

IMPACT OF SOLAR HOME SYSTEM TO THE USERS

(A Case Study of Belkot VDC of Nuwakot 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

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April 2016

Declaration

I hereby declare that the thesis entitled “ Impact of Solar Home System to the Users” (A Case Study of Belkot VDC of Nuwakot District, Nepal) 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.

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RECOMMENDATION LETTER

The thesis entitled “ **Impact of Solar Home System to the Users**” (A Case Study of Belkot VDC of Nuwakot District, Nepal) has been prepared by Bhupendra Pandey under my guidance and supervision. I hereby forward this thesis to the evaluation committee for final evaluation and approval.

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APPROVAL LETTER

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ACKNOWLEDGEMENT

I would like to express my gratitude to my respected supervisor Mr Suman Kharel, CDRD for his continuous guidance, advice and encouragement since the proposal preparation to report finalization. His, 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. Prem Sharma head of Central Department of Rural development, Tribhuvan University for providing an opportunity to carry out this project work on “A Study on the Energy Impact of Solar Home System to the Users”. Similarly I would also like to thank all the professor, 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 Belkot VDC and all the solar Home System users and non-users respondents for their generous cooperation and tireless responses during the field survey.

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.

Mr. Sunil Kumar Pariyar
April, 2013

ABSTRACT

This Study entitled “A Impact of Solar Home System to the Users (A Case Study of Belkot VDC of Nuwakot District, Nepal)” 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 Belkot VDC (specially in ward no: 4, 8 and 9) of Nuwakot 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, observation.

There were 1549 households (HHs) in the VDC. Of the total households, 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 Brahmin (50%) were the main beneficiaries of SHS, Agriculture (58%) was the main occupation, the average family size of the sample Households were 6.98 persons per family, average literacy rate 66.19%, 60% sample HHs can support expenditure by their income for 8 to 12 months, 52% sample HHs noticed increased study hour of their children by at least a hour after installing SHS. Firewood was the most common sources of energy with highest per capita energy share, 9.46 GJ/year/person by SHS users and 9.74 GJ/ year/person by SHS non-users. Only 37.5% SHS users uses kerosene while 100% SHS non users uses kerosene. The use of kerosene by SHS shares 0.00445 GJ/year/person in per capita energy consumption which is far less than by SHS non-users which was 0.09227 GJ/year/person. By installing SHS a household have saved at least Rs 1725 annually compared to SHS non users from kerosene. There was almost equality in consumption of LPG between SHS users and non users, 50% sample HHs uses LPG in the study area. The per capita energy consumption of PLG by SHS installed households was 0.09706 GJ/person/year and by Non users 0.08537 GJ/person/year. Since last Magh of 2069 B.S, this VDC got connected to national grid; all 100% sample HHs has grid electricity. The monthly consumption of electricity varied from 10 to maximally 20 units per month in the study area which comes within the minimum charges of RS 80 for 20 units. The per capita energy share of solar energy is 4.81GJ/person/year. The average Per capita energy consumption of total 50 samples HHs of Belkot VDC was 13.62 GJ /person/years which is slightly less than national per capita energy consumption by 0.58 GJ /person/year. Out of total energy consumption, the Share of traditional energy was 69.85%, commercial energy 1.49% and of solar energy 28.65%.

Similarly highest no of SHS 37.5% was installed in the year 2060B.S, most commonly installed system is of 20WP by 37.5% HHs, 92% people has access to radio, 50% HHs have received radio, television and phone facilities, 55% HHs used 5 to 8 no. of bulbs, 40% HHs used CFL and T.L, 50% HHs used SHS for lighting two hours daily and 45% HHs faced the maintenance problem with SHS in the study area. From the study it was found that all the households who are 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 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, no. of accidental fire hazard because of kerosene lighting has decreased. By the use of SHS, the reduction in emission of CO₂ 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 focused should be 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	=	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