

Potential development of Gravity goods ropeway and its impact on rural livelihood.

(A case study of Gholechappra settlement at Bukhel VDC in Lalitpur district)

A Thesis

Submitted to

Central Department of Rural Development

Faculty of Humanities and Social Science

Tribhuvan University

Kirtipur, Kathmandu

Submitted By:

Devendra Adhikari

Exam Roll no: 281086

Regd. no: 5-2-37-300-2003

Central Department of Rural Development

Kirtipur, Kathmandu

May, 2011

LETTER OF RECOMMENDATION

This is to certify that Mr. Devendra Adhikari has completed thesis entitled “Potential development of Gravity goods ropeway and its impact on rural livelihood, A case study of Gholechappa settlement at Bukhel VDC in Lalitpur district” under my guidance. This is his independent work for the fulfillment of Master’s in Rural Development. I recommend this thesis for final evaluation.

.....

Umesh Kumar Mandal

Supervisor

Associate Professor

Central Department of Rural Development

Tribhuvan University

Kirtipur, Kathmandu, Nepal.

APPROVAL LETTER

This is to certify that the thesis entitled “**Potential Development of Gravity Goods Ropeway and its Impact on Rural Livelihood, A case study of Gholechappra settlement at Bukhel VDC in Lalitpur district**” Submitted by Mr. Devendra Adhikari has been examined. It has been declared successful for fulfillment of the academic requirements toward the completion of Masters of Arts in Rural Development.

Thesis committee:

.....
Umesh Kumar Mandal
Associate Professor
Central Department of Rural Development
Kirtipur, Kathmandu, Nepal

.....
Prof. Dr. Pradeep Kumar Khadka
External
Central Department of Rural Development
Kirtipur, Kathmandu, Nepal.

.....
Prof. Dr. Pradeep Kumar Khadka
Head
Central Department of Rural Development
Kirtipur, Kathmandu, Nepal.

Acknowledgement

I would like to express my sincere gratitude to my thesis supervisor Mr. Umesh Kumar Mandal, Reader, the central Department of Rural Development, T.U and Associate Professor of Central Department of Geography, T.U Kirtipur. His patience, enthusiasm, cooperation, suggestions and keen interest in this study area is memorable. His vigorous effort efforts made up me present this research work in the present form. His brilliant skill of supervision makes this study enrich higher than my expectation. This research work wouldn't be possible without his simulation, inspiration and co-operation.

I would also like to express my gratitude to Prof. Dr. Pradeep Kumar Khadka, Head of the Central Department of Rural Development, T.U., Kirtipur for the invaluable suggestion and regular inspiration to develop this work.

Similarly, my special thanks go to my inmates cum brothers Sailesh Chaulagain (Gotikhel) and Anish Ghimire (Bukhel) for their direct and indirect cooperation and regular encouragement during field visit. I would also like to give heartfelt thanks to the people of my study area, i.e. Bukhel VDC, Lalitpur district. Last but not least, I must sincere grateful to my mother Nirmala Adhikari and my wife Urmila Neupane for their continuation support and inspiration.

Finally I would like to thanks University Computer and Photocopy Service, Kirtipur for their computer work.

May, 2011

Devendra Adhikari

Abstract

Nepal is a mountainous country. 83% of total area consists of mountains and hills. Hence inaccessibility is the greatest hindrances in the delivery of essential services and development as a whole. The highly challenging topography and problematic hydro geological condition has rendered the extension of road network really capital intensive, daunting and environmental hazardous. From the government data, just 62km road network was expanded in one year 2008/9. This dismal picture shows the priority of Nepal government in road building.

In this whole scenario, Gravity goods ropeway is power to the rural economy. It is environment friendly and financially viable technology and has the potential to economically empower the marginalized people in rural area. It has supported better market linkage, increased income generation activities, improve access to health and education services and fostered better community relation.

The mechanics of gravity ropeway is very simple. It consists of two trolleys, rolling over two separate steel wire ropes (track ropes) supported and suspended over two separate tower at the top and bottom ends. The trolleys are connected to a single looped wire rope (hauling rope) of a smaller diameter by means of rope ties. This hauling rope passes around the cast iron sheave fixed end. When the loaded trolley rolls down by its own weight along one track from the upper station, another trolley with lighter weight hauls up along the next track rope. A simple brake with a rubber/wooden brake shoe is fitted to the sheave at the lower station to regulate the speed of the moving trolleys.

Sustainability of a gravity ropeway by and large depends on the discretion of the site selection. Proposed site should be evaluated against some technical, economic and social parameters. Even the technical feasibility of gravity ropeway has bearing with socio-economic feasibility hence it should precede the technical feasibility.

In the context of Nepal's rural areas, clean and reliable green energy technologies like gravity good ropeways seem to be less expensive and require less time to develop. But still the knowledge based on technical and other socio economic aspects of gravity good ropeway is not that broad. With this limited knowledge

base, it is difficult chart out exclusive strategies for its development. Hence more is needed to be done in the areas of research and development. Involvement of academia like engineering institution would be important role in preparing of technical need of the rural community. They can play important role in the preparation of technical guidelines and code of practices. Likely, social research is required to find the niche of gravity goods ropeway in overall transportation sector, explore its potential as the complementary means of transport, identify existing policy hurdle if any propose more conducive policies and strategies.

In the research, it is difficult to study whole universe under study due to high cost, time consuming and complexities. Therefore, sampling plays important role in research work. Data collected without a proper sampling procedure and suitable sample size may not meet the objectives .Among the total number of directly study affected 120 HHs at Bukhel VDC, 62 HHs were selected purposively by stratified sampling method and one member from each household were further interviewed.

Social issues related to the construction of the proposed gravity goods ropeway dug out during this research work also must be addressed. Finding of this study will be useful for recommending planning and policy maker to formulate appropriate plans for further constructions of Gravity Goods Ropeways in rural villages.

Table of contents

LETTER OF RECOMMENDATION	i
LETTER OF APPROVAL	ii
ACKNOWLEDGEMENTS	iii
ABSTRACTS	iv
LIST OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
ACRONYMS/ABBREVIATIONS	xi
List of contents	
CHAPTER I: INTRODUCTION	
1.1 Background	1
1.2 Statement of the problem	2
1.3 Objective of the study	2
1.4 Scope of the study	3
1.5 Limitation of the study	3
1.6 Organization of the study	3
CHAPTER II: LITERATURE REVIEW	
2.1 Land topography of Nepal	4
2.2 Rural technologies in Nepal	5
2.3 Gravity goods ropeway	5
2.3.1 Working principle	5
2.3.2. Feasibility	6
2.4 Features of gravity good ropeway	7
2.5 Beneficiaries	8
2.6 Marketing linkage	8
2.7 Geographic positioning systems	9
2.8 Geographic information system	9

2.9	Case studies	10
CHAPTER III: RESEARCH METHODOLOGY		
3.1	Selection of the study area	15
3.2	Research design	15
3.3	Universe, Sample size and Procedure	15
3.4	Nature and sources of data	16
3.5	Techniques of data collection	16
3.5.1	Reconnaissance survey	17
3.5.2	Interview	17
3.5.3	Observations	17
3.6	Tools for data collection	17
3.6.1	Field checklist	18
3.6.2	Topo maps	18
3.6.3	Land capability map	18
3.6.4	Land system map	18
3.6.5	Land Utilization map	19
3.6.6	GPS	19
3.6.7	Interview schedule	19
3.6.8	Case study	19
3.6.9	Field note	19
3.7	Data analysis procedure	19
3.8	Research process	19
CHAPTER IV: DESCRIPTION OF STUDY AREA		
4.1	Location And Accessibility	20
4.2	Topography	21
4.3	Population	21
4.4	Educational Status	22
4.5	Major Occupation	22
4.6	Market Linkage	23
4.7	Travel Time	23

4.8	Local energy fulfillment	23
CHAPTER V: DATA PRESENTATION AND ANALYSIS		
5.1	Assessing topographical potentiality	24
5.1.1	Technical feasibility of the study area	25
5.2	Geographical condition of the study area	27
5.3	Major agriculture production in concerned settlement	28
5.4	Major goods imported in concerned settlement	29
5.5	The route and time taken by goods to reach the market after the installation of gravity good ropeway	30
5.6	The route and time taken by villagers to reach the village before the installation of gravity good ropeway	32
5.7	Aerial view of the study area	34
5.8	Analysis of land capability map	35
5.9	Analysis of land suitability map	35
5.10	Analysis of land utilization map	36
5.11	Analysis of topo map	37
5.12	Analyzing the economic feasibility issues for the installation of gravity goods ropeway	38
5.13	Analyzing the economic impact of gravity good ropeway	39
5.14	Analyzing the socio-cultural issues about gravity goods ropeway	39
CHAPTER VI: CONCLUSION AND RECOMMENDATION		
6.1	Conclusion	41
6.2	Recommendation	42
REFERENCES		
ANNEX-1 FIELD CHECKLIST		
ANNEX-2 QUESTIONNAIRE		
ANNEX-3 PHOTOS		
ANNEX-4 MATHEMATICS CALCULATION		

Abbreviation/Acronyms:

AEPC/N	=	Alternative Energy Promotion Center, Nepal
B.S	=	Bikram Sambat
CBS	=	Central Bureau of Statistics
CBOs	=	Community Based Organizations
DDC	=	District Development Committee
FY	=	Fiscal Year
GoN	=	Government of Nepal
GIS	=	Geographic Information System
GPS	=	Global Positioning System
HHs	=	House holds
NGOs	=	Non-government Organizations
INGOs	=	International non-government organizations
NPC/N	=	National Planning Commission, Nepal
CRT/N	=	Centre of Rural Technology, Nepal

List of tables:

Table 2.11	: A case study from Janagaun Village	14
Table 4.2	: Altitude of different settlements	21
Table 4.3	:Population status of different settlements	21
Table 4.4	: Education Educational attainment of the HH members by sex	22
Table 4.5	: Major occupation of the respondents	22
Table 4.7	: Time to reach the Bukhel bazaar from concerned settlements	23
Table 5.1.1	: Geographical status of the proposed upper and bottom station	25
Table 5.3	: Major agriculture production in different settlement	28
Table 5.4	: Major goods imported in different settlements	29
Table 5.4.1	: Average import per month per HH	29
Table 5.5	: Time taken by goods to reach the bottom station after ropeway	30
Table5.6	: The time taken to return village after ropeway construction	32
Table 5.10	: Comparison between seasonal productions	36
Table5.16	: Respondents involved in social issues regarding the project	39

List of figures

Fig 2.3.1	: Gravity goods ropeway during operation	6
Fig 4.1	: Map of Lalitpur district	20
Fig 4.1	: Bukhel VDC with its ward boundaries	20
Fig 5.1.1	: Technical feasibility of the study area	25
Fig 5.2	: Altitude of different settlements	26
Fig 5.5	: The time taken to reach bottom station after ropeway construction	30
Fig 5.5.1	: Time saving during up- down transport	31
Fig 5.6	: The time taken to reach bottom station after ropeway construction	32
Fig 5.6.1	: Time saving during down-up transport	33
Fig 5.7	: Aerial view of the study area	34
Fig 5.8	: Land capability map of study area	35
Fig 5.9	: Land system map of study area	35
Fig 5.10	: Land utilization map of study area	36
Fig 5.11	: Topo-map of study area	37