Overview of wetlands services for climate change adaptation

**Climate change phenomena and some potential impacts**

**Increased frequency and magnitude of freshwater floods:**
- Physical damage / loss of property and life
- Loss of ecosystems
- Water pollution (overflow of sewage systems)
- Decreased fish production through damage to productive systems and aquatic areas

**Increased frequency and magnitude of droughts (rising temperatures, periods with less rainfall):**
- Decreased food production due to freshwater shortage
- Water availability unstable for transport
- Loss of ecosystems and biodiversity
- Contamination of freshwater sources through salinization

**Increased frequency and intensity of storms affecting coastal areas:**
- Physical damage / loss of property and life
- Pollution and damage to ecosystems and health
- Decreased (food) production through damage to productive systems and agricultural areas

**Melted glaciers:**
- Increased floods after heavy precipitation in mountain regions, leading to floods
- Loss of freshwater from glacier-fed rivers during periods with little precipitation. This is leading to fresh water shortages

**Coastal inundation as sea levels rise:**
- Loss of coastal fisheries productivity
- Loss of coastal agricultural areas, cities and other economically important areas
- Loss of coastal ecosystems as land is lost
- Loss of agricultural production and increased fresh water shortage through saline intrusion

**Protection of and maintain resilience of freshwater sources:**
- Marshes and lakes can store excessive precipitation, just like glaciers used to do
- Marshes and lakes will release water in a relatively slow flow just like glaciers used to do

**Protection and maintenance of coastal zones and their ecosystems:**
- Mangroves, reefs and other coastal wetland ecosystems can guard against saltwater intrusion when coastal freshwater areas dry up
- Mangrove forests and coral reefs can provide havens for biodiversity during and after disasters

**Role wetlands in climate adaptation**
- Protect life, property, production systems and ecosystems:
  - Lakes and floodplains can reduce peak flood flows by delaying and storing floodwaters
  - Lakes and floodplains can detain polluted floodwaters
  - Highland regions can regulate river flows releasing flood flows slowly over time

**Provision of and maintain resilience of freshwater sources:**
- Marshes and lakes can store excessive precipitation, just like glaciers used to do
- Marshes and lakes will release water in a relatively slow flow just like glaciers used to do

**Mission:**
To sustain and restore wetlands, their resources and biodiversity for future generations.

**Our future activities on climate change adaptation**

Research & Evaluation
- Assess the full potential contribution of wetland functioning towards adaptation to climate change
- Evaluate the consequences of changing wetlands conditions for adaptation strategies

Sharing knowledge
- Share practical experiences on community-based wetland conservation and restoration as a practical tool for climate change adaptation
- Maintain the role of wetlands in local, national and international adaptation policies

Restoration & conservation
- Contribute to improved wetland conservation, rehabilitation and management focusing on:
  1. Vulnerable coastal areas
  2. High-altitude wetlands
  3. Wetlands in Sahelian zone

**Wetlands and Climate change adaptation**

Sustaining and restoring wetlands: an effective climate change response

Inland and coastal wetlands are being lost and degraded faster than any other ecosystem type in the world. This continuing trend will considerably magnify the problem that climate change will bring to nature and people. This is because the poorest communities are also the most strongly dependent on the natural resources and services that wetlands provide. Hence when wetlands are affected, the ability of these communities to adapt to climate change will be greatly reduced.

Wetlands International explains and demonstrates how conservation, restoration and wise use of wetlands can be a cost-effective strategy for climate adaptation with strong benefits for poverty reduction and biodiversity conservation. Conversely, we believe that strategies for climate adaptation and development that do not address the continuing crisis in wetlands loss and degradation, will have strong limitations.
Mangrove forests for coastal protection

Tropical coasts are becoming threatened when seawater caused by climate change increases in frequency and strength of storms. Ecosystems like mangroves, such as mangrove forests and coral reefs, can reduce the risk of storms and reduce the impacts of sea level rise. The Asian Tsunami showed that mangroves could significantly reduce the impacts of waves of areas behind them. Mangrove forests are important as a large percentage of the world's poor live in coastal areas. Many coastal forests and reefs have been lost or become vulnerable due to over-fishing, pollution and over harvesting. These losses led to a 40% reduction in mangrove areas from 1980 to 2008. Mangrove forests also support fish and other coastal communities, as well as providing other services like storing carbon, mitigating climate change effects, enhancing frequency of floods and droughts within the basin.

The Green Coast project

During the three-year EU-funded Green Coast project (2003-2006), Wetlands International has led the Green Coast project in South-east Asia, working together with partners and local communities to plant 1.2 million mangrove seedlings, establishing over 1,200 hectares of coastal forest, as well as managing other key natural habitats such as coral reefs and lagoons. In total this provided 91,000 people with greater security and a basis for new livelihoods in the hardest hit Tsunami areas of Indonesia, Thailand, Maldives, India and Sri Lanka. See www.prescon.ca.org.

In the Green Coast project, poor communities that participated were involved when they restored and managed their areas well. We provided financial and technical support for local people’s livelihood activities and in return they helped us to plant the mangroves or other coastal forests. Mangroves are very important in protecting against storm waves and other sea level rise, they can adapt to 3,8 up. Mangroves are also very important as a large percentage of the world’s poor live in coastal areas. Many coastal forests and reefs have been lost or become vulnerable due to over-fishing, pollution and over harvesting. These losses led to a 40% reduction in mangrove areas from 1980 to 2008. Mangrove forests also support fish and other coastal communities, as well as providing other services like storing carbon, mitigating climate change effects, enhancing frequency of floods and droughts within the basin.

Restoration of Watar Lake
This EU project (Watar Eco Programme) takes place in the Alamein Delta, a 53,000 km² sub-basin of the Indus river in India. This basin is fed by glacial rivers that are amongst some of the most important in the world and is expected to be affected due to sea level rise. This project was funded by the Netherlands and in collaboration with the Pakistan government.

The project focuses on improved management of the Watar Lake, a major wetland area with a storage capacity of 10% of the Alamein basin’s water. Water storage capacity has decreased by approximately 20% over the last 30 years due to conversion of the lake and advancing marshes for plantation of willow trees and agriculture. The project focuses on improved management of the Watar Lake, a major wetland area with a storage capacity of 10% of the Alamein basin’s water. Water storage capacity has decreased by approximately 20% over the last 30 years due to conversion of the lake and advancing marshes for plantation of willow trees and agriculture. Willow tree plantations to increase the lake’s capacity to store water in order to restore and maintain water flow into the lake. The project focuses on improved management of the Watar Lake, a major wetland area with a storage capacity of 10% of the Alamein basin’s water. Water storage capacity has decreased by approximately 20% over the last 30 years due to conversion of the lake and advancing marshes for plantation of willow trees and agriculture. Willow tree plantations to increase the lake’s capacity to store water in order to restore and maintain water flow into the lake.

Plan for restoration of the lake and its catchment. The implementation includes catchment conservation through afforestation, soil conservation measures and changes to more sustainable land management practices. Within the catchment area, reducing the loss of forest cover and the impact of logging and deforestation of the lake. A result of increased soil storage capacity will be increased resilience of local communities and downstream communities from future floods and droughts. The project focuses on improved management of the Watar Lake, a major wetland area with a storage capacity of 10% of the Alamein basin’s water. Water storage capacity has decreased by approximately 20% over the last 30 years due to conversion of the lake and advancing marshes for plantation of willow trees and agriculture. Willow tree plantations to increase the lake’s capacity to store water in order to restore and maintain water flow into the lake.

Wetlands International and her partners have developed an Action Plan for restoration of the lake and its catchment. The implementation includes catchment conservation through afforestation, soil conservation measures and changes to more sustainable land management practices. Within the catchment area, reducing the loss of forest cover and the impact of logging and deforestation of the lake. A result of increased soil storage capacity will be increased resilience of local communities and downstream communities from future floods and droughts. The project focuses on improved management of the Watar Lake, a major wetland area with a storage capacity of 10% of the Alamein basin’s water. Water storage capacity has decreased by approximately 20% over the last 30 years due to conversion of the lake and advancing marshes for plantation of willow trees and agriculture. Willow tree plantations to increase the lake’s capacity to store water in order to restore and maintain water flow into the lake. A result of increased soil storage capacity will be increased resilience of local communities and downstream communities from future floods and droughts.

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