

# Wetlands International

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## BETTER UNDERSTANDING OUR WETLANDS

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### THE FUNCTIONS AND CORRESPONDING VALUES OF WETLANDS

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#### Introduction

We now know that wetlands, like agricultural lands and forests, are among the major systems that sustain life on our planet. This awareness has played a key role in the emergence of global support for

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and political commitment to the sustainable development and conservation of the environment in general and wetlands in particular.

Interest in wetlands grows daily and a tendency to conserve their ecosystems can be observed in a number of countries which have adopted policies to prevent further loss or degradation of these environments, ensuring their wise use and encouraging research with a view to quantifying their values.

The aim of this series of publications is to help relevant bodies – NGOs, environmental planners, administrative authorities, national aid agencies, donors, the education sector, etc – become aware of the issues relating to wetlands and to facilitate the taking of environment-friendly decisions with respect to their development; decisions which pay greater attention to the preservation of these ecosystems and the sustainable use of their resources.

## **A wetland...**

“Generic term designating all marshy or lagoon, continental or coastal, aquatic biotopes. These are particularly threatened by drainage and desiccation for the purpose of cultivation. The conservation of these ecosystems is one of the major environmental problems in developing or ‘third world’ countries.”  
*(Dictionnaire encyclopédique de l'écologie, Ramade, 1993)*

Wetlands: their unique functions and special properties

The structural characteristics of wetlands – namely water, the substrate and biota (vegetation, fauna, microbes) and their functioning (cycle of nutrients, hydrological balance, organic production) - are determined by climate, hydrology and substrate and by the placement of these in the wider landscape.

Despite the existence of a wide range of wetlands due to differences in size and other specific features, some distinctive elements emerge which make it possible to draw up a character map of these environments.

## **High biological productivity**

The average net primary productivity of some wetlands is among the highest of the major ecosystems. The disproportion between this primary productivity and the land areas involved (24% of net primary productivity for 6.4% of the surface area) highlights the importance of wetlands as regulators and potential sources of food at the biosphere level.

This productivity, coupled with the saturation of soils, results in an accumulation of organic matter. But wetlands are also places where organic matter is transformed and carbon exported towards river or marine ecosystems at rates higher than is the case with land systems. Thus wetlands play a major role, sometimes indirectly, in the productivity and diversity of other environments.

The wise use of wetlands concept was developed within the framework of the Convention on Wetlands (Ramsar, Iran, 1971) to promote the understanding of and need to conserve these environments in the interests of the wider population. In fact this high biological productivity is integral to important sectors of agricultural, fish-farming, forestry and pastoral production, with significant financial implications.

## **Exceptional biological diversity**

In fact it is the variety and massive presence of waterbirds, in particular migratory waterbirds, which led to the signing of the Convention on Wetlands (Ramsar, Iran, 1971).

At the wetland level, variations in dampness favour colonisation by different species, in addition to which, depending on the season, are organisms frequenting wetlands to breed, rest or feed. This periodic presence of species - notably migrating birds, fish and breeding amphibians and reptiles - accounts for the high levels of biodiversity noted on the coastline and along the major rivers of West Africa (Niger, Senegal).

### **Attributes of wetlands for the maintenance of biological diversity**

- ✓ Persistence of habitats needed by different species at key periods
  
- ✓ Resilience due to marshy soils
  
- ✓ Capacity to maintain source populations

- ✓ Resistance to invasive species
- ✓ Capacity to transform nutrients

In so far as this diversity influences other ecological processes, often with major economic consequences, it deserves consideration from different perspectives - from the various steps of wetland characterisation, and from proposals for management actions, legislation and habitat restoration.

## **Role in relation to the water regime**

Wetlands have certain functions, which are manifest in given conditions:

- the retention of water or the ability to control floods: in this connection their role as a “sponge” has often been mentioned. It has been demonstrated that in some river basins it would be more economical to maintain wetlands in their natural state, utilizing their capacity as receptacles of floods, than to build artificial control structures;
- the gradual restitution of this water during low water periods. Wetlands have been described as “reservoirs in support of flows”;
- the retention of suspended matter due to a slower river flow at the entrance to or during the crossing of a wetland, conducive to sedimentation. In addition to advantages at the level of soil fertilization, this role as a “sediment trap” favours the improvement of water quality and the consolidation of banks;
- the transformation of nutrients such as phosphorous, a major element in the functioning of aquatic ecosystems, and of internal and external nitrates: wetlands have been described as “kidneys” at the level of river basins. By exploiting this property pragmatically wetlands can

serve to filter waters in which effluents are discharged.

## **What products and services can they provide?**

Wetlands, especially in the context of certain sahelian regions, are areas of great strategic interest from the point of view of socio-economic development. Regarded as "biological supermarkets", because of the high level of goods and services many of them provide, they have attracted man since the dawn of civilization. In spite of their importance for the community, however, the range of benefits they offer has traditionally been regarded as self-evident. Now that the total land area of these zones has receded, the need to preserve the resources and benefits of those that remain has increased.

## **Products of wetlands**

- Rich agricultural soil – due to soil humidity, the presence of water during the dry season, the input of sediments and nutrients through flooding and the alternation of dry and wet conditions
- Fuel, timber and service wood
- Fishing products (fish, shellfish)
- Drinking water
- Natural products of vegetable or mineral origin

## **Services of wetlands**

- Replenishment of water tables
- Flood control
- Bank protection
- Water purification
- Retention of pollutants
- Eco-tourism



**Implications of their functions and role**

**Implications of their function, role and ecology**

Wetlands can be distinguished from land or aquatic environments by certain properties or special ecological functions and by the advantages and benefits derived by local populations and society in general from their existence.

There are several reasons for the difficulties often encountered in evaluating these benefits, namely:

- The diversity of types of environment and functions complicates any assessment
- The overall value of a wetland increases as its surface area diminishes
- Cost-benefit analyses are not applicable to non-consumables or common-use functions
- Commercial values are determined in the short term whereas some benefits provided by wetlands are only meaningful in the long term
- Benefits to the general population do not necessarily accrue to the owners of the sites
- Information on the functions and impact of wetlands is still scarce

Ironically it is sometimes only the catastrophic consequences of the large-scale destruction of wetlands (floods, increased pollution, coastal erosion, decreasing catches, diminution of biological diversity, etc) which reveal the ecological and environmental importance of the role they play.

## Potential threats

The opinion that wetlands are “wastelands,” born of an ignorance and misunderstanding of the importance of the goods and services they provide, is the root cause of the transformation of these environments in favour of intensive farming, industry and urbanization.

Despite a multiplicity of functions that would undoubtedly justify greater attention being paid to the maintenance of their potential, wetlands have largely receded in terms of both surface area and quality.

## To conserve and restore wetlands is a mission for us all

In addition to bad practices such as soil occupancy and water pollution, and the impact of invasive species as a result of climatic vagaries, wetlands, as much as, and perhaps more so than most other natural or semi-natural ecosystems, are endangered by a constant increase in population and the attendant activities pertaining to the exploitation, transformation and consumption of resources.

No figures are available on the magnitude of wetland loss worldwide, but drainage with a view to increasing agricultural production is undoubtedly its main cause.

Legislative shortcomings, the poor implementation of regulations and ill-adapted laws in the area of aquatic pollution can also contribute to the decline of this type of ecosystem.

Conserving our wetlands at local, national and regional levels

The conservation of wetlands must be a major concern for our different countries if we are to achieve

the goals for the maintenance of biological diversity set out in international treaties and to fulfil our international obligations.

In fact these environments must now be given pride of place in the measures undertaken to conserve inland fresh waters and coastal ecosystems in the context of the Convention on Biological Diversity (1993).

Ensuring the conservation of wetlands and resolving their related problems calls, among others, for the following actions:

- Integrating the goal of conserving this ecosystem into government policy;
- Improved coordination and communication among government agencies;
- Creation of further incentives to conserve wetlands;
- Promotion of a better management of wetlands beyond their acquisition or maintenance;
- Improved knowledge of wetlands and the application of that knowledge;
- Education geared towards the wider public, decision-makers, the private sector, etc;
- Encouraging the participation of NGOs and local communities.

Given that the general population derives significant advantages from wetlands it would be reasonable for conservation efforts to be maintained through incentives financed or sponsored by public authorities.

A national wetlands policy can be a tool to encourage both the implementation of new and efficient economic and sectoral incentives and the removal of negative factors and incentives responsible, inter alia, for the decline of these environments.

#### Implications of the impaired functionality of wetlands

It is still difficult even now to make developers understand that the primary interest of a wetland derives from the plurality of its functions, and that the disturbance of one of these can provoke a chain of ecological effects.

Many developers have a tendency to forget that:

- a number of communities, both inside and outside a wetland, benefit from the goods and services which it provides ;
- these goods and services vary according to the season;
- any modification of a wet ecosystem can have a series of effects, the consequences of which will be felt well beyond the boundaries of the wetland, through a wide range of the population and amongst different sectors of the local, national and regional economy.

The evaluation of the benefits society derives from wetlands thus calls for a comprehensive vision. Sectoral intervention undertaken in order to increase, for example, agricultural, fish-farming or hydro-electric yields, is damaging to the multifunctional character of wetlands and is often a source of conflict between the different users.

The consequences of the loss of functions, which are generally noted after the disruption of wetlands, are unfortunately becoming more and more familiar. It is more than ever necessary that certain users, management services and national and international (development) agencies be made aware of this.

<b>Function</b>	<b>Consequences following destruction</b>
Watershed stability during rising water levels, delaying the spread of flow	Flood
Water storage, and replenishment of water tables	Drought
Storage of natural and artificial effluents, and water purification	Increased pollution
Regulation of hydrological and chemical cycles	Eutrophication and water quality problems
Stabilization of sediments; bank and storm protection	Coastal and bank erosion
Feeding and breeding zones for numerous species	Decreasing catches
Habitat and refuge for a wide variety of plant and animal species	Species extinction and diminution of biodiversity

Finally in this context the restoration and, above all, the creation of wetlands are two options that make it possible to respond to the problems raised by wetland loss, whilst engaging in the management of pollution.

### **Selecting the benefits to be preserved**

Criteria for the selection of benefits to be preserved can vary from one wetland to another. Nevertheless, it is imperative that three key considerations be taken into account:

- Priorities in the area of environmental protection which correspond to the formal commitments of the environmental authorities in the region;
- Developmental goals set by the authorities within the framework of national or regional development strategies on the one hand and sectoral resource development policies on the other;
- The absolute value of the benefits of a wetland. The value of a benefit can be such that it is advisable to maintain it even if its preservation does not correspond to a priority in the area of environmental protection or to a developmental goal.

Enhancing public awareness of the values and functions of sahelo-sudanese wetlands

This major goal of Wetlands International's West Africa Programme incorporates that of the 1999 – 2002 Information Programme of the Convention on Wetlands.

Wetlands are vital for the survival of mankind, and the preservation of their functions and benefits must henceforth be the concern of all and at all levels.

Wetlands International makes special efforts to encourage the public to take an interest in these ecosystems, to participate in the formulation of national policies and in the development and practical management of wetlands. Actions undertaken in this direction, in partnership with the authorities and with national and local structures, will make it possible, both in the short and long term, to promote behaviour which has a positive impact on these environments and which is conducive to the wise use of their resources.

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