Impact of Information and Communication Technologies (ICTs) on Livelihood of Rural People: A Case Study of Nangi Village of Ramche VDC in Nepal

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Impact of Information and Communication Technologies (ICTs) on Livelihood of Rural People: A Case Study of Nangi Village of Ramche VDC in Nepal

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Executive Summary

Information and Communication Technologies (ICTs) is considered as important tool to empower rural people with the ability to communicate instantaneously facilitating rural development process and information needs. However, reliable data on ICTs facilities in rural area and their contribution in socio-economic development is less. This is due to lack of making appropriate strategy and choice of resources which lead to failure of deploying ICTs as tools for rural development. After that, in developing countries potential of ICT4D still not understood, what ICTs can do in rural people life and how ICTs are used by rural people, so it has become area of discussion.

The interrelationships of ICTs and people to forge livelihoods using ICTs resources strategically is lacking in case of rural area of Nepal. Methodological study to expose its uses and impact that it brings in people life is in need. ICTs facilities provided by telecentres should be improved to use the employment opportunities, physical assets and to meet the economic opportunities. These context build people centred achievement of ICTs. To understand all these context fruitful study between the ICTs intervention and its touch with the livelihood of people in rural area is important. The aim of the study was to investigate: How has the implementation of information and communication technology (ICT) affected different livelihood opportunities for rural people in Nangi village of Ramche VDC in Myagdi District of Nepal? The study was accepted by Nepal wireless networking project (NWNP) involved in implementing ICTs services through telecentres in rural area of Nepal.

The study was conducted in rural Nangi village of Ramche VDC at Myagdi district of Nepal which is located at the height of 2300 m in western part of Himalayan region. Qualitative case study research design was adopted for the study. Research study manages structured interview with hundred fifty five users and non-users of ICTs. To provide supplementary information for data collected from individual interviews, four FGD (four focus group discussion) were conducted including both ICTs user and non-user of Nangi village of Ramche VDC. Semi-structured interview was conducted with two telecentres operator, two health workers and one NWNP project responsible person to know in depth of ICTs use and its effect on life of rural people.

The findings from the study shows people who come to telecentres to use ICTs facilities were young. Among the users of ICTs facilities in telecentres majority were male having higher secondary education (Grade 11 & 12) while minorities were female in study area because they were more responsible to look after their house and family members. Telecentres have failed to consider underrepresented groups in the provision of ICTs services in study area. The finding too shows uses of ICTs facility in telecenter has helped to reduce digital divide in small length but still “digital divide” exist in rural area of Nepal in wider range although international agencies are involved to deploy ICTs services through telecentres to rural communities. In study are ICTs sector development is still low due to under development of roads and national electricity. Terrible roads cause’s barriers for community people to transport their local products to city, if they got relevant
information of market and regular national power cut prohibit rural people to use ICTs facilities in telecentres. The study findings shows necessary conditions to access ICTs in telecentres exist while sufficient conditions such as ICTs skill, and awareness still lacking. The national ICTs policy of Nepal indicates gap exists in ICTs policy making and its implementation due to which ICTs sector development in rural area is affected. Information need assessment is critical in development, but the findings from the study indicates telecentres operators were lacking knowledge of the information needs and rarely conduct information needs assessment for the communities they serve. Thus telecentres operators were not in the condition to provide required information needs of the community. The findings of the study further shows ICTs in rural area may not support in socio-economic development fully but have some affects on different livelihood opportunities. Socially, technologies help for better communication, and knowledge sharing. Economically, technologies help for better income generation, savings and technologies facilitate for better access to information, improved techniques for paper products & Japanese mushroom farming, ICTs literacy as human capital. The study finding shows women group society learn how to produce local paper from local material and hand made products from paper, also how to cultivate Japanese mushrooms using tele-teaching facility available in telecentres which helps to diversify their traditional livelihood depending on potatoes. Language problem (illiteracy), lack of ICTs skill, lack of time, lack of electricity supply, low bandwidth of internet with timely disconnection, terrible road and poor infrastructure were found significant obstacles for effective use of ICTs in telecentres.

The study recommends NWNP project leader and telecentres operator should do regular information need assessment of poor, disadvantaged and underrepresented groups to redesign or restructure the program to bring them in provision of ICTs service instead of looking them as passive users of ICTs services. The study also recommends telecentres operators should learn to relate ICTs potential to health, education, and agriculture for sustainability of telecentres. Project leaders and telecentres operator should expand the need of access to ICTs facility by establishing adequate awareness to meet diverse needs of individuals and groups in the community exploring the relevance of technology. There should be collaboration between telecentres program and LDC (local development committee) to develop localized application for rural people. The developed localized ICTs application should meet needs of rural people to serve them efficiently and effectively.
Abstracts

Information and Communication Technologies (ICTs) is considered as important tool to empower rural people with the ability to communicate instantaneously facilitating rural development process and information needs. In developing countries potential of ICT4D still not understood, what ICTs can do in rural people life and how ICTs are used by rural people, so it has become area of discussion.

The study was conducted in rural Nangi village of Ramche VDC at Myagdi district of Nepal which is located at the height of 2300 m in western part of Himalayan region. Qualitative case study research design was adopted for the study. Research study manages structured interview with hundred fifty five users and non-users of ICTs. To provide supplementary information for data collected from individual interviews, four FGD (four focus group discussion) were conducted including both ICTs user and non-user of Nangi village of Ramche VDC. Semi-structured interview was conducted with two telecenter operator, two health workers and one NWNP project responsible person to know in depth of ICTs use and its effect on life of rural people. Majority of ICTs users were male having higher secondary education (Grade 11 & 12) while minorities were female in study area.

Telecenter have failed to consider underrepresented groups in the provision of ICTs services in study area. Necessary conditions to access ICTs exist while sufficient conditions such as ICTs skill, and awareness still lacking. In Nangi village of Ramche VDC, technologies do not support socio-economic development totally but have some effect on various aspects of livelihoods. Socially, technologies help for better communication, and knowledge sharing. Economically, technologies help for better income generation, savings and technologies facilitate for better access to information, and ICTs literacy as human capital. Language problem (illiteracy), lack of ICTs skill, lack of time, lack of electricity supply, low bandwidth of internet with timely disconnection, terrible road and poor infrastructure were found significant obstacles for effective use of ICTs in telecenter.

The study recommends NWNP project leader and telecenter operator should do regular information need assessment of poor, disadvantaged and underrepresented groups to redesign or restructure the program to bring them in provision of ICTs service instead of looking them as passive users of ICTs services. There should be collaboration between telecenter program and LDC (local development committee) to develop localized application for rural people. The developed localized ICTs application should meet needs of rural people to serve them efficiently and effectively.

Key words: ICTs, Impact, Telecenter, Rural Livelihoods, Development
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Vaxjo, December 2011

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<tr>
<td>BBC</td>
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<td>DFID</td>
<td>Department of International Development</td>
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<td>Email</td>
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<td>HMGN</td>
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<td>ICTs</td>
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<td>ITU</td>
<td>International Telecommunication Union</td>
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<td>LDC</td>
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<td>MoST</td>
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<td>NWNP</td>
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<td>NITDC</td>
<td>National Information Technology Development Council</td>
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<td>NTC</td>
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<td>VDC</td>
<td>Village Development Committee</td>
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<td>VSAT</td>
<td>Very Small Aperture Terminal</td>
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<td>VoIP</td>
<td>Voice over Internet Protocol</td>
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<td>Wi-Fi</td>
<td>Wireless Fidelity</td>
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<td>WGC</td>
<td>Women Group Society</td>
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**List of Abbreviations**
CHAPTER 1
INTRODUCTION

This chapter provides an insight to readers to understand the research area. At first background of research area is presented followed by problem area. The purpose of study is extended with research question to explain the objectives of research. Research topic is briefly justified with necessary arguments, scope and limitation of the study is also discussed.

1.1 Background

Information and communication technologies (ICTs) involve improvement in microelectronics, hardware, software, and telecommunication which improves the processing and storage of large amount of information with rapid distribution of information through communication networks (UNDP 2001, p.30). “DFID defined ICT as technologies that facilitate communication and the processing and transmission of information by electronic means” (Fengying et al., 2010, p.2). Information and communication technology is built on empowering people with an ability to communicate immediately in right way facilitating development process by increasing efficiency and effectiveness (Yonah 2002, p.1). “Information and communication are widely recognized as basic and fundamental elements of any development activity” (Soriano, 2007, p.2) contributing for integrated development by resolving problem of rural people (Fengying et al. 2010, p.2). “Ubiquitous and pervasive nature of information and communications technologies (ICTs) can support global community interaction, commerce and learning, resulting in higher standards of living and improved social welfare (Dewan & Riggins, 2005)” (Singh et.al, 2008, p.464). ICTs as a tool can bring direct benefit on life of rural people by reducing poverty, if relevant ICTs are incorporated in rural areas that are more relevant to socio-economic sustainability (Fengying et al., 2010, p.2). In developing countries majority of people live in rural areas and have limited access to technology and information (Hosseini et.al, 2009, p.027). For these groups of people “ICT helps people to communicate effectively, overcomes the limitations of time and space, empowers people by providing information and knowledge, provides income generating and learning opportunities, increases government transparency and efficiency and enables people to express their concerns and to actively participate in decision making processes (Asian Development Bank, 2004)” (Hosseini et.al, 2009, p.027) providing the opportunity for rural people to involve in decision making process at local level. Internet offers great opportunity for improving livelihoods of people with right access and utilization of information in rural area characterized by poor ICTs infrastructure, illiteracy, ICTs illiteracy, low awareness of ICTs use and its benefit (Singh et.al, 2008; Hosseini et.al, 2009). “Especially in terms of Information and Communication Technologies (ICTs) and related services, rural communities face constraints such as (a) high cost of accessing ICT such as telecommunication prices (b) restricted access to education, training and user-supported services and (c) inadequate technical capability of the telecommunications infrastructure to access services and information that require high bandwidth (Buckeridge, 1996)” (Singh et.al, 2008, p.466).
Information and Communication Technologies (ICTs) provide relevant information on health, education and secretarial services to improve livelihoods of rural people. The innovative use of relevant information provided by ICTs on health, education combining with traditional technologies helps to overcome possible constraint in rural area (Bernardo, 2005, p.13; infoDev, 2008, p.20). Rural people need more technology infrastructure and information to fulfill their ease of use of market information, maintaining social network and accessing government services. The problems of rural people are very critical and have direct impact on survival (Singh, 2010, p.2). Theoretically, “livelihood is ‘means of gaining living or a combination of the resources used in activities undertaken in order to live’” (Singh, 2010, p.3). Capability and equity are fundamental means and end of sustainable livelihoods where capability is ability to find and make use of livelihood opportunities, and equity is equal access and end to discrimination. These improve access to high quality education, information, training, social environment, and better access to basic services and infrastructure (Singh, 2010, p.3). “In terms of rural development, ICT can play an important role in improving the quality of life for rural people” (Hosseini et.al, 2009, p.027) but this statement has not been yet realized due to lack of accessibility to universal service among rural people (ibid. p.027). So it is necessary to remove the obstacles faced by rural people and provide basic infrastructure to spread ICT use (Hosseini et.al, 2009). “This would enable ICT to be part of a comprehensive socio-economic development strategy for rural development as a means, not an end (Lee and lee, 2004)” (Hosseini et.al, 2009, p.027). Information and Communication Technology (ICTs) have importance in both potential value and potential risk of greater socio economic exclusion faced by people of rural area who cannot access or benefit from ICTs in context of emerging global knowledge and information society (Parkinson et. al, 2006, p.1). In this context the flexibility of ICTs can make their uses bit hard to predict but careful planning of expected outcomes could be counterproductive (Parkinson et al., 2006, p.1). “At the same time, the desire for accountability and effective development requires serious efforts to understand what impact, or at least influence, ICT-related development efforts have had on people’s lives” (Parkinson et al., 2006, p.1). Assessment & evaluation has been concern from time of ICTs focused development effort began (Parkinson et al., 2006, p.1).

In developing countries most of the population resides in rural area where access to information and telecommunication is not possible but for development in such area it is still inadequate (ITU, 1998). International agencies ITU, UNESCO, IDRC, and UNDP realized access to information and telecommunication is essential for development, so donor agencies are investing in ICT for development projects in isolated areas of developing countries. The aim of these donor agencies is to develop best practices, effective and bearable approach for access to telecenter facilities and information service to people in rural and remote areas (ITU, 1998; Chilimo, 2008). The intervention of ICTs has a positive impact on livelihoods to improve and enhance social networking at various level and reducing cost and time (Singh, 2010, p.11). For example, e-krishak in Bangladesh allows rural people to enhance their livelihood through better information, bhoomi in India, Rabat Ghar in Pakistan, and Nanasala in Srilanka to enhance livelihoods of rural people (Singh, 2010, p.12).
1.2 Problem Area

ICTs are regarded as tools for socio-economic development but the major issues for developing countries is not the matter of introducing ICTs for development, but to find the best strategy to implement ICTs for development, and facilitate developing countries to information society to improve their peoples life (Chilimo, 2008, p.8). The paper of Quibri & Tschang (2001, p.4) says ICTs have the potential to improve the welfare of the poor through improved availability of market information, creation of economic opportunities and better access to health and education facilities. According to Castells (1998) rise of use of ICTs in rural area is responsible for rising inequality and social exclusion. The ability to use and adapt ICTs is regarded as critical factor for accessing information and generating knowledge which can be used to achieve socio-economic development (Castells, 1998, p.93). “Despite this strong belief, large investments, and encouraging anecdotal evidence, there has been little readily discernable, hard evidence that the use of ICT could be a significant contributor to poverty alleviation” (SIDA 2005, p.13). “In the cases where there has been some evidence of benefits from the use of ICT, there has been little indication that it could be cost-effective and scaleable” (SIDA 2005, p.13). International agencies are being involved in developing countries to make access of ICTs easy among people of rural and urban area for development and bridging the digital divide. If ICTs uses and its benefit are not promoted the divide between people who are close to technology and those who are not will be bigger so ICTs is the only tool to bring everyone into the information society and ensure that the benefits of this tool are shared in community (Chilimo, 2008, p.6-7; InfoDev, 2006).

In developing countries technologies have not reached to groups of rural area so the gap between those who “haves” and “have-nots” of ICTs use is large between people living in rural and urban areas (Bridges.org, 2003, p.3). In rural area of developing countries potential of ICTs still not understood, what ICTs can do in rural people life and how ICTs are used by rural people. In order to fully understand the relationship between ICTs and its impact on the quality of life of rural people, it is necessary to articulate multi-disciplinary theories capable to think about the realities and subjectivities that are enabled by ICTs on livelihood of rural people (Sife et al., 2010). “ICTs tools [in telecentre] can assist in wealth creation for the rural poor as, in an information society, wealth comes from knowledge. Knowledge is created by accessing, assimilating, sharing and using information that can be accessed via ICTs tools like…[Computer, email, internet etc]” (infoDev, 2008, p.27). Thus investment and assessment on ICTs tools in telecentre for better access to information bridge the digital divide and have positive impact on livelihood of rural people which is vital (infoDev, 2008). According to Pandit (2009) designed ICTs application for people of rural area can makes life easy by mitigating livelihood vulnerabilities. “Integration of ICTs with traditional knowledge systems at community level provide for rapid information exchange promoting development of the people of that community” (Pandit, 2009, p.7) because ICTs enabled knowledge networks can help poor and marginalised people for their development in rural area (Pandit, 2009). According to Parkinson (2006, p.1) ICTs have become increasing interest and development driving force to gear the livelihoods prosperity in developing countries. The interrelationship of ICTs & people to forge livelihoods using ICTs resources
strategically is lacking in case of rural area of Nepal (Parkinson, 2006, p.2) so methodological study to expose its uses and impact that it bring in people life is in need. ICTs facilities should be improved to use the employment opportunities, physical assets and to meet the economic opportunities. All these figure the people centered achievement of ICTs. In order to understand all these context it is necessary to have fruitful study between the ICTs intervention and its touch with livelihood of people in rural area.

1.3 Purpose

The major question studied in this research was: How has the implementation of information and communication technology (ICT) affected different livelihood opportunities for rural people in Nangi village of Ramche VDC in Myagdi District of Nepal?

1.3.1 Objectives

A. NWNP introduce telecenter for first time as a revolution for use of technology in rural Nangi village of Ramche VDC and the researcher is concentrated on understanding whether people’s have access to appropriate ICTs facility in telecenter or have variation in people’s access to ICTs, so this study require to understand up to which level rural people have “access” of ICTs facility in telecenter which make possible for people to use modern technology effectively.

B. Accessible of ICTs in rural Nangi village of Ramche VDC was made possible by NWNP so the researcher effort is concentrated on understanding the affect (impact) of “access” of appropriate ICTs in right time. This requires understanding of the nature of local livelihoods-how they employ ICTs in telecenter to convert livelihood assets to positive livelihood outcomes.

C. People in rural Nangi village of Ramche VDC are facing problem for use of ICTs, so this study focuses on finding major problems faced by people on use of ICTs to meet their daily information needs.

1.3.2 Research Questions

A. In rural Nangi village of Ramche VDC up to which level people have “access” of appropriate ICTs in telecenter which make possible to use modern technology effectively?

B. What are the affect (impact) of “access” of appropriate ICTs in telecenter on converting people assets to positive livelihood outcome in rural Nangi village of Ramche VDC of Nepal to improve people’s livelihood quality?

C. What are the major problems faced by rural people during “access” of ICTs in rural area Nangi village of Ramche VDC of Nepal?

1.4 Topic Justification

According to Nielinger (2003, p.4) “…many more articles have contributed to a deeper understanding of rural ICT access and have brought valuable input for many pilots and
start-ups. However, the debate is still in its infancy”. “Even in the developed world, the successful use of ICTs involves many obstacles. ICT projects are often poorly designed and implemented, and even when successful, it can take decades to reap substantial benefits from them” (SIDA, 2005, p.7). In developing countries ICTs is considered as new technologies for rural society but due to lack of government concern in introducing ICTs (i.e. computer, E-mail, Internet) people are not able to realize the potential of ICTs and are powerless to get bind to the world of information society, so in depth research of these technologies is required to understand how they can be used in socio-economic development effectively and to identify various aspects of poverty that can be addressed by implementation and use of ICTs (Chilimo, 2008). This study is important since the developing countries and their donor agencies make appropriate plans and pick source how to deploy ICT as tools for development goals in health, education, livelihoods and achievement of public development (InfoDev, 2011). On experience of “…the past year Sida, along with most donor and development agencies, has recognized that the time has come to better assess the connection (or lack of one) between the use of ICT and success in poverty alleviation activities” (SIDA, 2005, p.13) to improve the quality of life of rural people. So to make the ICT4D project to implement successfully there is need of consolidated data, evidence and best practices from field base for cooperative development donors and partners to understand how ICTs should be used to bring positive changes on livelihoods of people and reduced poverty because poorly designed ICTs for development projects can waste limited sources of nation, partner agencies as well strengthens the existing inequalities. The field base data and evidence supports development donors to assess the connection between use of ICTs and success of poverty reduction (SIDA, 2005, p.7; Chilimo, 2008, p.12). Beside the huge investment of public, NGO, private sectors in ICTs led development very little impact is seen in rural area since there is lack of knowledge to carry out the impact assessment in rural Nangi village of Ramche VDC (Thapa & Saebq, 2011). Most of the previous studies deal with opportunities and challenges of ICTs intervention but could not answer actual outcome or the impact of ICTs intervention on rural area (Thapa and Saebq, 2011, p.1). “According to Mansell and When (1998, p.95) ‘…ICTs have many revolutionary implications, but in order to achieve their full potential benefits it is necessary to focus on user-oriented and cost effective applications rather than of technology-driven application.’”(Ashraf et al, 2008, p.3). “Therefore, we contend that ICT enabled development needs to be better understood from the participants’ perspectives, providing another dimension and more rigour to the ICT impact research” (Ashraf et. al, 2008, p.3).

“ICT is now recognized to be one of the key sources of growth and competitiveness in the global economy” (infoDev, 2008, p.10) and “ICTs...have been recognized as an important tool in accelerating poverty reduction, increasing productivity, generating economic growth, creating jobs, and facilitating learning, knowledge sharing and global information flows”(ibid, p.10). “Further, while many of the recent studies concerning consumer adoption and usage of broadband (Dwivedi, Khan & Papazafeirpopulou 2007; Choudrie & Dwivedi 2007) appear attractive, these are focused on acceptance and usage of technology which fail to go beyond and understand the socio-economic influences, including the benefits of usage at the community level” (Ashraf et al (2008, p.3). Considering all these view, the study contributes for positive discussion on how far the
ICTs intervention have reached to its desired people and to identify changes brought by use of ICTs (Ashraf et al 2008). “As such ‘…impact evaluation of ICT-led development projects will enable researchers to understand the extent to which activities reach the people and the magnitude of their effects on people’s welfare’ (infoDev 2006, p.7)” (Ashraf et al 2008, p.3).

1.5 Scope and Limitations

In previous studies most researchers were succeed in addressing the challenges, opportunities, and evaluating outcomes of ICTs led development in rural area. Similarly, few projects of ICTs for development (ICT4D) examined the impact of ICTs intervention in rural areas. In this study the extent of ICTs use in rural area, and factor involved for assessment of ICTs led impact will be discussed. The study will also improve an understanding of the impacts of different variables on people’s livelihood as well to assist the ICTs led development practices. In order to have the proper assessment of ICTs impact we have to improve the efficiency and effectiveness of ICT4D projects. For continuous improvement of ICTs impact regular assessment, evaluation, and monitoring is required, also government policy makers should be alert to introduce ICTs strategy. So dealing with inequality, actual need, and policy gap to improve livelihood of rural area is the core part of ICTs led development during impact assessment. ICTs impact study has been carried out in order to understand the human, social, and economic development that have direct relation with peoples livelihood (Ashraf et. al, 2008). There are various challenges, limitation in research during its study period. Lower literacy rate especially in local ethnic mother tongue of people of study area remains the most formidable challenge. Regarding communication very limited infrastructure and basic services such as lack of electricity, terrible road. This research has limitation in time and resources. Data collection and analysis process take more time since I plan to collect data from rural Nangi village of Ramche VDC of Nepal which is located in western part of Himalayan region. All analysis will be based on the information from communities, but some scholar papers will be used in analysis part although community information is primary and journal as secondary. Major information for literature review and analysis will be derived from internet search engines, web based information Google scholars, and LibHub.

1.6 Disposition

This paper has been divided into seven chapters. In first chapter background of research area is presented which is followed by problem area and research questions. The purpose and objectives of study is presented, topic of study is justified by presenting necessary argument to the study subject area. First chapter ends with scope and limitation of study followed by disposition of thesis. Second chapter include information on Nepal background, Nepal wireless networking project, National ICTs policy and Study sites. Third chapter include theories and previous studies related to study are presented. Four chapters include research methodology adapted for the research study. Five chapters include empirical data collected from study field. Six chapters include empirical findings interpretation and seven chapters include summary, conclusion, recommendation, contribution of research and further suggestion for research in area of ICTs in future.
CHAPTER 2
NEPAL BACKGROUND, NWNP PROJECT, NATIONAL ICTs POLICY & STUDY AREA

This chapter gives brief background of Nepal, Nepal Wireless Networking Project (NWNP) and the study area (Nangi village of Ramche VDC) where this study was conducted. This chapter helps reader to know topography of Nepal, background of Nepal wireless networking project (NWNP) and ICTs policy in Nepal in a glance. It too gives the brief description of the village i.e. study area that the researcher have selected to meet the objectives of the study.

2.1 Nepal Background

“Nepal is a landlocked country situated between India and China. It has a total population of 231,51,423 in an area of 147,181 square kilometers with a density of 157 persons per square kilometer” (HMGN, 2002, p.1). The country is divided into three ecological zones: Terrain region 17% of total in south, central mountain region with 64% and 19% Himalayan region in north with more than 100 caste and ethnic groups (HMGN, 2002, p.10; Thapa & Saebq, 2011, p.2). Nepal is divided into 5 development region, 14 zones and 75 districts (Thapa & Saebq, 2011, p.2). In a district there are around 3914 VDCs, the lowest administrative unit in the ward, and each VDC covers 9 wards on average (Thapa & Sein, 2010, p.6). Nepal is one of the world’s least developed countries with 38 percent of people living below absolute poverty line and the scale of poverty is higher in rural areas than in urban areas (UNDP, 2001, p.1; HMGN, 2002, p.1). “Nepal, with an annual per capita income of around US$ 200, is one of the poorest countries in the world (World Bank, 1997)” (Chhetry, 2002, p.294). “It is ranked 129th out of 162 countries on the United Nations human development index” (UNDP, 2001)” (Harris et al., 2003, p.1).

According to Harris et al (2003, p.1) 87 percent of the populations live in rural areas and the country’s employment and economy depend heavily on agriculture. “Likewise, numerous national level surveys have repeatedly shown that over 60 percent of total household income originates from agriculture” (Chhetry, 2002, p.294). “Regional disparities in the incidence of poverty and illiteracy are quite stark in Nepal. In essence, regional disparity is a major dimension of poverty”(Chhetry, 2002, p.294). The incidence of poverty ranges from 44 percent in rural to 23 percent in urban. Likewise the illiteracy rate ranges from 67 percent in rural to 37 percent in urban (Chhetry, 2002, p.295). “Computer ownership per 100 inhabitants is 2.80, and telephone lines per 100 inhabitants are 3.5 (ENRD, 1997)” (Thapa & Sein, 2010, p.6). Similarly, “tele-density data are less than one per hundred in rural areas, while it is around 15 per hundred in urban areas” (Thapa & Saebq, 2011, p.3).

2.2 National ICTs Policy
“Nepal published its national ICT policy in 2001 after approving the final draft in October 2000” (HMG Nepal, 2001)(Harris et al., 2003, p.2). The national ICTs policy identified three critical areas for ICTs strategy formulation which are; universal access to ICTs, education & training for ICTs, and identification & adoption of ICTs application (Harris et al., 2003, p.2). Under the chairmanship of Prime Minister, HMGN established NITDC (National Information Technology Development Council) for providing broad guidelines and directives for nation’s development through use of ICTs (Harris et al., 2003, p.2). MoST (Ministry of Science and Technology) is trusted department of government having responsibility to implement ICTs project in different parts of Nepal for development of people skills, knowledge, livelihood and country itself providing the platform to join the world of electronic information (Harris et al., 2003, p.2; Thapa & Saebq, 2011). NPC (National Planning Commission) develop by MoST for mapping & formulation of ICTs, and promotion of policies, strategies for national development through ICTs which offers a vision for putting Nepal onto the global IT map with in next five years (Harris et al., 2003, p.2). “The NPC has outlined policies and strategies for achieving rural development through the deployment of ICTs” (Harris et al., 2003, p.3). “Among them, it has been stated that IT access will be provided to village communities through community information telecentres, and that the information needs of the people will be researched and appropriate information content developed accordingly” (ibid, p.3).

Nepal government has installed more then 250 telecenter through out the country as a part of ICT4D projects. Telecentre installations are more concentrated in cities and district centre’s to make easy for government workers. “They are more focused in the eastern and southern parts of Nepal where the density of the population is much higher in comparison to the population density of the north-western part of the country” (Thapa & Saebq, 2011, p.3). In rural Nangi village of Ramche VDC people in the community do not have internet, email, or IP telephony services but some community in Nangi village are using internet services using local VSAT technologies operated by the local community groups (Thapa & Saebq, 2011, p.3). Behind these rural areas, some places close to capital cities are not connected through internet services and people of these areas have more priority for face to face communication. In comparison to its neighboring country India and China, Nepal has very less investment on ICTs development. Nepal government national ICTs policy have targeted to run computer class for ICTs literacy at middle and high schools by 2010, also it have targeted to give emphasizes in the promotion of e-commerce, telemedicine, teleprocessing and distance learning for female in village (Harris et al., 2003, p.3).

2.3 Nepal Wireless Networking Project (NWNP)

Mahabir return to his birth place Nangi village after completing his Master’s study from United States to teach village people, where people were restricted from electronic information due to its mountainous topography. To make people of village close to world through use of technology, social activist Mahabir started Nepal Wireless Networking Project (NWNP) in year 1997. NWNP have established its functional office in Himanchal school of Nangi village of Ramche VDC (Village Development Committee) at Myagdi
district which is located at an altitude of 2300 meters above sea level (Thapa & Sein, 2010, p.7). In 1997 Mahabir Pun started to teach computer in Himanchal School with few computers obtain from Australia. By five hour walk to near city Beni from Nangi village of Ramche VDC and two hours bus travel, Pun used to travel to Pokhara to check email. Seeing and understanding all these problems faced by villagers in Himalayan region from close, Pun wrote email to BBC (British Broad casting Corporation) requesting ideas to connect rural mountain region to world of electronic information through internet in 2001. Mahabir get positive response from Europe and United States after BBC disseminate his email. Number of volunteers from Europe and United States visit Nangi village of Ramche VDC to help Mahabir for establishing wireless connection from Pokhara to Nangi village of Ramche VDC installing dish antennas in trees of neighboring village Khopra and Tikot, the center relay station to villages (Thapa & Sein, 2010, p.8). The story of NWNP spread out through WWW (World Wide Web) in world. NWNP a single man project start to get support from various countries like computers & their parts, Wi-Fi (Wireless Fidelity) equipment, individual skills and knowledge (Thapa & Sein, 2010, p.8).

Though there was long civil conflict between government & Maoist in Nangi village, and lack of government fund NWNP was successful in establishing telecenter operation in Nangi village of Ramche VDC of Myagdi district. Due to lack of fund NWNP uses minimal wireless technology, home-made antennas hidden on the tree at relay stations for communication (Thapa & Sein, 2010, p.8). For this innovative work (i.e. connecting rural people to world through internet where people have never seen and heard about computer, which is a single person investment and dedication) Mahabir Pun was awarded prestigious award Magsaysay award in 2007. In direct support of World Bank and authority of NTC (Nepal Telecommunication), NWNP have expanded its network in more then forty village of Myagdi and other district (Chilimo, 2008; Thapa & Sein, 2010). NWNP is moving with slogan telecenter village by village to connect people to information age. In collaboration with international donor agencies NWNP is testing online based learning in Himanchal telecenter whose main aim is to provide quality education to youngsters living in village through online. Tele-teaching and telemedicine services are initiated to overcome the shortage of experienced doctors and teachers to the village. Teachers and student take training on computer and other teaching material from experts of cities through tele-teaching without going to city. Health workers from village consult with experts in cities for checkup and prescription through videoconference established in telemedicine room. In association with Gandaki Software Engineering College, NWNP develop E-Commerce website for village which aims to do trading of locally produced goods through internet. The main aim of NWNP is to connect rural village of Myagdi district through internet to information society of world to contribute in improvement of rural livelihood (Thapa & Saebq, 2011, p.3).

2.4 Study Area

The site for the study was Nangi village of Ramche VDC of Myagdi district located at southern part of Himalayan region of western Nepal. Village development committee (VDC) is over village and controls the wards of village. Researcher chooses this village
because Nangi village of Ramche VDC was the first Himalayan rural region connected to electronic world through internet by support of NWNP. NWNP established at Himanchal School (also a telecenter) manages, maintains, and coordinates wireless network throughout the village in Myagdi district. Understanding the need of electronic world, NWNP has now started to expand its services and telecenter network other rural and remote areas of the country (Thapa & Sein, 2010, p.8). The population is around 2000 in Nangi village of Ramche VDC. People migrate to urban areas for better life or to have better education, health services and better job. Though, muddy roads is accessible to Nangi village from city Beni it still takes four hour drive on four wheel jeep which is very terrible or a day walk from city Beni (Thapa & Sein, 2010, p.8). The majority of group in this area is of Magar ethnics, with minor ethnics like Brahmin, Chhetry, and Bishwakarma. Due to unsuitable/unfertile land for residence and earning daily livelihood in rural Nangi village of Ramche VDC people are scattered in small clusters finding the suitable land (Thapa & Sein, 2010). Social network was limited among the people, and decision making process was fully depended on community leaders before NWNP was launched (Thapa & Sein, 2010, p.8).

In Nangi village of Ramche VDC health center are established and telemedicine is being run by Himanchal School to treat diseases of villagers contacting doctors in Capital through video conference but still people give first priority to traditional healers. Most middle age people in this area are farmers growing traditional crops like potatoes while most of youths give priority for arm force in India and United Kingdom because in India, British arm force more priority is given to physical fitness then high level of education, so younger generation of this village prefer to join military service rather going for higher studies. Remittances obtained from family members staying in foreign country and money earned by selling local products is the source of revenue (Thapa & Sein, 2010). The pictures taken during my study in the research site are presented on Appendix 1 showing technical infrastructure adopted by NWNP to implement ICTs, train people on use of ICTs, and interview conducted with respondents in ward 1, 2, 3 & 4 of Nangi village of Ramche VDC.

![Figure 1: Map of Nepal showing research sites Nangi village of Ramche VDC](Source: www.planetware.com)
CHAPTER 3
LITERATURE REVIEW AND CITATION

This chapter gives an idea of literature review for readers and how literature related to Information and Communication Technologies, Socio-Economic Development, Digital Divide and Sustainable Livelihood are organized in the research study. To provide clear understanding of research area problem, related literatures are reviewed, research works are discussed and available information and facts are explored.

3.1 Literature review definitions

According to Hart (2005) literature review is defined as selection of both published and unpublished documents on the available topic which contains information, ideas, and data written from particular point of view to fulfill aims and views based on the nature of the topic. Literature review explores available information, facts in the study area helping researcher to understand and establishing connection between research area problem and available information, facts and scholar papers (Hart, 2005). In order to receive initial picture of the study, literatures and related work by scholar on ICTs for rural community have been found.

3.2 Theoretical framework of study

This section provides brief description on theories and theoretical framework from different perspectives that guides this study. “Theory has been defined by Kerlinger as ‘a set of interrelated constructs [concepts], definitions, and propositions that presents a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting the phenomena’ (Kerlinger, 1970)” (Cohen et al, 2000, p.11). “In a sense, theory gathers together all the isolated bits of empirical data into a coherent conceptual framework of wider applicability” (Cohen et al, 2000, p.11). “More than this,..., theory is itself a potential source of further information and discoveries” (Cohen et al, 2000, p.11) and “…it identifies critical areas for further investigation; it discloses gaps in our knowledge; and enables a researcher to postulate the existence of previously unknown phenomena” (Cohen et al, 2000, p.11). Anfara & Norma (2006, p.xxvii) “define theoretical frameworks as any empirical or quasi-empirical theory of social and/or psychological processes, at a variety of levels (e.g., grand, mid-range, and explanatory), that can be applied to the understanding of phenomena”. “For Merriam, the theoretical framework is derived from the “concepts, terms, definitions, models and theories of a particular literature base and disciplinary orientation” (p. 46), and affects every aspect of the study, from determining how to frame the purpose and problem, to what to look at and for, to how we make sense of the data that are collected” (Anfara & Norma, 2006, p.xxiii-xxiv).

3.3 Information and Communication Technologies (ICTs)
Heeks (2002) defines ICTs as “electronic means of capturing, processing, storing and communicating information”. Information and communication technologies (ICTs) involve innovations in microelectronics, computing (hardware & software), telecommunications, micro-processor, semiconductors, and fiber optics (UNDP 2001). “These innovations enable the processing and storage of enormous amounts of information, along with rapid distribution of information through communication networks” (UNDP 2001, p.30). “ICTs are those technologies that can be used to interlink information technology devices such as personal computers with communication technologies such as telephones and their telecommunication networks” (Chapman et al, 2003, p.5) for example laptop with email and internet. “Michiels and Van Crowder (2001) have defined ICTs ‘as a range of electronic technologies which when converged in new configurations are flexible, adaptable, enabling and capable of transforming organisations and redefining social relations’” (Chapman et al, 2003, p.5) which “…can now be linked to others to share and exchange information and allow it to be used in such a way that they can also be categorised as ICTs” (Chapman et al, 2003, p.5). ICTs can be categorized based on time, how long that it has been used (SIDA 2005, p.16).

- **New ICTs** include computers, satellite, wireless one-on-one communication (including mobile phones), electronic mail and internet.
- **Old ICTs** include radio, television, landline telephones and telegraph.

“ICTs, therefore, are an expanding assembly of technologies that can be used to collect, store and share information between people using multiple devices and multiple media” (Chapman et al, 2003, p.5). The synergetic ICTs relationship is shown below.

![Dynamics of ICTs](Source: Yusoff & Lim, 2003, p.2)

In order to understand what ICTs can represent, it is necessary to found broader definitions of people centric approach, attention can now be given to some critical factors (i.e. local accessibility and human networks) for ICTs and development initiatives to co-exist (Yusoff & Lim, 2003, p.2). “Accessibility can represent not only the obvious physical access to ICT infrastructure, but also context-sensitive access in terms of local
language and relevant content” (Yusoff & Lim, 2003, p.3) for rural people. To understand ICTs it is necessary for ones to understand the pre-existing role of information with in development which includes process and outcomes (Heeks, 2002, p.2). Process is changing data with potential value into information with actual value and move from source to recipient through communication network i.e. internet, where electronic handling of these processes is main contribution of ICTs (Heeks, 2002, p.2). The outcome of ICTs in development is learning and decision making where information is transformed into knowledge as an input for decision making and actions (Heeks, 2002, p.2).

3.4 Telecenter Definition

“A telecenter is a public facility in the community that affords people the opportunity to use computers, networks, copiers, scanners, telephone, community, printed materials, and audio and video resources for information searching, communication, training, and entertainment” (Colle, 2002, p.102). Telecentres provide telephone services to remote and rural people and is equipped with computers, access to the internet, printers, copier, fax, scanner, television and video recorders with an aim to expose remote and rural people for potential use of various forms of ICTs (Oludolapo & Osunkunle, 2010). Around the world there are great variety of telecenter experiences so these diverse initiatives is given different names such as telecottage, community technology centers, and communication shops (Gomez & Hunt, 1999, p.17). Telecentres may be independent individual agencies or enterprises and project of a national agency operated by government departments, schools, community organization and NGOs (Jensen & Esterhuysen, 2001, p.4). Telecentres are found in co-operatives, libraries, community centres (Jensen & Esterhuysen, 2001, p.2). Telecentres believe to be relevant to community and integral part of community they serve. Today, multi-purpose community telecenter owned by community are more focused because of their potential to address the needs of people. “MCTs are generally seen as structures that can encourage and support communities to manage their own development through access to appropriate facilities, resources, training and services” (Jensen & Esterhuysen, 2001, p.2). “Telecentres may be used to provide access to distance education, employment opportunities, training and business enterprise” (Jensen & Esterhuysen, 2001, p.2) with access to telephone, faxes, email, internet and other information services to meet people needs.

Telecenter especially vary in their size, facilities and services based on location, weather they are in rural or urban area and weather they are in developed or developing countries (UNESCO, 2010). According to Jensen & Esterhuysen (2001, p.2-3) telecenter are categorized on basis of sizes, type of equipment they have and service they provide. Based on these categories telecenter are categorized:

- Micro telecenter are set at shop which provide pay phone with smart card reader and receipt number.
- Mini telecenter offer single phone line with three in one scanner/printer/copier/fax machine and internet access.
Basic telecenter offer number of phone lines, scanner/printer/copier/fax machine and internet access.

Full service telecenter offer many phone lines, scanner/printer/copier/fax machine, internet access, video camera, projector and video conferencing room.

3.5 ICTs, Telecenter in Developed Countries

According to Bernhardson cited by (Fuchs, 1998, p.46-47), Faergelanda was the first telecenter established on late 1985 in Sweden. The objective of telecenter in Sweden was to educate staff for industry & local government, supply telecommunication equipments, give guidance to local people, and increase working opportunities. The movement of telecenter was very quick throughout the world with in 10 years after introduction of telecenter in rural area of Sweden (Fuchs, 1998, p.8). It has been helping farmers to develop ICTs skills and expand the use of ICTs effectively in generating economy (Fuchs, 1998, p.33). Telecenter in rural area of developed countries build demand and awareness for better access of ICTs services (Fuchs, 1998, p.58). These centers are means for learning process, as it provides ICTs skills and knowledge to direct towards use of ICTs tool (Fuchs, 1998, p.9). In Wales and Australia telecenter focuses on training and education services (Fuchs, 1998, p.58). Short cited by (Latchem & Walker, 2001, p.18) says telecenter in Australia not only address educational network but also provide technology network for government and local community services. Countries like Canada, Chile, Costa Rica, United States and South Africa established telecenter to keep their economy growing, generate welfare for citizens, remain competitive, preserve democratic stability and reduce gap between rich and poor to prevent it from being more thick (Proenza et al, 2001). Downer cited by Fuchs (1998, p.16) point out telecenter in Canada helps to develop local skills of human resources through software application, E-mail, online databases, internet and World Wide Web (WWW), and business community development through business support services. Telecenter were established in rural and remote areas of developed countries like Europe, North America and Australia after the first telecenter was inaugurated in Sweden. These telecenter were closed when government withdraw the support. Since, there is significant difference between developed and developing countries because remote people in developed countries have their own telephone line and can afford to buy computers (Ernberg, 1998). People are more exposed to modern technology and have better access to computer training and computer education to develop individual technology skill in comparison to remote people in developing countries (Ernberg, 1998).

3.6 ICTs, Telecenter in Developing Countries

The potential of information and communication technologies (ICTs) is recognized in developed countries, when “Telecentres have considerable potential for narrowing the “digital divide” in remote, rural and otherwise disadvantaged communities” (Latchem & Walker, 2001, p.1). These potential are recognized by international aid agencies and are supporting for implementation of telecenter project in developing countries (Latchem & Walker, 2001, p.viii). In rural area of developing countries, telecenter are the gate way for rural people to access telecommunication services i.e. phone shops or public cal
offices. In today's time “…telecentres have become a vehicle for a wider variety of ICT services and applications, taking advantage of the growing availability and access speed options for Internet service” (Latchem & Walker, 2001, p.3). In developing countries rural telecenter help to “…take advantage of the information economy, access education, government information, healthcare and other services, and develop socially and economically” (Latchem & Walker, 2001, p.1). “Telecentres vary a great deal, especially in their size, facilities and services, according to whether they are rural or urban and whether they are located in the developed or developing world” (Latchem & Walker, 2001, p.3). The financing of telecenter varies according to whether center being implemented in developing countries or in developed countries (Latchem & Walker, 2001, p.7). Telecenter in developed countries are initially or partially funded by state or provincial governments, or federal government (Latchem & Walker, 2001). In developing countries, telecentres are almost exclusively funded by international aid agencies (i.e. UNDP, IDRC and World Bank) and are owned and/or managed by national or local NGO’s (Latchem & Walker, 2001, p.9). “However, telecentres in developing countries may enjoy certain financial advantages over those in developed countries” (Latchem & Walker, 2001, p.9).

3.7 Digital Divide and Access to ICTs

The intervention of ICTs led to technological revolution in globe changing the global social and economic condition making use of these technologies. In the globe, due to technology revolution developed countries become society of electronic information, and developing countries are involved in bridging digital divide by making effective use of ICTs among rural and remote people. Rural people of developing countries still do not have access to ICTs due to lack of ICTs facilities and low income to afford ICTs facilities (Oludolapo & Osunkunle, 2010, p. 373). “According to Lesame (2005: 3), the term “digital divide” refers to ‘the gap between the access of individuals, households, organisations, countries and regions at different socioeconomic levels of ICTs and Internet usage’” (Oludolapo & Osunkunle, 2010, p.377). “This shows that digital divide not only refers to the gap that exists between the impoverished, poor, rural “have-nots” and the affluent, rich, urban “haves”, but it also points to the divide that exits between the underdeveloped and developed nations of the world (Osunkunle, 2008)” (Oludolapo & Osunkunle, 2010, p.377). “The term ‘digital divide’ describes the fact that the world can be divided into people who do and people who don’t have access to - and the capability to use -modern information technology, such as the telephone, television, or the Internet” (Gurstein, 2007, p.44). In the world one third of population do not have phone calls and seventy percent of world population lives in rural areas where access to information and communication technologies is of scarce (Gurstein, 2007, p.45). “Most of the information exchanged over global networks such as the Internet is in English, the language of less than ten percent of the world’s population” (Gurstein, 2007, p.45). Digital divide exist due to “…socio-economic inequalities and can be characterized by insufficient infrastructure, high cost of access, inappropriate or weak policy regimes, inefficiencies in the provision of telecommunications networks and services, lack of locally created content, and uneven ability to derive economic and social benefits from information-intensive activities” (Gurstein, 2007, p.45). A person is more likely to be excluded from
information flows and networks if he/she have lower income and education level (WorldYouth, 2003, p.316). “The digital divide is not a single thing, but a complicated patchwork of varying levels of ICT access, basic ICT usage, and ICT applications among countries and peoples” (Bridges.org, 2003, p.4). In order to develop the concept of physical access to ICTs, term real access is needed “access that goes beyond just physical access and makes it possible for people to use technology effectively to improve their lives” (Bridges.org, 2003, p.11) closing the digital divide.

3.8 Information Chain Model

ICTs in telecenter disseminate processed electronic information according to the user’s request which contribute in socio-economic development, so in order to understand the necessary resources and activities needed for information to contribute to development, it is important to know the information chain (Heeks, 2005, p.1). The chain presents interconnection between data and effective actions for development (Heeks, 2002, p.7). Therefore “…access to data and access to ICTs might be necessary, but they are far from sufficient conditions to enable effective development” (Heeks, 2002, p.8) because to make ICTs intermediaries truly effective information chain resources i.e. social and economic resources must be provided. “More generally, all those involved with ICTs must adopt an interconnected approach that ensures an ‘information chain package’: not just technology but also the data, economic, social and action resources that are required to turn data into learning, decisions and actions of value” (Heeks, 2002, p.8). The study also found to understand the information related divides, and information should be result as process of accessing, assessing and applying data (Heeks, 2002; 2005). Data remain as data unless people have skills to transfer it into useful information or knowledge. Data are used as the input which is then processed assessing its relevance and applying assessed data to specific information as the output. Information of ones can be the data of other who has no valuable meaning (Heeks, 2002; 2005). “Finally, the information chain model also suggests ways in which ICTs may be a divergent rather than convergent technology” (Heeks, 2002, p.8). Today ICTs tools techniques are introduced and those who have information chain resources are likely to benefit and those who do not may not benefit (Heeks, 2002).

![Figure 3: Information Chain (Source: Heeks 2005)](image)

Heek’s information chain is a useful technique to understand ICTs led impact because it demonstrates how an individual processes data into information and act upon it to
achieve desired outcomes. According to Heeks (2002; 2005) information chain should be understood in context of economic, social, data and action resources which assist human beings to transfer data to information to acquire better livelihoods. Access to information via internet is not very difficult task since greater challenge is the assessment and transformation of data to meaningful knowledge as well as the availability of social resources. Hence, people capabilities to access and assess data and acquire and share knowledge need to be considered in developing countries (Ashraf et. al, 2008). We can use information chain to examine effectiveness of ICT4D projects, since most of ICT4D projects address only technology component of economic resources affecting other resources (social & action). In poor community of rural area telecentre provide information but rural people do not understand the content, and relevancy of content they access. Also through telecentre services poor community identify new markets for local products but are unable to deliver good to market due to terrible road and unaffordable transportation cost. All these lacking resources makes information chain un-functional and lead ICT4D projects to fail to produce significant impact in the community of rural area (Heeks, 2005).

3.9 Knowledge and Rural Development

“The power of knowledge for development was highlighted in the 1998/99 World Development Report (World Bank, 1999) which states that ‘recognition of the importance of knowledge has gained momentum, and there is a renewed impetus to integrate knowledge into countries’ development strategies’” (Chapman & Slaymaker, 2002, p.4). “The power of knowledge for development can be greatly enhanced by ICTs if they are harnessed to improve access and break down barriers to knowledge because ‘while education develops cognitive skills, information gives content to knowledge’ (UNDP, 2001:35)” (Chapman & Slaymaker, 2002, p.4). For understanding the potential of collective knowledge ICTs use is important as technologies represents as tools for achieving development and not merely the rewards of it (UNDP, 2001 cited in Chapman & Slaymaker, 2002, p.4). World development report focuses on knowledge gaps which refer to unequal distribution of technical knowledge. Emergence of knowledge economy through technology revolution and unequal distribution of information results in information problems that contribute to underdevelopment. ICTs improve the access to knowledge and information exchange addressing both barriers to rural development through its potential (Chapman & Slaymaker, 2002). To achieve these needs, ICTs can be used strategically by understanding the potential of technologies in social, political and cultural context in which ICTs could be used (Chapman & Slaymaker, 2002, p.30). “The strategic use of ICTs for poverty reduction will depend on developing the appropriate infrastructure to enable economic development and appropriate information content for the necessary social and human development to occur (Skuse, 2001)” (Chapman & Slaymaker, 2002, p.5). Considering these infrastructure help to inform future rural development strategies, assessing information users and their knowledge need. In technological revolution of the world, ICTs come as an important driving force for people and world to knowledge economy but ICTs development to-date has not been geared towards addressing specific needs of rural and remote people (Chapman & Slaymaker, 2002, p.5).
3.10 Sustainable Livelihood Framework

In order to understand the impact of ICTs use on livelihood of rural people in Nangi village of Ramche VDC this research study set out the asset pentagon model which is core components of sustainable livelihood framework (Thapa & Saebq, 2011, p.2) as shown in Appendix 2. Asset pentagon composed of five assets which show interrelationships of various capitals: social capital, human capital, financial capital, physical capital and natural capital. The implementation of ICTs for development generates multiple opportunities, so any single capital of asset can be “necessary condition” but not “sufficient condition” to achieve overall socio-economic development (Thapa & Saebq, 2011, p.2). The sustainable livelihood framework is a tool used for planning and assessing ICTs intervention in development. It focuses on how people strategically use the resources available to them to forge the livelihoods, and how ICTs interventions in development affect the available resources and the way people interact with them. The framework is particularly promising for assessing early and probable future impacts at community level of rural area (Parkinson et al., 2006).

The sustainable livelihood framework is centered on people. This framework focuses on understanding the strength of rural people, how people accept capital to convert into positive livelihood outcome. No single category of capital is sufficient enough to provide positive livelihood outcome that people are looking for. It’s true for people who have limited access to capital in rural area, so people in rural area should look for new ways to guarantee the survival. Improved understanding of rural livelihood helps donor agencies for designing effective ICTs led development projects (DFID, 1999, p.1). The livelihood framework helps people in rural area with different perspectives to engage in structured contest, about the factors that affect livelihoods, their relative importance and the way in which they interact, and should help to identify suitable entry point for support of livelihoods (DFID, 1999, p.1). The framework presents main factor that affects people livelihood and relationship among them. Sustainable livelihood framework plan new development activities and assess contribution to livelihood sustainability made by existing activities (DFID, 1999, p.1). The framework includes following component: capital assets, vulnerabilities context, processes and livelihoods outcomes. All these components present factors that affect the rural people’s livelihood and their relationships. The livelihood framework identifies five types of capital upon which livelihoods are built. Increasing ownership to use these capitals can provide support to rural people livelihood and reduction of poverty (DFID, 1999, p.5). The model of asset pentagon is shown in Figure 4.

**Human capital** “represents the skills, knowledge, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives” (DFID, 1999, p.7). “Many people regard ill-health or lack of education as core dimensions of poverty and thus overcoming these conditions may be one of their primary livelihood objectives” (ibid, p.7).

**Social capital** “…in the context of the sustainable livelihoods framework…is taken to mean the social resources upon which people draw in pursuit of their livelihood
objectives” (DFID, 1999, p.9) that is developed through networks and connectedness that increase peoples trust and ability to cooperate, membership of more formalized groups and their system of rules and sanctions, relationships of trust which facilitate cooperation reducing transaction cost for rural people (DFID, 1999, p.9).

Financial capital “denotes the financial resources that people use to achieve their livelihood objectives” (DFID, 1999, p.15) such as cash or equivalent i.e. available stock (cash, bank deposits, livestock and jewellery) and regular inflows of money (labour income, pensions, transfer from states and remittances) that enables people to adapt different livelihood strategies (ibid, p.15).

Natural capital “is the term used for the natural resource stocks from which resource flows and services…useful for livelihoods are derived” (DFID, 1999, p.11) such as land and forest.

Physical capital include necessary commodities and infrastructure needed to support livelihoods such as affordable transport, secure shelter and buildings, adequate water supply and sanitation, clean affordable energy and access to information (DFID, 1999, p.13).

![Figure 4: Asset Pentagon](source: DFID, 1999)

The vulnerability context frames external environment in which people exist where the existence is affected by population trends, economic shocks, civil conflict, natural shocks, and seasonal changes of prices, production and employment. In the livelihood framework structure and processes are the institutions, organizations, policies and legislation that shape livelihoods of rural people ((DFID, 1999). Strategies in livelihood denote combination of activities that rural people can adapt to achieve their livelihood goals. Through adjust of these strategies livelihood outcome is achieved such as improved income source, reduced vulnerability, improved sense of well being and increased sustainability of natural resources (DFID, 1999, p.25).
<table>
<thead>
<tr>
<th>Capital Asset</th>
<th>Potential Positive Impact of ICT</th>
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| Natural Capital (natural resource stocks) | • Mapping for land and resource security  
• Improved access to natural resource management institutions for land tenure and conflict resolution |
| Social Capital (relationships and networks) | • Improved global and national communication for family and social networking  
• Expanded social networks  
• Link to local and national governments  
• Advice and counselling for life events  
• Remote education links |
| Human Capital (skills, knowledge and basic health) | • Better access to information in local languages  
• Distance learning  
• School connectivity  
• Health advice and access to healthcare  
• Capture and storage of indigenous knowledge  
• New working skills |
| Physical Capital (basic infrastructure needs) | • Access to ICTs  
• Access to cheaper production equipment |
| Financial Capital (income, savings, credit) | • Increased profit margins through better access to market information  
• Potential for improved access to financial services  
• Remittances from migrant workers  
• Reduction in transport costs |

Table 1: Relation between ICTs and Livelihood Framework  
(Source: Silva, 2008, p.35)
According to Silva (2008, p.34-35) ICTs always have key role to mitigate context of vulnerability in people’s life and improve their assets which have direct relation with their livelihoods. ICTs always facilitate to select best strategies to have positive outcomes on rural people’s livelihood. For these sustainable livelihood framework provides best guidelines for researcher to study impact of ICTs on livelihood of people by linking between ICTs and assets, mitigating vulnerabilities faced by rural villagers to have better livelihoods as shown in Table 1. “Prof. Bhatnagar of the Indian Institute of Management, Ahmedabad, emphasizes that bridging the divide is not merely increasing the number of telephone lines or providing improved Internet access, but is basically about impacting the lives of people and empowering them through ICT” Singh (2006, p.4). So, in this study sustainable livelihood framework is useful. The activities of ICTs are fundamental element of rural development. According to Thapa & Saebq (2011) rural area are characterized as information poor where poor people typically lack access to information that is vital to their livelihoods and need of information has always become component of rural development (Thapa & Saebq, 2011). The livelihood framework does not necessarily aim at addressing all aspects of the livelihoods of the rural people in single intervention. The implementation of Nepal Wireless Networking Project (NWNP) in Nangi village of Ramche VDC has provided opportunity for rural people to access internet based information which focuses on vulnerability context and bring changes on livelihood assets (Thapa & Saebq, 2011).
CHAPTER 4

RESEARCH METHODOLOGY

The study purpose was to investigate: How has the implementation of information and communication technology (ICT) affected different livelihood opportunities for rural people in Nangi village of Ramche VDC in Myagdi District of Nepal? The objective of this study was to find out up to which level rural people have access to ICTs facility in telecenter and whether people are aware of it. Second, the changes introduced in livelihoods of rural people through intervention of ICTs, and lastly the problem faced by rural people for accessing ICTs facility in telecenter. To investigate these objectives empirical data was collected from actors involved in use and non-use of ICTs facility in telecenter. Interpretive case study research design with qualitative data collection method was adapted to response these objectives. This chapter also discusses data collection method, data analysis procedures, validity & reliability, ethical considerations, and problems involved directly or indirectly at the time of data collection in the research site Nangi village of Ramche VDC of Nepal.

4.1 Knowledge Claim

It is proposed that this research will follow social constructivist philosophy as the knowledge claim. According to Creswell (2003, p.8) social constructivists “hold assumptions that individuals seek understanding of the world in which they live and work”. “Individuals develop subjective meanings of their experiences” Creswell (2003, p.8) which leads the researchers “to look for the complexity of views rather than narrowing meanings into a few categories or ideas” (ibid, p.8). The goal is to rely as possible on participant’s views of the situation being studied where subjective meanings are negotiated socially and historically. Social “constructivist researchers often address the processes of interaction among individuals” but, “They also focus on the specific contexts in which people live and work, in order to understand the historical and cultural settings of the participants” (Creswell, 2003).

4.2 Research Purpose

According to Johari (2009, p.25) interpretive studies involve understanding the phenomenon subjectively. “The criteria adopted in classifying interpretive studies were evidence of a nondeterministic perspective where the intent of the research was to increase understanding of the phenomenon within cultural and contextual situations; where the phenomenon of interest was examined in its natural settings and from the perspective of the participants; and where researchers did not impose their outsiders’ priori understanding on the situation (Orlikowski and Baroudi, 1991, p.5)” Johari, 2009, p.25). “The use of interpretivism as a legitimate approach for understanding human interaction with and around IT is now relatively established in the IS field” Doolin & McLeod (2005, p.245). The author “might characterize interpretive IS research by an intention to understand “the context of the information system, and the process whereby
the information system influences and is influenced by its context’ (Walsham, 1993, pp. 4–5)” (Doolin & McLeod, 2005, p.245). So, it is proposed this research will follow interpretive paradigm and interpretive case studies as core because researcher is examining the level up to which rural people has access to ICTs facility and how intervention of ICTs leverage for change in livelihood of people in Nangi village of Ramche VDC through ICTs enabled services and the variable involved are ICTs, and citizen. Interpretivism claims reality and knowledge of reality is social product which can’t be understood alone without social actors who make reality meaningful (Doolin & McLeod, 2005), so interpretivist believes each individual have different meaning for same system in the world (Doolin & McLeod, 2005). Further more, interpretive techniques allow participants to use their own words and images and to draw on their own concepts and experiences.

“Interpretivism indeed is the best epistemology when the primary endeavour of the research is to describe, interpret, analyze and understand the social world from the participants’ perspective and any rigid a priori researcher-imposed formulations of structure, function, purpose and attribution are resisted (Glaser and Strauss, 1967)” (Johari 2009, p.27). Finally “interpretive study would provide an excellent guideline as to how interview should be conducted or more importantly how the case studies are interpreted” (Johari, 2009, p.26). Interpretive which is understood “as the ‘umbrella’ term would assist in filtering participants’ statements and actions through the lens of the researchers own subjectivity, and then produces a ‘story’ about the events that have occurred and some reasons for them (Walsham, 2001 p. 7)” (Johari, 2009, p.26).

4.3 Research Approach

According to Creswell (2003) research can be classified into qualitative, quantitative and mixed method research. As mentioned by Myers & Advison (2002) “Quantitative research methods were originally developed in the natural sciences to study natural phenomenon”. This method is well accepted in social sciences including survey methods and experimental study. It is also known method for hypothesis testing in research. “Quantitative research is a means for testing objective theories by examining the relationship among variables” (Creswell, 2008, p.4) where the variables can be measured in form of numeric patterns. These numerical patterns are analyzed using statistical procedures (Creswell, 2008).

According to Myers & Advison (2002) Qualitative research methods were developed in the social sciences to study social and cultural phenomena. This method is design to help researchers to understand people, social and cultural context with in they live. “Qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem” (Creswell, 2008). Action research, case study and ethnography are types of qualitative research. In qualitative research data can be collected from interviews, focus group discussion, direct observations and documents (Creswell, 2008). Understanding the research approaches helps to determine the best approach for the research. Qualitative research is suitable for the research. The research topic and specific problem area are more about theories rather than numeric data. The
ultimate target of this research is to investigate the impact of ICTs intervention in the livelihood of rural people, so the interaction of the researcher will be with the community. Thus qualitative research is found more appropriate than other research approach (Shrestha, 2010).

4.4 Research Strategy

The primary purpose of this research plan is to examine access to ICTs facility in telecenter, its uses and the impact brought by the uses of ICTs facility in the livelihood of rural people, so this research is primarily qualitative in nature and accomplished with case studies. “According to Orlikowski and Baroudi (1991), case study is one of the primary research designs for IS research, besides laboratory experiments and surveys. In fact case study research is the most common qualitative method used in information systems (Orlikowski and Baroudi, 1991)” (Johari, 2009, p.26). “Yin (1994) proposed that a case study is an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (p. 13)” (Johari, 2009, p.26). Also according to Yin the research questions are more explanatory in nature and are most likely in the forms of “how” and “why” (Yin, 1994). “Thus an important thing to note is that case study can be positivist (Yin, 1994; Benbasat et al, 1987), interpretive (Walsham, 1993), or critical, depending upon the philosophical stance chosen by the researcher” (Johari, 2009, p.26). In this research interpretive case study allowed investigation of specific instances in the attempt to understand the ICTs use and impact of ICTs intervention on livelihood of rural people. In the study researcher focus on people from different group in single environment, i.e. users and non-users of ICTs facility provided by telecenter in Nangi village of Ramche VDC because this is the first Himalayan region to establish ICTs facility through telecenter. The research study examine access to ICTs facility available in telecenter and the changes introduce in livelihood of rural people of Nangi village of Ramche VDC through use of ICTs, where interviewed people involved in formal and informal sector provide different information. Thus single case study with embedded unit will be followed to address the case and force researcher to give more attention to the case (Yin, 2003).

4.5 Research Design

According to Yin (2003) five components of research design are important for case studies. In this research study these five components will be followed while making case study research design.

A. Study Question: How has the implementation of information and communication technology (ICT) affected different livelihood opportunities for rural people in Nangi village of Ramche VDC in Myagdi District of Nepal?

B. Its Proposition: Each proposition directs attention to something that should be examined with in the scope of study. In this study ICTs use and ICTs impact in rural people life will be examined to answer research question.
C. Its Unit of Analysis: This study is based on investigating the influences of the ICTs intervention in rural area. This study will be conducted on rural Nangi village of Ramche VDC.

D. Logical linking the Data to Propositions: In this study, I will analyze interpretive case study with interviews. As the research is based on qualitative approach it proposed that data from interviews will be in high priority and this data will help to figure out research problem describing theoretical perspectives for assessing the impact of ICTs intervention in rural area.

E. Criteria for Interpreting the Findings: Linking all the necessary data to the propositions, I will see weather the data and result matches with the research problem, and theory.

“Analysis of case study is qualitative and interpretive based on Klein and Myers (1999) principles for conducting and evaluating interpretive field studies…” (Singh et. al, 2008, p.470) on ICTs led development. The impact is discussed under social, human, and financial capital interpreted from the outcomes of the ICTs initiatives. It is important to note that many of the ICTs initiatives are connected to improve the livelihood of rural people (Singh et. al, 2008, p.470).

4.6 Source of Data Collection

Qualitative research tells about component of social world that remain unseen to more traditional methodological techniques interviews and observation. In this study three different instruments are used for data collection: structured & semi-structured interview, focus group discussions and observations of event or phenomenon. The use of number of instrument helps researcher to collect data in detail from interviewed person with their different point of view from study area. In the study area rural people speaks local language (Nepali) and entire interview questions was converted to Nepali language to make simple for local people to understand the interview question. This helps to get factual data from user and non-user of ICTs. Before interview consent form was asked to sign with interviewed person if they agree to participate in interview as shown in Appendix 4. All the empirical data collected from interviewed person was recorded in note book indicating date of interview. The voice of few interviewed person was recorded in local language in voice recorder which was later transcribe to text in English to make easy for national and international academicians to understand the empirical data.

4.6.1 Interviews

“Interviews are typically a face-to-face conversation between the participant and the researcher (Gubrium & Holstein, 2002)” (Srivastava, 2009, p.75). It is one of the common and powerful ways in which researcher try to understand the society in large. In research specially qualitative, interviews are not recognized as neutral tool for data gathering but it’s an active interaction between people for examining “how” or “how” also “what” question leading to contextual negotiation, which more often like conversation (Ratcliffe, 2002, p.20). “Interviewing itself has become institutionalised, with a set of rules and roles, which are widely known and broadly shared” (Ratcliffe,
2002, p.20). “It is now part of a mass culture, whereby oral examination in various forms has emerged as the most practicable mechanism for obtaining information about individuals, groups and organisations” (Ratcliffe, 2002, p.20). “And, in this way, the interview really has become a means of contemporary story-telling (Gubrium and Holstein, 1997)” (Ratcliffe, 2002, p.20).

4.6.2 Structured Interviews

“Familiarly, the structured interview is where the interviewer [or researcher] asks all the respondents [Users and Non-Users] the same series of pre-established questions with a limited set of response categories” (Ratcliffe, 2002, p.20). In addition, “…there is seldom much flexibility in the way questions are asked and answered in the structured interview setting; a standard set of guidelines normally is employed; the interviewer plays a neutral role; little room is allowed for improvisation; and basically nothing is left to chance” (Ratcliffe, 2002, p.2).

4.6.2.1 Structured Interview Protocol

For purpose of this study, structured interview was conducted with Users and Non-Users of telecenter. User and Non-user are used in relation to usage of electronic information in telecenter. Rural people can be user of electronic information and can be non-user of telecenter (Ellen, 2000, p.70). Users are categorized as a person who have visited telecentres and have used electronic information, at the same time Non-Users are categorized as person who have never used electronic information and never visited telecenter, so to interview these actors on “access” of ICTs and its use closed and open ended question was developed (Ellen, 2000, p.70; Chilimo, 2008). The empirical data collected from interviewed person (i.e. users & non-users of ICTs) was recorded in paper in written text based on interview protocol as presented in Appendix5. In ward 1, 2, 3 & 4 of Nangi village of Ramche VDC researcher spent four days (March 11, 2011- March 14, 2011) to interview different person (i.e. users & non-users of ICTs) who agree to participate in interview. The interview period lasts from thirty minute to forty five minute depending upon the participants. Since Nangi village of Ramche VDC is rural himalayan region and people used to live in cluster at varying distance; it was very difficult to find people in their home because they used to go for their daily earnings in the farming field, so researcher was engaged in the study field from morning nine to evening six o clock for four days to interview people who agree for interview.

4.6.3 Semi-Structured Interviews

Generally “…the semi-structured interview provides a halfway house between the highly rigorous and inflexible fully structured interview and the open-ended and more subjective unstructured interview” (Ratcliffe, 2002, p. 21). Semi-structured interview have “a basic framework, a set of standard questions, and a given procedure, but great latitude is given to the interviewer in how different respondents are treated” (Ratcliffe, 2002, p. 21). In semi-structured interview “…the interviewer is free to modify the format and order of questions as appropriate” (Ratcliffe, 2002, p. 21). In real scenario also “semi-structured
interviewing takes a wide variety of forms and fulfils a diverse range of functions” (Ratcliffe, 2002, p. 21).

4.6.3.1 Semi-Structured Interview Protocol

For this study, semi-structured interviews were conducted with the operators of telecenter, and personnel responsible for introducing rural telecenter in Nangi village of Ramche VDC of Myagdi District. Semi-structured interview was developed with open ended question to interview operators of telecenter, village leaders/ social activist, project leader and health workers involved on establishing and implementing ICTs facility through telecenter with an aim to come across the information on the services provided by telecenter, service used by rural people, number of people using the services and matter concern on the sustainability of telecenter (Ratcliffe, 2002; Chilimo, 2008). The empirical data collected from telecenter operator, village leaders, social activist, project leader and health worker was recorded in paper in written text as shown in Appendix 6, 8, 9, and 10 based on semi-structured interview protocol. Semi-structured interview was conducted with telecenter operator on March 15, 2011 which lasts for one hour (12:00-1:00 PM). Second, semi-structured interview was conducted with women health worker of community health center on March 16, 2011 which lasts for one hour (10:00-11:00 AM). Third, semi-structured interview was conducted with leaders (forest leader & school leader) on March 17, 2011 which lasts for two hours (1:00-3:00 PM). Last, semi-structured interview was conducted with project leader on March 18, 2011 which lasts for one hour (3:00-4:00 PM). All the data collected from semi-structured interview was noted in paper in written text.

4.6.4 Focus Group Discussions

“Focus group discussions are…used to obtain knowledge, perspectives and attitudes of people about issues, and seek explanations for behaviours in a way that would be less easily accessible in responses to direct questions, as in one-to-one interviews (Kreuger, 1988; Kitzinger, 1995)"(Wong,2008, p.256). “Focus groups, unlike individual interviews, provide the added dimension of the interactions among members. In conducting the focus group, the emphasis should be placed on the interaction among group members” (Wong, 2008, p.256). “Instead of the moderator asking questions, the group members are encouraged to communicate with one another, exchanging ideas and comments on each other’s experiences or points of view (Kitzinger, 1995)”(Wong, 2008, p.256). For focus group discussion semi-structured interview was used with open ended questions to have different view from group discussion. In this study FGD was carried with farmers, drivers, telecenter operators, school teachers, health workers, village leaders and social activist. Data or a fact collected from FGD was used as supplementary data for other sources of data collection tool (i.e. individual interviews), and most focus groups consist of 6 to 12 number of peoples (Chilimo, 2008; Wong, 2008, p.257). In March 19, 2011 focus group discussion was conducted including people from different sectors (i.e. farmers, drivers, telecenter operators, school teachers, health workers, village leaders). The discussion last for three hours, in starting people were introduce to each other, then the aim of my research was mentioned to all participants in detail, and the uses &
importance of ICTs in daily life were explained with examples from other countries to make participants concentration more towards the issues. Finally discussion was continued based on the established open ended questionnaire. The view provided by participants was recorded in voice recorder as well noted in the paper in written text. In March 20, 2011 focus group discussion was conducted in Himanchal School with students of Grade 11 including both sex from different faculty (i.e. arts and commerce). The group discussion last for one hour (11:00-12:00 AM). Last, focus group discussion was conducted on March 20, 2011 with students of Grade 12 including both sex from different faculty. The group discussion lasts for one hour (1:00-2:00 PM). Since teachers were preparing students of Grade 11 & 12 for their final exam, researcher was not able to take their more time. Data collected from discussion was noted in paper as well recorded in voice recorder. All photos presented in Appendix 1 are randomly selected from number of photos taken in study site to validate collected empirical data, so these photos do not have any relation with data presented in table.

4.6.5 Observation & log

Observation gain insight into telecenter events and the activities of involved actor. “On the other hand, observation can…[provide more information in addition] what participants said during interviews (Mabry, 2008)” (Onyang, 2009, p.42). “Furthermore, observations afford the researcher the opportunity to gather live data from live situations and a chance to see and discover things that might otherwise be unconsciously missed or things about which participants might not freely talk in interview situations (Cohen et al, 2007)” (Onyang, 2009, p.42). Log is the record of performed activities. For this study telecentre premise was observed (i.e. types of hardware available, activities taking place), internet history log was noted in paper to know which websites user prefer more, and what kind of information they view.

4.7 Data Analysis

Categorizing, tabulating, examining and recombining evidence to address the initial propositions of study are the processes of data analysis (Yin, 2003). In case study logic models, with-in case analysis and cross-case analysis can be used as analytical tool for data. In this study within-case analysis supports internal validity of case study which is done by linking data collected from field with relevant theories. Detailed analysis of data helps to give conclusions, recommendations, and further suggestion of research (Shrestha, 2010).

4.8 Validity and Reliability

In the research, it is important to establish a criterion for judging the quality of research design. Kidder and Judd (1986) identify four dimensions which are common to all social science method. Construct Validity, identifying correct operational measures for the concepts being studied. Internal Validity, establishing casual relationships where by certain conditions is shown to lead to other condition as distinguished from spurious relationships. External Validity, establishing the domain to which a study’s finding can
be generalized. **Reliability**, demonstrating the operations of a study such as data collection procedures can be repeated with same results.

Yin (2003) mentions to construct validity multiple sources will be used at the phase of data collection. He also mentions it is necessary to establish chain of data and have key informants review draft case study report. I will use different sources of data from articles, books, web-data and empirical data collected from interviews, focus group discussion and observations. Since case study of this research is interpretive case study the internal validity of it should be considered, so with-in case analysis is used to support internal validity of case study. The method mention by Yin (2003) to establish the domain to which a study’s finding can be generalized are use of theory in single case study and use of replication logic in multiple case studies. This research involves single study so external validity of the study is ensured using related theory. A strong support for the theory will be provided for the result to be accepted. According to Yin (2003) reliability test is used for examining the quality of research design, which will be supported by case study protocol.

### 4.9 Ethical Considerations

Hart (2005, p.278-79) says ethics can be described as the codes and principals of moral behavior; generally we can make the distinctions between ethics and morals where ethics is referred to as what one ought to do and morals as accepted notions of right and wrong. American psychological association and code of conduct presents six general principles: competence, integrity, professional and scientific responsibility, respect people’s rights and dignity, other’s welfare and social responsibility (Hart, 2005, p.283). I will consider these ethical matters during the period of research work. In this research no one will be set under pressure to participate and no one will be forced to continue participating in the research if he/she changes his/her mind and wants to quit participating, so consent form shown in *Appendix 4* was distributed. Every participant has the right to back out of the research in every stage of research. Every participant has the right to know that his/her data will be deleted. Printed guidelines will be distributed to participants thus every one will know his/her rights and responsibilities (Creswell, 2008).

The researchers will act in a professional and ethical way with highest respect for honest. All communications and relationships between researchers and participants will be professional and with regards of behavior and research standards. If it is necessary to name a person, pseudonyms will be used. The participant is only allowed to see the collected data from himself/herself to protect incomparableness between the participants. On top of every question will be an explanation of the sense of the questions. The participant has always the right to ask about the sense of the question and observation. The data analysis will be carried out without judging any cultures or state of participants. Another area of ethics considered is the use of other authors work. The works of other authors will be properly referenced and the findings of the research work will be solely my work.

### 4.10 Sampling Procedures
Sampling means practice of selecting units (i.e. people, organization) from the population of interest. Telecenter involved in this study was collected based on location (i.e. mainly rural villages), opening times (i.e. 8 am to 8 pm), use of center (i.e. frequent user or occasional user, technology used), services provided (i.e. email, photocopy, computer training, fax and document scan) and operation mode (community or NGO owned) (Ellen, 2000, p.69). Before selecting telecenter of Nangi village of Ramche VDC an email was circulated to operators asking information of telecenter to identify which telecenter would give rich data related to research aims and objectives thus based on the relevant information received from the operator, researcher select two telecenter in Nangi village of Ramche VDC (Ellen, 2000, p.69-73). Rural people can be user of electronic information, at the same time can be non-user of telecenter (Ellen, 2000, p.70), so people were approached and asked weather they have visit and use telecenter. If they say “No” they were categorized as non-user and provided brief description of research aim so that they can give their agreement or disagreement for interview. The people who visited telecenter and use services were categorized as user (Ellen, 2000, p.73-74).

4.11 Problems Encountered at Research Site

The problems faced during data collection in research site includes terrible road, poor transport, difficult to get relevant data, bias of respondents with interviewer and problems in defining ICTs related terms in localized language. Study site reside at Himalayan range so long time was spent traveling rough roads to reach study sites. Nangi village of Ramche VDC was accessible to terrible road but still it takes one day walk or 5 hours difficult jeep travel from near city Beni (Thapa & Sein, 2010). The entire interview question was translated to Nepali language, to make easy for rural people to understand. Though few technical terms like computer, email, internet was difficult for researcher to explain in local language. This makes some questions confusing and difficult to understand for the respondents because in rural Nangi village of Ramche VDC majority of people do not have computer knowledge, nor aware of computers and technical term because computer content was not designed in localized language where people speaks local language from their own ethnicity.
CHAPTER 5

DATA PRESENTATION

This chapter presents empirical data collected from research site using different data collection techniques i.e. structured interview, semi-structured interview, focus group discussion and observations of activities or events. Structured interview were conducted with users and non-users of both telecenter at Nangi village of Ramche VDC and semi-structured interview were conducted with telecenter operator, health worker, and personnel of NWNP project i.e. project leader or social activist Mahabir Pun. Data collected from focus group discussion and observations of events/activities are also presented in this chapter to support collected data from different sources and address the objective of the study.

5.1 Access of ICTs facility in telecenter by rural people

The characteristic of respondents helps researcher to categorize rural people as user of electronic information and non-user of telecenter, which in-turn helps the researcher to interact with right users in the study site Nangi village of Ramche VDC to collect realistic data to address the define objectives. Due to background of rural people and traditional culture rooted in the society cause problem to use ICTs facility effectively in telecenter. Thus the study of these features help academic researchers to know the factors that affects respondents for use and non-use of ICTs facility. Data was collected from interviews with user and non-user of electronic information in telecenter of Nangi village of Ramche VDC. The collected data with number of respondents are presented in Table 2, 3, 4, 5, 6, 7 as shown in Appendix 3. In Appendix 3 tables represent the characteristics of respondents. Table 2 represents number of household respondents i.e. user and non-user of different age and gender interviewed in ward 3 & 4 of Nangi village of Ramche VDC. Table 3 represents number of household i.e. user and non-user of different age and gender interviewed in ward 1 & 2 of Nangi village of Ramche VDC. Table 4 represents number of respondents of different age and gender, from different sector (i.e. teachers, school leader, health worker, and farmer) participated in focus group discussion in ward 3 & 4 of Nangi village of Ramche VDC. Table 5 represents number of respondents of different age and gender, from different sector (i.e. teachers, school leader, health worker, and farmer) participated in focus group discussion in ward 1 & 2 of Nangi village of Ramche VDC. Table 6 represents number of respondents (i.e. student from grade 12 of various faculties) of different age and gender participated in focus group discussion from ward 1, 2, 3, & 4 in Himanchal school of Nangi. Table 6 represents number of respondents (i.e. student from grade 11 of various faculties) of different age and gender participated in focus group discussion from ward 1, 2, 3, & 4 in Himanchal school of Nangi.

First, the study focuses to determine whether or not rural people of Nangi village of Ramche VDC have real access to ICTs which make possible for people to use technology effectively (Bridge, 2003, p.5). In rural area access to ICTs is affected by number of factors, and the researcher reflects on these factors to address the study objectives
Data for this question was obtained using *Appendix 5*. Telecenter user were defined as a person who have visited telecenter, use its services (i.e. have used electronic information) and have been benefited from telecenter service through its direct communication, while Non-users were categorized as a person who have never visited telecenter, use the services (i.e. have never used electronic information) and have no any direct communication and benefit with/from telecenter (Ellen, 2000; Ratcliffe, 2002).

**5.1.1 Awareness on telecenter and ICTs facility provided by telecenter**

It is most necessary to investigate whether rural people are aware of ICTs facility provided by telecenter or not instead of determining whether ICTs services provided by telecenter have been successfully and have brought any changes in rural people’s life or not. To have in-depth understanding of this fact, respondents were asked whether they were aware of telecenter and ICTs facility provided by telecenter. Among hundred fifty-five interviewed respondents, hundred twenty five were aware of telecenter and ICTs facility provided by telecenter with little knowledge and skill to use E-mail, internet to communicate with people. All non-users (farmer, student, women, drivers, labors) were interested to use new technologies for generating income and better communication in cheap price if they could get training on use of ICTs in their local language. Awareness on telecenter and its services was found highest in ward 1 & 2 and less in ward 3 & 4 of Nangi village of Ramche VDC.

**5.1.2 Reason for visiting telecenter**

**5.1.2.1 Users**

Respondents were asked open ended question to provide their opinion, what is the main reason for visiting telecenter. On their response, internet access was main reason for visiting telecenter. In case of ward 1 & 2 of Nangi village 44 respondents response that they visit telecenter to access internet services and 39 respondents from ward 3 & 4 of Nangi village indicate they too visit telecenter to access internet services but 29 respondents indicate computer training as second choice for visiting telecenter in Nangi village of Ramche VDC, while 72 respondents indicate secretarial services was their third choice for visiting telecenter at Nangi village of Ramche VDC. Respondents also visit telecenter for other cause like finding examination center, schedule and results from these two websites: higher secondary education board (www.hseb.edu.np) and office of the controller of examination (www.soce.gov.np). Online notice, schedule and result were common service among student of Ramche VDC because youngsters from different village come to Himanchal Higher Secondary School at Nangi village of Ramche VDC to have higher secondary education (i.e. Grade 11 & 12). Few respondents come to telecenter to seek price information of local product in market, as well information on tool & techniques that can be used to increase the potato production and preserve it for longer time to have good price.

Regular telecenter users were asked whether they were satisfied with the ICTs services provided by telecenter or not. Majority of telecenter users from Nangi village of Ramche
VDC respond that they were satisfied with ICTs services provided by telecenter. Respondents who were close to telecenter and satisfied with the facility were asked how often they do visit telecenter to use ICTs facility. Majority of respondents said they visit telecenter one day in a week to use E-mail/internet facility because most people from Nangi village of Ramche VDC were farmers and have free time on Saturday only, while student visit several times in week to communicate with friends then knowledge acquisition. In comparison to ward 3 & 4 of Nangi village of Ramche VDC, ward 1 & 2 of Nangi village of Ramche VDC have more visitors daily to access email, internet because of Higher Secondary School. People from different wards of village reside here in ward 1 & 2 of Nangi for their higher studies, also the ratio of people who have been to foreign country to earn money is high and literacy rate is also high then other wards of Nangi village. Few respondents who were user of telecenter have their un-satisfaction because they indicate telecenter operator should give special care and training to illiterate and underrepresented group of people who are interested to use ICTs. NWNP project or telecenter operator should establish separate computer room for these groups of people so that educated person cannot hold back the computer most of the time in telecenter.

5.1.2.2 Non-Users

Respondents who were not aware of telecenter and not visiting telecenter to use the services were asked to explain reason for not visiting and using telecenter. On their response the main reason was ICTs knowledge, and skills obtained from training were not enough to use computer because they were facing small problem while using email & internet. At that time there will be no one to provide proper solution for their problems which creates obstacle for use. Due to absence of academically strong technician the problems remain unsolved. These small problems makes uncomfortable for use of email internet in telecenter. One non-user mentioned that due to illiteracy they were not user friendly with use of email, internet in telecenter. He added content in internet are in English script instead of local language, so inappropriate internet content for illiterate people drive for face to face communication rather then adapting to its use. Due to lack of searching skill and knowledge they were not able to separate which data is important and which not and could not convert data into information then knowledge of their needs.

One non-user (women) said women are less confident in using services of telecenter due to illiteracy and due to obstacle for attending in extra activities in the society. They have more responsibilities of home to care the family and children. She too added that she do not know how computer works and feel uncomfortable to use it. She also told that she do not understand well to use computer and need to repeat several time which is impossible for operator in the telecenter to go individually. In older age community lack of ICTs skills and appropriate knowledge affects for use of ICTs (i.e. computer, email, and internet) in telecenter. Lack of ICTs skills and appropriate knowledge in older community are the factors for non use of ICTs (email/internet) in telecenter. One non-user (65 yrs old: Ex Army Man) told he have heard lot about the email & internet from his children. He told according my children we can communicate with our people inside and outside the country sitting here in Nangi only. We can read news. But by laughing, he said it’s all about the time I was born at that time when there was no computer and
lack of awareness on the importance of education. That time in our village, all male used to join army forces because education was not needed to join the force. Now, when I heard lot about computer from my children I feel myself that I am leaving in the world of darkness. I am not able to use now though I am interested due to illiteracy and lack of appropriate ICTs knowledge.

One non-user (farmer) told it’s the matter of time and had to walk a long distance to and from their home which excluded them from visiting and using the ICTs facility available in telecenter. Behind these problems, he too adds lack of ICTs skills and confidence affect in use of ICTs facility in telecenter. One of the non-users (farmer) said Himanchal School runs HaatBazar.com for the villagers to advertise their products to sale but there are no volunteers to take the detail information including image of our product. Since we are not given any training to take the pictures of the product and we don’t have digital device (camera) to take the picture which creates less charm on people to sell product through internet. Due to lack of training for the use of internet and haatbazaar.com, villagers could not access the product information which create problem in running online bazaar and increasing its demand as much it should have.

5.1.3 Skills to use ICTs facility (i.e. computer, email, and internet)

According to report of Bridges.org (2003, p.73) when talking about the digital divide in rural area providing access to technology is critical since “access” is defined as physical access to computer interaction. If technologies are not used effectively then the connection of computer is worthless because rural people do not know how to put ICTs use in value, and unaffordable to use. So technology should be integrated into people to make computer connection more effective. The true access to ICTs in telecenter for effective use and improve livelihood of rural people is determined by appropriate technology (i.e. access appropriate tool for plan use), capacity (i.e. people should know potential of technology to use it effectively), relevant content (i.e. localized content) and affordability (i.e. not so expensive to use technology) (Bridges.org, 2003, p.73). Based on the concept of Bridges.org, respondents were asked whether they are familiar to use ICTs facility or not. At Nangi village of Ramche VDC, 107 respondents reply they know to use computer, while 48 provide their “No” opinion. Respondents who were familiar to use computer were asked whether they know to use internet, E-mail and have E-mail address or not. In Nangi village of Ramche VDC majority of respondents reply they know to use internet and have web mail (i.e. yahoo mail, Gmail and hotmail). To know whether rural people have knowledge and skills to use technology (i.e. computer, E-Mail and internet) respondents were asked on whose support you will use technology (i.e. computer, E-Mail and internet). Majority of respondents reply that they use technology (i.e. computer, E-mail, internet) by themselves but few respondents (farmers, drivers, old people) reply that they take assistance of friends and telecenter operator available in telecenter.

5.1.3.1 Cause & Regularity for E-mail use

Telecenter users were asked for what reason they use E-mail, majority of users reply for communication with family members, friends who are residing in city and outside the
country. Telecenter users also answer E-mail is used in family emergencies such as health issues, injury and death of close relatives to ask financial assistance with distant family. Users were asked how regularly they have access to internet for using Email. Majority of users especially students reply they access internet for E-mail thrice or daily in a week to communicate with close friends but few users, especially farmer’s access internet for E-mail once in week to communicate with their family members because rural villagers involved in informal sector especially agriculture are free from their work only on Saturday.

5.1.3.2 Frequently visited online sites by users

Telecenter users who were close to computer and internet were asked open ended question to have their opinion about the sites they frequently visit. For this question interviewer receive multiple answers from the interviewee. Majority of users in Nangi village of Ramche VDC reply they use web-based E-Mail (i.e. Yahoo, Hotmail, and Gmail). Few users, especially students & teachers surf educational sites and older people surf news sites through Nepal wireless local page. The educational sites www.hseb.edu.np, www.soce.gov.np provides information about education services such as examination notice & result. Similarly, BBC CNN for international news and Kantipur for national news. Examination results were considered as important information gained from these sites. Users reply, through internet facility hard copies of examination result is replaced by electronic result, so that they can access result easily and quickly without delay from the educational institute. Internet service in telecenter enabled students to receive results without delay. Other websites visited by the respondents were face book, and entertainment sites. Majority of students answer that they use face book to talk with friends and make network with new and old friends who were not found in groups involved in informal sector (i.e. Farmers, Labors, & Drivers).

5.1.3.3 Internet histories logs

Data recorded from internet history of individual computer provide additional information to understand data collected from telecentre users regarding the websites they frequently visit. The study recorded internet history from all computers used in the telecenter of Nangi village of Ramche VDC. Internet history shows users frequently visit sites of web based e-mail i.e. yahoo, hotmail, and Gmail. The data obtained from internet history go with what respondents said regarding the websites they visit frequently in section 5.1.3.2: Telecenter users who were close to computer and internet were asked open ended question to have their opinion about the sites they frequently visit. For this question interviewer receive multiple answers from the interviewee. Majority of users in Nangi village of Ramche VDC reply they use web-based E-Mail (i.e. Yahoo, Hotmail, and Gmail). Few users, especially students & teachers surf educational sites and older people surf news sites through Nepal wireless local page. Other websites regarding educational sites, news sites, social network sites and entertainment sites also go with data recorded from internet history of individual computer from telecentre.

5.2 Impact of access of ICTs (internet/email) on livelihood assets
NWNP made possible for accessible of ICTs in rural Nangi village of Ramche VDC of Nepal. The study focuses on understanding affect (impact) of right access of ICTs for the change of livelihood quality employed by rural people. Based on the activities provided by NWNP in Nangi village of Ramche VDC and the activities accepted by rural people for the change of their livelihood, among five capital of asset pentagon researcher found only human capital, financial capital, and social capital have direct relation on livelihood of rural people, and remaining two physical capital & natural capital ineffective. Thus the study examines the impact of ICTs implementation on these three social, human, and financial capitals. Empirical data to answer this objective was collected interviewing users & non-users of telecenter (Appendix 5), operator of telecenter (Appendix 6), health worker (Appendix 10), project leader (Appendix 9), focus group discussion (Appendix 7) with community members, and village leader (Appendix 8).

ICTs indirectly support for global advocacy on environmental matter connecting to national and international advocacy groups. But telecenter in Nangi village of Ramche VDC was not successful to provide advocacy on preserving himalayan environment. There are no ICTs enabled projects for eco-tourism, which can help to preserve the natural beauty and create source of income through tourism. Our neighboring country India implemented e-Krishi an ICTs enabled platform for farmers for making electronic payments. In Srilanka Hazinfo project provide information of natural disaster on timely manner, which supports for rural people in reducing land damage. Similarly, in India Bhoomi project provide facility of land records to determine land ownership right. Revising all these potential of ICTs been achieved in India and Srilanka, NWNP in Nangi village of Ramche VDC was not able to implement any similar type of projects which can add to improve natural capital of rural Nangi village of Ramche VDC. Thus researcher feels unproductive to study physical capital in the study site.

In today’s world internet service demand have increased with additional demand of value added services. To meet the demand, improving software standard only is not sufficient but development of effective hardware is most necessary, which indicate the need of necessary infrastructure for communication flow. Based on the information collected from study site only 10% of people in Nangi village of Ramche VDC have individual computers in their home while remaining do not have. Most of the households in Nangi village of Ramche VDC have taken the benefits of using internet available through the telecenter. Two third of the population in the village surf internet for personal communication in telecenter regularly or once in a while, and one third of the population do not use internet or do not have enough time to surf internet due to more responsibilities of house. In Nangi village of Ramche VDC people use internet for communication instead of business purpose or knowledge acquisition purpose. So utility is most important when talking about physical capital. The implementation of e-governance to reduce costs, human resources, and expenses related to state services is lacking in Nangi village of Ramche VDC, which is also one potential of ICTs use for development. E-commerce implemented by NWNP was also rarely used due to lack of excellence and availability of supporting infrastructure. Revising these entire facts researcher found the study of physical capital unproductive in this context.
5.2.1 Community Problems before launch of telecenter

In study site, respondents were asked semi-structured questions to explain the problem they faced before intervention of telecenter in rural Nangi village of Ramche VDC. For this question, multiple answers were obtained from the respondents. The numbers of respondents who participate in this interview and provide their opinion were telecenter users, telecenter operators, health workers, teachers and project leader involved in initiating telecenter in Nangi village of Ramche VDC which is geographically rural. Non-users provide “No” answer for this question because they were not aware of telecenter; have never used electronic information, and other ICTs facility that provide benefit to individual or society. According to the opinion of respondents, problem faced by community before telecenter initiation were lack of means of communication, lack of access to information & news, lack of pricing information, lack of secretarial services (i.e. scanning, photocopying, printing), Lack of quality education & health, and lack of computer training. Taking note of the community problem that people faced before telecenter launch, respondents were asked whether the intervention of telecenter in Nangi village of Ramche VDC have solved the problems faced by community or not. People who participated in interview indicate the major problems like education, health, communication, and access of information have been improved but all problems are not solved. They also added travel expenses have been saved which have brought stability in individual economy.

5.2.1.1 Lack of access to information

Before intervention of telecenter, community were facing problem to acquire appropriate information based on their needs. Now ICTs facility available in telecenter creates opportunity to acquire appropriate information from internet and learn new skills from workshop arranged by telecenter in touch with local development committee. Respondents also reply they acquire academic related materials from internet if they are interested to know in depth about the course literature, acquire information on academic institution, and obtain exam result of higher study in electronic format faster. Respondents too mentions ICTs intervention have eliminated access of hard copies of newspaper received after a day long from the time of publications, which was available only at VDC (village development committee). Villagers used to travel an hour walk to read the news. According to the opinion of respondents ICTs facility available in telecenter have help to solve these problems. They were happy to express, now rural people can read news published from international, national, and local level in electronic format through internet established by NWNP project at telecenter. ICTs facility in telecenter helps rural people to share greetings through community space, email & social site strengthening the social structure of society, similarly Billboard establish in telecenter helps to announce event happening in the society, and Nepal wireless page disseminate relevant information in localized language to aware people about health, fraud activities and take steps for precautions.

Before intervention of telecenter, it was very difficult to get price information for the local products from the market and villagers were forced to sell their products (i.e.
potatoes) to middle man in cheap price. Respondents reply, now telecenter are providing services of pricing information from Nepal wireless page. Telecenter operators translate relevant electronic content into localized language for illiterate people in the community and disseminate the information among people in village through Nepal wireless page, Billboard and volunteers circulated by NWNP. Information on market price for the local products from near city empowered villagers to bargain with dalali for fair price for their products. For illiterate people, telecenter operator are translating electronic content into localized language and disseminating through billboard established in telecenter and the volunteers circulated by NWNP project. Information about prices for the local products from different market empowered villagers to bargain with middle man for fair price for their products. Also, these information helps farmer to know the market demand of their local products, so that they can think new way of farming to improve the production and quality of food to meet market demand and earn better profit.

5.2.1.2 Lack of computer training

Before intervention of telecenter, villagers don’t know what is computer, how will be its shape, and how it will work. According to the opinion of respondent’s people of rural Nangi village of Ramche VDC are lucky enough because people of all age are able to see and use computer internet. ICTs facility available in the telecenter helps to resolve the travel to near city of village for computer training. Computer training as a ICTs facility provided by telecenter helps to build up technology skills and knowledge which enable villagers to use computer, email, internet, and photocopier to scan and photocopy documents. The technology skill build up in an individual reduces regular travel to near city to get typing, photocopying, scanning and printing. Computer training has extended the skills of people to use email and information sites in right way using internet.

5.2.2 Impact of access of ICTs (internet/email) on human capital

To understand the relation between access of ICTs and human capital, respondents were asked to provide their opinion/thinking how access of internet/email affect activities of human capital in its presence. To elucidate the objectives respondents were asked open ended question whether they have attended any technology training provided by telecenter and how the training was meaningful in their daily life. People who participated in the interview reply (i.e. ICTs user) they have attended and received computer training from telecenter. Computer training helps to develop skills and knowledge of individual to use computer, e-mail, and internet which facilitate to communicate with friends and family members scattered with in and outside nation. The use of internet has reduced the use of hard copy. They said now they could read news from Nepal wireless web page in localized language. Computer knowledge has made the work of student and teacher more efficient. One respondent (student) said the ability to use Microsoft word enables them to make good report fast without using pen and paper. Similarly one respondent (teacher) said the ability to use word processing and spread sheets enable them to keep record of financial expenses of school which helps for better financial management. He also added they can type questionnaire easily & fast in cheap cost without travelling to city. Computer training obtained from telecenter facilitates
young people to find employment. One respondent who have been working in mobile service center at Beni nearer city to Nangi reply computer training he got from telecenter of Himanchal school help him to get employment, which is the influence of computer training that he has first received at telecenter of Himanchal school.

Respondents who were electronic information users were asked to provide their opinion how access of ICTs facility (i.e. email/internet) in telecenter influence in gaining information and knowledge. For this question, only limited users provide their opinion who use internet for gaining knowledge following social communication. Internet facility available in telecenter facilitate people to access appropriate information like information on agriculture tools & techniques to replace traditional way of farming, information on education & health, also news of national & international. If ICTs facility were not made available in telecenter by NWNP projects then rural people have to invest a lot of money to get health treatment, to get quality education, to fulfill scarcity of teachers in teaching institute, and to buy hard copies of newspaper. ICTs facilities available in telecenter have provide rural villager’s good platform to learn new things and make them aware updating through electronic information obtained from internet. If the technology has not reached to rural area, still today people of Nangi village of Ramche VDC have to live in darkness of knowledge without being informed about the current development, also problem of world. One female respondents studying in grade 11 indicate that internet has helped her to collect information about health problem regarding symptoms of diarrhea, fever, pneumonia, common cold which is common in village due to illiteracy and lack of health awareness. One male respondent from Ramche studying at grade 12 indicate that he was able to access online books for more knowledge. He told that the course book they have was not sufficient to have good knowledge on the history of the nation. We use local intranet of Himanchal telecenter to access educational material (i.e. exam sample question) from the server which helps to give more idea to have better performance in our study and to be competitive in educational market.

Focus group discussion provides more information on use of ICTs facility and positive changes that are seen in livelihood of rural villagers. Participants of FGD were asked to provide their opinion on the positive changes brought by uses of ICTs facility (i.e. email/internet) on human capital. Participants express that ICTs facility provided by telecenter have create a good platform for rural villagers for improving the standard of education, providing better health service and improving the communication with friends and relatives residing inside and outside of nation in cheap price. Results of higher secondary level, Bachelor can be accessed in electronic format without delay through internet which facilitates academic students to proceed for further education in time and obtain scholarships for deserving students in the college. One participants share his bad experience, in past, examination results used to be publish in newspaper and was very hard to access the newspaper in our village. We used to receive the paper after 2-3 days of publication and people were forced to buy newspapers. Now internet services in telecenter had solved the problems providing the facility to access the results in time without delay in cheap cost. Participants said telecenter is helping academic student for finding relevant material for their courses and additional material of their interest topic. Regarding gaining of knowledge majority of participants indicates indicate villager rarely
use internet to gain knowledge because illiteracy is still rooted in Nangi village of Ramche VDC, and sound academic technician are not available to train/educate people. Before telecenter intervention there was technophobia among villagers due to lack of knowledge, skills to use computer and their belief that computer are complicated device to use but now NWNP is removing technophobia of rural people by providing computer education and training through telecenter making people self confident.

5.2.3 Impact of access of ICTs (internet/email) on financial capital

To understand the relation between access of ICTs and financial capital, respondents were asked to provide their opinion/thinking how access of internet/email affect activities of financial capital in its presence and absence. To elucidate the objectives respondents were asked open ended question whether the use of ICTs facility is cost-effective to add in economic level of rural people, but very limited number of respondents who were users of electronic information reply for the question because majority of users were not aware how to transfer ICTs potential in income generation. One respondent from WGC (women’s group community) said ICTs facility is cost-effective in making paper products because they have been running local paper factory to produce paper products from local materials. They use internet for searching different design of cards and color integration on local papers. She added demand of paper products increases in market after they transfer design and color in their local product downloading from internet. This increase individual income and income of society. She too added we also learn to cultivate Japanese mushroom using advanced technology through tele-teaching. This has created better source of income generation for women involved in household activities.

One respondent (Village leader) says truly speaking computer training from telecenter have created jobs for young. Good cases of Nangi village of Ramche VDC young people were trained by telecenter for using computer, and videoconferencing device through tele-teaching. After being trained they have been recruited in health job for operating telemedicine services. One respondent (lady health worker) said they use ICTS facility of telecenter to practice telemedicine for connecting patient to Kathmandu model hospital through video conference. She told so far they had helped more then 72 people (as recorded in health center catalogue) with various diseases. Another good case is telecenter operator of Ramche was student at Himanchal School. He was trained how to use computers for the first time at Himanchal telecenter. After being trained he has been recruited as computer teacher and operator at Ramche school/telecenter. This skill helps him to generate income. One respondent (farmer) said they use internet to search market price of their local products in assistance of their children and telecenter operator which contribute in their economy by saving their travel cost and selling potato in good price. He also added if internet facility was not available in telecenter we won’t be able to collect market information for our agricultural products. Lack of information make us to sell our traditional products like potatoes in low price to middle man. Villagers involved in local organization established with a motive to develop a community, response internet have helped them to report updates of development done in community regularly contributing success in monetary assistant. Disagree opinion was also obtained from respondents because of lack of literacy, lack of awareness on ICTs facility/activities of
telecenter, and lack of suitable web content in localized language to meet the information needs of villagers.

Participants of focus group discussion (FGD) provide additional information on positive changes brought by use of ICTs facility (i.e. internet/E-mail) in economic level in cost-effective way. Participants express ICTs facility provided through telecenter have solved a long distance travel for communication in emergency. Video conference room established in telecenter help villagers to have health checkup by establishing connection with doctors in capital. These facilities help rural people to save transport cost, accommodation cost which add in improving their economy level and save time which can be utilize in income generating activities like agriculture farming, handicrafts etc. Young generation who are searching job after higher secondary study are able to find jobs by searching vacancy on local, private and government organization which are published in private and public websites. 

5.2.4 Impact of access of ICTs (internet/email) on social capital

To understand the relation between access of ICTs and social capital, respondents were asked to provide their opinion/thinking how access of internet/email affect activities of social capital in its presence and absence. To elucidate the objectives respondents were asked open ended question to obtain their view on role played by ICTs in structuring social relation. People who participated in the interview reply people in Nangi village of Ramche VDC use internet for web based email, yahoo messenger, and Skype to communicate with their friends and family members residing inside & outside the countries which help villagers to establish good tie with distance members continuously. They too added hand written postal communication which was time consuming and expensive for villagers have been replaced by electronic mail which is faster, cheap and more secure. E-mail use have also reduce formal visit among villagers. If NWNP project have not provided ICTs facility through telecenter, then people won’t be able to communicate with family members with in nation and outside the nation in short time and cheap price. In absence of ICTs facility, today still people would have first priority for face to face communication and hand written postal. Absence of telecenter and ICTs facility would not have any negative impact on rural people life but the communication system would still be slow and dependent on human carrier in hilly region.

Participants of focus group discussion (FGD) provide additional information about role played by ICTs facility (i.e. internet/E-mail) in structuring social relation. Participants of FGD express telecenter in Nangi village of Ramche VDC are established by community budget in self initiation of social activist Mahabir Pun. These telecenter operate in coordination and cooperation of local villagers to reach among all levels of group of people to understand their needs, and also re-structure the plan, operation of telecenter based on inquiry of villagers to meet the need and demands of information. The community space created in telecenter by the groups provides a platform for villagers to share their knowledge, idea and community problems so that people can learn from each other experience and find solution for the community problems. These help villagers to
understand their responsibility for the village in development, which in return helps in strengthening social capital of society.

5.3 Problems for use of ICTs facility (email/internet) in telecenter

In rural Nangi village of Ramche VDC of Nepal people are facing problem for use of ICTs. This study focuses on finding major problems on use of ICTs facility in telecenter. To answer this objective empirical data were collected from interview with users/non-user of telecenter (Appendix 5), operator of telecenter (Appendix 6), health worker (Appendix 10), project leader (Appendix 9), and focus group discussion (Appendix 7) with community members. During interview respondents were asked to express the problem they faced on use of ICTs facility at telecenter before and after. People who participated in interview express due to illiteracy rural people are unable to understand internet content written in English script. Due to lack of sound technical academician’s problem faced by users are not understood so project initiators are not involved in designing internet content in localized language appropriate for the villagers. This factor create problem for people to use internet/E-mail, attend computer training and other services provided by telecenter in collaboration with VDC. In village ICTs facility provided by telecenter are mostly used by student of higher secondary school who has knowledge of computer, so people involved in informal sector do not have opportunity to learn and are less benefited from ICTs use.

According to respondents most of the youth fly to foreign country to earn money, so family members in house do not have enough time to travel long distance to use ICTs service in telecenter. One women respondent express, in village ICTs is considered as male dominant technology because women are responsible to look after the house, family members, and small children’s. Due to more responsibility in house then male, women do not have enough time to use any means of ICTs facility in telecenter. Also, if there is case to use ICTs in telecenter, male have more access then women’s due to traditional culture of the society. She too added women are able to use and learn computer, email/internet in telecenter or attend computer training after they are free from responsibility of family members. By laughing she says I will use ICTs facility in telecenter after small children are grown. She too adds in initial phase of telecenter she has taught other women’s of village to use computer email/internet after being trained from telecenter. Lack of ICTs skills, knowledge and confidence was also obstacles for use of computer and internet according to the respondents in Nangi village of Ramche VDC. In Nangi village of Ramche VDC internet content was not appropriate for the needs of villagers and level of literacy, technology skills was not considered while developing content.

Participants of focus group discussion (FGD) provide additional information about problems faced by rural people on use of ICTs facility in telecenter. Participant’s of FGD express there are limited number of telecenter in Nangi village of Ramche VDC. To make ICTs facility available in telecenter accessible to all level of groups of people, the number of telecenter should be increased along with its coverage. In Nangi village of Ramche VDC villagers have one belief that computers are very expensive and complex to use, and this belief come in rural people due to lack of computer knowledge, and lack
of awareness on computer benefits. All these beliefs indicate technophobia is still moving around the mind of villagers which puts them in problem to use ICTs facility. Poor ICTs infrastructure (i.e. improper networking, low bandwidth and time to time internet disconnection) also creates problem for using ICTs services in telecenter. At the same time regular national power cutoff of electricity, less number of computers, and absence of separate computer room place obstacles line to those who are interested to learn and to use ICTs in telecenter.
CHAPTER 6

DATA INTERPRETATION AND DISCUSSION

Chapter six interpret empirical data collected from users/non-users of telecenter, telecenter operator, health workers, project leader, observation of events/activities and group discussion with community people. Interpretation relates the findings acquired during data collection with current theories which facilitate researcher to find whether the findings are in line with the theories to answer the objectives of study or not. The discussion will be connected to acquire findings available in chapter five and presented according to study objectives.

6.1 Access of ICTs facility in telecenter by rural people

Real access (i.e. access) to technology is the preliminary factor that make possible for rural people to use ICTs in telecenter to improve their lives. Real access to technology must mean more than just computers and connections of internet (Bridges.org, 2003). As the finding from Nangi village of Ramche VDC shows villagers have access to ICTs with necessary conditions showing there is availability of ICTs services in telecenter but not the sufficient conditions. The target of real access is to connect people to internet once the necessary infrastructure (i.e. computer, hardware, and software & internet access) is in place. “Computers and connections are insufficient if the technology is not used effectively because it is not affordable; people do not understand how to put it to use, or they are discouraged from using it; or the local economy cannot sustain its use” (Bridges.org, 2003, p.5). Real access must be considered in broader context to ensure technology is integrated into rural people’s lives and make possible to use technology effectively to improve rural peoples lives (Bridges.org, 2003).

The study deal with access to ICTs facility in telecenter asking respondents about the awareness of telecenter and ICTs facility provided by telecenter to community in relation to the presented theory. The findings of study site show awareness was relatively high in Nangi village of Ramche VDC but few respondents were not aware about telecenter and ICTs facility available in center. Based on study sites and few papers related to ICT4D shows telecenter were unable to raise awareness and its importance to ensure maximum uses of ICTs facility in telecenter which have direct relation on human’s livelihood (Chilimo, 2008). “Government or private sector initiatives targeting popular participation in the Information Society should consider planning vigorous campaigns to illustrate the benefits of information as an important resource for daily living — assuming they, themselves, are reasonably convinced” (Roman and Colle, 2002, p.9). “Much time and effort is needed to build awareness of, and competence in, technology and its educational applications” (Latchem, 2001, p.3). According to “thick” conception of Chilimo (2008) on ICTs access, respondents were asked whether they were aware of ICTs facility in telecenter and have ever visited telecenter. The reply of respondent’s shows very less number of people among who were aware of ICTs facility visited telecenter to use ICTs facility. The findings also shows people who were aware of ICTs facility and telecenter
do not visit telecenter to use ICTs facility, due to lack of computer knowledge and skills to use computer, secondly people in rural Nangi village of Ramche VDC are illiterate and all the web contents are in English script which creates problem for illiterate people to understand the web content in absence of localized content. These were discussed in section 5.3: During interview respondents were asked to express the problem they faced on use of ICTs facility at telecenter before and after. Majority of respondents express due to illiteracy rural people are unable to understand internet content written in English script. Due to lack of sound technical academician’s problem faced by users are not understood so project initiators are not involved in designing internet content in localized language appropriate for the villagers. This factor create problem for people to use internet/E-mail, attend computer training and other services provided by telecenter in collaboration with VDC. In village ICTs facility provided by telecenter are mostly used by student of higher secondary school who has knowledge of computer, so people involved in informal sector do not have opportunity to learn and are less benefited from ICTs use.

The findings from study sites shows rural people visit telecenter depending on their needs, but as a first choice majority of people visit telecenter to access internet for web-based e-mail to communicate with family members, friends, and emergency support from close family members & state responsible department. Some people visit telecenter for secretarial services such as typing, printing, binding, photocopying and scanning. Many researchers article also shows web-based email was first choice among users for visiting telecenter (Chilimo, 2008). In Nakaseke telecenter main activity of users was primarily e-mail for sending and receiving message to/from friends, family members residing abroad to maintain ties with distance people (Ojo, 2005). Among telecenter users web-based e-mail proved to be the most popular facility used (Chachage, 2001). In rural area ICTs were more relevant for social activities than for development-oriented action (Etta & Parvyn-Wamahiu, 2003). In telecenter ICTs are used for making and receiving telephones call, sending and receiving email from/to family and friends for contact (Etta & Parvyn-Wamahiu, 2003). In Nangi village of Ramche VDC villagers rarely used internet/email for development activities like trading products through e-commerce websites HatBazar.com and obtain price information of local product from market. Thus using ICT services for social communication like web based e-mail may put questions on technology whether ICTs services in telecenter are able to reduce the digital divide and empower community people socially and economically (Ojo, 2005, p. 103).

According to reply of people participated in interview, telecenter operator and members involved to establish telecenter should provide innovative services from telecenter or should redesign the telecenter service strategy to meet information needs of rural villagers (Chilimo, 2008), so that rural villagers can benefit from its regular services. In Nangi village of Ramche VDC telecenter is established in school so most of the time computer are reserved by students and telecenter operator are not serious on providing computer training for groups involved in informal sector. By this circumstance older age people and groups involved in informal sector to support their living are excluded from using computer to learn and surf internet on their own capability, so special attention and training should be made available to benefit more rural villagers from using ICTs facility

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in telecenter. In Nangi village of Ramche VDC telecenter (i.e. Himanchal school telecenter & Ramche School telecenter) were providing relevant information in local language through community space, operated representatives, and bill board. In telecenter, users demand on services changes depending on time and information needs. To make telecenter service oriented according to the demand of users, their needs should be assessed regularly. Thus, effective approach should be developed to cope with rural villager’s information needs. As an effective move installing computer in room with internet connection is not sufficient condition for social and economic changes if telecenter users do not understand value of technology because technology will be outdated with passes of time without meeting the information needs of villagers in short time (Brdiges.org, 2003; Chilimo, 2008).

While trying to explore real access to ICTs in depth in relation to the findings and effective use of ICTs facility in telecenter, following factors appears as a problem in front of people: lack of computer knowledge and skills to use computer, unavailability of web content in localized language which creates problem for illiterate people to read web content in English script, long distance travel to telecenter specially women looking after small children do not have enough time to travel long distance, and low incomes of peoples due to which people are involved most of the time in field to grow crops. Latchem (2001, p.3) say ICTs facility in telecenter can improve real access to technology, provide faster interaction and enriched learning environment but cannot empower rural people who lack knowledge & skills to make use of ICTs, and guarantee learning outcome with success. “The internet is an unregulated information superhighway, thus information is not systematically organized, and there is sometimes clear bias in favour of certain subjects and to the detriment of others (Monereo, et al., 2000)” (Yusuf, 2006, p.165). “Because of the dynamic and volatile nature of the internet locating and evaluating information on it often require a degree of specialization on the part of users. Thus, it is difficult to search well, particularly by novice/non-expert users (Monereo, et al, 2000, NMSU Library, 2003)” (Yusuf, 2006, p.165). Most of the information on internet is reliable as well unreliable which creates difficult to search successfully specially for non-expert users because information’s on internet are sometimes not monitored when updating (Yusuf, 2006). Thus, information searching skill is needed to go through the internet and use the content effectively and efficiently to meet information needs (Yusuf, 2006; Chilimo, 2008).

6.2 Impact of access of ICTs (internet/email) on livelihood assets of people

This theme focuses on study of impact of ICTs on asset pentagon, and vulnerability context the core component of livelihood framework. Based on empirical data collected from Nangi village of Ramche VDC, impact of ICTs on asset pentagon and vulnerability context is discussed which have direct influence on the livelihood of rural people. According to DFID (1999, p.5) sustainable livelihood framework identifies five types of capital (i.e. asset pentagon) upon which people livelihoods are built. “The asset pentagon lies at the core of the livelihoods framework, ‘within’ the vulnerability context” (ibid, p.5). These pentagons enable information of people assets bringing to life the interrelationships between assets. Increasing the access i.e. giving the sense of ownership
or right to use these assets can support on rural people livelihoods and poverty reduction (DFID, 1999, p.5).

6.2.1 Human capital

“Human capital represents the skills, knowledge, ability to labour and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives” (DFID, 1999, p.7). In today’s context technology (i.e. computer/email/internet) have been contributing in human capital from different point of use but knowledge gathering as the main element of human capital was found very rare in rural people as the findings presented in section 5.2.2: Respondents who were electronic information users were asked to provide their opinion how access of ICTs facility (i.e. email/internet) in telecenter influence in gaining information and knowledge. For this question, only limited users provide their opinion who use internet for gaining knowledge. Those limited users mention in Nangi village of Ramche VDC most of the people use internet for personal communication with family members instead of business purpose or knowledge acquisition. Also, regarding gaining of knowledge majority of participants from FGD indicates villager rarely use internet to gain knowledge because illiteracy is still rooted in Nangi village of Ramche VDC, and sound academic technician are not available to train/educate people. Before telecenter intervention there was technophobia among villagers due to lack of knowledge, skills to use computer and their belief that computer are complicated device to use but now NWNP is removing technophobia of rural people slowly by providing computer education and training through telecenter developing more self confident in rural people. Frequent access of internet to use web-based email for communication in rural area failed to grasp the opportunities of knowledge gathering from internet. Internet/email is highly valued for social communications, to some extent in financial matters, but is largely irrelevant to knowledge acquisition i.e. human capital in developing countries due to lack of awareness on potential of ICTs on other activities (Souter et al, 2005). So international development agencies and stakeholders should “…focus on the established and trusted communication patterns within beneficiary communities and build upon these when seeking to influence behaviour or achieve development or business goals” (Souter et al, 2005, p. 124) but poor design of ICT4D project forces face to face communication one of the best medium for knowledge acquisition and sharing among rural people (Souter et al, 2005).

Telecenter in villages encourage schools to teach computer subject. Computer education for students in school and regular computer training for villagers from telecenter helps to make human capital more broaden with better ICTs skills enabling rural people to be more competent to find employment in near cities, thus improving better financial support (Chilimo, 2008). Soriano (2007, p.8) have reported promotion of e-literacy provides additional skills to rural villagers to find better earning jobs. “Likewise, the center helped the users, especially teachers, children and the youth (who would otherwise have been deprived of this resource) to overcome the fear of technology and computers and benefit from basic computer training, word processing and Internet search” (Soriano, 2007, p.8). This capacity would otherwise have been deprived in absence of e-literacy.
Tele-teaching available in telecenter help rural people in Nangi village of Ramche VDC to gain knowledge, develop skills or consult with academically sound specialist having expertise on related field to empower them individually and be always competitive in open market.

The skill to use ICTs (i.e. computer, email, and internet) not only enables rural people in developing countries to access information but also contribute information to become active participants in information society for eradication of digital divide (Ford & Botha, 2007, p. 9). ICTs are seen the most important networked knowledge exchange technology in rural area, if rural villagers have skill to use computer and internet (Ford & Botha, 2007). ICTs tools in telecenter are considered to be a reliable and convenient technology for communicating and providing necessary information for student and to find contents of the related topic of the course they are studying if they are interested for more depth knowledge (Ford & Botha, 2007). The online service provided by telecenter for checking exam results of higher secondary school (www.hseb.edu.np) and lower secondary school (www.soce.gov.np) are regularly used services by student in Nangi village of Ramche VDC. ICTs help for effective utilization of manpower facilitating faster processing and improved access to exam results enabling students to join college without delay (Mlaki, 2007, p. 4). He also suggests implementing e-ordering of results and e-registration of student for exam in rural area saves study time and travel cost of the student (Mlaki, 2007, p. 4). The finding shows online notification of results and schedule of exam along with centers presents positive impact on human capital because as the response of villagers this online service through internet facility provides an opportunity for rural student to access result in time & cheap cost, and access of exam results in time help student to fight for scholarship which opens way for their better future as well helps in their family economic conditions. Telecenter also fulfill the need of qualified teachers and improves quality of education. In Himanchal school student and teacher are using internet to collect study materials and local intranet for sharing study materials among student and teachers. These facilities provided by telecenter creates wide platform for students for acquiring general knowledge and solutions for study problems.

The online services (i.e. notification of results through internet) have shown rural people a new way for making their life simpler with an increased demand of online transactions (Chilimo, 2008). According to Ndou (2004, p.6) online transaction in developed countries are e-administrations, e-citizens, e-services and e-society. These innovative ICTs web applications bring people together and help in promotion of knowledge sharing among them. “It gives...[people] the possibility of accessing relevant information regarding: compensation and benefit policies, training and learning opportunities, civil rights laws, etc” (Ndou, 2004, p.6). These online services provide better customer service, transparency in organization, and minimization of travel cost for rural citizens. These reliable information and knowledge encourage rural people participation in government decision making in favor of rural area development. The online transactions implemented by Nepal government in cities are online tax payment which is successful to provide effective and efficient service to citizens in cities not in rural area. Besides these online transactions, e-registration service for birth and death certificates can be delivered in Nangi village of Ramche VDC which save the travel cost of villagers, makes the
service more transparent removing manual management, and also remove AdHoc process of dealing with rural villagers by government officials.

6.2.2 Social capital

“In the context of the sustainable livelihoods framework it is taken to mean the social resources upon which people draw in pursuit of their livelihood objectives” (DFID, 1999, p.9) such as networks and connectedness that increase peoples trust and ability to cooperate in more formalize group and their systems of rules (ibid, p.9). Social capital is more important for developing countries than developed countries because majority of people in developing countries rely on informal network instead of formal structure (Goodman, 2005, p.54). The finding of study shows telecenter users in Nangi village of Ramche VDC used web-based E-mail to communicate with family members, friends and person involved in administrative section to collect/provide relevant information inside and outside of country. ICTs is a convenient tool for tracing relatives, friend, and where about relying on information for possible jobs, also for social uses such as getting help in emergencies (Scott et al, 2004; Soriano, 2007, p.6). The benefit of use of ICTs facility in telecenter is a sense of wellbeing, improved income and reduced risk (Scott et al, 2004, p.ii) because villagers can call their members outside of village for assistance and can arrange for e-transfer of money in support of Money gram. In Nangi village of Ramche VDC villagers receive money identification code in their E-mail address from their family members which is secure. Using this code they can receive money from money gram run by Himanchal telecenter in Nangi village of Ramche VDC. In terms of remittances relation between ICTs, rural people, and urban people is important. In telecenter using internet for chatting and keep in touch are the most common use of ICTs services available. “This is of value because it strengthens social capital through improved networking with friends and family” (Scott et al, 2004, p.15). The villagers in rural Nangi village of Ramche VDC consists other social calls concerning funerals, festivals and financial matters which enables people in rural Nangi village of Ramche VDC to save time, increase production, diversify and get news (Scott et al, 2004, p.15). Research conducted in Botswana suggests that ICTs help to facilitate the expansion of social networks creating relation to better-quality information that can serve to strengthen social capital and improve communications with family members, friends and inform in emergencies (Duncombe, 2006, p. 92). ICTs application like Haatbazar.com also support in social networks in rural Nangi village of Ramche VDC that substitute for absent market functions in small ratio. In rural Nangi village of Ramche VDC email/internet has the potential to support networks of communication between CBO and other agencies that serve needs of rural people. Implementing new applications of ICTs to meet need of rural people will make ICTs more significant to people. The appropriate services of ICTs those are relevant to the poor should be encouraged to certain poor benefits. Existing commercial online service like horoscopes, football results have little relevance to the rural poor people (Scott et al, 2004, p.ii).

In Nangi village of Ramche VDC, e-commerce was developed as an online solution called HaatBazar.com to meet the needs of rural people where villagers can advertise their products and go for trade in localized language. Soriano (2007, p.9) indicate
telecenter in rural area provide common space for community people like youth, women, older to meet and exchange information and knowledge they have regarding education, employment, health and the community major events across the village. Billboard setup in community common space carry information on livelihood options translated by telecenter staffs to localized language downloaded from internet (Soriano, 2007, p.7-11). Similarly, telecenter in Nangi village of Ramche VDC have created community space in Nangi under the leadership of WGS. The attendance of villagers is compulsory in the community space to exchange idea, information and knowledge because regular attendance of community people helps to strengthen the social structure and organize community groups for strengthening social capital (Chilimo, 2008). The community group lead by WGS in telecenter is supporting the villagers financially to perform income generating activities by providing loans from the community saving accounts.

6.2.3 Financial Capital

“Financial capital denotes the financial resources [such as cash] that people use to achieve their livelihood objectives” (DFID, 1999, p.15). Computer training provided by telecenter creates opportunities for rural people to find service in government/private sector or create own service like communication center, mobile service center which assure rural people to have better access for income generation. Computer training provided by telecenter reduces operation and management cost of telecenter through using locally trained human resources, also it secure the sustainability of telecenter. The service of pricing information provided by telecenter in local language through bill-board in support of internet empower villagers of Nangi village of Ramche VDC to cope with middle man to sell their locally produce products on high price establishing direct link with main market. ICTs (i.e. email, internet & IP telephony) have the potential to reduce time & cost connected during receiving market information and the costs of conducting and agreeing the business dealing (Duncombe, 2006, p. 94).

According to Mukhebi (2004, p.3) “…agricultural markets are characterized by the following constraints among others: long chains of transaction between the farm-gate and consumers; poor access to appropriate and timely market information; small volumes of products of highly varied quality offered by individual smallholder farmers; and poorly structured and inefficient markets”. Lack of market information put obstacles for villagers to access market which increase transaction cost and reduces market efficiency (Mukhebi, 2004). Market information is needed for rural villagers to develop bargaining power for better price with middle men involved in chain of transaction for taking certain margin. ICTs offer unparalleled potential to deliver information to rural people and contribute to alleviate poverty, and transforming socio-economic conditions (Mukhebi, 2004). “It has been said that “information technology, together with the ability to use it and adapt it, is the critical factor in generating and accessing wealth, power, and knowledge in our time” (CABI, 2004)” (Mukhebi, 2004, p.4). The ability of ICTs to increase searching activities and provide relevant quality information empowers rural villagers to reduce travel cost, lower transaction costs for business dealing and enhance people access to market information (Mukhebi, 2004). Due to lack of relevant and timely market information, price of locally produced products are fixed by middleman that
leaves no way for villagers to bargain for good prices. ICTs empower villagers providing relevant and timely market information to bargain with middleman for better price in market and link villagers to markets more efficiently and profitably (Mukhebi, 2004, p.5). Now villagers are able to bargain with middleman for better price and produce local products according to the demand of market which is made possible by the telecenter staff in Nangi village of Ramche VDC providing market information on localized language (Chilimo, 2008). This also helps rural villagers to be more competitive in market providing better income generation.

In Nangi village of Ramche VDC telecenter is running HaatBazar.com for advertising and trading local products. But in the study site villagers were not aware on its use and benefit, so telecenter should establish awareness events on use of HatBazar.com which supports to reduce transaction cost and improve income generation source of villagers. According to Souter et al (2005) influence of email/internet/ VOIP phone/telemedicine/tele-teaching is considered to have high value on users in case of saving money in travel and postal service but it is not considered to have high value when it comes to earning money. In the study site also respondents agree on time and money saves through use of ICTs and rare support on income generation. Especially, educated villagers with qualification of grade 11 & 12 found ICTs valuable in income generation while people with lower education, and group involved in informal sectors find ICTs use unhelpful for generating income to support livelihood. Few people owning small business in Nangi village of Ramche VDC say they order goods through Email which is more reliable then verbal communication. Retailer from city sends goods through public transport or human carriers to the place. For the service small charge is paid which also add to improve income of individuals changing their living style. In Nangi village of Ramche VDC family members of villagers transfer cash from cities to rural area, so in terms of remittances relation between ICTs, rural people and urban people is important (Scott et al, 2004, p.8). People from village are working abroad and benefit from international remittances. Remittance continues to grow globally, with importance to national economies (Scott et al, 2004, p.8). In Nangi village of Ramche VDC ICTs enabled money gram run by Himanchal telecenter collect remittances from nation and international increasing the income of local community. “Remittances are the second largest financial flow into developing country economies after foreign direct investment” (Scott et al, 2004, p.8).

6.2.4 ICTs, Vulnerability & Diverse livelihoods

The sustainable livelihood framework views the factors that frame the vulnerability context in which the people exist because they have direct influence upon people access of assets types and choice which are open to people in pursuit of beneficial livelihood outcomes (DFID, 1999, p.3). “Different components of the Vulnerability Context affect different people in different ways” (DFID, 1999, p.4). The facility of accessing relevant information timely through ICTs helps people in rural area to be less vulnerable (Chilimo, 2008). As mentioned by Gerster and Zimmermann (2003, p.21) ICTs reduces rural poor people vulnerability (i.e. sickness, economic shocks, unemployment, & natural disaster) and help them to cope with such misfortunes building assets of rural people by
diversifying household activities, providing insurance or grants from international agency and states. Talking about the benefit of ICTs in vulnerability situations, respondents said that internet/email/VOIP phone helps rural people in emergencies case related to health, death and damage. In Nangi village of Ramche email/internet/VOIP phone was helping to get monetary assistance in emergencies from near family members which help people to be less vulnerable. All these circumstances were not possible in this village before telecenter initiation. Souter et al (2005, p.82) have indicated email/internet/VOIP phone the most important channel for communication in emergency to provide or receive relevant information from or to family members. Email/Internet/VOIP phone have the “...ability to elicit an immediate response or help; its immediacy overcomes substantial disadvantages of alternative communications means” (Souter et al, 2005, p.82) that is face to face communications. So it is best communication mode of choice for socio-economic groups at rural Nangi village of Ramche VDC. Email/Internet/VOIP phone are highly valued for social interaction (Souter et al, 2005, p.83) especially in family and nation responsible unit. Electronic information made available by telecentre through use of ICTs tool helps to improve the living standard of people adapting new way of life changing their traditional way of living but could not solve all problem that rural people are facing unless they are responsive themselves to overcome the vulnerabilities. (Chilimo, 2008)

Livelihood strategies “...denote the range and combination of activities and choices that people make/undertake in order to achieve their livelihood goals (including productive activities, investment strategies, reproductive choices, etc.)” (DFID, 1999, p.23). According to Temu & Temu (2006, p.22) villagers in Tanzania continue to supply traditional crops like soy, and bean flours to local market for income generation. But change in food safety regulation and global market, villagers began to lose market share to overseas suppliers. After advice from trade experts, villagers adopt new technology which increases their volume of production and quality. He concludes opportunities for use of new technology is important for villagers to diversify their livelihoods. In Nangi village of Ramche VDC training provided by telecenter helps villagers to try new livelihood strategies. As the case of Nangi village of Ramche VDC women group society learned how to produce local paper from local material and hand made products from paper, also how to cultivate Japanese red mushroom using advanced technology from telecenter which facilitate to diversify their traditional livelihood strategies mostly depending on cash crop potatoes. Another good case in Nangi village of Ramche VDC is people trained from telecenter are working as computer teacher in school, as operator in telecenter/telemedicine/mobile service center, and owning their own business besides cultivating cash crop. Telecenter is providing information for awareness to villagers that facilitate family leaders to send their children to school and get them to learn new technology (i.e. computer, E-Mail, internet) that supports to diversify their children livelihood. (Chilimo, 2008)

6.3 Problems for use of ICTs facility in telecenter

The discussion will focus on problems for use of ICTs facility in telecenter of Nangi village of Ramche VDC based on empirical findings available on chapter five. In Nangi village of Ramche VDC the main obstacles to visit telecenter and use its services are
illiteracy, lack of knowledge to use computers, lack of time due to involvement in traditional farming, long distance travel to telecenter from residing center, and thrust aside women, disable people, old people, and people involved in informal sector as passive users. Illiteracy is the root of language problem, and this creates difficulty for villagers to understand the content written in English script. People who participated in the interview reply due to language problem and inappropriate web content villagers are not confident to attend computer training and to use E-Mail/internet in telecenter to fulfill their information needs (Chilimo, 2008). In Nangi village of Ramche VDC to make easier for community people to understand the web content an effort have been done by NWNP developing E-commerce site and Nepal wireless page in localized language but this effort was successful to some extent only because people were not conscious for its use due to illiteracy, and the programme designed by NWNP fail to include groups involved in informal sector who are highly vulnerable.

Other problems such as lack of computer knowledge, lack of skill to use computer, long distance travel, and inappropriate web content in relation to community illiteracy, societal & personal barriers for women’s to use telecenter services stands as major problem, and access to ICTs as minor problem. Darkenwald & Merriam (1982) cited by (Hashim, 2008, p. 321) identified situational and psychological barriers to use ICTs in rural area for effective use of telecenter. Thus “situational barriers relate to an individual’s life context at a particular time, that is, the realities of one’s goal and physical environment. For example, cost, lack of time, lack of transportation, lack of childcare and geographical isolation (Darkenwald and Merriam, 1982)” (Hashim, 2008, p. 321). Especially women respondents in Nangi village of Ramche VDC have situational obstacles because they are illiterate and have no training to use computer also they have no time because they have to care their children and family. “Psychological barriers are individually held beliefs, values, attitudes, or perceptions that inhibit participation in organized learning activities (Darkenwald and Merriam, 1982)” (Hashim, 2008, p. 321). Especially older age respondents in Nangi village of Ramche VDC say they are too old to learn, few students in Nangi schools have no interest to use computer and few male student say they do not enjoy for taking computer class. All these developed attitudes and beliefs of respondents of rural Nangi village of Ramche VDC provide problems for ICTs use in telecenter. Another identified problem in Nangi village of Ramche VDC in use of ICTs is access to web content which is not adapted appropriately in localized language based on the needs of rural people, so community people find hard to use telecenter ICTs services (Bernardo, 2005, p.14). Level of literacy and technical skills should be considered while developing internet contents for the local villagers so ICTs use should be adapted according to rural people needs and skills (Bernardo, 2005, p.14). The report of HMGN also shows illiteracy rate is high in rural area then urban area of Nepal. “UNESCO defines illiteracy as a ‘person who cannot with understanding both read and write a short simple statement on their everyday life’” (Chipchase, 2008, p.1). Chipchase have used term “textually non-illiterate” to define illiteracy. In case of Nangi village of Ramche VDC majority of women’s are textually non-illiterate which creates problem for the use of ICTs because if women in rural area learn how to use computer then they can teach to children, family members and to the society driving village towards use of technology and bring the country in network of information society. McNamara’s (2008, p.6) indicate regardless of
potential benefits of ICTs people are restrict from using ICTs due to culture, tradition and economic hardship. Old age respondents from Nangi village of Ramche VDC show frustration about the use of ICTs facility in telecenter, since ICTs being new technology for rural people; they don’t have enough knowledge to use ICTs facility in telecenter.
CHAPTER 7

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In chapter six findings obtained from research site is interpreted with a key reason for establishing relation of findings with defined theories and literature in chapter three to have meaningful judgments of the findings to provide broad understanding of study among readers. In relation to data presentation and interpretation in chapter five and six; summary, conclusion and recommendations are provided in chapter seven.

7.1 Summary on:

The study is summarized based on the objectives of study. In the study site majority of ICTs users were male youth, with few female users & retired old army persons. This proves gender inequality is also rooted in use of technology in rural area because of lack of well planned programme or business model with ICT4D projects to include household women, disable, old retired person, and people involved in informal sector in case of ICTs implementation in rural Nangi village of Ramche VDC. Community people, especially student who are studying in Himanchal secondary school have regular access to ICTs facility in telecenter because of computer knowledge and skills provided in school, but farmers do use rarely due to lack of skills to use computer, computer occupied by students during their availability in telecenter, and to be dependent on other while using email or internet for communication or information searching. In Nangi village of Ramche VDC there are no other institution where community people can learn to use computer, so telecenter established in Nangi village of Ramche VDC are only the unique place where people can use computer, email/internet and secretarial services like scanning, photocopying, printing, and sharing of information through billboard.

7.1.1 Access of ICTs facility in telecenter by rural people

- In Nangi village of Ramche VDC majority of community people were aware of telecenter and ICTs facility provided by it but only minority of community people visit telecenter to access ICTs facility due to illiteracy, lack of computer skills, lack of time, long distance travel and lack of web content in localized language.
- Community people visit telecenter to access internet for web-based account (i.e. yahoo mail, hotmail, Gmail) and social site (i.e. face book) to communicate with close friends, and family members.

7.1.2 Impact of access of ICTs (internet/email) on social capital

- Web-based accounts (yahoo, hotmail, Gmail, face book) were used to communicate with friends, and family members which reduces gap between people and strengthen the social capital.
- Telecenter provide community space for villagers to meet and exchange information and knowledge they have on health, education and their own
community problems (Chilimo, 2008). So that they can find effective solutions for their problem by working together. This is important to make strong community through help of ICTs in telecenter. In addition, telecenter support various activities happening in village through billboard. Telecenter operator converts relevant internet information to local language and disseminate through billboard for people involved in informal sector (i.e. agriculture). This attracts villagers to telecenter and meets different people strengthening the social structure of society.

7.1.3 Impact of access of ICTs (internet/email) on human capital

People access internet for web-based email to communicate with people in relation but rarely use for knowledge gaining. Respondents reply they access internet to fulfill information need on education, health, news, jobs, entertainment, and market price for local products.

Online notification of exam result reduces processing time of results, since student can access electronic mark sheets from institute and government websites which reduces travel cost and can process for further education without delay.

In touch with local development committee, telecenter are providing income generating activities which creates opportunity for villagers to learn new thing using new technologies (i.e. computer, internet, email).

Hard copies of newspaper are replaced by electronic news through use of internet.

Computer training provided by telecenter increases skill of villagers to create own employment locally.

Computer knowledge was found to be more efficient for teachers and student to prepare reports, questionnaire in word processing and storing financial records of school in spread sheet for future reference.

7.1.4 Impact of access of ICTs (internet/email) on financial capital

Internet facility available in telecenter provide pricing information to community people which empower people to bargain with dalali (middleman) to get good prices for locally produced product.

Internet facility help women group society running local paper factory to search design for paper products, and transfer appropriate design to paper products increasing the demand of products in cities with improved profit.

People involved in community development sector use email/internet to provide updated information to international agencies related to community development, and have been successful to obtain/continue the fund.

People can search local, private and government jobs published in their official websites through use of internet facility available in telecenter. Computer training provided by telecenter enable villagers for defined employment (i.e. teaching, government jobs etc) and create own employment (i.e. communication center, small business). Some male and female villagers are working as computer teacher
and telecenter/telemedicine operator and some in mobile service center in near city. This helps to extend individual income, also the village income.

7.1.5 Problems for use of ICTs facility in telecenter

- Illiteracy, lack of computer skills, lack of knowledge on technology, long distance travel to telecenter, less number of computers mostly occupied by students, and lack of web content in localized language are the major problems for community people from using ICTs facility, though telecenter service in Nangi village of Ramche VDC is free, and considered as cheap means of communication.
- ICTs equipments are being worthless due to lack of proper maintenance. This indicates academically sound technician are lacking, and due to terrible road & poor transport worthless equipments were not carried to city because the cost is too expensive for maintenance (i.e. costly due to lack of funding). These too causes barrier for use of ICTs.
- Involvement of youth in unethical issues has been noticed after use of ICTs facility.
- Lower bandwidth, timely disconnection of internet, frequent national power cut causes interruption in telecenter services.

7.1.6 ICTs, Vulnerability context & Diverse livelihood

- Email/internet was found to be beneficial in communicating with family members for informing in case of emergency such as health problems, accident, death and asking for monetary assistance
- Computer training and relevant internet information provided by telecenter operator & representatives in local language helps community people to meet their information needs, assisting community people the modern way of living along with traditional way of living. A case of Nangi village where women involved in women group society are trained by telecenter how to make paper products from local materials, and how to grow red Japanese mushroom as an additional income generating source through tele-teaching or video conference using advanced technology. Youth trained from telecenter are involved in cities for maintenance of computer & mobile device and working as teacher & operator in their own village. These information and computer skills help villagers to change their traditional way of living towards technology dependent life, who were mainly dependent on cultivation of potatoes before telecenter initiation.

7.2 Conclusion on:

The research findings shows majority of telecenter users are male youth especially student from higher secondary study with less number of female users due to traditional system set by the society. ICT4D projects have failed to include major groups of people into the sphere of ICTs facility which is remarkable weakness for improvement of ICTs uses in rural area. These groups of people are women involved in household, old & disabled person, and people involved in informal sector like farming, labor job to earn
their living. But, telecenter in Himanchal School was found working for underrepresented groups through community space and billboard. Telecenter operator translate relevant internet information to localized content and operated volunteers from community collect information from local market, both these information are combined and disseminated to villagers through billboard and Nepal wireless web page. ICTs facility are provided by telecenter to villagers, but still there is challenge for operators and project leaders to reach to underrepresented groups of people involved in informal sector due to lack of awareness and literacy. In this context NWNP should redesign their strategy to reach to group involved in informal sector and restructured the ICTs services being provided by telecenter to meet information needs of people, also for the sustainability of telecenter, business model is found most appropriate to be design. The finding also shows to use ICTs facility in telecenter at first people should be aware about technology, and also should have computer knowledge, skills to use it effectively. The finding too shows uses of ICTs facility in telecenter has helped to reduce digital divide in small length, and have add some positive contribution on livelihood capital such as improved communication, improved health, improved education quality, and improved income generation source.

The findings of study in Nangi village of Ramche VDC shows there is need to create more data resources for locally produced content. The infrastructure of road, infrastructure of telecommunication, infrastructure of national electricity supply, and money to buy ICTs equipment that add to improve infrastructure which support in skills development are the economic resources to create data resources. But these infrastructures are inadequate in Nangi village of Ramche VDC. In Nangi village of Ramche VDC basic infrastructure of development such as roads and electricity underscore the information chain model of Heeks (2002; 2005) which indicates that these resources are important to help people to act on the information. Information chain model focuses on the resources that helps information chain function to be effective, and these resources are economic resources, social resources, action resources and data resources. Based on the findings of Nangi village of Ramche VDC telecenter is providing data resources through Nepal wireless page, but still people are unable to make the available data resources meaningful because in Nangi village of Ramche VDC yet they lack economic resources that is road infrastructure, electricity infrastructure and money that makes people to be capable to act on information.

The general conclusion of the study shows ICTs services provided through telecenter are playing positive role in life of people in rural Nangi village Ramche VDC such as improved community interaction, improved health, improved education standard, reduction in travel cost, enhanced way of knowledge sharing, timely market information and better profits on products due to electronic trading enabled by haatbazar.com. Nangi village of Ramche VDC also generating income from remittance sends my family members from nation or foreign country. Evaluating all these positive output it can be said undoubtedly ICTs services are having optimistic changes in livelihood of rural people in Nangi village of Ramche VDC. But due to illiteracy, lack of awareness on technology among villagers, poor technology infrastructure, and lack of localized web contents; ICTs facilities are not able to have its full potential affect (Chilimo, 2008). The Nepal wireless networking project boundary should be made wider and goal of telecenter
should be more adapted to information needs of groups involved in informal sector since these groups are majority in Nangi village of Ramche VDC. If these groups are consider into telecenter program structure, and ICTs services are incorporated with other activities like income generation, knowledge gaining apart from social communication then only ICTs for development project will be able to have full potential influence on people’ life.

7.2.1 Validity and Reliability of results

The results of this study have been achieved through proper interactions with rural people in Nangi village of Ramche VDC. Firstly, interview protocols were designed to deal with users/non-users, telecenter operator, health worker and village leaders. Rural respondents were asked weather they are interested to participate in the interview, those who were interested were told to sign the consent form after explaining the objective of study as shown in Appendix 4. Respondents answers collected during interview are presented in written text in Appendix 5, 6, 7, 8, 9, 10 to validate the result. The voice recorded in local language from the respondents are translated to English to make easy for international people also the snap taken during the field study are presented in Appendix 1. All these resource works for the validity and reliability of the study results.

7.2.2 Access of ICTs facility in telecenter by rural people

The study finding shows, ICTs tools and its services in telecenter provide basic infrastructure for access to telecenter but computer knowledge, skills and awareness on its uses were absent among people in village which were major element to access ICTs tools for effective use in telecenter. The data presented in chapter five shows majority of people use internet in telecenter to web based account and social network sites to interact with family members and close friends. As NWNP launch ICTs facility through telecenter in Nangi village of Ramche VDC people start to use technology for entertainment purpose, they don’t have still understood the value of use of ICTs. From observation of events in telecenter and reply of respondents, it was found importance of use of ICTs is for communication only and they don’t know alternative use of ICTs for income generation except the benefit of use of ICTs in reducing travel expenses. Telecenter operators too don’t have idea how to incorporate ICTs in income generating activities. All these realistic information shows that in the mindset of people of Nangi village of Ramche VDC the importance of ICT have very narrow scope. Interaction with family members and friends through web based account and social networking sites are valuable for rural people because it was successful in establishing strong social capital, so to make a sense to rural people that use of ICTs has wide scope in supporting livelihood of rural people socially & economically more income generating activities should be provided to people and awareness campaign should be established to show its broad uses.

7.2.3 Impact of access of ICTs on social capital

Telecenter create space for villagers to attend in a week to share their individual problems, community problems and find proper solution for their problem through knowledge sharing among the participants in group. Their individual comment on each
other idea helps to improve their idea and come to a single point through mutual understanding. This makes strong relation among people in community forming a supportive society. Rural people make them update through information discussed in community room, information disseminated in billboard, and searching relevant information from internet available in the community room. All these activities aid to make social capital more strong. The findings conclude email/internet assist people in rural area to communicate and search relevant information of need. The finding also shows though ICTs services have enter to Nangi village of Ramche VDC recently, people are making their own web account by self or in support of friends or telecenter operator and are sharing their E-Mail address with friends and family members. This shows rural people are finding electronic means of communication more reliable, secure, cheap and faster in comparison to hand postal service which is made possible through human carriers. This indicates rural villagers are taking E-mail as cooperative means of communication.

7.2.4 Impact of access of ICTs on human capital

In study sites it was found student from higher secondary school use internet to see notice of exam schedule and results of exam from institution website, also information on educational institution inside and outside the country for further study, but people in village use internet very rarely for searching information on new technology which can support to change traditional way of living, to meet demand of cash crops in market, and to obtain frequent change of prices of their locally grown products in main market. All these relevant information updated through use of ICTs facility available in telecenter helps rural community people to be out of the concept of middleman and dependency on them to sell village products (Chilimo, 2008). In support of international agencies and local development committee telecenter are providing computer training, handicraft training, and income generating activities like paper product production from local material, growing & cutting process of Red Japanese mushroom through experts from cities, also online training from video conference which provides opportunities for rural community people to learn new thing using new technology, which add skill on their traditional way of working. Computer training adds new skills on individual person which facilitate them to get employment of secretarial services, teaching, mobile maintenance, software installation, hardware maintenance, telecenter operator and telemedicine operator. According to Chilimo (2008) also computer training provided by telecenter to rural people in term of ICTs facility helps to extend their human capital, and the skills developed to use computer through training helps to extend financial capital. Computer knowledge is valuable for teachers, students, farmers, lawyers, government personnel’s and businessman to use ICTs services efficiently but lack of ICTs knowledge and skills in people limit the use of ICTs services in telecenter.

7.2.5 Impact of access of ICTs on financial capital

In Nangi village of Ramche VDC telecenter have limited services due to lack of proper business model but also these services are successful to meet information needs of villagers in small scale. Now a day’s importance of telecenter and uses of ICTs in
telecenter is increasing due to regular follow up done by NWNP. In coming days, these services being provided by telecenter could be insufficient due to higher demand of different services by rural villagers. Information on market price provided by telecenter, and circulated volunteers under supervision of telecenter operator empowered villagers to bargain with dalali to get good prices for their local products in comparison of market price. Nangi village of Ramche VDC is connected to Beni city by muddy road which is very terrible with less number of vehicles. These infrastructures limit villagers to take their products to near market to have good profit. HaatBazar.com which facilitates people in Nangi village of Ramche VDC to do trade of their local products electronically is found to be less used because villagers interact with dalali to buy and fix prices of their products in the village. Unless rural villagers are self conscious about the technology and benefits of its uses till that stage ICTs alone cannot make villagers powerful to bargain with dalali. The use of ICT in all other aspects of the business relationships is limited between villagers and dalali (Molony, 2008). In village rural people are poor in capital which makes them more reliant to dalali, and with this advantage dalali define their own prices without allowing villagers to take their products to market for high price (Molony, 2008). Due to frail economic condition of Nangi village of Ramche VDC people they are unable to transport their local products to nearer city for cash. The government and ICT4D projects (i.e. NWNP) should convinced villagers to use ICTs facility (i.e. email/internet) to get rid of dalali. NWNP should bring cost effective ICTs services which link villagers to central market. Molony (2008, p.637) “argues that the ability to communicate using these new information and communication technologies (ICTs) does not significantly alter the trust relationship between…” villagers and dalali. Instead dalali will be aware and pay good price for the villagers’ products which give good profit extending financial capital. It also helps to increase product quality to meet the consumers demand in the market.

7.2.6 Problems for use of ICTs facility in telecenter

For successful use of ICTs facility in rural area by people, still there are different problems existing such as illiteracy the main problem for limiting use of ICTs. Due to illiteracy people have language problem which creates difficulty for rural people to understand web content not available in localized language, other problems are lack of computer knowledge & Skills, lack of time due to involvement of women in their households, long distance travel to telecenter from residing place, limited number of telecenter with limited number of operating computers, low bandwidth, frequent national power cut, poorly designed programme which missed to include underrepresented groups of people who are main foundation to make use of ICTs in telecenter successful.

7.2.7 ICTs, Vulnerability context & diverse livelihood

The findings of study in relation to vulnerability conclude computer/E-Mail/internet were found worth full to communicate with family members, government person and international funding agencies in case of earthquakes, death, health disasters for monetary assistance. The study also founds ICTs facility available in telecenter are not able to solve
all the problems of rural people in emergencies but help to find best option to adapt different means for fund raising and immediate support to solve peoples problem.

The findings of study in relation to diverse livelihood concludes if villagers are provided with right information in right time then they can adjust new way of life with the existing traditional way of living. The different way of living life comes in term of computer teacher, telecenter/telemedicine operator, and mobile service operator, cultivation of red Japanese mushroom, fish farming, and production of paper products from local material. All these occupation are different form traditional occupation which totally depend on cash crops especially potatoes, and labor or security jobs in India.

7.3 Recommendation on:

NWNP and telecenter operator should be aware of the problems that obstruct disadvantaged people and women to use ICTs facility in telecenter. So the project boundary should be expanded to provide direct benefit of ICTs among disadvantaged people in village which confirms majority of disadvantaged people get ICTs benefit from telecenter. They also should redesign the project programme understanding the needs and demand of service query by the villagers which help disadvantaged people to get attracted towards ICTs services. Telecenter operator should give more priority to women and disadvantaged people in village who have no knowledge to use ICTs (computer/email/internet). Telecenter should also launch e-government concept like e-learning, e-health, e-registration to meet information needs of rural people and improve the efficiency of telecenter with a positive contribution on livelihood of rural people (Chilimo, 2008). In Nangi village of Ramche VDC most of the people depend on social activist Mahabir Pun for maintenance of system. In his absence system in telecenter seems functionless so telecenter operator and social activist Mahabir Pun should give hardware and software training to educated villager or should hire academically and technically strong person to this center to give sustainability to the project and telecenter.

7.3.1 Access of ICTs facility in telecenter by rural people

Telecentre operator should be aware of different access challenges because“…[a lot] of the attention regarding ICTs and telecentres deals with “connectivity” — that is, putting people in touch with the communication hardware” (Roman & Colle, 2002, p.14). “There is ample evidence to suggest that the sustainability of telecentres depends on recognising the dimensions of access, because without sufficient access, telecentres will not be able to justify their existence, nor be demand-driven” (ibid, p.14) for rural people. This study recommends telecentre should raise awareness on use of ICT as a valuable resource for individuals, families, organisations and communities (Roman & Colle 2002), also the benefits that ICTs bring in life of rural people after its use. Telecentres project should also check literacy, relevance, technophobia and complexity of ICTs protocols to make access of ICTs easier in people life (Roman and Colle, 2002). “People in telescenters need to be trained in how information can contribute to development” (Colle, 2002, p.106). In Nangi village of Ramche VDC telecenter manager are well known to use computers but do not know to link ICTs potential to health, education and agriculture. They should learn
to relate ICTs potential to health, education etc. Telecenter should aware communities about the value of information because awareness through relevant information helps rural people to realize value of ICTs available in telecenter (Colle, 2002).

7.3.2 Impact of access of ICTs on social capital

“Since access to ICT is seen to be increasingly essential for full participation in contemporary society, rural communities that have only minimal or costly access to ICTs have limited opportunities to explore the social...advantages that new technologies can offer (Bikson & Panis, 1995)” (Simpson, 2005, p.102). According to Simpson (2005, p.102) “social capital matters for effective implementation, widespread uptake, greater social inclusion, and the sustainability of...[ICTs] initiatives”. Since social capital and recognition of centrality of community is useful lens to examine sustainability of telecenter in rural area (Simpson, 2005). The lack of access to ICT or limited ICT skills prevents rural villagers from social and civic activities in their local community which reduces the chances of building strong community enriched with social capital (Simpson, 2005). Hence this study recommends telecenter should expand the need of access to ICTs facility by establishing adequate awareness to meet diverse needs of individuals and groups in the community exploring the relevance of technology (Simpson, 2005). NWNP and telecentre operators should “…include appropriate soft technologies, such as awareness raising, education and training, and building local, diverse leadership to support the uptake of the technology” (Simpson, 2005, p.115). The operator should enhance their contributions to local community by providing new form of community organization, interaction and interrelationships so that the increased participation of community increases trust and cooperation with strong community bonds which helps in creating stronger sense of community and shared sense of future and build social capital. The social capital created by expansion of ICTs should be used in valuable resources (Simpson, 2005, p.115).

7.3.3 Impact of access of ICTs on human capital

The study recommends telecenter operator should be more conscious on people who ask for assistance to use computer/email/internet in telecenter. NWNP manager should start training campaign to teach underrepresented group of people how to use computer, internet, and technology education to aware them about the benefits of ICTs. The NWNP also should introduce computer courses in lower secondary school to teach about technology. The project should also communicate with international agencies to have cheap laptops for secondary student to make familiar on technology and remove their technophobia.

7.3.4 Impact of access of ICTs on financial capital

Due to lack of education community people are not able to judge which information available in internet are relevant or which not, so telecentre operator should support by providing relevant information from market and internet based on the needs of villagers. Telecenter operator should incorporate both agriculture relevant information downloaded
from internet and the market information collected by circulated representatives. Then this information should be transcribed to localized language, and should be made accessible to disadvantaged people in village through bill board and community space established in the telecentre. This assist villagers to know the market price of their local products without moving to city which saves their travel cost, also they can produce quality agriculture product based on the market demand. Community people also can bargain with middleman for good prices or can send the goods directly to the market. These support rural villagers to increase their income with good profit.

7.3.5 Problems for use of ICTs facility in telecenter

The study recommends that there should be regular interaction between NWNP manager, telecentre manager, application developer and community people to develop user friendly application in localized language to solve language problem faced by majority of people who are illiterate and meet up information needs of frequent users and non-users (Chilimo, 2008). Telecenter operator should put more concern to make ICTs services available for women and marginalized community because these communities are of majority in Nangi village of Ramche VDC. Also there is one saying if we can teach one woman she can literate the whole family, so following this saying telecentre should start activities for these marginalized communities such as awareness campaign on ICTs, capacity building for women to use ICTs services and new technology in telecentre. There should be coordination between telecentre manager and groups involved in informal sector, and the benefits of ICTs should be spread among these groups of rural area so it would be easier to bind the potential users. If telecentre manager fails to consider these groups, benefit of telecentre is limited to educated people rather then disadvantaged people or underrepresented group, without solving arise problem in use of ICTs facility in telecentres.

7.3.6 ICTs, Diverse livelihood & Vulnerability context

The NWNP project leader and telecentre operator should commence income generating activities for household women and youth who are not interested in studies, in touch with CBOs so that they can adapt to new livelihood strategies following their traditional livelihood. Telecenter should start e-business of local products through haathbazar.com, so that villagers will be encouraged to start Nepali handicrafts, produce ghee, honey and organic cheese. VOIP phone and cybercafes should be established in newly announced tracking root by Nepal government, which provides way to earn money adapting different livelihood strategies. Telecenter operator also should expand network of telecentre, educate people for the use of ICTs in telecentre which initiate villagers to use during emergency, also the infrastructure should be updated with new technology.

7.4 Contribution to Research and Practice

Considerable contribution has been made to research and practice for areas within domain of ICTs in telecentre. The government of developing countries makes strategies and resource choice to setup ICTs facility in rural area through telecentre for core
development in collaboration with international agencies. But due to lack of realistic data

government are unable to design effective strategy and make choice of relevant resource

which leads all investment of international agencies to waste., so this study may

contribute exact data, evidence, best practices from study sites to government, local

NGO’s and INGO’s. The field analysis support international agencies to know how ICTs

can be implemented in cost effective manner to have admirable changes in livelihood of

rural people, where people are unaware on use of technology and have concept that

technology is complex to use. Research also contribute government, donor agencies and

academicians to know how is the condition of telecentre in rural area; whether they are

used as expected or not, weather implementation of ICTs is successful in changing the

way of leaving of people in rural area or not, barriers/inhibitor for use of ICTs, and why

telecentre in rural area are not able to include women, underrepresented groups into the

use of ICTs services in telecentre. This provides groundwork to improve efficiency and
effectiveness of telecenter. This study shows expected changes in rural area is dependent

on access to ICTs, so study facilitate telecenter manager, project leader, government,

international agencies to understand access as the opportunity to use ICTs regarding

availability of devices, financial ability for expanding ICTs services and technical ability
to maintain the system, train peoples and use the devices. Information and

Communication Technologies has appeared as technology of inequality supporting

people in rural area who are educated and capable to use ICTs, so this research study

assist government, academicians, donor agencies to understand women, underrepresented
people or groups involved in informal sector are the majority in rural area and excluding
these majority from use of ICTs in telecenter, development and sustainability of

telecenter is impossible in rural area. This facilitate local NGO’s, government, donors
agencies to design ICT4D programme that are able to include women’s and
underrepresented groups who are the bone in rural area for development and also focus

more on data that technology carry rather than technology.

In developing countries more stress is given to implementation of ICTs rather then

understanding impact brought on livelihood of rural people locally through ICTs

intervention so this research can be used as means for the academicians, local NGO’s

involved in development and international NGO’s to understand the impact of ICTs

intervention. This also aid them to know integration of development agenda with ICTs

enabled initiatives is an appropriate means for improving life of people in rural area. The

research finds barriers such as infrastructure, finance, skilled personnel’s and attitudes of
people; inhibitors such as users information needs, technology, coordination between

villagers and projects people that hinder/restrict successful use of ICTs in rural area
which is groundwork for development agencies to know before implementation of ICTs
project in rural area because it has been a problem for agencies to understand these factor
which lead project to failure. This research study provides few guidelines such as identify
and prioritize the problem, develop a strategy for action, apply to targeted groups, and
realize the corresponding changes which academicians, development agencies can follow
to understand the scenario of ICTs for better uses in the society. This research also aid to
design strong plan and inform donors about management plan which is essential for the
sustainability of telecenter in rural area for full uses of ICTs to produce positive changes
in life’s of rural people.
In practical the findings helps telecenter manager to design innovative services to meet information needs of villagers so that villagers can benefit from its services. Research contributes telecenter manager to find what kind of information, training and awareness campaign are of value to attract rural people to use telecenter services. UNDP suggest telecentre failure is due to lack of local and relevant content so this study focuses project leaders, telecenter operators and developers to assess information needs of people to develop user friendly application (Colle, 2002). This information need assessment provides avenue to address gap between telecenter and rural people because international agencies focus more on technology hardware or software but have very little effort on understanding the demand side of telecenter services from users. Telecenter operators are known to computers uses but unknown to link the potential of telecenter to education, health services so this research assist telecenter manager how to be more oriented to dynamic services that have direct relation on rural people’s life.

7.5 Future Research

This research studies the relation between ICTs and people livelihood to evaluate the changes brought by intervention of ICTs facility in Nangi village Ramche VDC through telecenter. During collection of empirical data to answer the objectives of this study, several issues are identified. These issues are not studied in context of developing countries like Nepal, so the researcher find meaningful to present these subject area for further research in future. First, the investigation on use of ICTs and its impact on livelihood of rural people was confined to Nangi-Ramche of Myagdi districts in Nepal. Thus to have complete picture of the impact of ICTs use on people’s livelihood, the research should be conducted on more village covered by telecenter project (NWNP). Doing comparison of multiple cases in different context helps to know difference on potential impact brought by ICTs intervention. But due to limited resources and time I was confined to Nangi village of Ramche VDC of Nepal. Second, the study found that there is need to develop sustainable business model to identify critical success factor for successful use of ICTs facility in telecenter of Nangi village of Ramche VDC. Third, in study sites most of the people were using mobile phones for communication though telecenter provide communication in cheap rate, so the study suggest to do comparison study on these services to establish which service is more beneficial to villagers. Last, Nepal government have not developed ICTs policies for telecenter regulation though government have announced cyber crime policies, so other academicians can conduct study on telecenter policies in involvement with government wings.
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Appendices:

Appendix 1: Photos Taken in Study Site (Nangi village of Ramche VDC)

Figure 5: Relay Station from Pokhara to Khopra, Nangi village of Ramche VDC
(Source: Google Map)

Figure 6: Dish Antenna used in Khopra for Relay
(Source: http://nepalwireless.net/)

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Figure 7: Topographic view (Nangi Village of Ramche VDC)

Figure 8: Ward 1 & 2 of Nangi Village of Ramche VDC

Figure 9: Ward 3 & 4 of Nangi Village of Ramche VDC
Figure 10: Telecenter in Nangi village of Ramche VDC

Figure 11: Video Conference Room in Telecenter of Nangi village of Ramche VDC
Figure 12: FGD Participant in Nangi village of Ramche VDC

Figure 13: FGD with Village Leaders

Figure 14: FGD with Students
Fig 15: Tele-teaching for health workers

Fig 16: Tele-teaching for computer operator

Fig 17: Nepal wireless main page in local language

Fig 18: Villagers reading news in local language from Nepal wireless page
Appendix 2: Sustainable Livelihood Framework

Figure 19: Sustainable Livelihoods Framework
(Source: DFID, 1999)
Appendix 3: Characteristics of Respondents

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Nangi Village of Ramche VDC</th>
<th>Ward 3</th>
<th>Ward 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household: 10 (interview 17, each house 1-2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 16-25</td>
<td>Age 26-45</td>
<td>Age 16-25</td>
<td>Age 26-45</td>
</tr>
<tr>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>User</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-User</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2: Household Respondents in Ward 3 & 4 of Nangi village of Ramche VDC

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Nangi Village of Ramche VDC</th>
<th>Ward 1</th>
<th>Ward 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household: 12 (interview 24, each house 2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 16-25</td>
<td>Age 26-45</td>
<td>Age 16-25</td>
<td>Age 26-45</td>
</tr>
<tr>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>User</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-User</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 3: Household Respondents in Ward 1 & 2 of Nangi village of Ramche VDC

<table>
<thead>
<tr>
<th>Respondent (Teacher, School Leader, health workers, Farmers)</th>
<th>Nangi Village of Ramche VDC</th>
<th>Ward 3 &amp; 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus Group Discussion (No of participants: 14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 16-25</td>
<td>Age 26-45</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>User</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-User</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 4: FGD with teacher, leader, health workers & farmers in Nangi village of Ramche VDC
### Table 5: FGD with teachers & health workers in Nangi village of Ramche VDC

<table>
<thead>
<tr>
<th>Ward 1 &amp; 2</th>
<th>Focus Group Discussion (No of participants: 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent (teachers, health workers)</td>
<td></td>
</tr>
<tr>
<td>Age 16-25</td>
<td>Age 26-45</td>
</tr>
<tr>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>User</td>
<td>2</td>
</tr>
<tr>
<td>Non-User</td>
<td>0</td>
</tr>
</tbody>
</table>

### Table 6: FGD with students of Grade 12: Various program in Nangi School

<table>
<thead>
<tr>
<th>Ward 1,2,3 &amp;4</th>
<th>Focus Group Discussion (No of participants: 14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent (Students)</td>
<td>Grade 12 : Various program</td>
</tr>
<tr>
<td>Age 16-25</td>
<td>Age 26-45</td>
</tr>
<tr>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>User</td>
<td>5</td>
</tr>
<tr>
<td>Non-User</td>
<td>0</td>
</tr>
</tbody>
</table>

### Table 7: FGD with students of Grade 11: Various program in Nangi School

<table>
<thead>
<tr>
<th>Ward 1,2,3 &amp;4</th>
<th>Focus Group Discussion (No of participants: 13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent (Students)</td>
<td>Grade 11: Various program</td>
</tr>
<tr>
<td>Age 16-25</td>
<td>Age 26-45</td>
</tr>
<tr>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>User</td>
<td>4</td>
</tr>
<tr>
<td>Non-User</td>
<td>0</td>
</tr>
</tbody>
</table>
Appendix 4: Consent Form

Consent Form for Focus Group Discussion

Title: Impact study of ICTs use on the livelihood of rural people

I (Biswa Karki) master student in information system at Linnaeus University, Sweden. I am looking for your assistance for my study and request you to participate in this investigation: How use of ICT by people in selected rural area impact the various aspects of their livelihood? At this study I am interested to study the impact of ICT use on livelihood of rural people. Since the information between the relation of ICT and sustainable livelihood is very less so your involvement can help to produce more detail information.

Though you people may not be benefited directly from the result of this study, but you may be benefited in future. The result will inform the project leader, community leaders, and the government people for promoting the use of ICT for development on better ways of operating telecenter in future and increasing the accessibility of ICT and its use more efficiently.

If you agree to participate, you will be asked to participate in focus group discussion which last for period of one hour. Your involvement in this study will be voluntary and all your contribution for information will be kept confidential from other group but cannot confirm the confidentiality of the information share in the group. During study you can withdraw your participation without pressure, if you are not interested.

Authorization: I have read the above statement and understand the nature of this study. I agree to participate in this study and I too understand that I can refuse the involvement or can withdraw from the study at anytime if not interested without pressure. For further inquiry and clarification I can contact the researcher (Biswa Karki: biswakarki@gmail.com) and the supervisor (Jan Aidemark: jan.aidemark@lnu.se) at Linnaeus University, Sweden.

Participant Signature:.............................. Date:..............................

Researcher Signature:.............................. Date: 16 March 2011
Consent Form for Village Leader/Social Activist

Title: Impact study of ICTs use on the livelihood of rural people

I (Biswa Karki) master student in information system at Linnaeus University, Sweden. I am looking for your assistance for my study and request you to participate in this investigation: How use of ICT by people in selected rural area impact the various aspects of their livelihood? At this study I am interested to study the impact of ICT use on livelihood of rural people. Since the information between the relation of ICT and sustainable livelihood is very less so your involvement can help to produce more detail information.

Though you may not be benefited directly from the result of this study, but you may be benefited in future. The result will inform the government people for promoting the use of ICT for development on better ways of operating telecenter in future and increasing the accessibility of ICT and its use more efficiently.

If you agree to participate, you will be asked to participate in semi-structured interview which last for period of one hour. Your involvement in this study will be voluntary and all your contribution for information will be kept confidential. During study you can withdraw your participation without pressure, if you are not interested.

Authorization: I have read the above statement and understand the nature of this study. I agree to participate in this study and I too understand that I can refuse the involvement or can withdraw from the study at anytime if not interested without pressure. For further inquiry and clarification I can contact the researcher (Biswa Karki, biswakarki@gmail.com) and the supervisor (Jan Aidemark: jan.aidemark@linu.se) at Linnaeus University, Sweden.

Participant Signature: ____________________ Date: ____________________

Researcher Signature: ____________________ Date: ____________________
Consent Form for Village Health Person

Title: Impact study of ICTs use on the livelihood of rural people

I (Biswa Karki) master student in information system at Linnaeus University, Sweden. I am looking for your assistance for my study and request you to participate in this investigation: How use of ICT by people in selected rural area impact the various aspects of their livelihood? At this study I am interested to study the impact of ICT use on livelihood of rural people. Since the information between the relation of ICT and sustainable livelihood is very less so your involvement can help to produce more detail information.

Though you may not be benefited directly from the result of this study, but you may be benefited in future. The result will inform the government people for promoting the use of ICT for development on better ways of operating telecenter in future and increasing the accessibility of ICT and its use more efficiently.

If you agree to participate, you will be asked to participate in semi-structured interview which last for period of one hour. Your involvement in this study will be voluntary and all your contribution for information will be kept confidential. During study you can withdraw your participation without pressure, if you are not interested.

Authorization: I have read the above statement and understand the nature of this study. I agree to participate in this study and I too understand that I can refuse the involvement or can withdraw from the study at anytime if not interested without pressure. For further inquiry and clarification I can contact the researcher (Biswa Karki: biswakarki@gmail.com) and the supervisor (Jan Aidemark: jan.aidemark@lnu.se) at Linnaeus University, Sweden.

Participant Signature: [Signature]
Date: [Date]

Researcher Signature: [Signature]
Date: March 14, 2011
Consent Form for Users/Non-Users of ICTs in Telecenter

Title: Impact study of ICT's use on the livelihood of rural people

I (Biswa Karki) master student in information system at Linnaeus University, Sweden. I am looking for your assistance for my study and request you to participate in this investigation: How use of ICT by people in selected rural area impact the various aspects of their livelihood? At this study I am interested to study the impact of ICT use on livelihood of rural people. Since the information between the relation of ICT and sustainable livelihood is very less so your involvement can help to produce more detail information.

Though you people may not be benefited directly from the result of this study, but you may be benefited in future. The result will inform the project leader, community leaders, and the government people for promoting the use of ICT for development on better ways of operating telecenter in future and increasing the accessibility of ICT and its use more efficiently.

If you agree to participate, you will be asked to participate in structured interview which last for period of one hour. Your involvement in this study will be voluntary and all your contribution for information will be kept confidential. During study you can withdraw your participation without pressure, if you are not interested.

Authorization: I have read the above statement and understand the nature of this study. I agree to participate in this study and I too understand that I can refuse the involvement or can withdraw from the study at anytime if not interested without pressure. For further inquiry and clarification I can contact the researcher (Biswa Karki: biswakarki@gmail.com) and the supervisor (Jan Aidemark: jan.aidemark@lnu.se) at Linnaeus University, Sweden.

Participant Signature: ........................................ Date: March 14, 2011

Researcher Signature: ........................................ Date: March 14, 2011
Appendix 5: Interview Protocol for Telecenter User/Non-User

Interview Questionnaire for ICTs User/Non-User in Telecenter

Name: Kham, Prisha, Bhim (Phakami)

Age/Gender: Eighteen (18)

Occupation: Students

Education: +2

District/Village/Ward: Sarbat Barhadhe, J (Baranav 32 Bhim)

Date of Interview: 06-11-25 (2011 March 14)

SECTION 1: ACCESS TO ICTs

1.1 Access to services in telecenter/awareness

1.1.1 Have you ever visit to telecenter? Yes ☑ No ☐ (If No, Go to 1.1.6)

1.1.2 If Yes, what is the reason for visiting telecenter?
☐ Meeting People ☐ Telephone service
☐ Computer training ☐ Typing & Printing
☐ Internet service (Email, Skype, VOIP)
☐ Other reasons explain: "play computer, game, editing photos"

1.1.3 Have you ever used the services offered by telecenter? Yes ☑ No ☐

1.1.4 Are you satisfied with services provided by telecenter? Yes ☑ No ☐

Please give reason for your answer: Yes, satisfied with services provided by telecenter because we can do easily important thing immediately whenever we want without money.

1.1.5 How often do you use the telecenter?
☐ Daily ☐ Several times in week ☑ Once in week ☐ Rarely

1.1.6 Why you are not using telecenter?
☐ No urgent need ☐ No message to send
☐ No money ☐ Have other means of communication
☐ Person to contact has no email address
☐ Not aware of the types of services
☐ Do not know how to use it
☐ Do not have need to use the services
☐ Too expensive as have limited income
☐ Don’t know who to contact, also am illiterate

1.2 Ability (Skills) to use computer, internet, and email

we can write without pen & paper, we work easily from computer and solve every problem.
1.2.1 Do you know how to use a computer, internet (www) and email? Yes [ ] No [ ]

*(If Yes, Go to 1.2.2)*

1.2.2 Have you used email? Yes [ ] No [ ]

1.2.3 How do you communicate by email INTERNET?

[ ] Use it myself
[ ] Ask attendant in telecenter

1.2.4 What do you normally use email for?

[ ] Gain knowledge/skills
[ ] Contact business/work related
[ ] Communication with friends/family
[ ] Communication with health experts (Doctor, Nurse)
[ ] Communication with technology experts (agriculture)
[ ] Emergencies (Family, Friends)
[ ] Other reason, please explain

1.2.5 How many times do you use email?

[ ] Daily
[ ] Several times in week
[ ] Once in week
[ ] Rarely

1.2.6 What type of website do you see on the internet?

[ ] Email (Yahoo, Hotmail, Gmail)
[ ] News (sports, current affairs)
[ ] Education
[ ] Entertainment (music, games)
[ ] Government Information
[ ] Business/work related
[ ] Health issues
[ ] Agricultural issues
[ ] Religious affairs
[ ] Social-finding penpals (Facebook, Hi5, Twitter)
[ ] Others...

2. Impact of Telecenter on Livelihood of Rural People

2.1 In your knowledge what are the biggest problems related to problems in reality?

[ ] Lack of access to computer
[ ] Lack of jobs
[ ] Lack of computer training
[ ] Lack of secretarial services
[ ] Others, please explain

2.1.1 In your knowledge, has this problem been solved by telecenter?

[ ] Yes [ ] No (Give your detail explanation)  Because all the problems we can solve by telecenter service like health, education

2.1.2 Do these statements agree with your expectations of Telecenter? It will probably lead to...

2.1.2.1 Better skills, knowledge, basic health (Better access to information in local language, school connectivity, health advice & healthcare, new working skills)
2.1.2.2 Increased income, saving of people in community (increased profit margin through better access to market information, remittances from workers, reductions in transportation costs)
- Totally agree
- Neutral
- Partially agree
- Partially disagree
- Disagree, Give reason for answer...

2.1.2.3 Improved relationship and networks (global & national communication for family, expanded social networks, advice & counseling for life events, remote education links)
- Totally agree
- Neutral
- Partially agree
- Partially disagree
- Disagree, Give reason for answer...

2.1.2.4 Access to basic infrastructure needs (access to 4G, access to cheaper production equipment)
- Totally agree
- Neutral
- Partially agree
- Partially disagree
- Disagree, Give reason for answer...

2.1.2.5 Access to natural assets resources (access to natural resource management institution for land tenure & conflict resolution)
- Totally agree
- Neutral
- Partially agree
- Partially disagree
- Disagree, Give reason for answer...

2.2 Impact of use of Email/Internet on Vulnerability context

2.2.1 Is Email/Internet important in emergency situation?
- Very important
- Important
- Not important (please give your example)

2.3 Obstacles to use Email/Internet

2.3.1 Do you face any problem with regard to use of Email/Internet?
- Yes
- No

2.3.2 Do you face any problem for use of other services provided by Telecentre?
- Yes
- No

Note: - If yes, explain the problem
We can read online books, search solutions of health problems, search question sample of examination, read updated news of world so it helps to gain more knowledge.

Our family members used to go to another village for communication with relatives. People in my community used to go to Pokhara & Bend to get money from there relatives who were in foreign country but now they can get or send money from telecenter through cooperative which saves travel cost.

We can send emails, get emails or chat with relatives by using internet. People in my community can communicate with health experts from Pokhara, Kathmandu and even from foreign countries.

People in my community, students, teachers all can use computer. Mothers can chat, send email to their husband or their relatives. Primary level students can play games or use computers.

Email/Internet is very important in emergency situation because we can communicate with people who are far. It takes much time to go by themselves. So it make much easy and quick to know their news and tell them our news. We can also ask support/assistance of money in difficulty.
Appendix 6: Interview Protocol for Telecenter Operator

<table>
<thead>
<tr>
<th>Semi-Structured Questionnaire for Telecenter Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Telecenter: Himanchal School, Nangi</td>
</tr>
<tr>
<td>Name of Manager: Kisan Pun / Teac.</td>
</tr>
<tr>
<td>Location/Date of Interview: March 15, 2011</td>
</tr>
</tbody>
</table>

1. What is the approximate number of users in this Telecenter currently?
   - Students, Villagers, around 15-20 per day & more abroad

2. List type of users served by this Telecenter?
   - Student
   - Farmers
   - Retired
   - Army
   - Women
   - Groom

3. What services do you currently offer? (Computer training, email, Internet, business support, economic support, etc.)
   - Language, local wireless page, communication, local news in local language
   - Technology, Web design com, online advertising

4. If the Telecenter has discussion center what issues, in which area, and which group of people are involved?
   - Funding problem, time management,
   - No, not able to read the communication, due to less computer difficulty,
   - Actually, villagers talk about health problem, education problem

5. Are the facilities available in this Telecenter enough to satisfy the needs of communities?
   - Actual, villagers talk about health problem, education problem

6. What is the most used service in the Telecenter?
   - Email, internet, voice telephone, typing, printing

7. What plan you are using to ensure that communities get access to information relevant to their needs? (Locally produced information access)
   - Paper board, bill board, make tools to set up more effective
   - Making people aware about using distance

8. What kind of problems do Telecenter face to acquire ICT?
   - Computer problem, funding problem, power problem, time
   - Some can be done from villagers due to lack of knowledge

9. What strategy you are using to overcome the problem to acquire ICT?
   - General problems

10. In your opinion, what has been the impact of ICT in development of people leaving in this community in these areas? Please explain.
    - Better skills, knowledge, basic health
    - Increased income, saving of people in community
    - Market information, economic benefits
    - Access to market, reduced production costs
    - Improved relationship and networks
    - Access to natural resources

    - Yes, there is good relation people are in need of the services provided by telecenter, on the services being provided are the needs of villagers, say understanding the need that are providing problem is understood

12. Is there any relation between services offered by Telecenter and development of livelihood of communities? Explain in detail for your answer.
    - Yes, there is good relation people are in need of the services provided by telecenter, on the services being provided are the need of villagers, say understanding the need that are providing problem is understood.
13. In your knowledge, what are the top ten advices to increase the accessibility of ICT and better operation of telecenter?

**Overview on hard system of Telecenter**

1. Number of computers: **25**
2. Size of hard disk: **40/80**
3. Nature of information stored: **educational/learning material**
4. Number of Printer: **2**
5. Number of photo copy machine: **1**
6. ICT services (telecenter, cafe):
   - photocopy, printing, Email, VoIP
7. ICT infrastructure (mobile & telephone tower, satellite dishes):
8. Telecenter operation hour:
   - 8-4 Saturday - Sunday
   - 8-6 Monday - Thursday
9. Number of people month/day:
10. Gender aspect of use:
    - Majority of male → More educated/Free
    - Minority of female → Should look after house & family & they are less literate
    - Our society do not give more opportunities to female to work with extra activities

→ Offline Internet
   - From where people/student receive educational materials
   - Online materials
   - Epect to study materials

- Voice for people
  - Fund from responsible org.
  - Able to buy instrument
  - Shortage of power so local power should be developed
  - Education standard is barrier and those who are able do use cannot use due to infrastructure poor
  - Retired person also use to communicate through roman language
  - Advanced technology
  - Information has been provided by email/internet
  - Could not feel importance of email by people
  - Problem - technical problem, shortage of computer, shortage of power
Appendix 7: Interview Protocol for Focus Group Discussion

Semi-Structured Questionnaire for Village Health Person

1. In your knowledge, what was the biggest community related problems you see before telecenter in reality?

2. In your knowledge, has the community related problem been solved by Telecenter?

3. In your knowledge, what has been the impact of ICT in development of people leaving in this community? Please explain in detail.

4. In your knowledge, has the service provided by Telecenter been used for the benefit of rural communities? Please explain in detail.

5. Do you see any problem in communities for the use of Telecenter Services? If Yes, Please explain.

6. In your knowledge, what are the top ten advices to increase the accessibility of ICT and better operation of telecenter?
(3) अथवा तुम्हारा केवल को जाते फिरो जाने हिफ्साही 
बाज़ अक्षर के, नाभिकी बाल्कर ज्ञाता हो देखा
के, जय-प्रत्येक अवकाश फँसाह, क्योंकि शिक्षा
हो रही है ज्ञान के अवकाश के अंदर अनजानी
की गलती। इनके अंतराल में ज्ञान की नई ओर
के नए चित्र के सिद्धांते ही सिद्धांत अथवा
के हार्मोन दोनों का सिद्धांते ही सिद्धांत
की विचार के आधार, जैसे वास्तविक सम्प्रा
जैसे इंटरनेट की कोई बैन्डविधि
Appendix 8: Interview Protocol for Social/Village Leader

Semi-Structured Questionnaire for Village Leaders/Social Activist

1. In your knowledge, what was the biggest community related problems you see before telecenter in reality?

2. In your knowledge, has the community related problem been solved by Telecenter?

3. In your knowledge, what has been the impact of ICT in development of people leaving in this community? Please explain in detail.

4. In your knowledge, has the service provided by Telecenter been used for the benefit of rural communities? Please explain in detail.

5. Do you see any problem in communities for the use of Telecenter Services? If Yes, Please explain.

6. In your knowledge, what are the top ten advices to increase the accessibility of ICT and better operation of telecenter?
Appendix 9: Interview Protocol for Project Leader

Semi-Structured Questionnaire for Project Leader

1. In your knowledge what were the biggest community problem you see before running the Telecenter project?

2. In your knowledge has the Telecenter project been successful in solving the community problem/Digital divide?

3. In your knowledge, what has been the impact of Telecenter services in development of people leaving in this community in this area? Please explain in detail.
   - In term of Human capital (Information, knowledge, health, skills)
   - In term of financial capital (Monetary resources)
   - In term of Social capital (network, relationship, group membership)
   - In term of Natural capital (climate, agricultural crops, vegetation, forest)
   - In term of Physical capital (transport, raw materials, tools, equipment)
   - In term of Vulnerability (Emergencies)

4. Do you see any problem in the communities for the use of Telecenter services? If Yes, Please explain.
   - Lack of electricity, less no computer, Lack of time management in people
   - Language problem, lack of awareness.

5. In your knowledge, what are the top ten advices to increase the accessibility of ICT and better operation of Telecenter?

   - Education campaign to educate villagers how to use Telecenter ICTs service
   - Widen the Internet / Telecenter service in village
   - Include Underrepresented group in the project structure
   - Make a business model to provide Telecenter sustainability because Telecenter project is depending on donors & community money
   - Develop local power energy to overcome natural energy
   - Human capital: Learn computer to use email/Internet
   - Financial capital: Use Haadbazar. com for advertisement.
   - Social capital: Increased community interaction, Information exchange
   - Physical capital: Through clinics people access health, get access camp.
Appendix 10: Interview Protocol for Health Worker

**Semi-Structured Questionnaire for Village Health Person**

1. In your knowledge, what was the biggest community related problems you see before telecenter in reality?

2. In your knowledge, has the community related problem been solved by Telecenter?

3. In your knowledge, what has been the impact of ICT in development of people leaving in this community? Please explain in detail.

4. In your knowledge, has the service provided by Telecenter been used for the benefit of rural communities? Please explain in detail.

5. Do you see any problem in communities for the use of Telecenter Services? If Yes, Please explain

6. In your knowledge, what are the top ten advices to increase the accessibility of ICT and better operation of telecenter?

- She knows to use computer, internet & Email
- She refers google to see news, health website to see/take health information
- She shares her experience, that many people come to telemedicine to contact with health experts for treatment. This has saved people travel cost, treatment cost and increase the social cohesion between people because people from different village come to the center which establish good relationship.
- Problem: Many people die of lack of treatment.
- No good treatment, no communication through Internet, have to send letter which is taking long time taking
- Time save, transaction save.
- Machine use to make grind the.
- All children know to use computer
Self involvement, awareness & use of technology all people like foreigners who come should donate a little for better running. Since lack of fund we are not able for proper maintenance of device. We are afraid in future that weather this service will function more or not.

More technical experts should be involved to operate the system in complex context or

We should be given more training
Appendix 11: Letter of Introduction

TO WHOM IT MAY CONCERN

REFERENCE: LETTER OF INTRODUCTION (STUDENT ID: 831212-T315, BISWA KARKI, INFORMATION SYSTEM PROGRAMME)

This letter introduces Biswa Karki who is registered at Linnaeus University as Master student in Information System. Mr. Karki is carrying out impact study of Information and Communication Technologies on livelihood of rural communities’. The objective of study is to investigate the current use of ICT in rural area of Nepal and its impact on livelihood of communities. The collected information supports for good decision making.

To undertake this study, Mr. Karki has to conduct interviews with groups of people, community leader and telecenter operator. In this context, Information System Programme at Linnaeus University kindly requests the community for your assistance to facilitate the study.

In need of further information regarding Mr. Karki study, please feel free to contact me Prof. Jan Aidemark supervisor of this study.

Thank you in advance.

Yours Faithfully

[Signature]

Prof. Jan Aidemark
Supervisor