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Water Quality Parameters and Fish Biodiversity Indices as Measures of Ecological Degradation: A Case Study in Two Floodplain Lakes of India

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ABSTRACT

A three year study was conducted in two floodplain lakes to evaluate changes between seasonal variation of water quality parameter and finfish diversity indices. Samples of water and fish specimens were collected every month from three different stations of each lake to determine physico-chemical parameters of water and the finfish diversity indices. Split-plot and MANOVA designs, Multiplicative decomposition method and quadratic regression analysis were used to analyze the effects of the rate of changes between the parameters and sustainability of the lakes. The obtained results suggested that the impact of environmental change (e.g depth, conductivity, salinity of water etc.) on diversity indices was significant and should be taken into consideration when designing policies to increase the long-term sustainability of fishing activities in the lakes.

KEYWORDS

Baur, Finfish, Diversity Indices, Multiplicative Decomposition, Quadratic Regression

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References

- [1] U. Bhaumik, B. C. Jha, K. Mitra, and G. K. Vinci " Fish yield optimization in beels: Some case studies from West Bengal," *Bulletin of Central Inland Fisheries Research Institute, Barrackpore*, No. 125, pp. 43– 54. 2003.
- [2] R. A. Khan, " The ecology and faunal diversity of two floodplain ox-bow lakes of south eastern West Bengal," *Records of the Zoological Survey of India*, No. 195, pp. 1– 57, 2002.
- [3] Anonymous, " Annual report 2004-2005," Department of Fisheries, Aquaculture, Aquatic Resources and Fishing Harbours, Government of West Bengal, pp. 25– 27, 2006.
- [4] S. R. Das and N. C. Nandi, " Oxbow lake environment and management of Ichhamati river basin, West Bengal," *Journal of Environment and Sociobiology*, Vol. 1, pp. 81– 90, 2004.
- [5] D. K. Mondal and A. Kaviraj, " Distribution of fish assemblages in two floodplain lakes of North 24 - Parganas in West Bengal, India," *Journal of Fisheries and Aquatic Science*, Vol. 4, pp. 12– 21, 2009.
- [6] J. Carol, L. Benejam, C. Alcaraj, A. Vila-Gispert, L. Zamora, E. Navarro, J. Armengol, and E. Garcia-Berthou, " The effects of limnological features on fish assemblages of 14 Spanish reservoirs," *Ecology of Freshwater Fish*, Vol. 15, pp. 66– 77, 2006.
- [7] M. M. Goswami, T. K. Deka, P. K. Singha, P. K. Sharma, and M. Kakati, " Studies of some wetlands of Assam with reference to the eutrophication stresses," *Journal of the Inland Fisheries Society of India*, Vol. 31, pp. 39– 43, 1999.

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- [8] V. V. Sugunan and B. K. Bhattacharjya, " Ecology and fisheries of beels in Assam," Bulletin of Central Inland Fisheries Research Institute, No. 104, pp. 1– 65, 2000.
- [9] D. K. Mondal and A. Kaviraj, " Ecotoxicological effects of jute retting on the survival of two freshwater fish and two invertebrates," Ecotoxicology, Vol. 17, pp. 207– 211, 2008.
- [10] APHA (American Public Health Association), " Standard methods for examination of water and waste water," American Public Health Association, American Water Works Association and Water Pollution Control Federation, Washington, DC, USA, 1995.
- [11] C. E. Shannon and W. Weaver, " The mathematical theory of communication," Urbana, University of Illinois, pp. 117– 125, 1963.
- [12] E. C. Pielou, " The measurement of diversity in different types of biological collections," Journal of Theoretical Biology, Vol. 13, pp. 131– 144, 1966.
- [13] E. W. Simpson, " Measurement of diversity," Nature, Vol. 163, pp. 688, 1949.
- [14] S. Makridakis, S. C. Wheelright, and R. J. Hyndman, " Forecasting methods and applications," 3rd edition, John Wiley & Sons, Singapore, 2003.
- [15] B. J. Benson and J. Magnuson, " Spatial heterogeneity of littoral fish assemblages in lakes: Relation to species diversity and habitat structure," Canadian Journal of Fisheries and Aquatic Science, Vol.