



October 2014



**RISC-KIT**

RESILIENCE-INCREASING  
STRATEGIES FOR COASTS - TOOLKIT  
[WWW.RISCKIT.EU](http://WWW.RISCKIT.EU)

**pearl**

Preparing for Extreme And Rare  
events in coastal regions



# DISASTER RISK REDUCTION STRATEGIES IN EU COASTAL AREAS

Coastal storms, sea level rise and flooding have caused and will continue to cause significant impacts across Europe and endanger the security of people and their livelihoods. Presently, one third of the European Union's (EU) population lives within 50 km of the coast and generates an estimated 30% of the total EU Gross Domestic Product (GDP). The economic value of coastal areas within 500 meters of European seas is estimated to be between €500 - 1000 billion alone. Due to population and economic growth and the increased likelihood of hazards due to climate change, risks (the probability of occurrence of a hazard multiplied by the consequences) are expected to increase in the near future. The costs of inaction are estimated to be €6 billion by 2020, which is higher than the annual costs of taking precautionary and adaptation measures. Conversely, up to €4.2 billion in net benefits could be created if action is taken. Thus, a reevaluation of current coastal Disaster Risk Reduction (DRR) strategies is needed and a new mix of prevention, mitigation, preparedness and early response measures should be considered.

This policy brief is an output of RISC-KIT (Resilience-Increasing Strategies for Coasts- Toolkit) and PEARL (Preparing for Extreme And Rare events in coastal regions). A key input for this brief are the results of an international case study analysis of DRR strategies.

**Climate-induced coastal storms and on-going coastal development necessitate a re-assessment of Disaster Risk Reduction strategies. Strategies which depend on preparedness and some risk mitigation measures will need to adopt more mitigation or preventive measures.**

DRR measures can be separated into three categories: prevention, mitigation and preparedness measures. The first category is used to prevent the hazard from occurring through measures such as dikes and dunes. These measures are applied in highly-developed coastal areas. Mitigation measures are used to reduce the impacts of a hazard and are often applied in less urbanised areas. These include structural (e.g. low dunes, beach nourishments, marshlands) and non-structural measures (e.g. limiting construction or flood-resistant buildings). Preparedness measures such as Early Warning Systems (EWS) and evacuation plans are used in combination with prevention and mitigation measures for cases when storms exceed the level of protection or as stand-alone measures in areas with minimal assets and low population in the coastal zone.

Because the investment level in coastal areas plays an important role in the selection and effectiveness of DRR measures, coastal development necessitates that DRR strategies are adjusted to adapt to these changes. The expectation is that DRR strategies which depend heavily on preparedness and some mitigation measures will shift to more preventive measures as the level of coastal development increases.

**Both technical and ecosystem-based solutions are feasible options to build long-term Disaster Risk Reduction strategies. Ecosystem-based solutions can support win-win solutions, although to date their implementation is limited due to a disconnection between disaster risk management, adaptation, and nature conservation goals.**

Ecosystem-based approaches are risk mitigation measures, which can be combined with preventive hard structures. While the implementation of hard structures usually comes at an ecological expense (e.g. physical loss of coastal areas), integrating natural protection capacities into prevention strategies can achieve flood protection goals while promoting ecological values, and reducing the load on hard structures. Ecosystem-based solutions can thus provide 'win-win' or 'no-regret' solutions to meet disaster reduction as well as nature conservation and climate adaptation goals. However, the current implementation of such solutions in DRR strategies remains limited. This is because ecosystem management is often considered independently from DRR strategies, ecosystem solutions are undervalued compared to other solutions, or there is a lack of interaction between science and policy on the use and application of such options.

**Targeting local values and adapting national Disaster Risk Reduction strategies to local historical and sociocultural characteristics and priorities through multi-level communication and stakeholder inclusion can lead to greater adoption and more effective implementation of policies.**

It was found that socio-cultural as well as historical perspectives play a critical role in the design and implementation of DRR strategies, especially on the regional level. By effectively taking socio-cultural and historical considerations into account, it is expected that DRR strategies could be significantly improved by adapting to local perceptions of risk and helping to increase understanding and acceptance of DRR measures. This can be done by communicating in ways that are oriented towards local and personal values and priorities, as well as through multi-level communication and focusing on inclusiveness of all stakeholders, to enable people to make decisions that are well informed and thus leading to outcomes that are agreeable to broad group of stakeholders. Including local stakeholders as well as end users in the decision making process also provides an opportunity to influence the risk perception (the subjective judgement that people make about the characteristics and severity of a risk) of inhabitants of an area at risk as well as enable more locally responsible DRR planning and acting.

**The European Union is in a unique position to support and coordinate Member State efforts to develop Disaster Risk Reduction strategies, as well as support collaboration on the development and sharing of knowledge, standards and cost-effective tools.**

EU support and coordination is essential to provide a platform and framework to improve DRR strategies across Member States and regional authorities. RISC-KIT and PEARL identified several areas which offer significant potential and opportunities for improving European risk management.

- Although a large variation of historical, socio-cultural, socio-economic and physical characteristics within the EU exists, a platform to share knowledge and experiences on technical and governance issues is needed to support Member States. This is particularly relevant in the case of cross-border impacts and inter-regional cooperation activities.
- Synergies between disaster risk management, nature conservation and adaptation to climate change should be exploited. This is especially evident in the potential that ecosystem-based solutions provide to meet climate adaptation and nature conservation objectives.
- Scientific findings enable policy makers and disaster risk managers to make more informed, knowledge-based decisions. In particular, new knowledge is needed regarding ecosystem-based solutions for DRR management, the inclusion of socio-cultural and historical perspectives into DRR strategies, and how to best address cross-boundary effects.
- A common set of tools for risk assessment and analysis need to be developed to support Member States and contribute to a shared knowledge base to inform DRR decision making.
- European data standards and protocols for recording disaster losses should be designed and implemented to enable comparison and assessment of disasters.
- Enhancing preparedness should be achieved by improving response capacities, planning and training networks, reinforcing cooperation among authorities and strengthening Early Warning Systems.

## Additional information

More information about RISC-KIT can be found at:

<http://www.risckit.eu/np4/home.html>

or by contacting Ap van Dongeren, Project Coordinator, Deltares:

[ap.vandongeren@deltares.nl](mailto:ap.vandongeren@deltares.nl)

More information about PEARL can be found at:

<http://www.pearl-fp7.eu/about-pearl/>

or by contacting Zoran Vojinovic, Coordinator UNESCO-IHE,

[z.vojinovic@unesco-ihe.org](mailto:z.vojinovic@unesco-ihe.org)

## Contact Points

Boram Lee

Senior Scientific Officer of World Climate Research Programme (WCRP), WMO

[E-mail: blee@wmo.int](mailto:blee@wmo.int)

World Meteorological Organization

<http://www.wmo.int/>

Prof. Paolo Ciavola

Associate Professor of Coastal Dynamics in the Department of Physics and Earth Sciences of the University of Ferrara.

[E-mail: cvp@unife.it](mailto:cvp@unife.it)

Consorzio Futuro in Ricerca

<http://www.cieffeerre.it/>