

A Cortical Study of Floristic Survey of Wetland of Muzaffarpur with Special Reference to Angiosperms

Dr. Alpana Kumari

M.Sc., Ph.D. , Botany, B.R.A. Bihar University, Muzaffarpur, Bihar, India

ABSTRACT

The present work deals with floristic survey of wetland of Muzaffarpur with special reference to angiosperms. Studies were also made on utilization of this vast area of wan land species and their proper exploited. In this investigation, studies were made on an important wetland of Muzaffarpur called Manika Mun which is a permanent wetland situated in mushier block of Muzaffarpur.

Keywords : Subextrmination, Swamps, Bogs Marshes, Mires, Chauras, Muns

I. INTRODUCTION

Wetland is one of the most important economy system on earth and commonly known as kidney of nature. Wetlands are most precious and unique components of the biosphere as they serve an important habited for plants, water foes, fishes and other wildlife. It includes swamps, bogs marshes, mires, chauras, muns and many other water ecosystems. Large numbers of wetland are situated in Muzaffarpur district (table-1.4), near muzaffarpur city, one wetlands is manika mun. this wetland comes under mushahri block (26.8° north latitude and between 85° & 22.5° east longitude and has an elevation of 84m mean sea level)and selected for the present investigation. the detailed study was made at two sites (site I-samples & data were taken from mid of the wetland , site II- average sample & data were taken from two subextrmination of the wetland) which are of different nature,site I (average water depth=8-10 ft, permanent deep water) & site II (average water depth = 4-6 ft, shallow water). The wetland recives agricultural wastes of the field .the main objective of the present work was to focus on the survey of biodiversity of macrophytes,to study some physiochemical parameters of water and soil and to assess economic and conservation management of the wetland .some suggestions have been made for sustainable use of resources of wetland and its proper upliftment. Data were collected during November 2003 to October 2004 at regular intervals of one month. Data and observation were presented in tables 3.1, 3.2, 3.3, 3.4, 3.5, 3.6&3.7,

Some important findings of present investigation are as follows:

1. The experimental wetland, Manika Mun is situated in Muzaffarpur (N. Bihar), 10 km east of town. This wetland is famous in Muzaffarpur and is a typical wetland of this district so far water spread area, aquatic vegetation and number of aquatic animals are concerned .a map of India and Bihar showing Muzaffarpur and Manika wetland has been shown in fig.1.1,1.2,1.3&1.4. A list of important chauras/ wetlands of Muzaffarpur district has been presented in table 1.4 Muzaffarpur districts including a total are of 3172 sq

.km out of which 3.2% land is occupied by wetlands (a rough estimate). The experimental wetland, Manika mun has been selected for the present investigation as a model system and this wetland can be exploited for fish & fisheries aquaculture, prawn culture, trapa & lotus culture and dairy etc. Makhana & Saccharum cultivation can also be promoted in this wetland.

2. Winter rain was recorded in Jain 2003 (9 mm/2 days),march 2003 (45 mm/day), per monsoon rain in april, 2003 (70 mm/3 days) july,2003 (263 mm/8days),august 2003,(596.0 mm/16 days),sept,2003(124 mm/5 days) and oct 2003(14.14 mm), total rain per year in 2004 was recorded 872 mm maximum rain in 2005 was recorded in july and august as 235 mm and 158.1 mm respectively while rain in 2005 was recorded as 8.6 mm in January (table 2.1).
3. The Manika wetland is spread over an area of about 4000 acra out of which about 1500 acres of the wetland is submerged with water throughout the year. The water depth of the wetland varies from 8 to 10 ft in rainy and winter seasons, part of the wetland and water free area are used for agriculture purposes by the local farmers and land owners. The main crops are rice (*oryza sativa*), bajra moong (*vigna aureus*),janera (*sorghum vulgare*) and wheat (*triticum sp*) . Rain and water over flow over of burhi gandak are the main source of water for the wetland.

The soil of Manika chaur is alluvial and black consisting of sand particle (20%-30%), silt (7%-13%) and clay (60%-70%).

4. Physic-chemical parameters of water (table 3.1 &3.2) observed during research period (nov.2003 to oct.2004) showed the following range of variations;

Ph (7.30-7.90), temp, (16.80-35.50), transparency (16.00cm-23.00cm), E. conductivity (0.20 mho/cm - 0.60mho/cm), dissolved O₂ (2.70 ppm-6.20ppm),free co₂ (8.50 ppm-65.20 ppm), totl nitrogen (1.60 ppm – 2.60ppm), chloride (2.12 ppm – 5.00ppm),magnesium (5.50ppm-22.50ppm), calcium (19.00 ppm- 21.50 ppm), carbonate (0.25 ppm-0.65ppm), bicarobonate (2.10ppm-5,10ppm) and BOD (5.00ppm-7.08ppm).

5. Physico-chemical parameters of soil observed during research period (Nov. 2003 to oct.2004) showed the following range of variations (table 3.3&3.4) ;

pH (7.65-8.05), E. conductivity (o.20 mho/cm-0.80 mho/cm)total nitrogen (0.12ppm-0.45ppm),phosphate(8.90ppm-10.00ppm),org. carbon (0.50-0.60%), calcium(2.10ppm -8.30ppm) potassium (110-215.50ppm), zinc (4.25-8.00ppm) and chloride (3.00-7.70ppm).

6. A survey of aquatic and semi-aquatic macrophytes was taken into record in the entire wetland especially at site I & II. A total of 70 species of angiosperms belonging to 56 genera and 34 families were identified and recorded, of which 49 species were aquatic and 21 species were semi aquatic and terrestrial. Dicots were represented by 32 species,27 genera and 23 families whereas monocots were represented by 38 species , 29 genera and 11 families.

Some common aquatic angiosperms were Eichhornia Crassipes, Trapa bispinosa, Saccharum munja, Nelumbo sp, Typha sp, Cyperus, Hydrilla, Ceratophyllum, Polgonum sp., Ipomoea sp., Lemna sp. and Convolvuls aquatica etc. Some floating algae and Azolla were also growing in water of wetland.

7. 13 varieties of residential birds and 9 varieties of migratory and residential migratory birds were identified.
8. Fishes and other aquatic funa constitute most important trochaic level of wetland ecology. About 28 fish species were collected and identified from the wetland. Some common fishes collected in wetland are :

Labeo rohita (Rehu), *Mystus bleekeri* (Belaund), *Putinus phutinio* (Pothia), *Calarias batrachus* (Mangur), *Mystus tengala* (Tengra), *Channa sp.* (Gairi) and *Wallago attu* (Boaari). A list of fishes were presented in table 3.6.

Further studies on biomass productivity, density and frequency of some economically important macrophytes are under progress.

On the basis of aforesaid observations i.e. physico-chemical parameters of water and soil, species diversity and productivity of aquatic flora and fauna and personal survey, it seems that wetland is least polluted. The source of its pollution mainly agriculture waste, fertilizer and domestic effluent from local people and personal investigation, it was found that aquatic plants and animals are the good source of live stock feed, human food, fish feed, bio-fertilizer and energy sources, further, aquatic plants have the capacity to purify waste water through the uptake of dissolved nitrogen phosphorus and undesirable minerals including heavy metals.

Local people residing adjacent to the experimental wetland utilize macrophytes for food, fodder, medicines, fibre, thatching basketry and aesthetic purposes. Some plants like lotus and Karmi (*Impomoea aquatica*) occupy religious importance.

Keeping in view the poor socio-economic condition of people, increased population and consequent shrinkage of the cultivable lands for crops, proper exploitation of this wetland (Manika mun) is the need of the hour. Manika wetland is a permanent wetland but some parts of it are being exploited by people for their rabbi crops, vegetables, fuel needs and fodder for animals. This wetland is also rich repository of cash crops like *Trapa*, *Scripus*, *Saccharum sp.*, fishes and fodder. A well planned strategy and management are required to develop this wetland for proper cultivation and management of crops which will flourish full-fledged cottage Industries and can intimately be linked with the livelihood of poor masses of this region.

Manika wetland of Muzaffarpur as a model system can be exploited for fish & fisheries, aquaculture, prawn culture. *Trapa* and lotus culture and dairy etc. This wetland can also be promoted for makhana and *Saccharum* cultivation.

Conservation and management plan of the wetland

Wetlands are dynamic systems which are complex ecosystems involving hundreds of species of microbes, plants and animals which have developed in an intricate fashion to attain diversity. In the light of these difficulties, most of the efforts on wetland restoration have had little success. Wetland land loss has been a global problem and they are being destroyed all over the world because of the disruption of natural processes by agricultural intensification, urbanization, population, dam construction, regional water transfer and other forms of intervention in the ecological and hydrological system.

Wetlands in North Bihar are often looked upon as no better than wastelands available for reclamation and resettlement. This is the reason that most of the wetlands in Bihar have vanished and others are facing threats for destruction. It is therefore, necessary to consider the conservational measures for the wetlands before they die out from prevailing threats. They could be conserved and developed for tourism, pisciculture, irrigation,

wildlife habitat and scientific studies. A number of conservation measures were suggested by several workers for different wetlands of the country (Chapter IV, Discussion).

Keeping the suggestions made by different workers in mind, following conservation strategies were formulated and suggested for the present wetland in question:

- ❖ To identify sites and locations and boundaries of wetland and to establish these locations on map.
- ❖ Administrative notification is desirable for declaring these areas as environmentally protected zones. For this, Survey and demarcation are necessary. The lack of demarcation and notification often results in the degradation of wetland.
- ❖ A general inventory of flora and fauna of the wetland be prepared so that the planning decision can be made on a full understanding of the values of the wetland and of its socio-economic implications to provide services to the society.
- ❖ Bird population is the part of the wetland system; this includes both residential and migratory birds. The preservation of bushes and emergent species should be encouraged for the birds. This type of vegetation in wetland should be encouraged to facilitate the visit of avifauna.
- ❖ The creation of environmental awareness is an important part of wetland management. This needs government support. The people of the locality need to be educated through films, TV and video messages, posters and pamphlets etc on the importance of wetlands as a natural resource.

The government of Bihar should make an action plan in right perspective for the proper utilization of wetlands in North Bihar. The proper encouragement and financial assistance may be provided to manage these wetlands in North Bihar and wetlands should be identified for their uses for cultivation of particular crops like makhana, singhara, lotus other cottage industry based weeds. Fish cultivation can be encouraged & managed in every wetland. Efforts in this direction need proper attention of the Government and upliftment action plan for some important wetlands of North Bihar should be undertaken by government itself as model system.

In spite of all the recommendation, sustainable use of the wetland is for the long term gain. Over exploitation of wetland resources in any form would adversely affect the wetland ecosystem. So, careful exploitation is a part of conservation and development of the wetland.

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