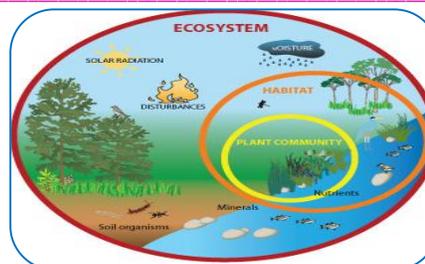




PRIMARY PRODUCTION OF THE DIVERSE FRESHWATER ECOSYSTEMS: AN OVERVIEW

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ABSTRACT :

This review article focuses on the study of the net primary productivity of the freshwater macrophytes which has become necessary to assess the functioning as well as dynamics of the aquatic bodies.

KEYWORDS : *primary productivity, dynamics, aquatic bodies.*

INTRODUCTION

Wetlands are lands transitional between terrestrial and aquatic ecosystems where the water table is usually at or near the surface or the land is covered by shallow water" (Cowardin et. al., 1979). This definition is most widely accepted by wetland scientists in the United, States and Asian Wetland Bureau. It has also recently been accepted as the official definition of wetlands 'by India (Gopal et. al., 1982). R.L. Smith (1980) defined. "Wetlands are a- halfway world between terrestrial and aquatic ecosystems and exhibit some of the characteristics of each". Therefore, Mitsch & Gosselinks (1986) have rightly mentioned that wetlands are ecotones. It is well known fact; that ecotones are rich in species diversity and productivity.

Prior to mid 1970's wetland drainage and destruction were accepted practice in all' over the world and were even encouraged by certain Government policies. However, the recent emphasis on wetland management has been demonstrated by various scientific studies and conference proceedings over the past decade. The important among them, Good et.al., 1978; Kusler & Hontanari, 1978; Greeson et.al., 1979; Gopal et.al., 1982, SCOPS & UNEP, 1982; Patten et. al., 1986; Hook, 1987 and Lee & Saenger, 1989. They have recently begun to look at the properties and functions of wetlands. Now, it has been accepted that wetlands are not wasteland rather they are among the most important ecosystems on the earth. Wetlands are sometimes described as "the kidneys of the landscape", for the functions they perform in hydrology and chemical cycles and as the downstream receivers of wastes from both natural and human resources. They have been found to cleanse polluted waters. Their value for wildlife conservation, flood control, shoreline protection, in recharging ground water aquifers and the production have also been emphasized.

DISCUSSION

In spite of its high value, in our nation in general and Bihar in. particular, the importance of wetlands is not fully recognized. Most of our planners think that wetlands are wastelands and therefore, wetlands are drained, ditched and filled at an alarming rate. In Bihar, Kalyanpur Block, Samastipur District, Roy Choudhary (1964) writes "Chauras are low tracts of land which remain water-logged for six to nine months in a year. There are a number of such chauras in this district. They are useless for growing crops as such and also breed mosquitoes. The Irrigation Department has taken the chauras

drainage schemes to make the existing chauras fit for cultivation". The scheme is still effective under Bihar Wasteland (Reclamation, Cultivation and Improvement) Act 1946. In the districts of North Bihar Drainage Departments have been established to convert the wetlands into cultivated land. It is alarming that most of old days chauras (wetlands) have already vanished and it is disappearing rapidly.

In tropical countries, particularly in India, no systematic survey of wetlands has been done and the studies are of very scanty nature. However, in order to inventorise wetland resources of the country, the Ministry of Environment and Forests conducted a questionnaire survey and published a wetland directory in 1990. As per this survey, total wetland area of the country is about 4.1 Million ha., out of which 0.295 million ha. is in Bihar. The important Indian publications available in this field are Gopal et al. (1978), Kaul (1980), Kaul et al. (1978, 1980), Pandit (1980), Yadav & Varsney (1982) etc. Ecological studies on the wetlands of Bihar are inadequate and very fragmentary (Dehadrai & Tripathi, 1976; Rai, 1981; Rai & Datta Munshi, 1979 & 1982; Laal, 1981; Yahya, 1988). North Bihar abounds in ponds and jheels to an extent rarely seen anywhere else in the country excepting some parts of West Bengal. To understand what wetlands are and to analyse their characteristics, a case study pertaining to Kalyanpur Block, Samastipur, District of North Bihar was undertaken. Following objectives were stated in the project proposal.

In the present Research Project, Net Primary Productivity (NPP) is the rate of storage of organic matter in plant tissues in excess of respiratory utilization (R) by the plants during the measurement period (Odum, 1971). Jordan (1985) reported that productivity of an ecosystem is vital and indispensable for ecosystem analysis as the same integrates the cumulative effects of the various physiological processes and interactions occurring simultaneously within the ecosystem. Long and Hutchinson (1991) have also defined it as the net rate of gain of organic carbon by the vegetation over a given time interval. Primary productivity is the measure of the rate at which biomass or organic matter is produced by the primary producers per unit area (Mackenzie et al., 2001). According to Odum and Barrett (2008) the primary productivity of an ecological system is the rate at which radiant energy is converted to organic substances by the photosynthetic and chemosynthetic activity of the producer organisms. The aquatic resources have been till date the potential source of organic production for the entire living organisms. Many ecologists of the world have laid emphasis on the importance of the primary productivity as an important functional attribute of the biosphere because of its controlling effects on the rate of multiplication and growth of the living organisms of the ecosystem (Westlake, 1963).

CONCLUSION

The International Biological Programme (IBP) of the UNESCO has paid due attention on the assessment of Primary Production of the diverse freshwater ecosystems of the Biosphere under the section on Productivity of freshwater communities (PF).

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