Wetlands: at the heart of Disaster Risk Reduction

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What are wetlands?

- Definition: land areas that are flooded with water, either seasonally or permanently
  - Inland wetland types:
    - Marshes, ponds, lakes, fens, rivers, flood plains and swamps
  - Coastal wetland types:
    - Mangroves, saltwater marshes, seagrass beds, estuaries, lagoons and coral reefs
- Man-made wetlands including fish ponds, saltpans, rice paddies
- Ranging in size from less than one hectare to the massive Pantanal in Brazil, Bolivia, and Paraguay; (= the size of Guyana or Belarus)
Wetlands provide vital services and benefits for humanity

**Water provision and purification**
- At a very basic level, humans require 20-50 litres of water per day
- 2 billion people in Asia and 380 million EU residents depend on groundwater aquifers

**Food supply**
- Rice, grown in wetland paddies, is the staple for 3 billion people; 20% of global nutrition
- Average human consumes 19kg of fish each year; two–thirds of commercial fish breed and spawn in coastal wetlands; esp. mangroves and river estuaries

**Biodiversity**
- Home to more than 100,000 known freshwater species alone
- Essential for many amphibians and reptiles, for bird breeding and migration
- Wide range of important medicinal plants
Most fundamentally, wetlands are nature’s shock absorbers

- Coastal wetlands reduce impact of storms, hurricanes, tsunamis
  - Mangroves, saltmarshes act as buffer against storm surges
  - Coral reefs reduce speed and height of waves
  - Plant roots bind the shoreline, resisting erosion by wind and waves and providing a physical barrier to protect populated areas

- Inland wetlands act as a sponge – relieving both floods and droughts
  - Peatlands and wet grasslands alongside river basins absorb rainfall and control flow into streams and rivers
  - Peatlands alone also store twice as much carbon as all forests in the world!
The pace of wetland loss and degradation is alarming

- 64% of wetlands lost since 1900 and 87% lost since 1800

- Wetlands Extent Index is another indicator of this trend
  - 40% loss between 1970 and 2008 in more than 1000 surveyed sites

- 76% of populations of Wetland species lost in last forty years (2014 Living Planet Index-WWF)
For effective wetland restoration, establishing a baseline is essential

- Help of multiple partners and initiatives needed – Progress made
- Mangroves: Japanese Space Exploration Agency (JAXA)
  - Classifying mangrove communities focused on extent, structure, biomass and/or dominant/species or genus.
  - Data generated for insular and mainland Southeast Asia, northern Australia, Belize and the Amazon. Global maps of all mangroves across time sequences by 2016
- European Space Agency (ESA) is supporting an Africa-wide mapping of all wetlands – GLOBWETLANDS II
- NASA interested in carrying out wetland assessment mapping
- Ramsar working on mapping the State of the Worlds Wetlands Systems (SOWWS) as a baseline for targets and actions
Why healthy wetlands are at the heart of disaster risk reduction

• Number of people affected by flooding is set to triple by 2030 (WRI)
• Degraded wetlands can exacerbate floods, storms and droughts (eg New York & Sandy; New Orleans & Katrina )
• Mangroves removed from coastlines leave the way open for cyclones and storm surges to rampage inland
• Drained marshes and embankments that cut rivers off from their floodplains leave water with nowhere to go but downstream
  o Ends up finding the weakest point in flood defences
• Loss of forests, drainage of wetlands and silted up lakes all make rivers more likely to have flash floods
  o Prone to periods of both intense floods and low flows
Urban wetlands for flood control: Colombo, Sri Lanka

• In November 2010 Cyclone Jal dropped nearly 0.5 metres of rain on Colombo
  o 250,000 people displaced and US$50 million worth of damage
• Rainfall frequency has nearly doubled in the past 30 years
• World Bank provided US$213 million to the city to increase city’s flood resilience
  o restoring lakes and wetlands that act as natural water retention areas

Flooding in Colombo
(Sri Lankan Land Reclamation and Development Corp)
Restoring floodplains for DRR: Yangtze River region, China

- Increased frequency of floods in the central Yangtze River region from 1950s-1990s
- Dykes were built to control the floods
  - Construction in 1996 alone cost US$20 billion
- Still, floods in 1996 and 1998 caused up to US$5 billion and US$3.3 billion of damage
- New, integrated solution by government:
  - reforested hillsides in the upper catchment
  - removing the dykes along the central river
  - revert 2,900 km² of farmland back to natural wetlands to store the floodwaters
Wetland water storage against drought: Palau and Samoa

• Lake Ngardok Ramsar Site in Palau
  o Largest lake in Micronesia
  o provide waters for the new capital city of Melekeok
• Lake Lanoto’o Ramsar Site in Samoa
  o Crater lake which provides water for the capital city of Apia

Photos: Lew Young, Ramsar Secretariat
Managing flood vulnerability: Mozambique

• Nine major rivers drain through the country
  - Over 50% of population live in extreme poverty
  - 80% of population work in agriculture and fisheries
• Extreme climate events disrupt development
  - 7 major droughts and 7 major floods since 1980
• Integrated policy response since 1999
  - Flood early warning system integrates weather, water and climate change information
  - Disaster management system in place at multiple levels
  - Regional co-operation through Southern African Regional Climate Outlook Forum (SARCOF)

Photo: P.A. Petterson / Still Pictures
Integrated water resource management: Niger River Inland Delta, Mali

• One of the largest wetlands in the world
  ○ covers 60,000 sq. km
• Livestock, agriculture and fishing industries for 1 million people depend on its annual flooding
• Integrated management response:
  ○ Management plans for whole water cycle, including both drought and floods
  ○ Engineered wetlands to alleviate floods
  ○ Land use regulation
  ○ Community participation in determining uses

Photo: Wikimedia Commons/NASA
Disaster risk prevention initiative: Coastal zone wetlands, Benin

• Benin’s coastal zone is home to 60% of the country’s population, and accounts for 70% of its GDP

• Project targets wetland towns of Grand Popo and Ouidah adjacent to Ramsar Site 1017 (Basse Vallée du Couffo, Lagune Côtière, Chenal Aho, Lac Ahémé)
  o Mangroves, swamp, flooded grassland, palm formations
  o Local fishing employs 10,000; harvesting of crabs and oysters reserved exclusively for women

• Multi-faceted programme:
  o Two-day training for technical staff, youth, elected officials
  o Establishment of early warning mechanisms
  o Promotion of solar energy at village level
Ramsar Convention: the first major international environmental treaty

- Aims to promote wise use of wetlands that can form a global basis for disaster risk reduction efforts
- 168 Parties commit to wise use and naming “wetlands of international importance” and protecting these Ramsar Sites
- New Strategic Plan for 2016-2021 with clear Vision: “Slow, Stop and Reverse the Loss and Degradation of Wetlands”
- Four Goals to tackle roots of loss and degradation and restore wetlands:
  I. Addressing the drivers of Wetland Loss & Degradation
  II. Effective conservation and management of the Ramsar Site Network
  III. Wise use of all Wetlands
  IV. Enhancing Implementation of the Strategic Plan
Thank you!

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