Environmental Assessment of the Chameliya Hydroelectric Project, Darchula during Construction Phase

A Dissertation Submitted to the

Central Department of Environmental Science

T.U. Kirtipur

For the partial fulfillment of the requirements for

Master's Degree in

Environmental Science

Submitted by

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Symbol No.: - 464

T.U. Registration No: 5-1-61-89-98

May 2010

Acronyms and Abbreviations

%	Percentage
+ve	Positive
^{o}C	Degree Centigrade
'	Minutes
^{o}	degree
$\mu g/m^3$	microgram per meter cube
amsl	Above Mean Sea Level
APHA	American Public Health Association
BOD	Biological Oxygen Demand
BGLB	Brilliant Green Lactose Broth
CBS	Central Bureau of Statistics
CDES	Central Department of Environmental Science
CITES	Convention on International Trade in Endangered Species of Wild Fauna and flora
CHEP	Chameliya Hydroelectric Project
dBA	A-weighted frequency spectrum in dB
DHM	Department of Hydrology and Meteorology
DO	Dissolved Oxygen
d/s	Down Stream
EDTA	Ethylene Diamine Tetra Acetic Acid
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPR	Environment Protection Regulation
EPA	Environment Protection Act
GDP	Gross Domestic Production
GoN	Government of Nepal
GWh	Giga watt hour
ha	Hectare
HHs	Households
ICIMOD	International Centre for Integrated Mountain Development
IEE	Initial Environmental Examination
IUCN	The World Conservation Union
km	kilo meter
kV	Kilo volt
L_{eq}	Equivalent Continuous Sound pressure level
L_5	Sound presuure level,which is equivalent or exceeded for 5% of the time over a measurement period
L_{10}	Sound presuure level,which is equivalent or exceeded for 10% of the time overa a measurement period
L_{50}	Sound presuure level,which is equivalent or exceeded for 50% of the time over a measurement period
L_{90}	Sound presuure level,which is equivalent or exceeded for 90% of the time over measurement period
L_{95}	Sound presuure level, equivalent or exceeded for95% of the time over measurement period
L_{max}	Maximum Sound Pressure Level

L_{min}	Minimum Sound Pressure Level
L_d	Avg day noise level
m	meter
m^3/s	Cubic Meter per Second
mg/l	milligram per liter
MB	McConkey Broth
ml	milli liter
MW	Mega Watt
NAAQS	National Ambient Air Quality Standard
NEA	Nepal Electricity Authority
NGO	Non Government Organization
Spp.	Species
PAFs	Project Affected Families
PVC	Poly Vinyl Chloride
PM_{10}	Particulate Matter with an equivalent aerodynamic diameter less than 10 micron
TDS	Total Dissolved Solid
TSP	Total Suspended Particulate
TU	Tribhuvan University
TUCL	Tribhuvan University Central Library
u/s	Up Stream
VDC	Village Development Committee
WHO	World Heath Organization
WECS	Water and Energy Commission Secretariat

ACKNOWLEDGEMENTS

This dissertation work had been benefited from many people and institution in one or various ways to come in the final version. First of all, I express my sincere and deep gratitude to my academic supervisor Prof. Khadag Bahadur Thapa, of Central Department of Hydrology and Metrology, Tribhuvan University who rendered me valuable guidance and suggestion in completing this work. Every time discussion with him made my thesis improved and I really learnt and improved a lot from him.

I gratefully acknowledge Dr. Kedar Prasad Rijal, Head of Central Department of Environmental Science, for being incessant source of inspiration and guidance and all those helping and supporting hands from teachers, administrative and lab staffs of this department. I am also grateful to Mr Rishikesh Sharma, Director and other staffs of Environmental Management Unit of CHEP for providing financial and technical support. I also like to highly acknowledge Mr. Ananta Man Singh Pradhan, Geologist for his help during report preparation.

My special thanks go to Mr. Mohan dev Joshi for supporting me during the field study period. I also need to extend my copious appreciation and thanks to my friends Mr. Damber Bista, Mr. Harish Bhatt, Mr. Om Krishna Uprety, Mr.Dinesh Bhandari, and Mr. Padam Rokaya for their support.

Thanks to all social respondents, local fishermen, and the local residents of Sikhar VDC, Rudreshwor VDC for their help for their valuable time, information and good hospitality, they provided during my field visit. I would like to express my genuine appreciation to all those cooperative and helpful staffs of CDES, TUCL, DHM and ICIMOD for providing valuable information and literature. I am also grateful to all those who directly or indirectly contributed in completing this work.

At last but not least, my paramount dedication is to my family members who have been an uninterrupted some of encouragement and generous support for me throughout this work.

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ABSTRACT

Environmental Assessment is the method to quantify the project induced impact on the environment. Monitoring is also essential aspect of environmental management in River valley project. Chameliya hydroelectric project (30MW) is six hours daily peaking run of river generating system, located in the Darchula district of Far Western Region of Nepal. The entire project structure lie along the Chameliya River bank, a distance of 4067m from weir to powerhouse. The broad objective of the study entitled *"Environmental Assessment of Chameliya Hydroelectric Project, Darchula during Construction Phase"* is to assess various environmental impacts vis-à-vis status of mitigation measures adopted by the project during construction period as recommended by EIA report. The research design involved both field work and laboratory investigations to generate analytical data for the accomplishment of objectives since 2009.

Flood frequency analysis has been conducted with 20 years of data using Gumbel's distribution function. The design flood of 710m^3/s has been worked out to be 50 years. All the physico-chemical parameters of Chameliya river water have been found within the limit to support the aquatic ecosystem of river. The study has revealed that there is small increment in pH, alkalinity and BOD_5 but significant increment in some parameters such as Total coli form, conductivity, magnesium, sodium, and total dissolved solid with base line value. The values of TSP and PM_{10} around the Audits and head works have been found to be higher than the NAAQS guideline values for 24 hours mean. Like wise, the increments in the TSP and PM_{10} have been observed to be ten folds and four folds higher than the baseline values respectively.

The study has depicted that the average day time noise levels at the monitoring station except at the headwork were within the acceptable range set by W.H.O. Impact of Chameliya hydroelectric project on fishermen's livelihood considering bio-physical and socioeconomic aspect has been assessed revealing a reduction in the over all abundance of fish fauna than the number stated in the EIA project report Project felled 3075 plants of 46 species which were higher than EIA report of CHEP. Impact on wild life was also investigated and the magnitude of impact is low, and site specific. The field study revealed

that the mitigation measures except compensation for land, house, plant, fodder and physical structure, were partially complied and in premature stage but implementations of these were seen not satisfactory in accordance of EMP.

Keywords: *Environmental assessment, Chameliya hydroelectric project, flood frequency, mitigation measure, baseline value*

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