



WETLANDS AND DISASTER RISK REDUCTION



Wetlands protect us from extreme weather events. They provide a buffer against the impacts of floods, droughts, hurricanes and tsunamis, and build resilience to climate change. Well-managed wetlands can also help communities recover from disasters and “build back better”. With climate- and weather-related hazards becoming more frequent, wetlands are vital for reducing the human and economic devastation they cause.



WHY DISASTER RISK REDUCTION BY WETLANDS MATTERS

Wetlands are a natural safeguard against disasters. They can reduce the human, economic and environmental losses and disruption suffered by a community or nation when an extreme weather event strikes and make recovery faster. Different types of wetlands act in different ways before, during and after disasters to help lessen their impact and enable communities to bounce back.



Coastal wetlands reduce the impacts of extreme weather

Coastal wetlands such as salt marshes, mangroves, seagrass beds, and coral reefs act like shock

absorbers. By reducing the intensity of waves, absorbing storm surges, and buffering tsunamis, these ecosystems help shield the 60% of humanity that lives and works along coastlines from flooding, property damage, land erosion, and loss of life.

Coral reefs act as offshore wave barriers, providing protection from extreme events worth up to US\$33,556 per hectare of reef every year. Studies show that a healthy coral reef can provide communities twice as much protection from natural hazards like tsunamis compared to a dead coral reef.

Mangroves bind the shoreline together with their roots. Each kilometre of mangrove forest can reduce a storm surge by 50cm, blunting the impact of hurricanes and tsunamis. Every hectare of mangrove and coastal marsh is worth up to US\$15,161 a year in disaster-related services. For example, in the U.S.A., coastal wetlands helped avoid over US\$625 million in damages from Hurricane Sandy in 2012.



Inland wetlands reduce floods and relieve droughts

Inland wetlands such as floodplains, rivers, lakes and swamps act as sponges, absorbing and storing excess rainfall and reducing flood surges. In arid climates, wetlands release stored water during dry seasons, delaying the onset of droughts and minimizing water shortages.

Rivers meander to create wide, silted floodplains. If left intact, with their related inland lakes and swamps, these floodplains act as a giant reservoir. During sudden floods, they can spread and store flood water over a wide area, reducing damage downstream.

Wetlands help before, during and after disasters

Before a disaster, wetlands can help people to prevent and prepare for impacts, if steps are taken in advance to study the risks and designate storm- and flood-prone areas as protected wetlands. For example, the estuaries, lakes and marshes in Senegal's Saloum Delta Biosphere Reserve help control flooding and ensure that humans,

animals and plants have fresh water throughout the year.

During a disaster, wetlands can absorb the worst of the shock. For example, in the Sri Lankan town of Hikkaduwa, where coral reefs were protected, damage during the 2004 Indian Ocean Tsunami extended just 50m inland, whereas in nearby Peraliya, where coral mining had degraded the reefs, damage reached 1.5km inland.

After disasters, wetlands can help people to bounce back by enabling quicker recovery and – ideally – “building back better” than before. For example, after a cyclone hit Odisha in eastern India in 1999, the rice paddies that were protected by mangroves recovered food production much more quickly than unprotected croplands. Maintaining healthy wetlands and restoring degraded ones means that a community is better equipped to deal with a disaster next time.

WHAT ARE WETLANDS?

Wetlands are a major, planet-wide habitat that make life on Earth possible. Article 1.1 of the Convention on Wetlands defines wetlands as: “areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.” They are ecosystems where water is the primary factor controlling

the environment and the associated plant and animal life. This encompasses all inland wetlands, such as marshes, ponds, lakes, fens, rivers, floodplains, and swamps; a range of coastal wetlands, including saltwater marshes, estuaries, mangroves, lagoons, and coral reefs; and human-made wetlands like fishponds, rice paddies, and salt pans. Global inland and coastal wetlands cover over 12.1 million km², an area larger than Canada.



WHAT ARE THE CHALLENGES?

The frequency of disasters worldwide has more than doubled in just 35 years, driven by climate- and weather-related hazards like flooding, tropical cyclones, and droughts. UN Water estimates that 90% of natural hazards are water related and the Intergovernmental Panel on Climate Change predicts even more extreme events in the future.

The human toll is staggering: 1.35 million people died as a result of disasters between 1996 and 2015, with low- and middle-income countries accounting for 90% of fatalities. In material terms, weather-related disasters caused US\$3.3 trillion in damage between 1980 and 2014.

We need healthy wetlands more than ever, yet these ecosystems are being destroyed at an alarming rate around the world. At least 64% of wetlands have disappeared since 1900, and 35% have been lost since the 1970s. Those that remain are vanishing three times faster than forests. Destroying and mismanaging

wetlands diminishes their ability to reduce disaster risk in multiple ways, for example:

- **Canalizing rivers and limiting drainage** reduces their natural floodplain sponge effect and makes flood surges more powerful
- **Clearing mangroves** to create shrimp fisheries and salt pans removes the natural coastline buffer and reduces carbon storage
- **Mining coral reefs** can leave the shoreline exposed to stronger than normal waves
- **Draining wetlands** for agriculture and development removes their function as a natural sponge against flooding.

One of the drivers of wetland loss is the fact that the general public are largely unaware of how wetlands protect us. People often see wetlands as nothing more than wastelands to be filled in or converted to other uses. Changing this mindset is one of the biggest challenges.

WHAT CAN WE DO?

There are many ways that we can help wetlands to help us reduce the risk of disasters caused by natural hazards and everyone has a role to play.

Policy-makers

Governments should include wetlands in their strategies for coping with disasters. Possible measures include: designating wetlands in flood- and storm-prone zones as protected areas; restoring degraded wetlands that act as protective barriers; working with local stakeholders and civil society to promote sustainable agriculture, fisheries and tourism; adopting cross sectoral policies to help protect wetlands, especially in agriculture and water; and investing in disaster risk reduction. Governments should also meet their commitments to the Convention on Wetlands, the

Sustainable Development Goals, and the four priorities of the 2015-2030 Sendai Framework for Disaster Risk Reduction.

Communities

Local communities should investigate how the wetlands in their



area are being used or overused, who depends on them, and how they protect the area during extreme events. Practices and measures to ensure the long-term sustainability of the local wetlands for everyone could include: controlling illegal fishing and dumping; agreeing no-take rules; setting fishing catch limits; clearing rubbish from wetlands; and unblocking streams and rivers.

Individuals

Each person can make a difference. Individual actions could include: organizing or joining a wetland clean-up; using water more sparingly and avoiding toxic products that drain into wetlands; participating in local activities to conserve and restore wetlands; and becoming a wetland ambassador to advocate for their protection.

COASTAL PROTECTION STRATEGY FOR TACLOBAN, PHILIPPINES

In 2013, the city of Tacloban in the Philippines was struck by Typhoon Haiyan, the deadliest tropical cyclone in the country's history. It was a terrible wake-up call for the people, triggering action to protect the region. In 2016, a new nature and infrastructure-based plan was presented, showing how the area could "future-proof" itself against disasters. The Netherlands Enterprise Agency (RVO), the Philippine Reclamation Authority (PRA), and experts from Deltares, Arcadis, Wetlands International, the Red Cross, Rebel, and Van Oord suggested a combination of measures and outlined ways to fund them.

The plan includes:

- **restoration of mangroves** and other ecosystems
- **identifying specific sites** along the coast for building infrastructure that works with nature
- **capacity building** for communities and government agencies.

By integrating wetlands into its disaster risk reduction strategy, Tacloban is maximizing the natural protection they offer and building the city's resilience to future extreme weather events.

THE CONVENTION ON WETLANDS

Adopted in Ramsar, Iran in 1971, the Convention on Wetlands is the only global treaty to focus on a single ecosystem. Its 171 Contracting Parties commit to:

- **Designate wetlands of high value on the list of Wetlands of International Importance (Ramsar Sites), and**
- **Use all wetlands wisely and cooperate on transboundary issues.**

Today there are 2,400 designated Ramsar Sites, covering a total surface area of over 250 million hectares (an area slightly larger than Algeria). The network of Ramsar Sites includes coastal and inland wetlands of all types. The Convention on Wetlands is working to reverse wetland loss and degradation around the world. The Convention supports sustainable development, disaster resilience, and climate action, contributing to 16 different Sustainable Development Goals.