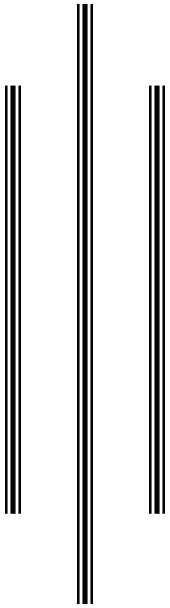
A STUDY ON PHYSICO-CHEMICAL CHARACTERISTICS OF BEESHAZAR LAKE, CHITWAN, NEPAL



A Dissertation
Submitted to the Central Department of Environmental Science for the Partial Fulfillment of Requirements for the Master's Degree of Science in Environmental Science

Submitted by

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LETTER OF RECOMMENDATION

It is certified that Mr. Ujwal Bastakoti has worked proficiently under my guidance and supervision and that the dissertation entitled "**A Study on Physico-Chemical Characteristics of Beeshazar Lake, Chitwan, Nepal**" embodies the candidate's own work. The dissertation or a part thereof has not been previously submitted for any other degree. Hence, I recommend this dissertation for approval for the partial fulfillment of M. Sc. Degree in Environmental Science.

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LETTER OF APPROVAL

The dissertation presented by Mr. Ujwal Bastakoti entitled "**A Study on Physico-Chemical Characteristics of Beeshazar Lake, Chitwan, Nepal**" has been accepted as a partial fulfillment of the requirement for the final year of the Master's Degree in Environmental Science.

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Date: **Ujwal Bastakoti**

ABSTRACT

Physico-chemical analysis of water and surface soil parameters and quantitative analysis of tree species of Beeshazar Lake System were performed to assess the general ecological status of the lake system. The values of certain water parameters (pH, conductivity, surface water temperature, free CO_2, total solids, GPP, chloride, orthophosphate, nitrate and total nitrogen) were observed highest in monsoon season; while total alkalinity, D.O. and transparency values were observed highest in winter season and total hardness value was observed highest in autumn season. The observed value of transparency, total nitrogen and orthophosphate ranked the lake in eutrophic to hypereutrophic state. The surface soil of the forest around Beeshazar Lake was observed acidic with sandy loam texture. The values of certain surface soil parameters (O.M., phosphorous and potassium) were observed highest in monsoon season; while soil conductivity, and total nitrogen values were observed highest in autumn season and soil pH value was observed highest in winter season. All together 11 tree species belonging to 9 families were recorded in the forest around the lake with the dominancy of *Shorea robusta*. The total density of the tree species recorded in the present study was 372.50 pl/ha, with total basal area of 28.3246 m^2/ha., total volume of 225.6159 m^3/ha and total above ground biomass of 196.6291 ton/ha.

Key words: Physico-chemical parameters**,** seasonal variation**,** water, surface soil, tree biomass

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Abbreviations and Acronyms

ANZECC	:	Australian and New Zealand Environment Conservation Council
APHA	:	American Public Health Association
ARMCANZ	:	Agriculture and Resource Management Council of Australia and New Zealand
Avg.	:	Average
AWWA	:	American Water Works Association
BOD	:	Bio-Chemical Oxygen Demand
BPP	:	Biodiversity Profile Project
$CaCO_3$	:	Calcium Carbonate
CBIP	:	Central Board of Irrigation and Power of India
CNP	:	Chitwan National Park
CO_2	:	Carbon dioxide
$CuSO_4$	:	Cupper Sulphate
D.O.	:	Dissolved Oxygen
DOFD	:	Directorate of Fisheries Development
dbh	:	Diameter at Breast Height
DHM	:	Department of Hydrology and Meteorology
DNPWC	:	Department of National Park and Wildlife Conservation
EDTA	:	Ethylene diamine tetra acidic acid
GoN	:	Government of Nepal
GPP	:	Gross Primary Productivity
GPS	:	Global Positioning System
H_2SO_4	:	Hydro Sulphuric Acid
ha	:	Hectare
HCl	:	Hydro Chloride Acid
IUCN	:	The World Conservation Union
$K_2Cr_2O_7$	:	Potassium Dichromate
K_2O	:	Potassium Oxide
Kg	:	kilogram
KI	:	Potassium Iodide

m	:	meter
mg/L	:	milligram per liter
ml	:	milliliter
mm	:	millimeter
MoEST	:	Ministry of Environment, Science and Technology
MoFSC	:	Ministry of Forest and Soil Conservation
N	:	Nitrogen
NaCl	:	Sodium Chloride
NaOH	:	Sodium Hydroxide
NBS	:	Nepal Biodiversity Strategy
nm	:	nanometer
No_3	:	Nitrate
O.M.	:	Organic Matter
P	:	Phosphorous
P_2O_5	:	Phosphorous Pentaoxide
pl/ha	:	Plant per hectare
PO_4	:	Phosphate
ppm	:	part per million
S.D.	:	Standard Deviation
spp.	:	Species
TN	:	Total Nitrogen
UNDP	:	United Nations Development Programme
UNEP	:	United Nations Environment Programme
UNESCO	:	United Nations' Educational, Social and Cultural Organization
VDCs	:	Village Development Committees
WPCF	:	Water Pollution Control Federation
%	:	Percentage
^{o} C	:	Degree Celsius
^{o} F	:	Degree Fahrenheit
µgm	:	microgram
µS/cm	:	micro siemens per centimeter