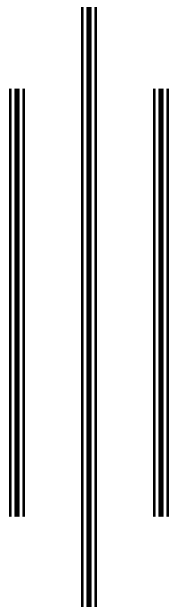


**A STUDY ON PHYSICO-CHEMICAL
CHARACTERISTICS OF BEESHAZAR LAKE,
CHITWAN, NEPAL**



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 CO₂, 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 m²/ha., total volume of 225.6159 m³/ha and total above ground biomass of 196.6291 ton/ha.

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

TABLE OF CONTENTS

LETTER OF RECOMMENDATION
LETTER OF APPROVAL
ACKNOWLEDGEMENT
ABSTRACT
LIST OF TABLES
LIST OF FIGURES
LIST OF APPENDICES
ABBREVIATIONS AND ACRONYMS

Chapter –I	<u>Page No.</u>
Introduction	1-14
1.1 Background	1
1.2 Literature Review	5
1.3 Justification	9
1.4 Objectives	9
1.5 Limitations	10
1.6 Study Area	
1.6.1 Location	10
1.6.2 Genesis	11
1.6.3 Climate	11
1.6.4 Hydrology	13
1.6.5 Biodiversity	13
1.6.6 Socio-Economic	13

Chapter –II

Materials and Methods	15-28
2.1 Reconnaissance Survey	15
2.2 Physico-Chemical Analysis of Water Parameters	
2.2.1 Water Sampling	15
2.2.2 Analysis of Water Parameters	18
2.3 Physico-Chemical Analysis of Surface Soil Parameters	
2.3.1 Surface Soil Sampling	23
2.3.2 Analysis of Surface Soil Parameters	23
2.4 Quantitative Analysis of Tree Species	
2.4.1 Sampling of Tree Species	27
2.4.2 Analysis of Tree Species	27

Chapter –III

Results	29-46
3.1 Physico-Chemical Analysis of Water Parameters	
3.1.1 Transparency	29
3.1.2 Surface Water Temperature	30
3.1.3 pH	30
3.1.4 Conductivity	31
3.1.5 Total Solids	32
3.1.6 Dissolved Oxygen (D.O.)	33
3.1.7 Free CO ₂	33
3.1.8 Total Alkalinity	34
3.1.9 Total Hardness	35
3.1.10 Chloride	36
3.1.11 Orthophosphate	37
3.1.12 Total Nitrogen (TN)	37
3.1.13 Nitrogen-NO ₃	38
3.1.14 Gross Primary Productivity (GPP)	39

3.2	Physico-Chemical Analysis of Surface Soil Parameters	
3.2.1	Soil Texture	40
3.2.2	pH	40
3.2.3	Conductivity	41
3.2.4	Organic Matters (O.M.)	42
3.2.5	Total Nitrogen	42
3.2.6	Phosphorous	43
3.2.7	Potassium	44
3.3	Analysis of Tree Species	
3.3.1	Density	44
3.3.2	Total Basal Area	45
3.3.3	Total Volume	45
3.3.4	Total Biomass	45

Chapter -IV

Discussion	47-60
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Chapter -V

Conclusions and Recommendations	61-62
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5.1	Conclusions	61
5.2	Recommendations	62

References

Appendices

List of Tables

	<u>Page No.</u>
Table 1: Wetland Types in Nepal	1
Table 2: Wetland Sites in Nepal	2
Table 3: Tree Species Recorded	46
Table 4: Density/BA/Volume/Biomass	46

List of Figures

Figure 1: Rainfall (mm)	12
Figure 2: Temperature (°C)	12
Figure 3: Location Map of Beeshazar Lake	14
Figure 4: Map of Beeshazar Lake Showing Water Sampling Sites	17
Figure 5: Transparency (cm) at three Sites in three Seasons	29
Figure 6: Surface Water Temperature (°C) at three Sites in three Seasons	30
Figure 7: pH of Water at three Sites in three Seasons	31
Figure 8: Conductivity (µS/cm) of Water at three Sites in three Seasons	31
Figure 9: Total Solids (mg/L) Content in Water at three Sites in three Seasons	32
Figure 10: D.O. (mg/L) Concentration of Water at three Sites in three Seasons	33
Figure 11: Free CO ₂ (mg/L) Concentration of Water at three Sites in three Seasons	34
Figure 12: Total Alkalinity (mg/L) Concentration of Water at three Sites in three Seasons	35
Figure 13: Total Hardness (mg/L) Concentration of Water at three Sites in three Seasons	35
Figure 14: Chloride (mg/L) Concentration of Water at three Sites in three Seasons	36
Figure 15: Orthophosphate (mg/L) Concentration of Water at three Sites in three Seasons	37
Figure 16: Total Nitrogen (mg/L) Concentration of Water at three Sites in three Seasons	38
Figure 17: N-NO ₃ (mg/L) Concentration of Water at three Sites in three Seasons	39
Figure 18: GPP (O ₂ mg/L/hr) of Water at three Sites in three Seasons	39
Figure 19: Surface Soil Texture (%)	40
Figure 20: pH of Surface Soil in three Seasons	41
Figure 21: Conductivity (µS/cm) of Surface Soil in three Seasons	41

Figure 22: O.M. (%) Content in Surface Soil in three Seasons	42
Figure 23: TN (%) Content in Surface Soil in three Seasons	43
Figure 24: Phosphorous (P_2O_5 kg/ha) Content in Surface Soil in three Seasons	43
Figure 25: Potassium (K_2O kg/ha) Content in Surface Soil in three Seasons	44

List of Appendices

Appendix 1	:	Rainfall (mm) in Rampur Station (Chitwan)
Appendix 2	:	Temperature ($^{\circ}C$) in Rampur Station (Chitwan)
Appendix 3	:	Physico-Chemical Parameters of Surface Soil
Appendix 4	:	Quantitative Analysis of Tree Species
Appendix 5	:	Trophic State Criteria Proposed by Forsberg & Ryding (1980)
Appendix 6	:	Soil Classification Proposed by Pradhan (1996)

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	:	Copper 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 ₂ SO ₄	:	Hydro Sulphuric Acid
ha	:	Hectare
HCl	:	Hydro Chloride Acid
IUCN	:	The World Conservation Union
K ₂ Cr ₂ O ₇	:	Potassium Dichromate
K ₂ O	:	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 ₂ O 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
° C	:	Degree Celsius
° F	:	Degree Fahrenheit
µgm	:	microgram
µS/cm	:	micro siemens per centimeter