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# A Review : Wetlands as Treasure of Earth by Providing Ecological Benefits, Threats to Wetlands and Conservation of Wetlands

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## ABSTRACT

Wetlands are very important as they provide valuable services to human and ecology. It protects the land from flood, erosion and soil degradation. It is very important for biodiversity, as shelter for migratory birds. Water of wetlands are used for irrigation and drinking purposes. It is very important to know the quality of water and soil. As Wetlands has many threats due to human activities, access use of wetland products, irrigation and pollution. There are many projects for conservation of wetlands. It is necessary to take immediate action to protect wetlands.

**Keywords :** Wetlands, Water, Biodiversity, Conservation

## I. INTRODUCTION

Wetlands are the areas of land that are either permanently or temporarily covered by water exhibit enormous diversity according to their genesis, geographical location, water regime and chemistry. A wetland is a land area that is saturated with water, either permanently or seasonally, such that it has characteristics of a distinct ecosystem of the earth. Primarily, the factor that distinguishes wetlands from other land forms or other water bodies is the characteristic vegetation that is adapted to its unique soil condition (Abraham, 2015).

Ramsar Convention on Wetlands, which is an international treaty signed in 1971 for national action and international cooperation for the conservation and wise use of wetlands and their resources, defines Wetlands (Article 1.1) as **"areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters"**. Only 26 of these numerous wetlands have been designated as **Ramsar sites** (Ramsar, 2013).

Wetlands are of two basic types: **natural** and **constructed wetlands**. Natural wetlands are natural areas where water covers the soil, including swamps, marshes, fens, sloughs and bogs. Constructed wetlands are ecosystems similar to natural wetlands,

combining physical, chemical and biological processes (USEPA, 2000; Mitsch and Gosselink, 2007).

In terms of the proportion of the geographical area, in India Gujarat has the highest proportion (17.5%) and Mizoram has the lowest proportion (0.66%) of the area under wetlands. In terms of contribution of the total water spread area in country, highest during post monsoon was observed in the states of Gujarat (12.6%) and lowest was in Sikkim and Tripura (0.1% each) (N. Bassi *et al.,* 2014).

The global researches of wetlands mainly focus on ecology, biodiversity and conservation (Whitehouse *et al.,* 2008), water quality improvement (USEPA, 2000), circulation of materials (biogeochemical cycle) (Raich and Schlesinger, 1992), and environmental restoration (Suding *et al.,* 2004; Fink and Mitsch, 2007; Moreno *et al.,* 2007).

## II. RESULT AND DISCUSSION

One of the first widely used classification systems, devised by (Cowardin *et al.,* 1995), was associated to its hydrological, ecological and geological aspects, such as: marine (coastal wetlands including rock shores and coral reefs, estuarine (including deltas, tidal marshes and mangrove swamps), lacustarine (lakes), riverine (along rivers and streams), palustarine ('marshy'- marshes, swamps and bogs) (Wetlands of Gujarat Book).

Wetlands are often considered as nature based solutions that can provide a multitude of services of great social, economic and environmental value to humankind. Changes in land use, water use and climate can all impact wetland functions and services (Thorslund *et al.,* 2017).

In the past 100 years, vast areas of wetlands have disappeared, but programs have been initiated to restore and create wetlands to compensate for this loss was described by (Mitsch *et al.,* 1998; Verhoeven, 2014). According to N. Bassi *et al.,* (2014) Wetlands provide numerous ecological goods and services but are under tremendous stress due to rapid urbanization, industrialization and agricultural intensification, manifested by the shrinkage I their areal extent and decline in the hydrological, economic and ecological functions they perform. Wetlands are subjected to anthropogenic pressures, including land use changes in the catchment, pollution from industries and households, encroachments, tourism and over exploitation of their natural resources.

Peterson and Baldwin (2004) showed that flooding significantly decreased plant biodiversity in a freshwater wetland, but Brock *et al.,* (1999) argued that when flooding regime are managed correctly in terms of depth and duration of flood, the number of habit typed increases, in turn positively affecting species richness. Allen-Diaz *et al.,* (2004) reported that in tropical and sub-tropical wetlands the aquatic plants act as bio filter, as they intake large amount of organic as well as inorganic nutrients from the eutrophic water bodies enriched pollutant through various dynamic processes, e.g. water cycle, nutrient cycle and food chain, therefore known as 'Kidney of the Landscape' or 'Biological Super Market' by the experts or the areas where the soil is saturated with water are crucial incubators known for the high species diversity.

Golez and Kyuma (1997) has observed that oxidation of pyrite can lead to severe acidification of soil, negatively impacting the environment by potential heavy metal release, on the other side Lamers *et al.,*(2012) if the sediment contains high amounts of iron-bound phosphorus, alternating water regimes can affect ecosystem development by including P mobilization.

Acharya and Adak (2009) had reported that the wetland water are used for irrigation, industry,

thermal power plant, potable supply and fish production under natural eco-system. Livelihoods of people are secured he explained by the example of 30,000 people is dependent on public at lake for their survival. At Chilika Lake 9000 fishing vessels are active throughout the day and night.

Seshamani *et al.,* (1994) reported that one of the finest tools of modern science is the use of remote sensing and GIS in delineating the area, discharge arte, water volume, ground water recharge, soil loss calculation as well as deposition in reservoir, pollution distribution etc. Fish farming, migratory bird movement and water transport or tourism can also be managed in an effective and efficient way using GPS systems. Marshy land and other swampy forest land area, tree coverage, timber-volume, forest fire etc., other important spatio-temporal variability in the wetland forest can be successfully delineated using remote sensing and GIS.

### A. Ecological Importance

Costanza *et al.,* (1997) was investigated that wetlands are most valuable biomes on our planer providing ecosystem services such as nutrient cycle, soil formation and wastewater treatment.

Climate change and large-scale land-user changes (Seneviratne *et al.,* 2006) affect large-scale water fluxes and balances. These changes should therefore also be expected to affect wetland functions and associated ecosystem services.

Balasubramanian and Selvaraj (2003) had reported tanks are also very important from the ecological perspective as they help conserve soil, water and bio-diversity. According to Raje *et al.,* (2013) had given some of the nature-based engineered solutions already used in urban planning and water management (e.g. green roofs, bio-infiltration rain gardens, vegetation in street canyons) have demonstrated to be more efficient, cost-effective, adaptable, multi-purpose and long-lasting than the so-called 'grey infrastructure' alternatives.

### B. Threat to wetland ecosystem

As per Smakhtin *et al.,* (2004) most of the rivers basins in southern and western India are experiencing environmental water scarcity, which means the discharge in these basins has already been reduced by water withdrawals to such levels that the amount of water left in the basin is less than that required by the freshwater dependent ecosystems.

A study found that out of 629 water bodies identified in the Nation al Capital Territory (NCT) of Delhi, as many as 232 can't be revived on account of large scale encroachments. Similarly, between 1973 and 2007, Greater Bengaluru Region lost 66 wetlands with a water spreads area of around 1100 ha due to urban sprawl (Ramachandra and Kumar, 2008).

Studies reveal the removal of water bodies had led to the decline in water table. Water table has declined to 300 m from 28 m over a period of 20 years after the reclamation of lake with its catchment for commercial activities. In additional, groundwater table in intensely urbanized area such as Whitefield, etc. has now dropped to 400m to 500m (Ramachandra *et al.,* 2012)

Jiang *et al.,* (2015) had reported wetland degradation caused reduction of wetland area, water pollution, environmental degradation, and biodiversity loss among other issues. At the same time, these studies allowed that increased urbanization and agricultural activities are the reasons for wetland degradation.

### C. Conservation of wetlands

In the past 100 years, vast areas of wetlands have disappeared, but programs have been initiated to restore and create wetlands for compensate for this loss (e.g. Mitsch *et al.,* 1998; (Verhoeven, 2014). Although most created wetlands have been designed

for wastewater treatment (Vymazal, 2011), they can also be designed to increase the ecological value of the ecosystems itself (e.g. Weller *et al.,* 2007).

In order to support the implementation of innovative nature-based solutions in environmental management and land use planning, valuation becomes essential; Valuation can refer to monetisation (assessing a monetary value) or to an estimation of worth or importance (Fontaine et al., 2014).

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