



पंचायत



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Role of Panchayat in

“Wetland Conservation”



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ROLE OF PANCHAYATS IN ENVIRONMENTAL MANAGEMENT

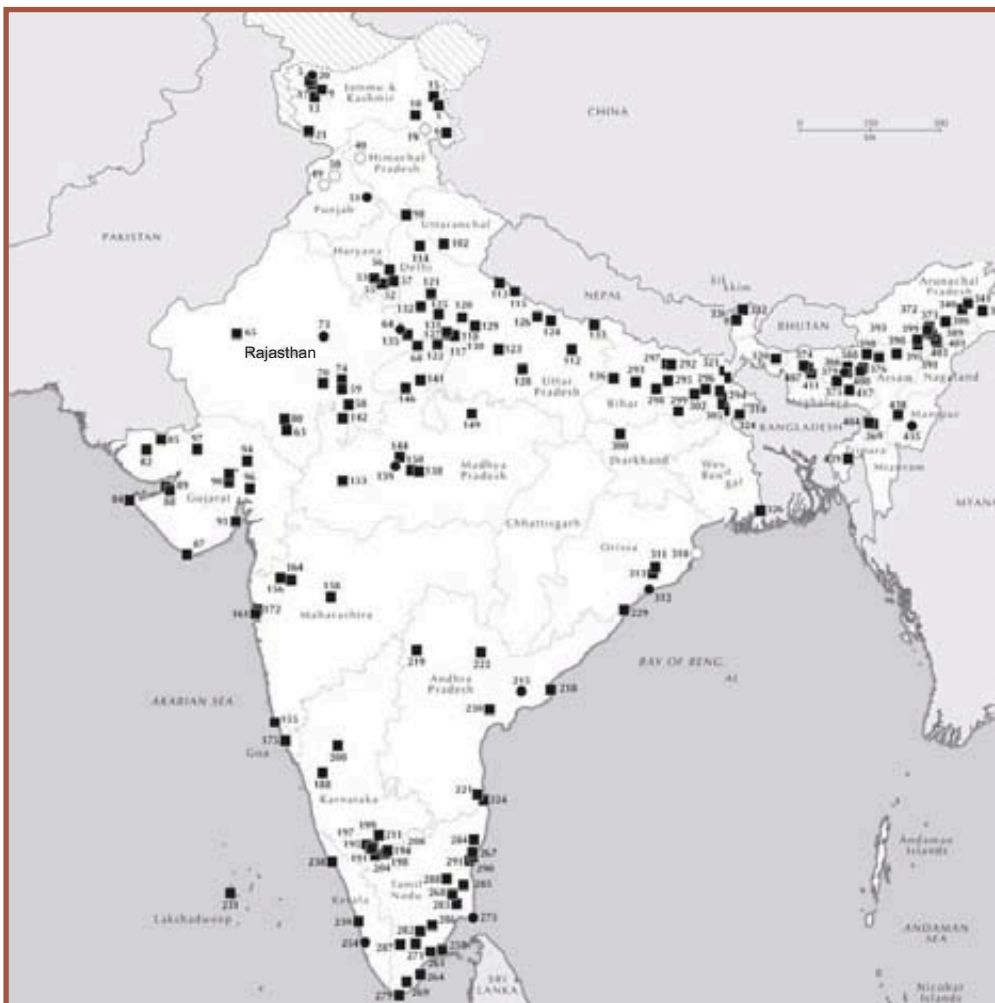
The views expressed in the articles are of the writers and not of the IES. Your views are solicited as a feedback, I.E.S. would be pleased to solve your queries.

CONTENTS

● Editorial	3
● Wetlands: An Introduction	4
● Medicinal Plants in Wetland	5
● Mangrove Wetlands-The Most Productive Ecosystem	6-7
● East Kolkata Wetland- A Case Study	8-10
● List of Ramsar Sites in India	11-12
● From Print Media	13
● समाचार पत्रों से	14
● Messages	15
● Forthcoming publications of our ENVIS centre and forthcoming events of Indian Environmental Society	16

Do U Know

- Mangroves are salt-tolerant forest ecosystems found mainly in tropical and sub-tropical intertidal regions of the world
- According to Forest Survey of India (FSI), out of 4, 87, 100 ha of mangrove wetlands in India, nearly 56.7% (2, 75, 800 ha) is present along the east coast, and 23.5% (1, 14, 700 ha) along the west coast, and the remaining 19.8% (96,600 ha) is found in the Andaman and Nicobar Islands.



Wetland Areas in India

Note - This map is not to the scale and it is only a graphical presentation.

Articles are invited on the topic of **“Role of Panchayat in strengthening SHGs for Environmental Improvement”**, for the next issue of this newsletter “PANCHAYAT”.

Editorial

I am happy to place before you the newsletter with the theme “Role of Panchayat in Wetland Conservation” by the ENVIS centre on “Role of Panchatyats in Environmental Management”. Wetlands are of great importance and are World's most productive ecosystem. The speedily rising population figure has been demanding more food day by day. Thus food availability can stand as a major social problem and wetland can solve this problem by providing food security. East Kolkata Wetland is a burning example for this.

India have significant portion of its land as wetland. Out of all 25 have been already identified as the wetland of international importance and listed as Ramsar site. These natural resources if managed properly can solve many problems related to environmental as well as social issues. If we count the value of wetland then we can realize its value as it provides aesthetic value, medicinal value, cultural value, tourism etc. It also conserves the biodiversity and provide home to many threatened flora and fauna.

It is unfortunate that most of our wetlands are threatened due to improper management, unplanned exploitation of its resources, excess siltation, weed invasion etc. This creates an alarming situation for us and we need to be aware and sensitized for conserving our food banks. No one can do it alone. This needs an integrated effort to save the wetlands and to take maximum benefit from nature's filter. People's participation for wetland conservation is the first requirement to achieve the objective. Panchayati Raj Institutions (PRIs) are working in close contact with the people at grass root level. They are the central point that can take the ideas to the community and change the behavior and attitude of the people at grass root level.

I am sure this issue of the newsletter will help in sensitizing the PRIs to realize the importance of these resources. We hope these institutions will definitely try and succeed to promote the sensitization and involvement of Youths, women, children etc at grass root level.

Dr. Desh Bandhu
President

WETLANDS: AN INTRODUCTION

Mr. Abhaya Kumar Tripathy, Project Manager, Indian Environmental Society

Wetlands are habitats that fall on the environmental spectrum between land and water. Since wetlands lie at the interface of terrestrial and aquatic habitats, they possess a unique mixture of species, conditions, and interactions. As a result, wetlands are among our planet's most diverse and varied habitats.

Wetlands are defined by the soils, hydrology, and species that occur within them. Wetland soils, also known as hydric soils, are shaped by water. These soils are saturated or even submerged throughout or part of the year. Hydric soils vary depending on the composition of the soil and water in the area and therefore, wetlands vary throughout the world.

It can also be an area of land whose soil is saturated with moisture either permanently or seasonally. Such areas may also be covered partially or completely by shallow pools of water.

Wetlands are considered as the most biologically diverse ecosystems. Plant life found in wetlands includes mangrove, water lilies, cattails, sedges, tamarack, black spruce, cypress, algae, gum, and many others. Animal life includes many different microbes, Pisces, Amphibians, Reptiles, Birds etc.

Wetlands have been categorized both as biomes and ecosystems. They are generally distinguished from other water bodies or landforms based on their water level and on the types of plants that thrive within them. Specifically, wetlands are characterized as having a water table that stands at or near the land surface for a long enough season each year to support aquatic plants. Put simply, wetlands are lands made up of hydric soil.

The **Ramsar Convention (The Convention on Wetlands of International Importance, especially as Waterfowl Habitat)** is an international treaty for the conservation and sustainable utilization of wetlands, i.e., to stem the progressive encroachment on and loss of wetlands now and in the future, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value. It is named after the town of Ramsar in Iran where the first 1st wetland conference was held.

Definition

Under the Ramsar Convention:



- Article 1.1: "...wetlands are areas of marsh, fen, peat land 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."

- Article 2.1: "[Wetlands] may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six meters at low tide lying within the wetlands".

In other word, a wetland can be defined as the area of marsh, fen, peat land, or water whether natural or artificial, permanent or temporary with water that is static or flowing, fresh, brackish or salty including areas of marine water the depth of which at low tide does not exceed 6 meters.

General Method for Wetland Determination

The indicators to declare an area as wetland are vegetation, hydric soil, and wetland hydrology. It is not intended to be used to make a final wetland determination or delineation; however, it can provide some general information concerning wetlands identification.

There are three major characteristics of wetlands for making wetland determinations such as Vegetation, Soil and

Hydrology;

A) Vegetation indicators

You can usually determine if wetland vegetation is present by knowing a relatively few plant types that commonly occur in your area. For example, mangroves, sphagnum moss, cattails, bulrushes, cordgrass, bald cypress, willows, sedges, rushes, arrowheads, water plantains etc., usually occur in wetlands. Additionally several types of oak and Pine trees do occur in wetlands.

If you cannot determine whether the plant types in your area are those that commonly occur in wetlands, ask the local office dealing with wetland/ water resource or providing assistance for providing information related to the wetland/ water resource.

B) Soil Indicators

Hydric soils, have characteristics that indicate they were

developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season. If the soil in your area is listed as hydric, the area might be a wetland.

If the name of the soil in your area is not known, an examination of the soil can determine the presence of any hydric soil indicators, including:

- Soil is sandy, and has consists of predominantly of decomposed plant material (peats or mucks) on the surface. It has dark stains or dark streaks of organic material in the upper layer below the soil surface. These streaks are decomposed plant material attached to the soil particles. When soil from these streaks is rubbed between the fingers, a dark stain is left on the fingers.
- Soil has a bluish gray or gray color below the surface, or the major color of the soil at this depth is dark (brownish black or black) and dull. It has the odor of rotten eggs.

C) Hydrology indicators

Wetland hydrology refers to the presence of water at or above the soil surface for a sufficient period of the year to significantly influence the plant types and soils that occur in the area. Although the most reliable evidence of wetland hydrology may be provided by gaging station or groundwater well data, such information is limited for most areas and, when available, requires analysis by trained individuals. Thus, most hydrologic indicators are those that can be observed during field inspection. Most do not reveal the frequency, timing, or duration of flooding or the soil saturation.

Following indicators can also provide some evidence of the periodic presence of flooding or soil saturation:

- Standing or flowing water is observed on the area during the growing season.
- Soil is waterlogged during the growing season.
- Water marks are present on trees or other erect objet. Such marks indicate that water periodically covers the area to the depth shown on the objects.
- Drift lines, which are small piles of debris oriented in the direction of water movement through an area, are present. These often occur along contours and represent the approximate extent of flooding in an area.
- Debris is lodged in trees or piled against other objects by water.
- Thin layers of sediments are deposited on leaves or other objects. Sometimes these become consolidated with small plant parts to form discernible crust on the soil surface.

Plants in Wetland

Plants growing in wetlands and other moist soils may either be annuals or perennials. Many of the smaller and slender herbs are annuals. They flower, fruit, and disperse seeds, and die in a single year. However perennials survive for many years developing food storing woody structure such as rhizomes, corms, stolons etc.

There have been many attempts to classify wetland plants according to their growth forms. Cook (1990) summarized them and suggested a classification based on the response of the plant to milieu for growth and development rather than directly on its morphology or the way it survives adverse conditions (Cook. C. D. K, 1996). According to this the different types of growth forms are:

- **Ephydates** Bottom-rooted with floating leaves. (Ex: Potamogeton nodosus, Nymphaea pubescens, Nymphaea rubra, Nymphaea nauchali,)
- **Haptophyte** Attached to but not penetrating the substrate. (Ex: Isochrysis galbana)
- **Hyperhydate** Emergent aquatics (lower parts almost always in water). (Ex: Arundo donax, Pragmites karka, Typha angustifolia, Monochoria vaginalis, Arundo donax, Phragmites karka,)
- **Plankton** Free swimming below the water surface. (Ex: Pheocystis ponchetii, Dunaliella salina- a green algae, Diatoms, Dinoflagellates etc)
- **Pleustophyte** Free-floating (at the water surface). (Ex: Eichornia crassipes, Azolla pinnata sub sp. asiatica, Salvinia nataus, Nymphoides hydrophylla.)
- **Rosulate:** Submerged, bottom rooted, leaves in a rosette. (Ex: Valisnaria spiralis)
- **Tenagophyte** Juvenile submerged, adult usually terrestrial. (Ex: Neptunica oleracea, Burnatia anniandra, Alternanthera sessilis etc)
- **Vittate** Submerged, bottom rooted leaves cauline. (Ex: Hydrilla verticillata, Ceratophyllum demersum etc) However many species change their dependence on water in regions with different climates or with different hydrological regimes.

Animals in Wetland

The animal of wetland broadly can be categorised in to two different categories such as Invertebrate and Vertebrate

I) Invertebrate

This group can again be classified in to following sub groups such as

- **Poriferans** (Mostly microscopic but few are visible to naked eyes also. Ex: Euplactella and other sponges)
- **Coelenterates** (Ex: Hydra, sea anemones, Portuguese man-of-wars, corals etc)
- **Annelidans** (Ex: Segmented worms, including Earth worms, Leeches, and Marine Worms)
- **Arthropodans** (Ex: Prawn, Crabs, millipedes, centipedes, and insects etc)
- **Molluscs** (Ex: Bivalves, Snails and slugs, Octopuses, Squids etc)
- **Echinoderms** (Ex: Sea stars, Sea cucumbers, Sand dollars, and Sea urchins)

All type of invertebrates can be observed in a wetland. However, animals from the groups like Annelidans, Arthropodans, and Molluscs can be observed commonly in wetlands

II) Vertebrate

- **Pisces** (Ex: Rahu, Catla, cartilaginous fish etc.)
- **Amphibians** (Ex: Frog, Toad, Salamander etc)
- **Reptiles** (Ex: Snakes, Crocodiles, etc)
- **Birds** (Ex: duck, crane, and water fowl etc)



MEDICINAL PLANTS IN WETLAND

Sonal Gupta, Indian Environmental Society

People have used wetland animals and plants for medicinal purposes for thousands of years. Records of medicinal plant uses date from around 4,000 B.C. Today, on a global scale, we use between 50,000 and 70,000 species of higher plants medicinally as well as other plant groups such as algae (including seaweeds). The plants, their leaves, flowers, roots, etc., or chemical extracts from them, are used in three main 'forms' of medicine: traditional medicine, alternative medicine (including, for example, homeopathy and ayurveda), and modern western medicine.

Wetlands provide a unique habitat for several medicinal plants. Apart from their commercial value, the local community utilizes a good number of these plants for various curative purposes, which are unknown to the large number of people.

The importance of plants for human health is evidenced by the estimated 70-80% of people worldwide who rely chiefly on traditional, largely herbal, medicine to meet their primary healthcare needs, and the millions of people who gain income from the wild harvest or cultivation of plants or from their trade or processing for medicinal purposes. But apart from local villagers many people do not know the necessity of the wetland plants. Local extinction of the wetland and side by side these medicinal plants very often leads to the loss of traditional knowledge of the medicinal properties, since such traditions are transmitted orally. Once such knowledge systems are gone to the oblivion it would be an irrecoverable loss to the society. Hence the conversion of these plants at local level is very essential. Some examples of medicinal plants found in the wetland area are given below:

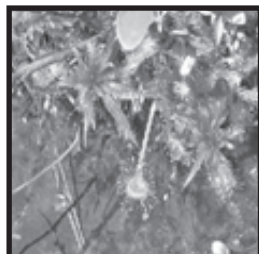
- White willow, *Salix alba*, a riverine plant, is the original source of salicylic acid, the precursor of aspirin, and is also used in skin care products.
- The bark of the red mangrove (*Rhizophora mangle*), found in coastal wetlands throughout the tropics, has a variety of reported uses in local remedies.
- Sundews (*Drosera* spp.), insectivorous herbs found in acidic bogs, have proved useful in homeopathic and pharmaceutical treatments for bronchial complaints.
- Labrador tea (*Ledum palustre*), a widespread bog bush, is used against many illnesses and also as a mosquito repellent.
- Several seaweeds are undergoing extensive testing since extracts from various species have shown indications of activity against such diseases as human immunodeficiency virus (HIV), polio, cancer, and herpes simplex.

- Vernacular name: *Cherula*; Syn: *Achyranthes lantana*; (Amaranthaceae)
Uses: Chopped leaves boiled with water are used for controlling diabetes and urinary disorders. Leaf juice reduces acidity.
- Vernacular name: Brahmi; Syn: *Lysimachia monnieri* (Scrophulariaceae)
Uses: Plant juice is considered effective in enhancing intelligence in children.
- Vernacular name: *Mukkutti*; Syn: *Biophytum sensitivum*; (Oxalindaceae)
Uses: Plant paste is used for skin diseases.
- Vernacular name: Uzhinja; Syn: *Cardiospermum helicacabum* (*Sapindaceae*)
Uses: The entire plant is used for making a special preparation, locally called as *Marunnu Kanji* (Medicinal soup), which is used for improving physical conditions and immunity.
- Vernacular name: Kudavan; Syn: *Hydrocotyle asiatica*; (Apiaceae)
Uses: Plant paste is effective in treating paediatric diseases, throat disorders and piles.
- Vernacular name: Muthanga; Syn: *Cyperus rotundus*; (Cyperaceae)
Uses: Tuber is used for digestive disorders especially for children.
- Vernacular name: Kuyyunni; Syn: *Eclitpa alba*; (Asteraceae)
Uses: Plant is squeezed and boiled with coconut oil and is applied on the scalp is a good medicine for preventing hair loss and dandruff.
- Vernacular name: Moyalchevi; Syn: (Asteraceae)
Uses: Plant juice is filtered and applied into eyes for curing injuries. Semi-boiled juice is given to treat asthma. Plant paste is applied for reducing inflammation.
- Vernacular name: Kizharnelli; Syn: *Phyllanthus amarus*; (Euphorbiaceae)
Uses: Plant paste or chopped leaves boiled with water is given to control and prevent jaundice.
- Vernacular name: Kallurukki; Syn: *Scoparia dulcis*; (Scrophulariaceae)
Uses: Plant paste together with fresh cow milk is given for relieving urinary disorders. It is believed that this medicine can eliminate kidney stones when the preparation is used regularly, once in a day, for 21 days.

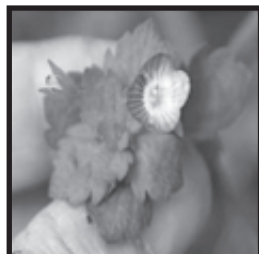
Few Photographs:



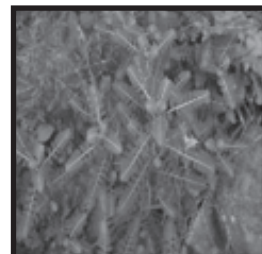
White willow, *Salix alba*



Drosera



Scrophulariaceae



Phyllanthus amarus



Emelia sonchifolia



MANGROVE WETLANDS-THE MOST PRODUCTIVE ECOSYSTEM

Indian Environmental Society

Mangroves are salt-tolerant forest ecosystems found mainly in tropical and sub-tropical intertidal regions of the world. They are trees or shrubs that have the common trait of growing in shallow and muddy salt water or brackish waters, especially along quiet shorelines and in estuaries. Mangrove forests are one of the most productive and biodiverse wetlands on earth. Yet, these unique coastal tropical forests are among the most threatened habitats in the world.

The coastal zone of the mainland of India and Andaman and Nicobar islands is endowed with the presence of extensive and diverse mangrove wetlands. These mangrove wetlands act as a barrier against cyclones, avoid coastal erosion and provide nursery grounds for a number of commercially-important fish, prawns and crabs.

According to Forest Survey of India (FSI), out of 4, 87, 100 ha of mangrove wetlands in India, nearly 56.7% (2, 75, 800 ha) is present along the east coast, and 23.5% (1, 14, 700 ha) along the west coast, and the remaining 19.8% (96,600 ha) is found in the Andaman and Nicobar islands.

BENEFITS OF MANGROVES

- Mangroves are a source of firewood, of wood products such as timber, poles and posts, and of non-wood product such as fodder, honey, wax, tannin, dye and plant materials for thatching.
- Mangrove wetlands and forests act as a shelter belt against cyclones. (In Orissa state a few years ago, villages surrounded by mangrove forests survived the fury of cyclones, unlike other villages). They also prevent coastal erosion.
- They provide feeding, breeding and nursery grounds for a number of commercially important fish, prawn, crabs and mollusks.
- They serve as good webs and enhance the fishery production of nearby coastal waters by exporting nutrients and detritus.
- They provide habitats for wildlife ranging from migratory birds to estuarine crocodiles, tigers etc.
- They are sites of accumulation of sediment and they act as 'sink' for carbon and nutrients.
- The filtering effects of mangrove forests protect vital coral reefs and sea grass beds from damaging siltation.
- Shoreline protection and sediment accretion; mangroves buffer the shoreline from the erosive impact of storms and waves.
- Trap and bind sediments; reducing coastal turbidity and making cleaner waters.
- Major source of primary productivity in the form of plant materials; supporting many important trophic pathways by providing a source for food chains that support many terrestrial and marine organisms.
- Mangroves are a sink for atmospheric carbon; helping to reduce

global carbon dioxide levels and global warming.

- Mangroves capture effluents from terrestrial runoff; providing a buffer for nutrients, metals and other toxicants entering coastal waters.
- And more recently, changes in mangroves have been proposed as a means to monitor change in coastal environments as indicators of global warming, climate change, storm effects, sea level change, pollution, and sedimentation rates.

THREATS TO MANGROVES

Mangroves face several abiotic and biotic pressures as listed below:

a) Abiotic pressures are in the form of Cyclones,

- Earthquakes
- Tsunami
- Pollution from point and non-point sources resulting in deterioration of quality
- Poor flushing by tidal waters and consequential high saline condition

b) Biotic pressures are in the form of following;

- Habitat destruction
- Encroachment resulting in shrinkage of area
- Anthropogenic pressures resulting in habitat destruction and loss of biodiversity
- Uncontrolled dredging resulting in succession changes
- Hydrological interventions resulting in loss of aquifers
- Uncontrolled siltation and weed infestation. The spread of the invasive *Prosopis juliflora* is a threat to the future of the mangroves.
- Uncontrolled discharge of waste water, industrial effluents, surface run-off etc. resulting in proliferation of aquatic weeds which has detrimental effect on flora and fauna

LEGAL AND REGULATORY APPROACH

At present, the mangroves are protected through a range of regulatory measures. Mangroves located within the notified forest areas are also covered under the Indian Forest, 1927 and Forest (Conservation) Act, 1980.

National Conservation Strategy and Policy Statement on Environment & Development (1992) highlights conservation and sustainable development of mangroves, including coastal areas, riverine and island ecosystems. Similarly, National Forest Policy and National Wildlife Action Plan emphasize conservation of mangroves on scientific principles of evolution and genetics, including social and cultural aspects.

Table 1: Mangrove wetlands of India

State	Mangrove Wetland	Total area of the wetland (ha)*	Actual forest cover (ha)
East coast			
West Bengal	Sunderbans	4,26,000	2,12,500
Orissa	Mahanadi	67,000	21,500
Andhra Pradesh	Godavari	33,25	24,100
	Krishna	25,000	15,600
Tamil Nadu	Pichavaram	1,300	900
	Muthupet	13,000	1,200
West coast			
Gujarat	Gulf of Kutch	58,200	85,400
	Gulf of Khambat	53,123	17,700
Other mangroves	-	-	11,600
Andaman and	Andaman islands	-	92,900
Nicobar islands	Nicobar islands	-	3,700
Total			4,87,100

*Records of the State Forest Department

On the macro scale, geomorphic settings of the mangrove wetlands of the east coast of India are different from those of the west coast. The coastal zone of the west coast is narrow and steep in slope due to the presence of the Western Ghats. Secondly, there is no major west-flowing river. As a result, mangrove wetlands of the west coast of India are small in size, less in diversity and less complicated in terms of tidal creek network. On the other hand,

mangrove wetlands of the east coast are larger, high in diversity, and water-bodies associated with mangroves are characterized by the presence of larger brackish water-bodies and a complex network of tidal creeks and canals. This is mainly due to larger delta created by east flowing rivers and gentle slope of the coast.

**Table 2: Environmental setting of mangrove wetlands of India**

Mangrove	Setting	Dominant features
Sunderbans and Mahanadi	Tide-dominated allochthonous type of mangroves	High tidal range with strong bi-directional current; main river channels funnel-shaped with extensive tidal-flat, colonized by mangroves.
Krishna and Godavari mangroves of Andhra Pradesh, and Muthupet and Pichavaram mangroves of Tamil Nadu	River-dominated allochthonous type of mangroves	Rapid deposition of terrigenous material; delta expand seaward; mangroves dominate in the region of abundant delta; active delta found nearby without mangrove vegetation.
Gulf of Kutch and Gulf of Khambat mangroves of Gujarat	Drowned bedrock valley type of mangroves	Bedrock valley drowned by rising sea-level; relatively small river delta could be seen at the head of the valley; tidal delta may occur in the mouth of the estuary.
Andaman and Nicobar Island mangroves	Carbonate platform on low energy coasts type of mangroves	Platform slowly accreting due to the accumulation of marl (calcareous) and peat; coral reef or sand barrier mitigate wave energy and allow fringe Mangrove to grow extensively in shallow water area.

EAST KOLKATA WETLAND – A CASE STUDY

Indian Environmental Society

The East Kolkata Wetlands have an interesting hydrological history. The wetlands to the east of Kolkata are well known over the world for their multiple uses. The resource recovery system, developed by the local people through ages using waste water from the city, is the largest in the world. In the process, it treats the waste water and has saved the city of Kolkata from constructing and maintaining a wastewater treatment plant. It also is the only metropolitan city in the world where the State Government has introduced development controls to conserve the water bodies.

Wastewater Aquaculture

The Kolkata Municipal Corporation area generates roughly 600 million lt. of sewage and wastewater every day and more than 2500 metric Tons of garbage. The wastewater is led by underground sewers to the pumping stations in the eastern limit of the city, and then pumped into open channels. The responsibility of the Kolkata Municipal Corporation ends with the reaching of the wastewater to the outfall channels. Thereafter, the sewage and wastewater is drawn into the fisheries of the East Kolkata Wetland by the owners of the fisheries, where within a few days' detention, biodegradation of the organic compounds of the sewage and wastewater takes place.

The area had been a brackish water lagoon swamp but as fresh drainage water came out of Kolkata it became suitable for raising fish. Local farmers stocked some of the ponds and then dug more. Currently, there are 300 or so large fish farms and ponds cover a total area of 3,500 hectares, some individual ponds extend to 70ha.

Many more, in Kolkata city, depend on the fish and vegetables produced; 13,000 tonnes of fish are produced annually in ponds managed for wastewater aquaculture and 150 tonnes vegetables per day are harvested from small-scale horticultural plots irrigated with wastewater.

Land use in the East Kolkata Wetlands

(*Source: www.nrsp.org)

Land use	Area
Water bodies	5,852 ha (about 3,899 ha used for fish farming)
Agricultural land	4,960 ha
Garbage farming	603 ha
Rural settlement	1,235 ha
Urban settlement	91.5 ha
Total area	12,500 ha

Methodology Used

Organic loading rate on these fish ponds appears to vary between 20-70 kg. per hectare per day (in the form of bio-chemical oxygen demand). There are networks of channels that are used to supply untreated sewage and to drain out the spent water (effluent). The cumulative efficiency in reducing the B.O.D. (a measure of organic

pollution) of the sewage wastewater is above 80% and that in reducing the coli form bacteria is 99.99% on an average. The solar radiation here is about 250 langleys per day, and is adequate for photosynthesis to take place. In fact, the sewage fed fishery ponds act as solar reactors. Solar energy is tapped by a dense population of plankton. Plankton are consumed by the fishes. While the plankton play a highly significant role in degrading the organic matter in the wastewater, it becomes a problem of pond management to tackle the phenomenon of plankton overgrowth. It is at this critical phase of the ecological process that the fishes play an important role by grazing on the plankton. The two fold role played by the fishes is indeed crucial they maintain proper balance of the plankton population in the pond and also convert the available nutrients in the wastewater into readily consumable form (viz. fish) for the humans. This complex ecological process has been adopted by the fish farmers of the East Kolkata Wetland, who have developed such a mastery of these resource recovery activities that they are easily growing fish at an yield rate and production cost unmatched in any other fresh water fish ponds of this country.

On the other hand, the conventional technology options for the treatment of municipal sewage and wastewater have been found to be excessively capital intensive, operationally unreliable and highly energy expensive. Compare this with the city of Kolkata which gets its huge volumes of daily sewage treated at no expense and getting in addition substantial daily supply of highly edible freshwater fish (a very essential protein supplement in their daily food). In fact, Kolkata city receives about one third of its daily requirement of fish from the sewage-fed fisheries (about 11,000 Metric Tonnes per annum).

Values of East Kolkata Wetland

- **Garbage:** Kolkata generates roughly 2500 Metric Tonnes of garbage (viz. solid wastes) which is collected daily and dumped at designated sites in the East Kolkata wetland. The Garbage filled areas are extensively used to raise a variety of vegetables. The city receives roughly 150 Metric Tonnes of vegetable everyday from its garbage farms.
- **Food grains:** The paddy fields in the East Kolkata Wetland (many of which get irrigation water from the effluent waters of the fisheries) produce 15,000 Metric Tonnes of additional paddy per annum.
- **Air Purification:** On the issue of characteristics and importance of East Kolkata

Wetland to the ecosystem, it is claimed by environmentalists that these wastewater bodies and fisheries act as carbon-dioxide sink and help to improve the air quality of Kolkata and its environs. Any loss of wetlands, therefore, will have a negative impact on the overall environmental condition of the area. So, the role and

importance of the wetland in relation to its surroundings cannot be undermined. It is vital for maintaining micro climatic condition and absorbing the pollution from the air space.

Livelihood Generation

Recent field surveys showed that 8,500 people are directly engaged in sewage fed fisheries, of which about 90% are from local villages falling within the EKW, the others mainly coming from adjoining areas of Districts 24-Parganas (North) and 24-Parganas (South), Midnapore and sometimes from neighbouring states. Fish culture presents opportunities for various types of specialised labour, including security services, harvesting work, loading, unloading, packing and distribution of fish, and as a consequence such opportunities often attract migrant labourers from other districts

and states. In general however, traditional economic activities, namely sewage-fed agriculture and fish culture, primarily involve the inhabitants of the EKW. The main stakeholders are the fishermen, farmers, labourers engaged in fish culture and agriculture, night guards and carriers.

Conclusion

The Ramsar Bureau selected 17 case study sites from all over the world to demonstrate and understand the wise use of wetlands. In that list the East Calcutta Wetland is the only entry from India and also the only one that is by the side of a city and is largely acclaimed as an urban facility for using the city sewage in traditional practices of fisheries and agriculture. This can be taken as a model and similar wetlands can be developed in other Indian cities.

List of Ramsar Sites in India

S.N		States
1.	Wullar	J&K
2.	Chandratal	Himachal Pradesh
3.	Ropar	Punjab
4.	Chilka	Orissa
5.	Bhitarkanika mangroves	Orissa
6.	Sambhar	Rajasthan
7.	Kolleru	Andhra Pradesh
8.	Ashtamudi	Kerala
9.	Bhoj Wetland	Madhya Pradesh
10.	Hariker Lake	Punjab
11.	Deepor Beel	Assam
12.	East Calcutta Wetlands	West Bengal
13.	Keoladeo National Park	Rajasthan
14.	Loktak Lake	Manipur
15.	Point Calimere Wildlife and Bird Sanctuary	Tamil Nadu
16.	Rudrasagar	Tripura
17.	Hokera Wetland	Jammu Kashmir
18.	Pong Dam Lake	Himachal Pradesh
19.	Sasthamkotta Lake	Kerala
20.	Kanjili	Punjab
21.	Surinsar Mansar Lakes	Jammu Kashmir
22.	Tsomoriri	Jammu Kashmir
23.	Upper Ganga River	Uttar Pradesh
24.	Vembanad Kol Wetland	Kerala
25.	Renuka Wetland	Himachal Pradesh

WETLAND RESOURCE MANAGEMENT AND ROLE OF COMMUNITY

By: Ravi Kumar Rathore, Project Associate, IES

Introduction

Wetlands are submerged or water saturated lands (both natural and artificial, permanent and temporary) with water that is static or flowing, fresh brackish or salty including area of marine water, the depth of which at low tide does not exceed six meters. Wetlands may be of several types like lake / ponds, ox-bow lake / cut-off meander, water areas, estuaries, coral reefs, reservoirs, tanks, marshy lands etc. Wetlands are important center of biodiversity, especially birds and aquatic organisms; they are amongst the most productive ecosystems on earth, providing food and materials for many people living in the nearby areas of wetlands.

The total wetland area of the world is around 85, 58,000 sq. Km. That is about 6.4% of the total area of the earth. India has 2,167 natural wetlands covering an area of 1.5 million hectares. There are varieties of inland and coastal wetland ecosystems in India.

India has a varied terrain and climate, which supports a rich diversity of inland and coastal wetland habitats. Wetland habitats in India have been destroyed by draining and land filling. Wetlands are also severely disturbed by over exploitation of fish resources, pollution, choking by exotic weeds and other human pressures. It is reported that one third of Indian wetlands have already been wiped out or got severely degraded. One of the most important wetland in India is the Keoladeo National Park in Bharatpur, Rajasthan, which is a manmade wetland. This park is visited by various migratory species of birds almost every winter. Another important wetland is Chilka, the largest (1100 sq. Km.) Brackish-water lake in India, situated in Puri and Ganjam districts of Orissa. There are a number of Ramsar sites (Wetlands of International Importance) in India, which are rich in biodiversity characteristics.

What do we have from wetlands

Wetlands have been playing a crucial role in human history and major stages in the evolution of life itself. Wetlands have been offering their services in following three broad categories.

Functions of Wetlands

Functions are like, ground water recharge, ground water discharge, flood control, shoreline stabilization / erosion control, sediment / toxicant retention, biomass export, storm protection / wind break, micro climate stabilization, water transport, and recreation / tourism.

Products of Wetlands

These include various products like forest resource, wildlife resource, fisheries, forage resource, water supply, irrigation and power generation.

Attributes of Wetlands

These include biological diversity and uniqueness to culture and heritage.

How are they threatened

The threats to the wetlands are aroused from over exploitation of the resources, habitat destruction, infrastructure development, unplanned construction, water pollution, agricultural and urban runoff, human encroachment, flood control measures and

deforestation. All these activities are resulting in eutrophication specially avian and fish fauna, flood problems, water scarcity etc.

How should the Panchayats and Community act

Community participation planning is an integral part of area development. The involvement of the people in the planning process becomes necessary so that the plan is more responsive to the local needs, reflects more accurately the local perceptions and produces a sense of ownership and responsibility. Such community participation is of particular relevance for mobilizing community resources in which participation is viewed as facilitator of a desired plan output, to sort any differences in the planning and implementation stages, to speed up the process of implementation, and to complement and supplement the efforts of the government in the development process. It is being realized now that unless people are involved in the process of development, no real improvement will take place.

The local communities can play an important role in wetland resource conservation by being watchdogs of environment, remain organized and above all being sympathetic to their future generation.

Therefore there is need for an effective local level institution to energize and involve the public managing and controlling their resources. The local leaders of the community, teachers, students, people's representatives, beneficiaries groups, non-governmental organizations, farmers groups, self help groups, users groups, research institutions etc., Need to be actively involved in the various stages of the planning. People's participation in the management of wetland resources can assured if the programmes are based on the requirements of the people.

Local residents, particularly the poor, derive significant benefits from the wetlands. Traditional customs and use of natural resources formerly protected the resources by the local community. Traditional ways should be maintained in spite of economic pressure and urbanization. Information and awareness must be made available to the rural people so that the informed participation can be beneficial both to themselves and the wetlands. They should be made realized the socioeconomic benefits they are acquiring from the wetlands and the fragile nature of the wetlands.

Local and village groups should be organized by the Panchayats and followed by the NGO resource staff based on existing local organization and group. Panchayats at various levels promote the masses in participation, motivation and involvement in conservation and management of the wetlands. Management of wetlands can be planned by the Panchayats at the upper levels of the hierarchy.

The Panchayats may broadly follow the following steps to perform in wetland management.

- Check the over exploitation of wetland resources.
- Control the habitat destruction and human encroachment into the wetlands.
- Stop the trade and export of endangered biotic resources.

- Control the use of chemical fertilizer and pesticides in the surrounding agricultural fields of the wetlands.
- Stop the unplanned construction which may obstruct the natural flow of water to and from the wetland.
- Stop the untreated urban sewage from reaching the wetland.
- Eradication of the weeds in the wetlands and preparation of materials (like organic fertilizers) from those.
- Check the dumping of waste in the wetlands.
- Don't allowing the untreated industrial waste to drain into the wetland.
- Arrangement of awareness campaign about importance of wetlands and encourage the local community to follow the indigenous beneficial practices of resource utilization.
- Development of proper flood control measures which does not disturb the natural ecology of the wetland.
- Desedimentation of the bottom and cleaning of wetlands.
- Implementation of management plan through actions involving rural communities and NGO's based on the local communities.

Print Media

SAVING THE MANGROVES

India's eastern coastline and regions east of India have been suffering serious environmental degradation without any sincere efforts at mitigation. The Orissa super-cyclone of 1999 smashed through huge tracts of land, taking countless lives and wrecking incalculable damage to crops, cattle and property. The 13 coastal districts along Tamil Nadu's 255-km long coastline are regularly exposed to cyclonic fury, and the terrifying tsunami of 2004 is still fresh in public memory.

Summer 2008 has been kind to India; Hurricane Nargis, which shattered the lives of untold thousands in Myanmar, has spared this land; it could so easily have been otherwise. A grim earthquake has devastated China, raising the toll of human tragedy manifold. Delhi's unseasonal rains have also taken some lives, and the weather has been inexplicable enough for experts to global warming and environment degradation.

Resurrecting the mangroves, now almost extinct in our part of the world, can even now end this continuing legacy of human misery, this horrible haemorrhaging of the earth itself. Mangroves, literally dense forests on the shore, tolerate the salinity of sea water and protect inland water sources and soil from salinity and erosion; above all, they mitigate the impact of cyclonic winds. There is no more ecologically sensitive and cost-effective measure of saving the seacoast and continental shelf than mangroves; yet, we have seen least action in this direction.

Given the pulsating environmental instability in our region, it is astonishing a debate still persists regarding the desirability of the Rs. 2,400 crore white elephant called the Sethusamudram Shipping Canal Project (SSCP). The plan to dredge a 300-metre wide channel through the land-link between India and Sri Lanka, to reduce the distance between the western and eastern coast ports, is opposed by environmentalists, economists and security analysts. Colombo has raised an alarm fearing human intervention on Ram Setu could threaten its very existence in the event of another tsunami, already predicted by Nature magazine (December 2007).

- Training at local level for conservation and management of the wetlands.

At grass root level, the Block and Gram Panchayats can take the most important steps in implementation of the schemes. Awareness can be created among the local people about the wise and sustainable use of wetland resources and treat those wetlands with care. The conservation of wetland resource to be initiated through pilot project activities, which would work through locally, based resource management centers to be setup at each key wetland site through the hierarchical order of institutions and groups.

Conclusion

As a part of management programme, a sense of collaborative responsibility needs to be instilled so that the needs of the people, local or non local, those are dependent on wetland resource are met.

Our mother earth has enough to serve and satisfy everyone's need, not for the fulfillment of everyone's greed. The crucial time has arrived to think and take steps about the wise use of the wetlands i.e. the sustainable utilization for the benefits of humankind in a way compatible with maintenance of the natural properties of the wetlands.

The historical-civilisational significance of Ram Setu is obvious. Sinhala scholar Prof Tissa Kariyawasam, former dean of the University of Jayawardenapura, Sri Lanka, says most probably Emperor Ashoka's son Mahendra and daughter Sanghamitra came to the island by walking across the Ram Setu. It symbolises the establishment and protection of dharma; the Skanda Purana prescribes, worship of the Ram Setu and the Shivalinga installed in its middle with appropriate mantras. It is a popular place for offerings to pitrs (ancestors).

The proposal to hack a channel was publicly welcomed by the LTTE in Sri Lanka and Tamil politician Vaiko. The Indian Navy and Coast Guard warned of the possibility of facilitating militant groups! Capt H Balakrishnan (ret) of Chennai made an in-depth study of the SSCP's viability, particularly the claim that it would save ships nearly 424 nautical miles (780 km) and about 30 hours of sailing time, with commensurate savings in fuel, thereby becoming self-sustaining over time. An estimated 3,055 vessels were projected to use the canal annually.

But its economic viability alone is questionable from a study of the Information Memorandum of the UTI Bank (now Axis Bank), wherein dredging costs alone are pegged at Rs. 200 million in the first year. This will actually be higher as the open sea will constantly bring sand, which may keep the channel effectively closed much of the year. It is pertinent that the Suez Canal was cut through land, though it too has to be annually desilted. Many international shipping companies have already stated that using the canal would involve reducing speed, switching fuels, and incurring extra costs like canal charges and navigation assistance to negotiate it; hence, it made better sense to go around Sri Lanka! With news reports suggesting cost escalation up to Rs. 4,000 crore, the argument for economic viability of the project is certainly over.

The Kochi-based Centre for Marine Fisheries Research Institute (CMFRI) has warned about the adverse effect on marine biodiversity in the protected Gulf of Mannar Biosphere Reserve, if the

SSCP is implemented. Director KGK Pillai has affirmed that the 3,600 species in the biosphere would be endangered if the Gulf of Mannar was linked to the Bay of Bengal, in the manner in which the Kochi shipyard had caused loss of nearly 60 per cent biodiversity in the Kochi estuary. Worldwide, the phenomenon of vanishing wildlife is reaching endemic proportions, and unless strict measures are taken, biodiversity loss could touch 60 per cent to 70 per cent in the next three decades. In this regard, the practice of trawl fishnets needs an urgent rethink, as they cause immeasurable damage to non-edible biota.

The National Institute of Ocean Technology has affirmed that Ram Setu is a man-made structure, dating back to antiquity, a view shared by the National Remote Sensing Agency of the Ministry of Space, which has even been tabled in Parliament. This is why, once it was forced to withdraw the controversial affidavit denying the existence of Sri Ram, the Union Tourism and Culture Ministry insisted only an archaeological investigation could determine if the Ram Setu is man-made, and a legitimate heritage site worthy of protection under the Ancient Monuments Preservation Act, 1904.

With monsoons ruling out an early investigation, the project is virtually in a limbo for the present.

But the danger is far from over as the forces behind SSCP are resourceful and powerful, as reflected in the ingenuous argument of protecting the Ram Setu while continuing with the project through a different alignment! It needs to be understood that the Ram Setu is a single, somewhat winding, land track between Sri Lanka and India, wide enough for an army to cross over. Over the centuries, natural erosion in the turbulent waters there has cut natural channels into it, wide enough for shallow boats to cross over to either side.

Any move to preserve the pristine glory of the Setu must envisage filling these passages and restoring the 'Rampath' between the two countries. Stopping SSCP vandalism at a spot where dredging is difficult and attacking the structure at a more vulnerable point, in the name of realignment, is desecration in disguise. It is pertinent that the southern sands are rich in thorium, our nuclear future India does not need unnecessary activity in this area. □□□

'DEAD' WATER BODIES TO COME ALIVE

The green city is finally giving its water bodies a serious thought with the Delhi Government Environment Department Planning to begin its ambitious project of identifying and starting work on reviving its "dead" water bodies by giving it a productive "green cover".

The Capital at one time boasted of several hundred water bodies that are vital for the well-being of the water table and the environment. Many of them have vanished, having fallen prey to rapid urbanisation growth of population and non-availability of dumping sites.

"The Government agencies have identified over 600 water bodies and after a joint inspection it was found that not all of them can be restored as some have been lost after land owning agencies allotted them or because they have been encroached upon. A healthy water body is vital for a sound ecology and we understand that there is an urgent need to preserve it. With the water table in the city dipping dangerously the project is vital to ensure that the city has enough ground water" said D.M. Shukla, Chief Wildlife Warden of the Dept. Of Forests and Wildlife.

"We have been given a nine-point action plan to revive the water bodies and while some part of the work including clearing up of the 'malba,' making rainwater harvesting

structures have been completed, we are now working on using aquatic vegetation and trees to revive our endangered water bodies" added Mr. Shukla.

According to Delhi Environment Secretary J.K. Dadoo, 175 water bodies in rural areas are being greened. High Court advocate Arvind Sah, who is a member of the committee which inspected the to be-revived water bodies, said: "Development in the city often does not seem to go hand-in-hand with environmental protection. There are several water bodies that have disappeared because sewage and 'malba' is being dumped into the same. We are demanding that dead/dying water bodies be revived in a manner where soil erosion can be curtailed, water table brought up and a healthy environment is provided to the city."

Professor Emeritus at the Centre for Environmental Management of Degraded Eco-system, Delhi University, C.R. Babu, said: "Restoration of the wetlands is one of our top-priorities and we have drawn up a list of aquatic vegetation that can be planted to improve the health of the area. Healthy wetland would mean a site for birds and aquatic life." □□□

WATER EXPRESSWAY AT CHILIKA SOON

In bid to protect the endangered species of Irrawaddy dolphins from extinction the Chilka Development Authority (CDA) has mooted an ambitious plan to construct a water Expressway in the Chilika lagoon itself. This will act as a channel for the smooth movement of the dolphins from the outer channel to the main lagoon.

It may be noted that due to some solid steps taken by the CDA, the number of Irrawaddy dolphins in Chilika lagoon

has marginally increased this year, as per the annual census conducted on February 20, 2007. The survey was carried out from 6.30 am to 3pm by dividing the lagoon into four sectors.

CDA chief executive S Panda said the Dolphins, which are residing in the outer channel of the lagoon, are under a threat. They need a big space to live in. In the main part of the lagoon, the movement of the tourists and other fishing

boats is restricted. They can safely live there. The total population of Irrawaddy dolphins in the world is estimated to be less than 1,000. In India, this species is only found in the Chilika. As per the strategy, the new channel, know as the water expressway connecting the main lagoon to the outer channel, will be dug before the arrival of the monsoon. Now the channel has a depth of 1 to 1.5 metre and width of 100 metre. As the channel is shallow in nature the dolphins are not able to come to the main lagoon. The channel will be deepened further. Panda said once the channel is dug up to 3 metre, the dolphins can move

smoothly to the main lagoon and settle there. This would act as a door for more fishes and shrimps to come from the seal to the lagoon itself. The channel would be dug near the Magaramukha. "The work has already been started and it would be completed before the arrival of the monsoon." He said. Panda informed that 135 dolphins reside in Chilka. Out of these, 115 are adults 15 semi-adults and five calves.. The number of dolphins has increased from 111 in 2005 to 135 in 2007. To give more protection to the dolphins, the CDA has signed as MoU with the University of Tokyo to study their behavioural pattern



समाचार पत्रों से

वैटलैंड घटे तो मानो जैव विविधता बीज मिटे

इंस्टीट्यूट ऑफ मेराइन बायोलॉजी (ताइवान) के विजिटिंग साइंटिस्ट डॉ. रामकुमार के अनुसार दिल्ली के वैटलैंड यानी झील, तालाब व दलदली इलाके बड़ी तेजी से मर रहे हैं। अगर वैटलैंड के बारे में हमारा नजरिया नहीं बदला तो वहां माइक्रोब्स के रूप में मौजूद जूएलैकटन यानी जैव विविधता के बीज तक समाप्त हो जाएंगे। मयूर विहार के संजय झील, रामघाट और भलस्वा झील का उदाहरण देते हुए उन्होंने कहा कि दिल्ली के वैटलैंड तेजी से समाप्त हो रहे हैं। अगर इनकी ओर ध्यान नहीं दिया गया तो जैव विविधता को होने वाली क्षति के साथ ही जलसंकट के गहराने का खतरा बढ़ेगा। वैटलैंड के मरने से भूजल की क्षतिपूर्ति की राह बन्द होगी। वे शुक्रवार को विश्व वैटलैंड डे के मौके पर यमुना बाँयो डॉयवर्सिटी पार्क में आयोजित एक समारोह में बोल रहे थे।

श्री कुमार के अनुसार रामघाट जहां पहले कभी 40 फुट गहरा पानी हुआ करता वहां आज पॉलीथीन व कीचड़ का अंबार देखने को मिलता है। इसी तरह भलस्वा झील की आज की हालत देखकर किसी को शायद ही अंदाजा हो कि यह हाल तक दिल्ली पर्यटन का प्रमुख स्थल हुआ करता था। यहाँ वटर स्पोर्ट्स प्रतियोगिताओं का आयोजन किया जाता था।

विश्व वन्यजीव कोष के वैटलैंड निदेशक परीक्षित गौतम के अनुसार आम लोग भले वैटलैंड को आर्थिक रूप से बेकार मानते हों, पर हकीकत

इसके विपरीत है। विशेषज्ञों की राय में पर्यावरण द्वारा दी गयी सेवाएं 33 ट्रिलियन डॉलर के समतुल्य हैं। जिसमें वैटलैंड का योगदान लगभग 13 ट्रिलियन डॉलर है जो करीब 40 फीसदी है।

लोग वन को तो आर्थिक रूप से फायदेमंद मानते हैं पर वैटलैंड के आर्थिक फायदे की ओर किसी की नजर नहीं जाती। एक हेक्टेअर में लगे वन से जहां हमें लगभग 20,000 डॉलर का आर्थिक लाभ मिलता है वहीं एक हेक्टेअर के वैटलैंड से होने वाला लाभ 14,000 डॉलर के समतुल्य है।

वरिष्ठ पर्यावरण विशेषज्ञ प्रो. मोहन राम ने कहा कि भारतीय संदर्भ में इन वैटलैंड का महत्व और भी अधिक है। दुनिया भर में पाए जाने वाले जलीय पौधों की प्रजाति में से 50 फीसदी से अधिक अकेले भारत में पाए जाते हैं। जिसने विदेशी विद्वानों को अपनी ओर आकर्षित किया है। अमेरिका, इंग्लैंड और कनाडा जैसे देशों से बड़ी संख्या में विशेषज्ञ यहां शोध के लिए आ रहे हैं। वैटलैंड बड़ी संख्या में जीवन के अन्य प्रारूप को धारण करते हैं। वैटलैंड हमें कई जीवनपयोगी चीजें प्रदान करता है। इस अवसर पर पक्षी विशेषज्ञ डॉ रंजीत लाल दिल्ली विश्वविद्यालय के पर्यावरण विज्ञान विभाग के छात्र व शिक्षक के साथ ही कई पर्यावरण प्रेमी भी मौजूद थे।



पर्यटकों को आकर्षित कर रही नैनी झील

माडल टाउन के रिहायशी क्षेत्र विकसित दिल्ली पर्यटन एवं परिवहन विकास निगम की नैनी झील पर्यटकों को आकर्षित कर रही है। गर्मी की तपन से परेशान लोग नैनी झील पहुंच कर वोटिंग का आनंद उठा रहे हैं। इसे झील परिसर में रौनक है और पर्यटकों की भीड़ देख कर विभागीय कर्मचारियों के चेहरे भी खिल उठे हैं। इससे पहले राजधानी में खासी गर्मी होने के कारण मई माह में नैनी झील बेजान रहती थी।

पश्चिमी दिल्ली के माडल टाउन कालोनी के मध्य में निर्मित नैनी झील दिल्ली की अन्य झीलों की अपेक्षा सुंदर, गहरी एवं सुव्यवस्थित है। रिहायशी क्षेत्र के मध्य नैनी झील में नौका विहार का अपना ही आनंद है।

दिल्ली पर्यटन एवं परिवहन विकास निगम के अधिकारी एनएल मीणा ने बताया कि करीब दो वर्ग किमी. क्षेत्रफल में फेली झील आठ फुट गहरी 250 मीटर लंबी और 120 मीटर चौड़ी है। झील में तीन दर्जन से अधिक बतखों का झुंड पर्यटकों को अपनी ओर आकर्षित करता है। झील की

सुंदरता को चार चांद लगाने के लिए बीचोबीच एक द्वीप भी निर्मित किया गया है। सुरक्षा के मददेनजर झील को चारों ओर से लोहे के ग्रिलों से कवर किया हुआ है। इसके अलावा पर्यटकों के सैर-सापटे के लिए झील के चारों ओर पैदल पथ और छायादार पेड़ लगाए गए हैं। झील में लाइटों और पर्यटकों के बैठने के लिए कुर्सियों की व्यवस्था है। उन्होंने बताया कि नौका विहार के शौकिनों के लिए पैडल बोट, एक वाटर स्कूटर और शिकार का बंदोबस्त है।

मीणा ने बताया कि झील में प्रतिदिन 50-60 पर्यटक नौका विहार का आनंद उठा रहे हैं। पर्यटकों के खानपान के लिए भी झील परिसर में पूरी व्यवस्था है। उल्लेखनीय है कि माडल टाउन कालोनी का विकास डीएलएफ ने किया था तभी डीएलएफ ने नैनी झील बनाई थी। इसके बाद से नैनी झील की जिम्मेवारी पर्यटन एवं परिवहन निगम के जिम्मे है।



Messages



पंचायत में प्रकाशित सामग्री पर्यावरण संरक्षण की दिशा में नयी सोच और जागृति पैदा करने वाली है। अतः निःसंदेह पत्रिका के नियमित प्रकाशन से सचमुच एक बेहतर भविष्य की आशा कर सकते हैं।

अवतार सिंह (अनेदकर शिक्षा समिति)



Panchayat Newsletter is very informative and covers useful articles to environment, agriculture & specially organic farming & pollution.

Dr. A. Noor (Chemitech Corporation, Jodhpur)



In which areas / what issues, NGOs can work together with the Panchayats.

Malay Dewanji (Liberal Association for Movement of people, Kolkata)



कृपया पंचायत के अंक में हिन्दी लेखों का अधिक संकलन करें और "सौर उर्जा", जैविक खाद वागवानी आदि संबंधित जानकारी देने का प्रयास करें।

अभय यादव (हरिशचंद्र सिंह संपर्क सेवा समिति, आगरा)



Kindly send us the 'Panchayat Newsletter' regularly & also send us the dates of your Seminar & Exhibitions.

Dr. Jaswinder Singh Bilga (Amritsar)



Give information about Food Technology & Send us your Newsletter.

Dr. T. Viruthagiri (Tamil Nadu)



Please publish a detail article on e-waste management pertaining to Indian Condition.

Dr. V.S. Yadav



आपके द्वारा "पंचायत" नामक प्रकाशित पत्रिका बहुत ही अच्छी है। इसमें पर्यावरण संरक्षण में महिलाएँ अच्छी भूमिका निभा सकती है।

रज्जन लाल शर्मा(अखिल भारती पर्यावरण एवं समाज कल्याण समिति)

Role of Panchayats in Environmental Management

ENVIS Newsletter Glimpse of the Website www.iespanchayat.net.in



ENVIS CENTRE ON ROLE OF PANCHAYATS IN ENVIRONMENTAL MANAGEMENT

The website has compiled all the relevant data and comprehensive information on different components of Panchayati Raj and Environment. The website contains information on databases developed; geographical distribution of Panchayats; success stories, areas of Panchayati Raj co-operation; elections, finance, query services; bibliography; resource repository etc.

We hope that the information contained in the website will suffice your requirements.

We would appreciate your comments & suggestion about the website so that we can update it as per the requirements of our browsers.

Wish you a Happy browsing on www.iespanchayat.net.in

The Centre invites for Publications :

- Reports on Panchayati Raj (specially related to environmental management).
- Short report on seminars/workshops on the related topics are also invited. Those found suitable will be published in the newsletter.
- Articles for the newsletter "Panchayat" are invited.

Forthcoming Events

- **World Wetland Day Celebration at INSA, New Delhi on February 2, 2010.**
- **Series of seminar on "People's Agenda on Climate Change (At Goa, Darjeeling, Puri and New Delhi)**
First seminar at the conference hall of DON BOSCO Public School, Goa (February 26-27, 2010)
- **Teacher's Training Programme on GLOBE Activity (April 2010)**
- **Conference on "Earth System Science Researches"**
at INSA, New Delhi (April 2010)

Book Post

Please return, if undelivered :

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Delhi - 110092 INDIA

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To _____

