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RESEARCH ARTICLE

IMPORTANCE OF WETLANDS: A STUDY ON TWO BLOCKS OF MALDA DISTRICT (W.B.)

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ABSTRACT

Wetlands are an incredibly important resource for wildlife, the public and to all of us as a social being. These productive and diverse ecosystems can be used to learn about many different topics including the water cycle, food chains, food webs, the importance of habitat, human impacts and how to get involved in conservation activities. It is widely accepted that wetland have a significant influence on hydrological cycle. Wetland has therefore become important elements in water management policy at national, regional and international level. There are many examples where wetlands reduce floods, recharge groundwater augment low flows. Wetlands are important repositories of aquatic biodiversity. Wetlands are said to perform 'hydrological functions' to 'act like a sponge' soaking up water during wet periods and releasing it during dry periods. Wetlands are also known as a 'House of Thousand Species'. This paper is an attempt to highlight the importance of wetlands on villagers through observation and case study method on Chanchal-I & Chanchal II blocks of Malda District of West Bengal (India).

INTRODUCTION

The term 'wetlands' refer to lowlands covered with shallow and some time temporary or intermittent waters. They are referred to by such names as marshes, swamps, bogs, wet meadows, potholes, sloughs, and river overflow lands. Shallow lakes and ponds, usually with emergent vegetation as conspicuous features are included in the definition, but the permanent water of streams, reservoirs and deep lakes are not included. Neither are water areas that are so temporary as to have little or no effect on the development of moist-soil vegetation. Wetlands are defined as lands transitional between terrestrial and aquatic ecosystems were the water table is usually at or near the surface or the land is cover by shallow water (Mitsch & Gosselink 1986). Wetlands are one of the most important ecosystems on the earth. It was the swampy environment of the carboniferous period which produced and preserved many fossil fuel of economic importance. Sometimes wetlands are described as "the kidneys of the landscape" due to their functions which they perform in the hydrological and chemical cycle as the downstream section receives wastes from both natural and human sources (De & Jana, 1997). Wetlands are traditional zone between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. 'wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface' (Cowardin, December 1979). Wetlands vary widely because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation, and other factors, including human disturbance. Wetland' is a generic term for water bodies of various types, and includes diverse hydrological entities, namely lakes, marshes, swamps estuaries, tidal flats, river flood plains etc. The finite natural resources of our planet are under tremendous stress due to demographic pressures and economic growth. Fresh water which holds the lifeline for human beings and for that matter for all living organisms is a rapidly shrinking resource, and is likely to be the cause of competing claims and resultant conflicts. The main objectives of the present Paper are

- to identify the significance of wetland
- to find out the importance of wetland to rural poor
- ecological role of wetland
- hydrological role of wetland
- pollutant container of locality
- natural habitat for different sepsis
- To search out the impact of wetlands into socio-economic profile of the study area

METHODOLOGY

To fulfil the above objectives, primary data have been collected through intensive field investigations and interviews with well designed questioner. The primary information has been supplemented with secondary information as per requirement. The collected data have been

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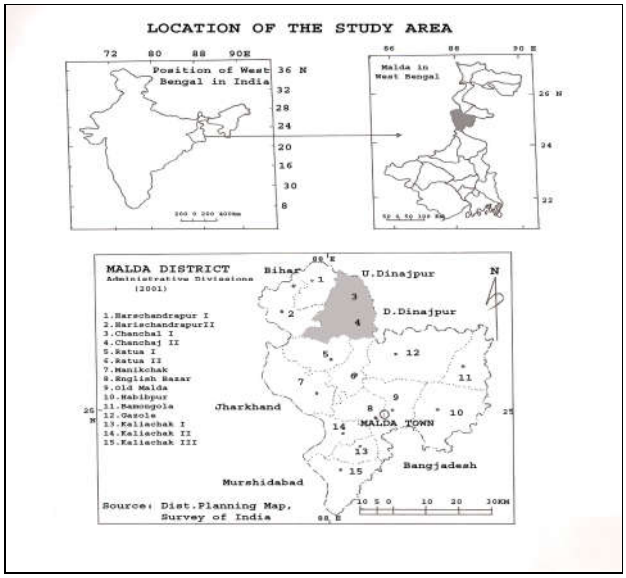
analyzed and examined with simple percentage technique. To analyzed data briefly, some pictorial diagrams are used.

Study Area

Chanchal-I and Chanchal-II Blocks are situated in the northern part of Malda District. The study areas are situated between 25^0 23́ 00̋ N to $25^0$23́15̋N latitude and 87^0 59́ 15̋ E to 88^0 00́ 30̋ East longitude. The total population and area of the study area are 339345 persons and 367.30sq.km respectively. This comprises 9.84% of the total land area and 10.31% of total population of Malda district. Sandy soil, by far the largest and the most important soil of the study area, is fertile and productive to crops. Climatic conditions of the study area are hot and humid, which is highly favourable for the development of agriculture. Annual average rainfall is around 175cm which is most suitable for cultivation of rice, temperature varies in summer from 24^0c to 40^0c and in winter from 10^0c to24^0c.The monsoon extends from June to September. Nearly two third of the total land area of the study area is used for cultivation and more than 80 percent of the total population of the study area is engaged in agriculture. Neither large nor small agro- based industries are noticed in the study area. Thus agriculture and also wetlands are indirectly constitutes to the employment generation for the rural poor.



wetlands, Doabs, Jalkars etc .Most of the Beels are within t situated in Chanchal-I, Chanchal-II blocks. About 30 percent of the entire area (3733sq.km) of the Malda district is covered with beels. That's why Malda is also called the 'Lake District' of West Bengal. Malda district is dotted with many large and small beels. Some of the major beels of these blocks are Kalma, Bogole, Kapargella, Khurial, Kankardaha, Gorutola, Mayamari and Chandamari beels. Other important beels of the district are Bara Sagardighi, Bhatiar, Tangon, Gour and Jatradanga beel, etc.These beels are used for Makhna, Paniphal, Dhap, Shalok cultivation and fisheries. Cultivation of food varieties such as Makhna and Paniphal can lead to alternative sources of food of local people. Kai, Singi, Magur, Saul, Tengra, Puti, Gati, Garai, chingri, Khalisha (local name) etc are important fish varieties are found in these Beels. During rainy seasons fish like Rui, Katla, Mrigal, Boail etc are caught by local fisher men .They fishes are sold in the market at high price. Various birds like Heron, Tufted Pochard, Adjutant stork, Purple Moorhen, common Teal and plants like Dhap, Shaluk with flowers are found in these Beels. So Beels are looked like an 'Aquatic Botanical Garden'.

(I) Kalma Beel

Kalma Beel is situated in Chanchal-I block of Malda district. It is surrounded by Kachcha road in the north, Gourakpur in the south, Ranikamat in the east and Uttar Rasulpur in the west. The total area of Kalma Beel is 29.88 hectares. The depth of this Beel is 1-3 metres. Makhna is cultivated in Kalma Beel at a large scale and it produces 19.20 quintal/hectare. Various types of fishes are caught from Kalma Beel. Kalmi, Sushni (Marsilea Minuta) etc are also collected from this beel for vegetable purpose by the local women. About 171 persons are engaged for fishing, collecting Makhna and shaluk in the aforementioned Beel. Water, this beel is irrigated for the agricultural prosperity of Boroo Paddy, Mustard seeds, in the vegetables wheat etc. Therefore, Kalma Beel plays an important role in the agricultural and economic development of the local people.

(II) Kankardaha Beel

Kankardaha Beel is situated in Chanchal-I block of Malda district. It is surrounded by the village of Sankarkola in the north, Chilapara in the south, Kachcha road in the east and Birasthali in the west. The total area of Kankardaha Beel is 14.58 hectare. The depth of this Beel is 1-3 metres. Jalsingara

Table 1. Area and resource production of some wetlands of ch-i, ch-ii, blocks of malda Distict

S. No	Name of the wetlands	Name of the Blocks	Area in hectares	Fish production Quintal/hec.	Total fish production In quintal	Makhna production Quin/hec.	Total production of Makhna	Paniphal Production Quin/hec.	Total production of paniphal	Perso engag
1	Kalma Beel	CHL-I	12.10	14.10	170.61	19.20	232.32	0	0	171
2	Kapargela Beel	CH-I	1.10	10.50	11.55	20.40	22.44	0	0	45
3	Khurial Beel	CH-I	1.30	14.20	18.46	0	0	35.50	46.15	49
4	Kankardaha	CH-I	14.30	13.10	187.33	0	0	36.00	514.80	181
5	Dhanmela	CH-I	2.15	12.40	26.66	0	0	0	0	30
6	Barjan	CH-II	3.50	14.60	51.10	21.50	75.25	0	0	53
7	Ghoradhaha	CH-II	15.20	15	228	22	338.96	35	532	183
8	Bogole	CH-II	7.0	11.70	81.90	14.60	102.20	0	0	101

*CH-I=Chanchal -I Block, CH-II=Chanchal-II Block; Source: B.L. & L.R.O Office, April 2012

Major Wetlands

In Malda district low-lying water bodies are mostly called Beels. Beels are inland wetlands. Beels are synonymous with

(paniphal) is grown in Kankardaha Beel and production of Jalsingara is about 36 quintals/hectare. Fish like Kai, Singi, Magur, Soal Tengra etc. are also caught by the fisherman

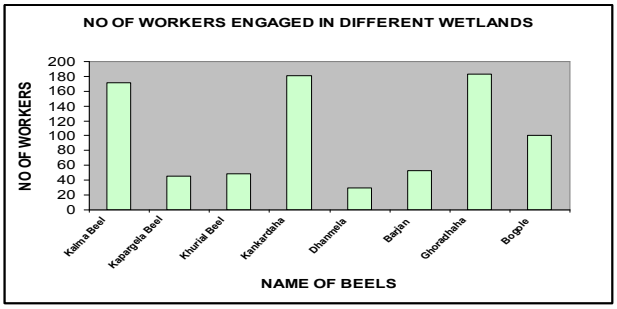


Chart: 1. Distribution of workers in different wetlands

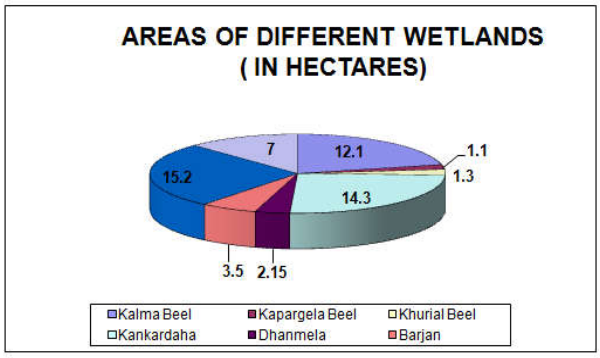


Chart 2. Areas of different wetlands

from this Beel. The production of fish is about 13.10 quintals/hectares. Water resource of the beel is used for irrigation using pumps. Shepherds collect grasses for feeding their domestic animals (cow, goat, buffalo etc.) from Kankardaha Beel.

(III) Bogole Beel

Bogole Beel is situated in Chanchal-II block of Malda district. It is surrounded by Laxmipur in the north, Dahuka village in the south, Makarsui in the east and Paraninagar in the west. The total area of this Beel is 7 hectares. The depth of the Beel is 1-3 metres. Makhna is grown in this Beel. Per hectare production of Makhna is about 14.60 quintals. Fish like Magur, Punthi, Gati, Chingri etc are caught from Bogole Beel. It is a store-house of rain water and the water is irrigated mainly for crops cultivation. About 101 persons are engaged in fishing and Makhna cultivation in this Beel. Bird hunters hunt birds like Heron, common Teal etc. by using-net or trap.

Importance of wetlands

Wetlands are store house of fish, makhna, paniphalal (Trapa natans bispinosa), shola (Aeschynomene aspera), shaluk, kalmi, kachu (Colocasia esculenta), dhap, hingche (Enhydra fluctuans), sushni (Marsilea minuta), hogla (Typhado mingensis), thankuni etc. They grow up in the wetlands of Malda. Makhna is a seasonal or perennial giant water lily, having flat leaf surface. Makhna is an aquatic cash crop. Makhna supports a fully fledged cottage industry, which provides sustenance of a many rural communities. Makhna seeds are edible and extremely nutritious and consist of easily digestible starch. Kalma beel is mostly used for Makhna cultivation. Fishing is done in Bogole, Kankardaha, Khurial and Kapargeela Beel. Paniphal, Shaluk, Makhna are cultivated in Chong, Siera, Ghoradour and Baromashia Beel. Dhap is collected from Khurial and Hazar Takia Talao (beel). Different types of fishes (like Kai, Magur, Singi, Chingri,) are fishing from the Beels which is more profitable. Shola is obtained from the soft stem pith of Aeschynomene aspera and it is cultivated for commercial purposes. Thermocol is made of shoal. It is used by engineers, designer, students and others. Makhna is one of the most important commercial crops which cultivated in different Beels. Water chestnut locally called paniphal (Trapa natans bispinosa) is one of the traditional water crops found in Malda. It is commercially cultivated as edible fruits. Kalma, Kachu, Thankuni, Sushni are also consumed as supplementary vegetables for their medicinal values. On the other hand wetlands of the study area are play a vital role for hydrological cycle and it is also plays a vital role for ground water recharged. The wetlands of this area are branded as the 'house of thousand species'.

Threats To Weatlands

Human activities cause wetland degradation and loss by changing water quality, quantity, and flow rates; increasing pollutant inputs; and changing species composition as a result of disturbance and the introduction of non-native species. Common human activities that cause degradation include the following:

Hydrologic Alterations

The characteristics of a wetland evolve when hydrologic conditions cause the water table to saturate or inundate the soil for a certain period of time each year. Any change in hydrology can significantly alter the soil chemistry and plant and animal communities. Common hydrologic alterations in wetland areas include:

- Deposition of fill material for development.
- Drainage for development, farming, and mosquito control.
- Dredging and stream channelization for navigation, development, and flood control.
- Construction of ponds and lakes.
- Diversion of flow to or from wetlands.
- Addition of impervious surfaces in the watershed, thereby increasing water and pollutant runoff into wetlands.

Pollution Inputs

Although wetlands are capable of absorbing pollutants from the surface water, there is a limit to their capacity to do so. The primary pollutants causing wetland degradation are sediment, fertilizer, human sewage, animal waste, road salts, pesticides, heavy metals, and selenium. Pollutants can originate from many Sources, including:

- Runoff from urban, agricultural, silvicultural, and mining areas.
- Air pollution from cars, factories, and Power plants.
- Old landfills and dumps that leak toxic substances.
- Marinas, where boats increase turbidity and release pollutants.

Vegetation Damage

Wetland plants are susceptible to degradation if subjected to hydrological changes and pollution inputs. Other activities that can impair wetland vegetation include:

- Grazing by domestic animals.
- Introduction of non-native plants that compete with natives.
- Removal of vegetation for peat mining

The other most important threats to wetlands are:

(i) Rapid growth of population (population explosion)
(ii) Huge changes of land use pattern
(iii) Agricultural improvement due to Green revolution
(iv) Development of communication systems
(v) Misuse of water from wetland to irrigation or domestic purposes
(vi) Uses of fertilizer and pesticide in agricultural field
(vii) Over fishing from wetland
(viii) Over grazing in wetland (EPA- Sep.2001).

Wetland Conservation And Management

Now a day's wetland management is burning topics to planners and environmentalists. Worldwide every year, 2nd February is celebrated as 'World Wetland Day'. And every year, 16th June is observed as 'Paschimbango Jalabhumi Diwas' or 'West Bengal state Wetlands Day'. State Govt. provides the framework for taking action at the state and district wise co-operation for the conservation of wetlands. The wetland authorities of Malda District recognized the importance of Wetlands as-habitats supporting a characteristic flora and fauna, especially water fowl and resource of great economic, cultural, scientific and recreational value. So, there is a need for their conservation with co-ordinate actions.

Wetland management - current status

Wetlands are not delineated under any specific administrative jurisdiction. The primary responsibility or the management of these ecosystems is in the hands of the Ministry of Environment and Forests. Although some wetlands are protected after the formulation of the Wildlife Protection Act, the others are in grave danger of extinction. Effective coordination between the different ministries like energy, industry, fisheries revenue, agriculture, transport and water resources, is essential for the protection of these ecosystems.

Protection laws and government initiatives

Wetlands conservation in India is indirectly influenced by an array of policy and legislative measures (Parikh & Parikh 1999). Some of the key legislations are given below:

- The Indian Fisheries Act - 1857
- Water (Prevention and Control of Pollution) Act - 1974
- Water (Prevention and Control of Pollution) Act - 1977
- Environmental (Protection) Act - 1986
- National Conservation Strategy and Policy Statement on Environment and Development– 1992
- National Policy and Macro level Action Strategy on Biodiversity-1999

Apart from government regulation, development of better monitoring methods is needed to increase the knowledge of the physical and biological characteristics of each wetland resources, and to gain, from this knowledge, a better understanding of wetland dynamics and their controlling processes. India being one of the mega diverse nations of the world should strive to conserve the ecological character of these ecosystems along with the biodiversity of the flora and fauna associated with these ecosystems.

National wetland strategy

- National wetland strategy should encompass
- Conservation and collaborative management,
- Prevention of loss and restoration and
- Sustainable management. These include:

Protection

Today the primary necessity today is to protect the existing wetlands. Of the many wetlands in India only around 68 wetlands are protected. But there are thousands of other wetlands that are biologically and economically important but have no legal status.

Planning, managing and monitoring

Wetlands that come under the protected area network which have proper management plans. And active monitoring of these wetland systems over a period of time is essential.

Comprehensive inventory

There has been no comprehensive inventory of all the Indian wetlands despite the efforts by the Ministry of Environment and Forests, Asian Wetland Bureau and World Wide Fund for Nature. The inventory should involve the flora, fauna, and biodiversity along with values. It should take into account the various stakeholders in the community too.

Legislation

Although several laws protect wetlands there is no special legislation pertaining specially to these ecosystems. Environment Impact Assessment needed for major development projects highlighting threats to wetlands need to be formulated.

Research

There is a necessity for research in the formulation of national strategy to understand the dynamics of these ecosystems. This could be useful for the planners to formulate strategies for the mitigation of pollution. The scientific knowledge will help the planners in understanding the economic values and benefits, which in turn will help in setting priorities and focusing the planning process.

Building awareness

For achieving any sustainable success in the protection of these wetlands, awareness among the general public, educational and corporate institutions must be created. The policy makers, at various levels along with site managers need to be educated. As the country's wetlands are shared, the bi-lateral cooperation in the resource management needs to be enhanced (Prasad, 2002).

Research Voids

Wetlands of Malda District are natural assets, although the planners and administrators fail to feel it. Wetlands and their significance, diversity of plants, animal's resources, livelihood support values and their region wise ecological rolls should be included in the curriculum of school, college and university level. Wetlands are common property of society at large and destruction and misuse such natural resources amounts to violation of environmental laws. The wetlands of Malda districts are natural features but these features fully disturbed by anthropogenic causes. These wetlands are managed through adopting G.I.S techniques and it should be done by- Flood zonation mapping, Inventory and monitoring of irrigation and cropping pattern, Water quality analysis and modeling, Mapping changes in the river course, Water resource management, Wetland mapping etc.

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