A STUDY ON SOCIO-ECONOMIC IMPACT OF SOLAR HOME SYSTEM ON COMMUNITY

(A Case Study of Maharudra VDC, Baitadi District, Nepal)

A Thesis Submitted to

The Central Department of Rural Development, Tribhuvan University,

in partial fulfillment of the requirement for the Degree of the

Master of Arts (M.A.)

in

Rural Development

By:

SHANKAR PRAKASH PANT

Central Department of Rural Development

T.U. Reg .No : 5-2-22-524-2001

Exam Roll No : 2628

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RECOMMENDATION LETTER

The thesis entitled **"A Study on the Socio-Economic Impact of Solar Home System on Community"** (A Case Study of Maharudra VDC of Baitadi District, Nepal) has been prepared by **Shankar Prakash Pant** under my guidance and supervision. I hereby forward this thesis to the evaluation committee for final evaluation and approval.

(Prof. Dr. Rhiddi Bir Singh)

Thesis Supervisor

Central Department of Rural Development

Date: 29-03-2015

15-12-2015

APPROVAL LETTER

This is to certify that the thesis report has completed .The thesis entitled "**"A Study on the Socio-Economic Impact of Solar Home System on Community"** (A Case Study of Maharudra VDC of Baitadi District, Nepal)submitted by **Shankar Prakash Pant** in partial fulfillment of the requirements for the Master's Degree in Rural Development has been approved by the evaluation committee.

Evaluation Committee

Prof. Dr. Chandra Lal Shrestha.

Head of the Department

Prof. Dr. Jagannath Shrestha

External Examiner

Prof. Dr. Rhiddi Bir Singh
Supervisor
Date: 01-04-2015
18-12-2071

ACKNOWLEDGEMENT

I would like to express my profound gratitude to my respected supervisor Dr. Rhiddi Bir Singh, Professor, Central Department of Rural Development and Research Center for Applied Science and Technology for his continuous guidance, advice and encouragement since the proposal preparation to report finalization. His constructive comments, untiring help, guidance and practical suggestions inspired me a lot to accomplish this work successfully.

I would also like to express my gratitude to Dr. Chandra Lal Shrestha, Head of Central Department of Rural development, Tribhuvan University for providing an opportunity to carry out this project work on "A Study on Socio-Economic Impact of Solar Home System on community". Similarly I would also like to thank all the professors, Lecturers of Central Department of Rural Development for their continuous help, support and guidelines during my two years study in the University.

Similarly, I would like to express my appreciation to AEPC officials and staffs for their comments and suggestions and providing the important knowledge and data. I acknowledge to Tribhuvan university Central library of Kirtipur, AEPC library Khumaltar and Library and Librarian of Central Department of Rural Development for making the required books, journals and reports of past literature available.

My special thanks go to the secretary of Maharudra VDC and all the Solar Home System users and non-users respondents for their generous cooperation and tireless responses during the field survey.

I would also like to thank my friends, Mr. Hem Shankar Bhattarai, Dibya Ratna Shakya, Bir Bahadur Chand, Birendra Bhatt ,Manindra Ranjan Khanal, Chavi Kiran Poudel, Birendra Khattri,and my brothers Bir Datt Pant, Dharnidhar Pant, K.D Ojha and Rajesh Pant for their valuable contribution in preparing this report.

Last but not the least, my deep love and respect goes to my parents and family members who always inspire and helped me a lot to build my educational career.

It is hoped that this report tried to portray accurately the energy scenario, the potential impact of SHS to the users in the study area and shall be instrumental in the promotion and development of sustainable SHS program in the future.

Mr. Shankar Prakash Pant

March, 2014

ABSTRACT

This Study entitled “A Study on the Socio-Economic Impact of Solar Home System on Community (A Case Study of Maharudra VDC of Baitadi District, Nepal)” was conducted with the objectives of assessing energy scenario, per capita energy consumption, finding socio-economic and other impact of SHS to the users and assess the knowledge and attitude towards SHS in Maharudra VDC (specially in ward no: 1,2 and 3) of Baitadi District. This study is mainly based in the primary information and the data were collected using the techniques of field survey with the help of questionnaire, field visit and observation.

There were 712 households (HHs) in the VDC. Of the total households, there were 186 HHs in ward no.1, 2 and 3, 40 households who have installed and still using Solar Home System and 10 Solar Home System non-users was selected as the sample for the study. During the study it is found that Brahhmin 48%(24) were the main beneficiaries of SHS, Agriculture 58%(29) was the main occupation among 50HHs, the average family size of the sample Households were 6.56 persons per family, average literacy rate 70.12%, Among 50 HHs, 40%(20) sample HHs can support expenditure by their income for 8 to 12 months, 42.43%(14) sample HHs noticed increased study hour of their children by at least one hour after installing SHS. Firewood was the most common sources of energy with highest per capita energy share, 13.15 GJ by SHS users and 12.608 GJ by SHS non-users. Only 52.5% SHS users uses kerosene while 100% SHS non users uses kerosene. The use of kerosene by SHS shares 0.00367 GJ(27.5 l) in per capita energy consumption which is far less than by SHS non-users which was 0.067348 GJ(127 l). By installing SHS a household have saved at least Rs 1309 annually compared to SHS non users from kerosene. This VDC not still connected to national grid; and there were no LPG. The per capita energy share of solar energy is 3.124 GJ. The average Per capita energy consumption of total 50 samples HHs of Maharudra VDC was 13.24GJ, which is slightly less than national per capita energy consumption by 0.96 GJ. Out of total energy consumption,(4342552.5MJ) the share of traditional energy (fuelwood 3518505MJ) was 81.02%, commercial energy(kerosene 5810MJ) 0.13% and of solar energy(818640MJ) 18.85% .

Similarly highest no. of SHS 35% was installed in the year 2070B.S, 22.5% was installed in the year 2067 and rest in different years till Baisakh 2071. Most commonly installed system is of 20WP by 67.5% HHs, 87.5% people has access to radio, 92.5% HHs have access to mobile phones and only 2.5% received all radio, television and phone facilities. Each SHS users have DC to AC inverter as mobile charging systems. About 60% HHs used 1 to 4 no. of bulbs, 47.5% HHs used CFL and Tube Light, 62.5% HHs used SHS for lighting two hours daily and 37.5% HHs faced the maintenance problem with SHS in the study area.

From the study it was found that all the households using SHS are getting benefit through white and smokeless light, had saved money from buying kerosene significantly, had started various income generating activities at local level by both men and women resulting gender equality and women empowerment. Their access to energy and means of communication has increased, local health post are running facilities at night during emergency , children study hour has increased significantly, no. of accidental fire hazard because of kerosene lighting has decreased. By the use of SHS, the reduction in emission of CO2 equivalent 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. They suggested that focus 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.

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ABBREVIATIONS / ACRONYMS

AEPC	=	Alternative Energy Promotion Center
AET	=	Alternative Energy Technology
CBS	=	Central Bureau of Statistics
CDM	=	Clean Development Mechanism
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
Ltd	=	Limited
MJ	=	Mega Joule
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	=	Rursal 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