Disaster Risk Management plans
- Multi-disciplinary research for diversified, supplementary and alternative livelihood opportunities for fishing communities including new technologies and industries
- Promote new digital technologies to improve cost-effectiveness of data acquisition and analysis needed to ensure good governance

South Pacific

- Foster development of climate change action plans for coastal communities that take into account sustainable fisheries management, food security and livelihood adaptation (i.e. emerging economies, new community opportunities) and are based on reliable and available data sources
- Establish networks between science, fisheries management and local communities that promote sharing of knowledge and the co-management of coastal and marine resources
- Support adaptive management measures within fisheries and mariculture sector that facilitate diversification of fishing gear and target species, spatial and temporal flexibility in fishing operations, alternative production methods and improvements in post-harvest processing. Introduce transformative measures that allow fishermen to sustain livelihoods through alternative sources of income

West Africa

- Strengthen knowledge and understanding of the linkages between climate change and small-scale fisheries, and integrate these into regional and national strategies and institutions / organisations (e.g. CSRP) that acknowledge these linkages and the risks of climate-related human migration
- Develop and establish an appropriate financial and insurance mechanism that is adapted to the needs of artisanal fisheries
- Support the design, implementation and operation of reliable data collection, management and dissemination systems

Published by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
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As at December 2019

Design W4 Büro für Gestaltung, Frankfurt

GIZ is responsible for the content of this publication.

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