Wetlands of Namibia

What are wetlands?

- Wetlands are areas where there is permanent or temporary surface water. Wetlands include perennial and ephemeral rivers, floodplains, pans, lakes, dams, springs, swamps, marshes, seeps, oshanas, estuaries and shallow seas and islands.
- Wetlands are aquatic or semi-aquatic ecosystems, each supporting its own aquatic, semi-aquatic and riparian plant and animal communities.
- Wetlands are among the world's most biologically productive ecosystems and are rich in biodiversity.
- There are many types of wetlands found throughout Namibia, although many of them may be dry for months or years, such as ephemeral rivers, pans and floodplains.
- Almost 5% of Namibia's surface area is covered by various types of wetlands, although the majority are dry most of the time.

Why are wetlands important?

Wetlands provide both goods and services. They provide a variety of renewable natural resources as well as vitally important ecological services.

Natural Resources:

Water – Water maintains all life processes in the environment and is necessary for human health and to maintain agricultural, industrial and other activities.

Vegetation – Wetland and riverine vegetation have multiple uses, such as food (fruit), medicines, building materials, etc.

Animals – Animals such as marine and freshwater fish, frogs, reptiles, birds and many aquatic invertebrates are found in wetlands, while other wildlife congregates around wetland areas.

Floodplains – Rivers carry sediment or silt which are rich in nutrients. These nutrients provide the basis for aquatic and adjacent terrestrial food webs.

Ecological Services:

Flood attenuation – Wetland vegetation regulates stream and river flow, helping to control floods.

Erosion prevention – Vegetation in and adjacent to wetlands and rivers slows water flow, holds soils and prevents erosion.

Aquifer recharge – Water from wetlands recharges adjacent underground aquifers.

Improvement of water quality – Wetland ecosystems maintain good water quality in several ways such as filtering pollutants and breaking down dead and decaying material.

Climatic stability – Wetland vegetation can act as a carbon reservoir and assists in reducing the amount of carbon dioxide in the atmosphere, decreasing the greenhouse effect and leading to a more stable climate.

Linear oases – Both perennial and ephemeral rivers that pass through otherwise arid areas are sources of water and support linear strips of vegetation, enabling people and wildlife to survive there.

Protection of wetlands

- A comprehensive Wetlands Policy for Namibia has been developed which aims to integrate sustainable wetland management, protection and conservation into decision making at all levels.
- Current legislation and policies that are important to wetland management include: The Water Act 1954, The National Water Policy 2000, the National Agricultural Policy 1995, the Water Supply and Sanitation Policy 1993, The Water Corporation Act 1997, and Vision 2030.
- Namibia is a signatory to the Ramsar Convention which is the Convention on Wetlands of International Importance. The Convention recognises the economic, ecological, cultural, scientific and recreational importance of wetlands and advocates wise-use.
- Four wetlands in Namibia are currently designated as "wetlands of international importance," or Ramsar sites:
  - * Walvis Bay Lagoon
  - * Orange River Mouth
  - * Sandwich Harbour Lagoon
  - * Etosha Pan

Perennial Rivers

e.g. Kunene, Okavango, Zambezi, Orange Rivers and Kwando-Linyanti-Chobe System

- Flow throughout the year, carrying large volumes of water
- Are only found along Namibia's northern and southern borders; all originate in neighbouring countries


Okavango River *(K. Roberts)*


Kunene River *(J. Mendelsohn)*

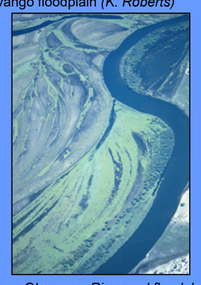

Kwando River *(C. Brown)*


Okavango floodplain *(K. Roberts)*

Floodplains

e.g. areas alongside the Okavango and Zambezi Rivers and the Kwando-Linyanti-Chobe System

- Typically low-lying areas next to rivers where water overflows in times of seasonal flooding
- Support diverse populations of mammals, birds, fish, reptiles, invertebrates, plants and people.

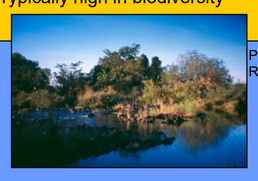

Okavango River and floodplains (J. Mendelsohn)

Swamps/Marshes

e.g. Linyanti swamp, confluence of Cuito and Okavango Rivers

- Well vegetated areas with permanently water-logged soils
- Found alongside perennial rivers, at confluence of rivers or in coastal areas (salt marsh)
- Typically high in biodiversity


Kwetze marsh – Okavango River *(S. Bethune)*


Papyrus island – Okavango River *(S. Bethune)*

Springs/Seeps

e.g. Sesfontein, Karstveld, Damaraland, Naukluft, Ai-Ais and Gross Barmen springs

- Permanently vegetated pools or streams formed by artesian water or by groundwater raising to the surface
- Geothermal springs are biologically harsh environments, but are popular tourist attractions


Seep in Khaudum *(S. Bethune)*


Damaraland spring *(S. Bethune)*

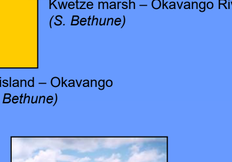
Dams/Impoundments

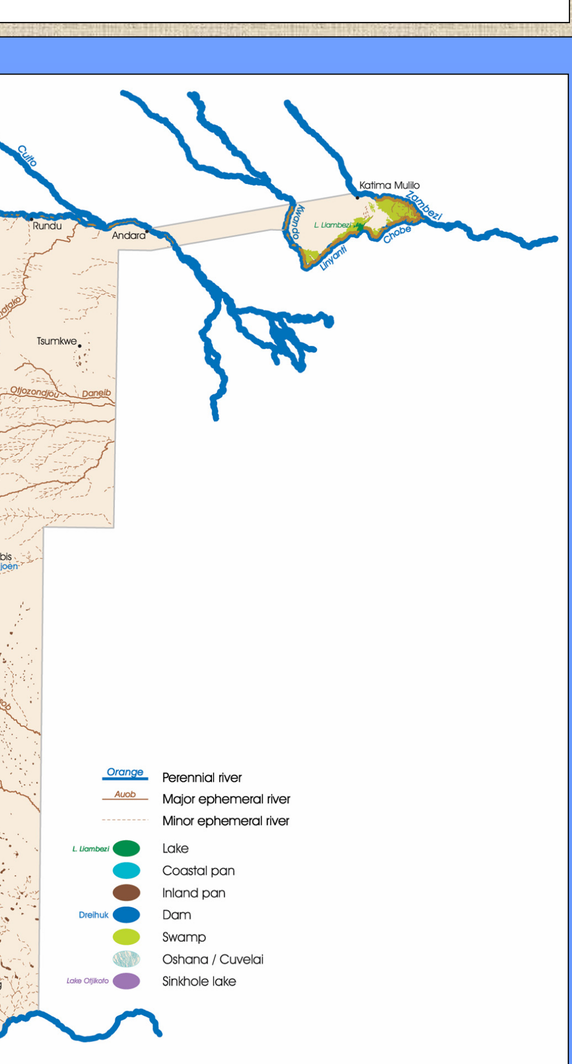
e.g. Hardap, von Bach, and Olushandja Dams

- Artificial bodies of water created by damming the flow of river water
- Built for human use – water storage, supply to urban areas, agriculture, hydroelectric power (not yet in Namibia), recreation, etc.

Aerial view of Goreangab Dam *(J. Mendelsohn)*

Naute Dam *(B.Curtis)*


Swakoppoort Dam wall *(B. Curtis)*



This map was compiled by Carole Roberts using data from the Atlas of Namibia Project, Directorate of Environmental Affairs, www.dea.met.gov.na

Ephemeral Rivers

e.g. Hoanib, Huab, Ugab, Swakop, Kuiseb, Fish, and Nossob Rivers

- Flow after good rains, usually for a few days to a few weeks only, and sometimes not for several years
- Most originate within Namibia – the majority of Namibia's rivers are ephemeral
- Serve as 'linear oases' – provide underground water and maintain dense riparian vegetation that is used by humans, livestock and wildlife in arid areas


Ephemeral rivers in Damaraland *(J. Mendelsohn)*


Kuiseb River after rains *(C. Brown)*


Hoanib River in flood *(K. Roberts)*

Oshanas

e.g. the Cuvelai drainage area

- Complex delta network of interlinked shallow channels and pans in north-central Namibia which receives both local seasonal rain and inflow from Angola
- Provide fish and other food resources when in flood, and recharges the water table in the cuvelai regions


Oshana *(K. Roberts)*

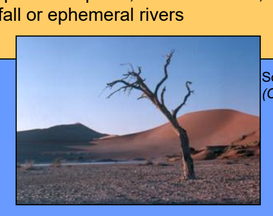

Cuvelai region *(C. Brown)*


Nyae-Nyae Pan *(K. Roberts)*

Pans

e.g. Etosha Pan, Nyae-Nyae Pan, Sossousvlei and Kalahari *pannetjiesveld*

- Shallow ephemeral pools, often salt-lined, fed by local rainfall or ephemeral rivers

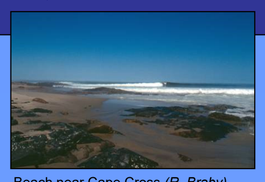

Sossusvlei *(C. Brown)*

Coastal Lagoons & Beaches

e.g. Walvis Bay, Sandwich Harbour and Lüderitz wetlands

- Sheltered marine areas (lagoons) or beaches provide a haven for breeding and feeding coastal species
- Typically high in biodiversity and attract numerous bird species – in places up to 300,000 individuals and 40-50 species


Walvis Bay Lagoon *(C. Brown)*

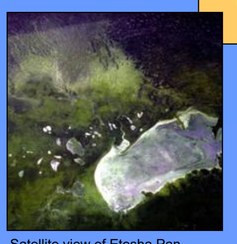

Beach near Cape Cross *(R. Braby)*


Swakop River mouth *(R. Braby)*

Estuaries

e.g. Kunene River mouth, Orange River mouth

- Areas at the mouths of perennial rivers
- Experience river and tidal flows – alternation of freshwater and saline water
- Sensitive and highly productive ecosystems


Satellite view of Etosha Pan *(NASA/USA)*


Kunene River mouth *(R. Braby)*


Caprivi rainwater pool *(K. Roberts)*


Makuri Pan *(C. Brown)*

Vleis

e.g. Tsumkwe *vleis* (Makuri Pan), rainwater pools in Caprivi and Otjozondjupa regions

- Shallow well-vegetated pools fed by local rainfall or groundwater seepage – can be either seasonal or permanent

Constructed Wetlands

e.g. Evaporation ponds at sewage works or abattoirs, artificial ponds, and canals

- Artificial discharge areas for waste water treatment
- In some cases, they are specially designed to partially purify waste water for alternative uses
- Water transfer canals, such as Eastern National Water Carrier


Canal in northern Namibia *(C. Brown)*


Eastern National Water Carrier *(N. du Plessis)*


Water treatment area at Namwater *(C. Brown)*

Sinkhole Lakes

e.g. Otjikoto and Guinas Lakes, Aigamas Cave, and Dragon's Breath

- Deep, permanently filled caverns formed when the roof of an underground cave collapses (Namibia has some of the largest underground lakes in the world!)
- Support unique endemic invertebrates and fish


Lake Otjikoto *(K. Roberts)*


Aerial view of Lake Otjikoto *(J. Mendelsohn)*

Explanation of Terms:

aquatic: relating to water
aquifer: layers of permeable material such as sand, surrounded by non-permeable rock, which hold water. Aquifers are sources of groundwater.
biodiversity: the variety of life on all levels. Biodiversity includes genetic variation within a species, the diversity of species and the variety of communities and ecosystems.
ecosystem: the combination of all the living and non-living factors which make up an environment and its organisms
ephemeral: flowing only for a short time after good rains
geothermal: relating to heat from the interior of the Earth
greenhouse effect: the warming of the Earth as a result of the release of gases, mostly from burning fossil fuels
perennial: flowing throughout the year
riparian: relating to a river bank
semi-aquatic: the overlap between aquatic and terrestrial zones
terrestrial: relating to dry land

Economics of Wetlands

Most people take wetlands and wetland-services for granted and do not realize the economic value of wetlands. If these natural resources were degraded, Namibian livelihoods would be affected and people would have fewer resources available to them. If the ecological services provided by wetlands were reduced, they would need to be replaced with artificial alternatives which are extremely expensive.

Tourism is an important economic incentive for the conservation and management of wetlands is tourism. With conservation, these areas can attract tourists and provide economic benefits for local communities and for Namibia.

What are the pressures on Namibia's wetlands?

- Over-exploitation of wetland resources due to human population growth and poverty
- Poor integrated planning and inadequate sectoral cooperation
- Increasing demand for water
- Over-abstraction of groundwater
- Pollution from domestic, agricultural and industrial sources
- Physical alterations to natural water courses (dams, reservoirs, etc.)
- Alien and invasive species
- Urban, coastal and hydropower developments
- Erosion caused by deforestation and overgrazing
- Climate change

What can be done to reduce these pressures?

- Promote integrated land-use management and planning, involving different sectors as well as the broad participation of all stakeholders
- Promote integrated water resource management
- Create incentives and support regulations which ensure the conservation and sustainable use of wetland resources
- Increase the conservation of wetland ecosystems and biodiversity
- Prevent water pollution in wetlands, their catchments and groundwater sources
- Strengthen monitoring, legislative frameworks and institutional capacity
- Continue and promote research and environmental assessment of wetland areas
- Control development in or immediately surrounding wetlands
- Control alien species and prevent further introduction

This poster was commissioned by the Namibia Nature Foundation and designed and compiled by Danica Shaw, Eco-Logic Environmental Management Consulting CC (061) 235460