Tribhuvan University, Kathmandu, Nepal

A

Thesis on

STUDY ON THE ENERGY IMPACT OF SOLAR HOME SYSTEM TO ITS USERS

(A Case Study of Gaguda VDC of Doti District, Nepal)

Submitted To:

The Central Department of Rural Development, Tribhuvan University,

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In

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Submitted By:

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RECOMMENDATION LETTER

The thesis entitled **"Study on the Energy Impact of Solar Home System to its Users"** (A Case Study of Gaguda VDC of Doti District, Nepal) has been prepared by **Nirmala Mahara** under my guidance and supervision. I hereby forward this thesis to the evaluation committee for final evaluation and approval.

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Date: 02-10 - 2015

15-06-2072

Approval Letter

The thesis entitled "**Study on the Energy Impact of Solar Home System to its Users** "submitted by **Nirmala Mahara** in partial fulfillment of the requirements for the Master's Degree in Rural Development has been approved by the evaluation committee.

Evaluation Committee

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Declaration

I hereby declare that the thesis entitled **"Study on the Energy Impact of Solar Home System to its Users"** submitted to the Central Department of Rural Development, Tribhuvan University, is entirely my original work prepared under the guidance and supervision of my supervisor. I have made due acknowledgement to all ideas and information borrowed from different sources in the course of writing this thesis. The result of this thesis has not been presented or submitted anywhere else for the award of any degree or for any other purposes. No part of the content of this dissertation has been published in any form before. I shall be solely responsible if any evidence is found against my declaration.

Nirmala Mahara

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Nirmala Mahara
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ABSTRACT

This study describes the energy Impact of Solar Home System to the users of Gaguda VDC in Doti District of Nepal. The study was conducted with the objectives of assessing energy scenario and per capita energy consumption, finding socio-economic and other impact of SHS to the users and assess the knowledge and attitude towards SHS in Gaguda VDC (specially in ward no: 2 and 3) of Doti District. The relation between such SHS and its impact (attitude towards SHS, socio-economic impact, per capita energy consumption) in Gaguda VDC of Doti District had not been studied earlier.

There were 584 households (HHs) in the VDC. Of the total households, 242 households had installed the SHS and for the purpose for the study 50 households form local community (40 SHS users and 10 non SHS users) were randomly selected and interviewed at different period of time. A carefully designed questionnaire were prepared and data were collected using field visit and observation. The responses were then analyzed manually using a spreadsheet wherein correlation between SHS and its impact were determined using a table, chart, frequencies and percentage.

From the study it was found that the sampled households who were using SHS are getting benefit through white and smokeless light, had saved money from buying kerosene significantly, had started various income generating activities at night like like batti kathne, tapari bunne, making woolen bags etc.at local level by both men and women resulting gender equality and women empowerment. Their access to energy and to means of communication has increased, local health post are running facilities at night during emergency as well as store vaccines in solar run refrigerator, children study hour has increased significantly, number of accidental fire hazard because of kerosene lighting has decreased. By the use of SHS, the reduction in emission of CO_2e, BC and motivation for entrepreneurship development at local level has helped positively in reduction of poverty and in holistic development of rural areas. All users were very positive towards SHS installation and they do strongly support their adoption but they recommended that focused should be given in easy availability of solar components at low price and skilled technicians at local level as well as clear plans and policies for further promotion and sustainable development of solar home system is most.

This research therefore can be used as a reference for further researches in finding out such benefits of SHS in in small solar PV home systems, institutional solar PV systems, solar drinking water pumping systems, solar dryer and cooker etc. that would be most relevant in rural areas of Nepal and for the local and government policy makers for making their policy and strategies in directing their resources in such projects for the welfare of the society.

***Keywords**:* Solar Home System, Socio-economic impact, Per capita energy consumption

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ABBREVIATIONS / ACRONYMS

AEPC	=	Alternative Energy Promotion Center
BC	=	Black Carbon
CBS	=	Central Bureau of Statistics
CDM	=	Clean Development Mechanism
CO_2e	=	Carbon Dioxide Equivalent
CRT	=	Center for Renewable Technology
DANIDA	=	Danish Development Agency
D.C.	=	Direct Current
DDC	=	District Development Committee
ESAP	=	Energy Sector Assistance Program
GJ	=	Giga Joule
HHs	=	Households
i.e.	=	That is
KTOE	=	Kilo Tone Oil Equivalent
kW	=	Kilo Watt
kWp	=	Kilo Watt Peak
Ltd.	=	Limited
MJ	=	Mega Joule
MWp	=	Mega Watt Peak
MW	=	Mega Watt
NEA	=	Nepal Electricity Authority
NGOs	=	Non-Governmental Organization
No.	=	Number

NPC	=	National Planning Commission
NTC	=	Nepal Telecom
PV	=	Photovoltaic
Pvt.	=	Private
RECAST	=	Research Center for Applied Science and Technology
REDP	=	Rural Energy Development Program
REF	=	Rural Energy Fund
RET	=	Renewable Energy Technology
SELF	=	Solar Electric Light Fund
SHS	=	Solar Home System
SPV	=	Solar Photovoltaic
TV	=	Television
VDC	=	Village Development Committee
W	=	Watt
WECS	=	Water and Energy Commission Secretariat
Wp	=	Watt Peak