



Developmental perspective of wetlands in Birbhum district, West Bengal, India

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ABSTRACT We present the detail investigation over the 19 Blocks of the district where survey on wetlands have been carried out since 1998 to 2014 to record water bodies and study their characteristics. Out of 173 plant species discovered major areas of their utilization include folk-medicine (83 species), vegetables and fruits (24 species), fodder (15 species) and miscellaneous items of herbal origin (35 species). Developmental activities that can be based on Birbhum wetlands under the existing conditions are suggested here which may prove worthwhile for consideration by the proper authorities. Long term developmental programmes through promotion of duckery, floriculture, pisciculture, vermiculture, cultivation of vegetables during dry periods of seasonal wetlands etc are the best management drivers of these wetlands in this province of West Bengal.

KEYWORDS : Wetlands, Management Practices, Birbhum, India.

INTRODUCTION

Preparation of an inventory of a country’s resources is an important prerequisite for judicious planning for sustainable development and prosperity. Wetlands being as valuable as a distinct natural resource deserve consideration in such a work. In view of this, it has been deemed essential to prepare an inventory of wetlands located in Birbhum District of West Bengal and to contribute towards sustainable development based on them (Baattrup-Pedersen et al. 2003, 2006; Ali et al. 2007; Becerra-Munoz & Schramm 2007; Balian et al. 2008; Akasaka et al. 2010; Bagella et al. 2010; Bakker et al. 2013).

Birbhum is one of the smallest districts of West Bengal lying between 23032’30” and 24035’00” N latitude and 88001’40” and 87005’25” in the East longitude covering an area of 4545 square kilometers (Fig. 1). The climate of the place is of tropical dry monsoonal type. The soil is mostly porous with extremely low water holding capacity. The rivers of the district are mostly non-perennial and during heavy monsoonal rain most of the river- and stream water run to waste overflowing their banks and carrying substantial volumes of sand and silt to cause severe soil erosion.. The problems of water scarcity and soil erosion were more acute before implementation of the Mayurakshi River Valley Project when ‘bund’ and ‘tank’ irrigations were in practice. The Dwarka barrage at Deocha and Brahmani barrage at Baidhara, Tilpara barrage at Suri and Hinglu dam at Khayrasole are engaged in conservation of the water resources of the district, which are still inadequate. The wetlands are considered as the major matrix for retention of water even today, as they were considered in the past (Brabec & Szoszkiewicz 2006; Bogut et al. 2007; Boschilia et al. 2008; Bouma et al. 2009; Borics et al. 2012). The present study was aimed at to formulate a strategy for development of wetlands in Birbhum district of West Bengal, India.

MATERIALS AND METHODS

All the 19 Blocks of the district were surveyed since 1998 to 2014 record water bodies and study their characteristics. As many as 25 wetlands, each with an area exceeding 5 acres and distributed in 15 Blocks of the district, were identified for studying their ecological characteristics and macrophyte diversity. The names of the wetlands, wherever available, place of occurrence (town/village, Block) were recorded in the field note book and tabulated. Periodic visits to these wetlands were paid in different seasons for observations covering hydrology, biodiversity, threat perceptions, use pattern, existing mode of management etc. An information collecting sheet was prepared for use in the field more or less based on Zalidis & Mantzavelas (1996) in which information about location, area, hydrology, uses, the pressures threatening the wetlands, the legal status and the positive actions were noted. The data, thus noted during field work, was used in classification of the concerned wetlands on the basis of various parameters such as

hydrological regime, biodiversity, threat perception, use and ongoing management practices etc.



Fig. 1: Map showing the study sites in Birbhum district, West Bengal

Based on the data thus procured, wetland- wise developmental strategy covering such important aspects as pisciculture, floriculture and plant and animal resource utilization, setting of biogas plants and vermiculture units with the organic matter removed during management, promotion of tourism, establishment of cottage industries, creation of marketing channels and co-operative societies was prepared and presented in form of a model (Fig 2).

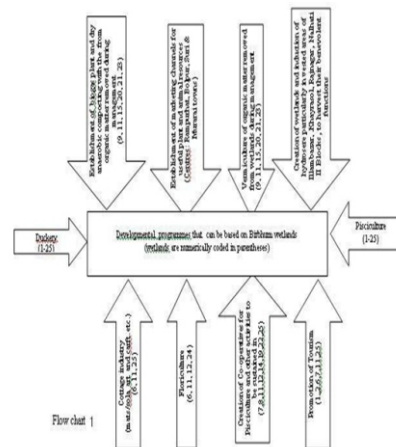


Fig. 2: Developmental strategies based on pitlakes

Legend of wetland codes

1-Baidhara barrage 2.-Ballabpur bandh 3-Barabandh 4-Baradighi 5-Chamna dighi 6 -Datin dighi 7-Dwarka barrage 8-Gopalnagar bandh 9-Joysagar dighi 10-Jugadamai dighi 11-Lalbandh 12-Lambadharpur Sayer 13-Lohabandh dighi 14-Mahulah dighi 15-Mahindrapur dighi 16-Mayureswar dighi 17-Paboipara dighi 18-Paikar dighi 19-Panchpara dighi 20-Rampurhat dighi 21-Ramsayer 22-Santhla/Manthla dighi 23-Sarbasundari dighi 24-Sayer 25-Tilpara barrage

RESULTS AND DISCUSSION

Although wetlands are one of the most productive ecosystems and of immense ecological and economic values, their existence has been seriously questioned at many a places due to ignorance about their values and defective land use. Considering inventorization of the wetlands of prime importance in stocktaking of natural resources of a country, the present work puts into record as many as 25 wetlands from several waterbodies observed in the district (Table 1). These wetlands occur in 15 Blocks of the district of which Bolpur- Sriniketan Block has four of them, viz. Ballabpur bandh, Bara bandh, Lal bandh and Lohabandh dighi ; Rampurhat-I also has four wetlands, viz. Jugadamai dighi, Mahindrapur dighi, Rampurhat dighi and Sarbasundari dighi. Muhammad Bazar has three wetlands, viz. Dwarka barrage, Gopalnagar bandh and Joysagar dighi; Dubrajpur has two wetlands, viz. Datin dighi and Sayer. Sainthia Block also includes two wetlands, viz. Chamna dighi and Panchpara dighi. The remaining 10 Blocks have one wetland each which can be used for sustainable development, viz. Nalhati I, Labhpur, Murarai- I, Murarai II, Mayureswar I, Mayureswar II, Nanoor, Rampurhat II Suri I and Suri II. Manmade wetlands need to be incorporated in four blocks of the district, viz. Illambazar, Khayrasol, Nalhati II and Rajnagar wherein the water bodies are scarce and do not exceed 5 acres in area (Palit & Mukherjee 2007). These areas are relatively drier and warmer.

In an investigation on the economic prospect of the macrophytes associated with wetlands of Birbhum district, the present authors (Mukherjee & Palit 2002) brought into light 173 plant species. The major areas of their utilization include folk-medicine (83 species), vegetables and fruits (24 species), fodder (15 species) and miscellaneous items of herbal origin (35 species). Under careful management programmes ensuring optimum biotic and abiotic characteristics, these resources of wetlands can directly and indirectly promote developmental activities. Developmental activities that can be based on Birbhum wetlands under the existing conditions are suggested here which may prove worthwhile for consideration by the proper authorities. Implementation of the programmes suggested appropriate and ecofriendly for the concerned wetlands can generate employment and improve the economic conditions of the local people who are mostly below poverty level. However, care must be taken while executing the developmental programmes since use of water resources, fisheries; tourism, recreation etc. are likely to prove detrimental. Since there is an urgent necessity to conserve natural resources, wetland restoration projects need to be implemented very carefully with the objective of sustainable utilization of its resources. Moreover, extensive and intensive field and laboratory studies in correlation with information obtained from application of remote sensing technology on wetlands of the district can not only rationalize resource utilization but also help in identifying areas of uncertainty, crisis and problems so that safety, restorative and preventive measures can be formulated for practical application. Such an integrated approach can provide scope for protecting the environment from future havoc and strengthen economy.

Table 1: An inventory of wetlands in Birbhum District

Name of the Wetlands	Latitude	Longitude	Block	Nearest village/town
1. Baidhara barrage	24016' N	87049' E	Nalhati I	Nalhati
2. Ballabpur bandh	23041' N	87039'45'' E	Bolpur-Sriniketan	Bolpur
3. Barabandh	23040' 05'' N	87040' 50'' E	Bolpur-Sriniketan	Bolpur
4. Baradighi	24025' 57'' N	87054' 21'' E	Murarai I	Murarai

5. Chamna dighi	23059' 40'' N	87043' 15'' E	Sainthia	Sainthia
6. Datin dighi	23048' 11'' N	87021' 10'' E	Dubrajpur	Dubrajpur
7. Dwarka barrage	24003' 10'' N	87034' 45'' E	Muhamma d Bazar	Muhammad Bazar
8. Gopalnagar bandh	24004' 10'' N	87039' 15'' E	Muhamma d Bazar	Gonpur (near Muhammad Bazar)
9. Joysagar dighi	23059' 34'' N	87034' 55'' E	Muhamma d. Bazar	Muhammad Bazar
10. Jugadamai dighi	24012' 55'' N	87052' 32'' E	Rampurhat I	Rampurhat
11. Lambadharpur Sayer	23055' 30'' N	87031' E	Suri I	Suri
12. Lalbandh	23041' 15'' N	87040' 50'' E	Bolpur-Sriniketan	Bolpur
13. Lohabandh dighi	23042' 45'' N	87042' 25'' E	Bolpur-Sriniketan	Uttarnarayan pur (near Bolpur)
14. Mahulah dighi	24006' 15'' N	87046' 30'' E	Mayureswa r I	Mayureswar I
15. Mahindrapur dighi	24011' 30'' N	87049' 10'' E	Rampurhat I	Rampurhat
16. Mayureswar dighi	23055' 49'' N	87049' 26'' E	Mayureswa r II	Mayureswar
17. Paboipara dighi	24013' 13'' N	87053' 07'' E	Rampurhat II	Rampurhat II
18. Paikar dighi	24026' 08'' N	87055' 15'' E	Muraroi II	Muraroi
19. Panchpara dighi	23051' 38'' N	87051' 40'' E	Sainthia	Sainthia
20. Rampurhat dighi	24010' 15'' N	87047' 10'' E	Rampurhat I	Rampurhat
21. Ramsayer	23059' 13'' N	87044' 12'' E	Labhpur	Ramkrishnau r
22. Santhla/Manthla dighi	23042' 35'' N	87051' 28'' E	Nanoor	Nanoor
23. Sarbasundari dighi	24011' 42'' N	87048' 35'' E	Rampurhat I	Mahindrapur
24. Sayer	23048' 25'' N	87021' 25'' E	Dubrajpur	Dubrajpur
25. Tilpara barrage	23056' 35'' N	87031' 30'' E	Suri II	Suri

CONCLUSION

It is conceivable that most of the wetlands in Birbhum District are associated with rural life, their values being mostly linked with the amelioration of chronic problems arising from water scarcity. In a drought prone district like that of Birbhum wetlands deserve a very high status of significance. The general awareness of multifarious environmental implications, aesthetic values and economic potential of wetlands is inadequate. This work can be used to promote awareness beyond the general consideration of wetlands merely as water-reservoirs.

The wetland inventory and the map presented in this work are compliant with its objective of contributing towards the Wetland Directory of the state as well as of the country. The map can be used in general physical planning programmes and in finding out the sites for creation of new wetlands, delineation of conservation areas and ecological units. The inventory can also afford opportunities for co-operation in matters of information exchange regarding resource utilization.

It is felt that the Government authorities should at the earliest opportunity applies remote sensing technology for procuring essential data on the wetlands of the district. The information presented in this work can be used as the ground data for correlation with the remotely sensed ones. This kind of effort in future can bring into light the predictive values of the data with greater accuracy and objectivity for formulation of action plans for eco-restoration and optimum sustainable utilization of resources. Moreover, the physico-chemical characterization of water and soil samples of wetlands necessitate

periodic monitoring of their states for restoration hand in hand with undertaking of long term developmental programmes through promotion of duckery, floriculture, pisciculture, vermiculture, cultivation of vegetables during dry periods of seasonal wetlands etc. The utilitarian aspects of macrophytes covered in this work can augment economic prosperity. However, such strategies should be adopted which for ensuring uninterrupted supply of resources should in no way affect the biodiversity and functional perspectives of the ecosystem.

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