Study On

Vegetation and Soil Analysis in

Nyadi Hydro-Electric Project, Lamjung, Nepal During Pre - Construction Stage

A Dissertation Submitted for the Partial Fulfillment of the Requirements for the Master's Degree in Environmental Science, Tribhuvan University,
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LETTER OF RECOMMENDATION

This is to certify that Mr. Dammar Singh Saud has prepared this dissertation entitled **"A Study On Vegetation and Soil Analysis in Nyadi Hydro-electric Project, Lamjung, Nepal During Pre - Construction Stage"** for the partial fulfillment of the requirement for the completion of Master's degree in Environmental science and he has worked satisfactorily under my supervision and guidance. This study work bears the candidates own work and original. To the best of my knowledge this report has not been submitted for the any other degree.

Therefore, I recommend this dissertation to be accepted and approved for the partial fulfillment of Master's Degree in Environmental science.

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LETTER OF APPROVAL

This dissertation work entitled **"A Study On Vegetation and Soil Analysis in Nyadi Hydro-electric Project, Lamjung, Nepal During Pre - Construction Stage"** Submitted by Mr. Dammar Singh Saud is in accordance with his special paper "Water Resources Development and Planning" has been accepted as partial fulfillment of M.Sc. Degree in Environmental Science.

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ABSTRACT

This research deals with the study of vegetation status and edaphic properties of the Nyadi Hydro-electric project. Forest is the most important natural resource and habitat for the wildlife. Loss of forest causes various important environmental problems such as loss of wildlife, soil erosion, loss of bio-diversity and change in micro-climate .The study was carried out in Bahundanda VDC of Lamjung District in the Western Development Region of Nepal during the month of July, 2007.The study area is concerned with the Nyadi River which is one of the tributary of the Marsyandi River. The total capacity of the project is 20 MW with generating 127 GWH of energy annually.

Quantitative analysis was conducted followed by Zobel *et al*. (1987) and soil by method given by Goel and Trivedi (1984). Besides these, questionnaire survey with local people who will face the direct impact from the project was conducted. The present study revealed that the project area was mostly covered with *Schima wallichii, Bombax ceiba,* and *Engelhardtia spicata* because the density, frequency, IVI, Basal area and Volume were found highest for these plant species. For the Shrubs *Innula cappa, Hypericum chisia, Mimosa rubicaulis, Colebrookia oppositifolia* and *Woodfordia fruticosa* were found to be dominant and *Artemisia vulgaris, Cynodon dactylon, Imperata cylindrica* and *Eupatorium adenophorum* were found as dominant herbs species in the project area. It has also been found from the questionnaire survey that most of the people used forest resources for their livelihood mainly for firewood, medicine, fodder and timber.

Soil analysis showed that whole of the study area posses loamy sand and slightly acidic soil. The distinct variations in the soil parameters were not observed. Since the Nyadi Hydro-electric project is medium sized project it may give some negative impacts on vegetation. Change in the landuse pattern is the significant impact and it might cause long term impact in future like soil erosion, landslide. To minimize the adverse impacts the project should implement the proper mitigation measures as described in the EIA report of the project.

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ACRONYMS AND ABBREVIATIONS

BA	Basal Area
BAR	Basal Area Ratio
BPC	Butwal Power Company
BPP	Biodiversity Profile Project
Cd	Index of species Dominance
CITES	Convention on International Trade in Endangered Species
CIWEC	Canadian International Water and Energy Consultants
cm	Centimeter
DBH	Diameter at Breast Height
DFRS	Department of Forest Research and Survey
DPR	Department of plant resources
e.g.	For Example
eds.	Editors
EIA	Environmental Impact Assessment
EPA	Environmental Protection Act
EPR	Environmental Protection Regulation
et.al.	Alii, Aliae or Alia (Latin), i.e., and others
etc.	Etcetera
Fig.	Figure
FINNIDA	Finnish International Development Agency
FY	Fiscal Year
GTZ	German Agency for Technical Co-operation
GWh	Giga Watt hour
H	Index of species diversity
ha	Hector
HH	House Hold
HMG/N	His Majesty's Government of Nepal
i.e.	That is

ICIMOD	International Center for Integrated Mountain Development
IEE	Initial Environmental Examination
IUCN	International Union for Conservation of Nature
IVI	Importance Value Index
J	Index of species Evenness
Km	Kilometer
Km^2	Square Kilometer
Kv	Kilovolt
LEDCo	Lamjung Electricity Development Company
m	meter
m^2	Square meter
m^2/ha	Square meter per Hector
m^3	Cubic meter
m^3/ha	Cubic meter per Hector
MFSC	Ministry of Forest and Soil Conservation
MKI	Mirrison Knudsen International
MOPE	Ministry of population and Environment
MW	Mega watt
NCS	National Conservation Strategy
NEA	Nepal Electricity Authority
NGo	Non Governmental Organization
No.	Number
NPC	National Planning Commission
NRDB	National Red Data Book
NTFPs	Non-timber forest Products
^oC	Degree Celsius
OM	Organic Matter
Pl/ha	Plant per Hector
RC	Relative Coverage
RD	Relative Density
R.Do.	Relative Dominance
RF	Relative frequency
ROI	Region of Influence
ROW	Right of Way

T.U.	Tribhuvan University
VDC	Village Development Committee
Viz.	Videlicet, i.e., namely
WHC	Water Holding Capacity
WWF	World Wildlife Fund

NOTE:

1. Acts and regulations have been cited under the name of the Ministry that promulgated them. The official version of the Acts and Regulations is published in the Nepal Gazette (in Nepali). Some Acts and Regulations have been published by other Government agencies and related Ministries in English language.

2.The then His Majesty's Government of Nepal (HMG/N) is known as the Government of Nepal (GoN). However, Citations in this dissertation have been made in the name of HMG/N because literatures were on that name.

3.The then Ministry of population and environment (MOPE) is now known as Ministry of Environment, Science and Technology (MOEST).