

Wetlands: Our natural safeguard against disasters



Ramsar Convention on Wetlands



World
Wetlands Day
2 February 2017

Wetlands for Disaster Risk Reduction





**World
Wetlands Day**
2 February 2017

Wetlands for Disaster Risk Reduction

World Wetlands Day 2017 – get involved!

Celebrated every 2 February to mark the adoption of the Ramsar Convention in Iran in 1971

Ways you can participate:

- Visit a wetland site near you
- Organize a wetland clean-up
- Enter the photo contest (open to contestants aged 18-25)
 - Take a photo in a wetland location between 2 February and 2 March 2017 and upload it to www.worldwetlandsday.org
- Educate others about the importance of wetlands
- Register and upload your event to www.worldwetlandsday.org



World
Wetlands Day
2 February 2017

Wetlands for Disaster Risk Reduction

Ramsar Convention on Wetlands: Working to reverse wetland loss and degradation

- Only global treaty to focus on a single ecosystem
 - Adopted in Ramsar, Iran in 1971
- Parties commit to designating protected wetland Ramsar Sites, wise use of wetlands and cooperation on transboundary issues
- Number of Member Country Contracting Parties: **169**
- Number of Ramsar Sites: 2,243
- Total surface of designated Sites: 216,338,080 ha (slightly larger than Mexico)
 - www.ramsar.org/sites-countries/the-ramsar-sites





Ramsar Convention on Wetlands: Partner for sustainable development & disaster resilience

- Ramsar Convention Strategic Plan contributes to 16 different SDGs; many part of managing disaster risk:
 - Goal 9: Build resilient infrastructure
 - Goal 13: Combat climate change
 - Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems
- Support the four priorities of Sendai Framework for Disaster Risk Reduction 2015-2030
 1. Understanding disaster risk
 2. Strengthening disaster risk governance
 3. Investing in disaster risk reduction for resilience
 4. Enhancing disaster preparedness for effective response and to “Build Back Better”



Mangrove planting, Balanga City Wetland Park, Philippines



Wetlands: on the forefront against extreme weather events

- Definition: land areas that are flooded with water, either seasonally or permanently and include:
 - Coastal wetlands:
 - mangroves, salt marshes, estuaries, coral reefs
 - barrier against waves, absorb part of storm surges
 - protect land from erosion
 - Inland wetlands:
 - rivers & floodplains, swamps/marshes, peatlands
 - slow and absorb water flows, lessen damage from floods
 - lessen drought
- Many types store carbon against climate change.

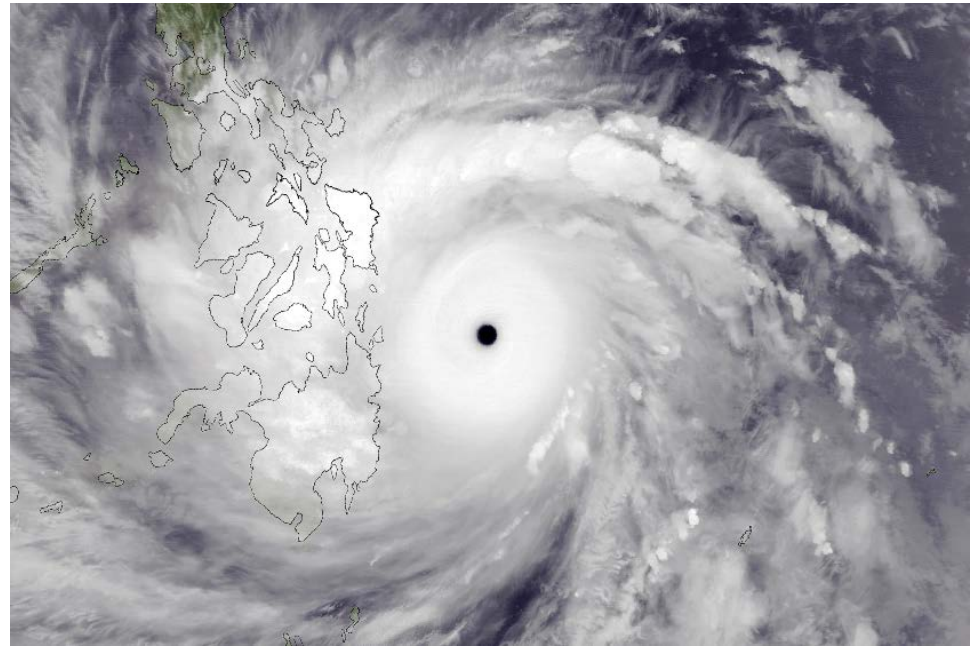




Background terminology: hazards v. disasters

Natural hazard:

- Naturally-occurring event that could have a negative effect on humans
- Includes floods, droughts earthquakes, tsunamis, cyclones/hurricanes, dust storms & other extreme events



Typhoon Haiyan nearing the Philippines, 7 November 2013
Picture: Wikipedia



Background terminology: hazards v. disasters

Disaster:

- Severe disruption that is caused to a community or nation in human, material, economic or environmental losses
- The effect when a natural hazard strikes
- Humans can contribute to or reinforce disasters
 - Over abstraction of water leading to drought
 - Draining of wetlands/ De-forestation and in-filling leading to erosion & flooding down stream
 - Draining and burning of peatlands, releasing CO₂

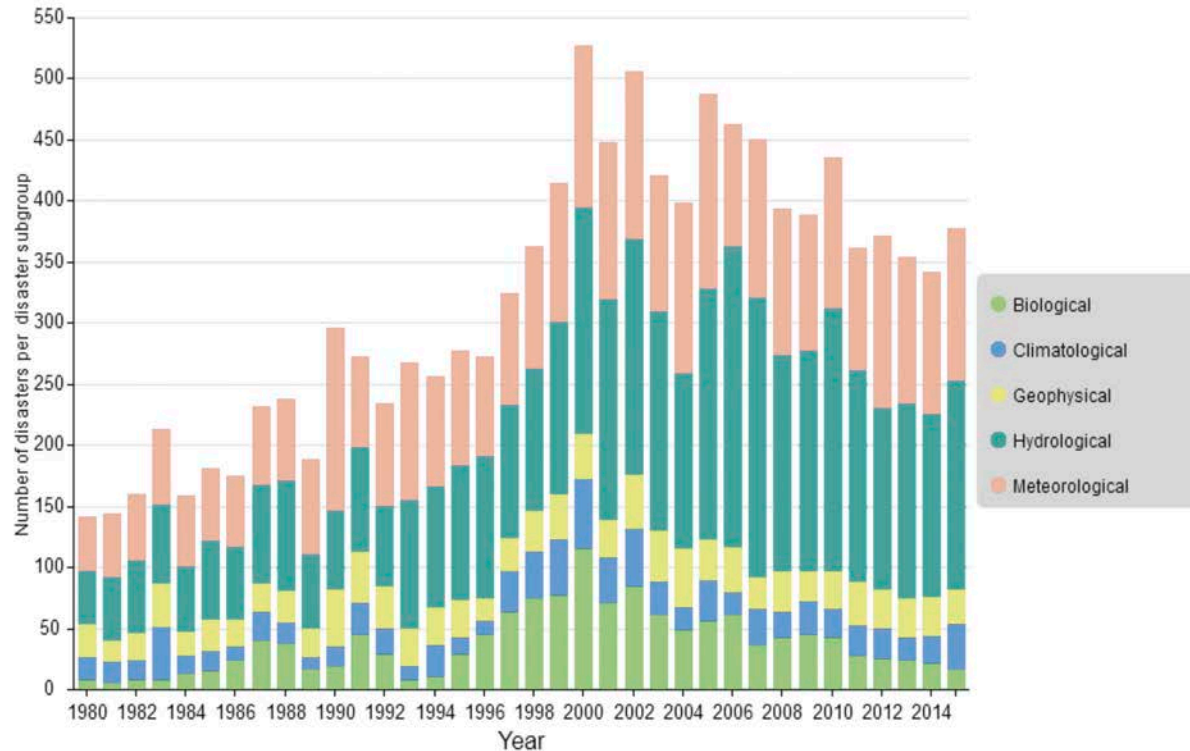


Tacloban, Philippines after Typhoon Haiyan, 2013
Picture: Wikipedia



Disasters are growing more frequent

- More than doubled in 35 years
- Most of the increase comes from weather- and climate related events
- Geological events have remained fairly steady
- UN Water: 90% of all natural hazards are water-related

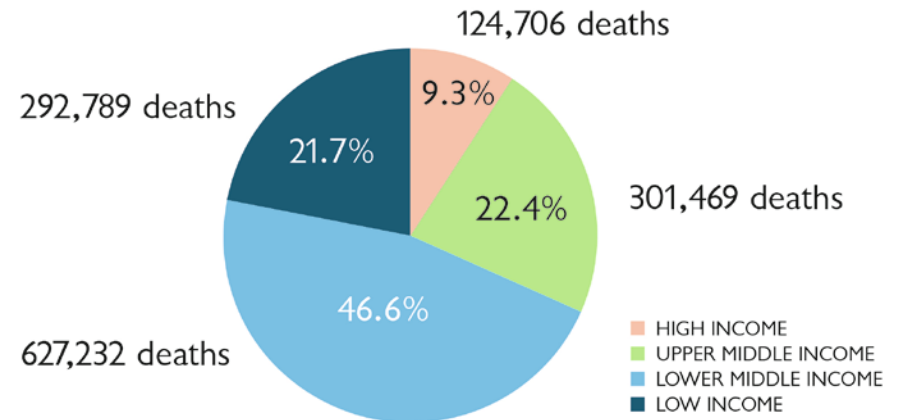




The losses are staggering

- Disasters killed 1.35 million people worldwide from 1996-2015
- Low and middle income countries account for 90% of fatalities
- Economic losses: US\$3.3 trillion from 1980-2014

Natural hazard fatalities by country income group 1996-2015



Statistics from *Poverty & Death: Disaster & Mortality*, CRED, 2016: p.12



**World
Wetlands Day**
2 February 2017

Wetlands for Disaster Risk Reduction



Wetlands help before, during and after disasters:



Wetlands help before disasters: Preparing/preventing

- Beforehand, study & understand the risks posed by disasters
- Designate storm- and flood-prone areas as protected wetlands
- Example: Biosphere Reserve of the Saloum Delta, Senegal
- Benefits
 - Controls flooding
 - Protects against coastal erosion
 - Provides freshwater year round



Saloum Delta, Senegal
Picture: Wikipedia



Wetlands during disasters: Coping

- When disaster strikes, wetlands absorb some of the worst shock.
- Example: Coral reefs in Sri Lanka during 2004 tsunami;
 - In Hikkaduwa, where coral reefs were protected: damage extended just 50m inland.
 - In nearby Peraliya, where coral mining had degraded reefs, damage extended 1.5 km inland.



Hikkaduwa Beach, Sri Lanka
Picture: Wikipedia



World
Wetlands Day
2 February 2017

Wetlands for Disaster Risk Reduction

Wetlands after disasters: Bouncing back (“building back better”)

- Enable quicker recovery.
- Support biodiversity.
- Ideal case: stronger than before disaster.
- Example:
 - 1999 cyclone that hit Odisha in eastern India.
 - Rice paddies protected by mangroves recovered food production much more quickly than unprotected croplands.



Bhitarkanika Mangroves in Odisha, India
Picture: Wikipedia



**World
Wetlands Day**
2 February 2017

Wetlands for Disaster Risk Reduction



Five wetlands that help us cope with extreme events:



Five wetlands that help us cope with extreme events:

1. Mangroves

- Salt-water tolerant shrubs and trees
- Grow in shallow coastal waters, mostly in tropical, sub-tropical areas
- Roots bind shore, prevent erosion
- Each additional kilometer of mangrove forest can reduce the height of a storm surge by 50cm
- Blunt effect of cyclones/hurricanes and tsunamis
- Carbon-rich tropical forests
- Each hectare worth up to \$US 15,161 a year in disaster protection



Mangroves, Uzi Island, Zanzibar



Five wetlands that help us cope with extreme events: 2. Coral reefs

- Solid structures found in shallow tropical waters
 - Formed by living colonies of tiny coral polyps, building on exoskeletons of previous generations
- Home to 25% of all marine species
- Act as important offshore wave and surge barriers
 - Protection worth up to \$US 33,556 per hectare/year
- Small investment / huge effect:
 - US\$1 million a year on restoring reefs at the Folkestone Marine Park on the west coast of Barbados could lower annual storm losses by US\$20 million



Pictures: Wikipedia



Five wetlands that help us cope with extreme events:

3. Rivers & flood plains

- Rivers and streams meander to create fertile, silted floodplains
- Left intact, along with their network of inland lakes and swamps, they can act as a giant reservoir
- During intense rainfall or sudden floods, they can spread and store water over a wide area
 - Reduce damage downstream
- Many rivers are canalized, especially near cities, eliminating this natural flood control



Casamance, Senegal



Five wetlands that help us cope with extreme events: 4. Inland deltas

- When water flows into a wide, flat inland lake without draining into the ocean, an inland delta is formed
- In extremely arid areas, these seasonal flows are a strong natural safeguard against drought
- Okavango Delta in Botswana: annual flooding of an area the size of Belgium
 - home to 200,000 large mammals
 - 400 bird species
 - safeguards against drought in dry winter



Okavango Delta, Botswana
Picture: Global Wetlands Africa



Five wetlands that help us cope with extreme events: 5. Peatlands

- Water-saturated lands made of decomposed plant material, built up over time
 - up to 30 metres deep
 - also known as mires, bogs or moors
 - cover 3% of the earth's land surface
- Key fact: peatlands store more than *twice* as much carbon as all of the world's forests combined:
 - vital way to mitigate some effects of climate change



Peatland in Estonia



World
Wetlands Day
2 February 2017

Wetlands for Disaster Risk Reduction

Mismanaging wetlands can make the impact from disasters worse

- 64% of wetlands have disappeared since 1900
- Canalizing rivers can make floods more powerful
- Clearing mangroves and mining coral reefs can expose coastlines to storms
- Burning or draining peatlands releases large quantities of CO₂



Los Angeles River, California, USA
Picture: Wikipedia



Wetlands: how can we take care of them? Communities:

- Do a wetlands clean-up
- Analyze how local wetlands are being used
 - Who depends on them?
 - Who uses what and when?
- Adopt local policies to promote long-term sustainability, e.g.:
 - Practice sustainable fishing & agriculture
 - No-take rules; catch limits
 - Restrict construction in wetlands



Clean-up of a Ramsar Site in Ghana, 2015



**World
Wetlands Day**
2 February 2017

Wetlands for Disaster Risk Reduction

Wetlands: how can we take care of them?

Policy-makers

- Include wetlands in disaster planning strategy
- Protect wetlands in flood and storm-prone areas
- Restore degraded wetlands
- Work with local actors to promote sustainable fishing, agriculture and tourism
- Adopt cross sectoral policies especially in agriculture and water to help protect wetlands



Restored wetlands, Hastings, New Zealand



World
Wetlands Day
2 February 2017

Wetlands for Disaster Risk Reduction

Wetlands: how can we take care of them? Individuals

- Organize or join a wetland clean-up exercise
- Become a **Wetland Ambassador** advocate for wetlands
- Participate in actions to conserve and restore wetlands
- Use non-toxic products that don't pollute wetlands
- Use water sparingly





**World
Wetlands Day**
2 February 2017

Wetlands for Disaster Risk Reduction

World Wetlands Day 2017 – get involved!

Celebrated every 2 February to mark the adoption of the Ramsar Convention in Iran in 1971

Ways you can participate:

- Visit a wetland site near you
- Organize a wetland clean-up
- Enter the photo contest (open to contestants aged 18-25)
 - Take a photo in a wetland location between 2 February and 2 March 2017 and upload it to www.worldwetlandsday.org
- Educate others about the importance of wetlands
- Register and upload your event to www.worldwetlandsday.org



**World
Wetlands Day**
2 February 2017

Wetlands for Disaster Risk Reduction

Thank you!

Ramsar Convention on Wetlands

Rue Mauverney 28 | CH-1196 Gland | Switzerland

+41 22 999 01 70 | ramsar@ramsar.org



World
Wetlands Day
2 February 2017

Wetlands for Disaster Risk Reduction

Sources

For official definition of disasters and hazards: United Nations Office for Disaster Risk Reduction website <https://www.unisdr.org/we/inform/terminology>

For chart of disaster frequency and type: OFDA/CRED International disaster database http://www.emdat.be/disaster_trends/index.html

For percentage of water-related natural hazards:
UN Water website: *Water-related hazards*
<http://www.unwater.org/topics/water-related-hazards/en/>

For disaster fatalities by country development status:
Centre for Research on the Epidemiology of Disasters (CRED) / United Nations Office for Disaster Risk Reduction (UNISDR): *Poverty & Death: Disaster Mortality 1996-2015* (pp. 05 and 12)
http://reliefweb.int/sites/reliefweb.int/files/resources/CRED_Disaster_Mortality.pdf

For disaster-related financial losses 1980-2014:
Munich RE/NatCat SERVICE: *Loss events worldwide 1980 – 2014* (slide 10)
https://www.munichre.com/site/touch-naturalhazards/get/documents_E2080665585/mr/assetpool.shared/Documents/5_Touch/NatCatService/Focus_analyses/1980-2014-Loss-events-worldwide.pdf

For Saloum Delta example:
IUCN/ Ministry of Environment (Japan)/ CEM: *Protected Areas as Tools for Risk Reduction* (p. 23)
<http://reliefweb.int/sites/reliefweb.int/files/resources/2015-001.pdf>

For coral reef damage example from Sri Lanka:
IUCN: *Safe Havens – Protected Areas for Disaster Risk Reduction and Climate Change Adaptation*, (p. ix)
<https://www.iucn.org/sites/dev/files/2014-038.pdf>

For post-cyclone recovery of rice production with mangrove protection:
IUCN/ Ministry of Environment (Japan)/ CEM: *Protected Areas as Tools for Risk Reduction* (p. 16)
<http://reliefweb.int/sites/reliefweb.int/files/resources/2015-001.pdf>

For mangrove reduction of storm surges:
Keqi Zhang et al., *The role of mangroves in attenuating storm surges*, (abstract)
<http://www.sciencedirect.com/science/article/pii/S0272771412000674>

For mangrove carbon storage:
Nature Geoscience 4, 293-297, Donato et. al: *Mangroves among the most carbon-rich forests in the tropics*
<http://www.nature.com/ngeo/journal/v4/n5/abs/ngeo1123.html>

For hectare per year value of disaster-related services provided by mangroves:
TEEB: *The Economics of Ecosystems and Biodiversity for Water and Wetlands* (p. 65)
http://www.ramsar.org/sites/default/files/documents/library/teeb_waterwetlands_report_2013.pdf

And for value of extreme events protection offered by coral reefs: (p. 63)

For potential effects of reef restoration in Barbados:
IUCN: *Safe Havens – Protected Areas for Disaster Risk Reduction and Climate Change Adaptation* (p. 19)
<https://www.iucn.org/sites/dev/files/2014-038.pdf>

For Okavango Delta information:
Ramsar website news: *Okavango Delta Ramsar Site is now 1000th World Heritage Site*
<http://www.ramsar.org/news/okavango-delta-ramsar-site-is-now-1000th-world-heritage-site>

For peatlands as percentage of earth's land area:
International Peat Society: *Peatlands and Climate Change* (p.9)
<http://www.peatsociety.org/sites/default/files/files/PeatlandsandClimateChangeBookIPS2008.pdf>

For peatlands and carbon sequestration in relation to forests:
TEEB: *The Economics of Ecosystems and Biodiversity for Water and Wetlands* (p. 11)
http://www.ramsar.org/sites/default/files/documents/library/teeb_waterwetlands_report_2013.pdf