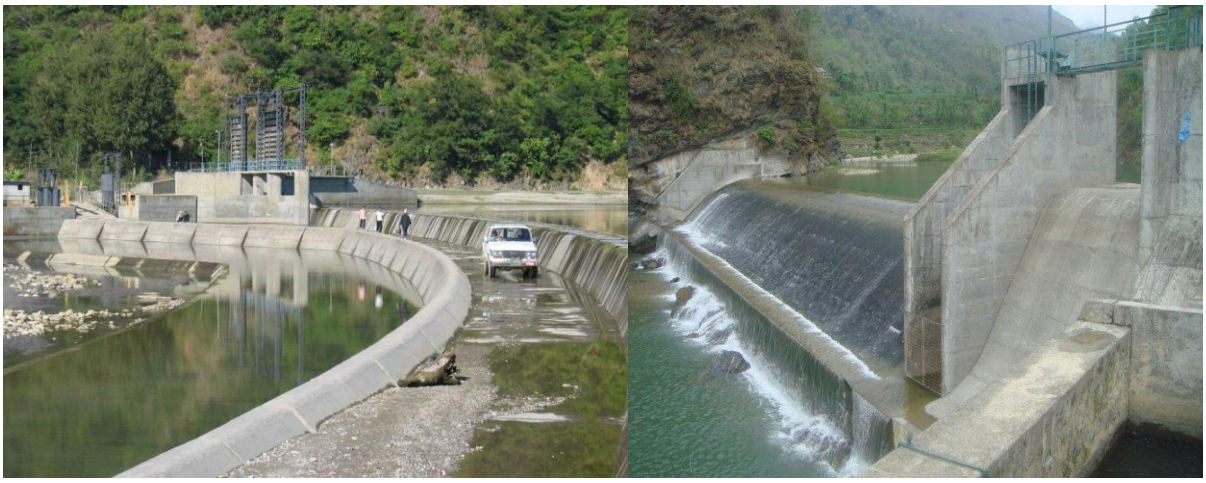

UMN and HP Contribution to the Development of Hydropower in Nepal and Its effect on the environment

Master's Thesis Submitted for the Degree in Diakonia and Christian Social Practice

AT

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IN

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By

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Under the Supervision of

Hans Morten Haugen

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June 2016 **Rumakanta Kafley**

Abstract

This thesis discusses about the UMN/HP contribution to the development of hydropower in Nepal and its effect on the environment by exploring the research question: how have UMN/HP contributed hydropower plants affected the socio-economic conditions and the environment? with the application of empowering and caring dimension of diaconal and community resilience theories.

First, this study describes about UMN/HP reflecting on how they are working for the welfare of Nepalese communities and people emphasizing their contribution to the promotion of hydropower in connection with economy development and environment. Empowering and caring aspects of Diaconia and community resilience theories are then described highlighting the proximity between the theories in regard to empowerment and resilient characteristics. Then UMN/HP support to the development of Andhikhola and Jhmiruk and their effect on environment, economy, livelihood etc. was focused through the interview with affected communities people, UMN/HP ex-employee and UMN/HP initiated and strengthened BPC employee.

This research discovered UMN/HP supported Andhikhola and Jhmiruk hydropower plants' have heralded more positive effects by supporting to improve the required significant characteristics of sustainable environment/ecology and resilient community. Despite the fact of having some negative effects to the downstream environment and livelihood, electricity has been contributing to improve the education, health, communication, transportation, employment, economy, justice, forest area etc.; and reduce the consumption of CO_2 gas emitting fossils and wood fuel by maximising equal distribution of opportunities and resources along with diversifying economic sources.

Creation of self-employment, through the promotion of small scale businesses, interprenuireship, commercial farming, cooperatives etc. help to increase community people's capacity building, strengthen power to function properly; and shifting the way of living with the exploitation of their competency and network to adapt the changes or stresses. Hydropower plants' empowering vision through the self-employment strategy helps to promote resilient eco-friendly livelihood resources which maximises community resilience by minimizing negative environmental stresses.

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List of Abbreviations

AIN	Association of International NGOs in Nepal
BEW	Butwal Engineering Work
BIT	Butwal Technical Institute
BPC	Butwal Power Company
BPCSL	BPC Service Limited
CR	Community Resilience
EA	Environment Assessment
EIA	Environment Impact Assessment
EPA	Environment Protect Act
EPR	Environment Protect Rule
HCE	Hydro Consult Engineering
HL	Hydro Lab
HHGCC	Himal Hydro and General Construction Company
HP	Himal Partner
IEE	Initial Environment Examination
INGOs	International Non-Governmental Organizations
IPPAN	Independent Power Producer's Associations of Nepal
LAA	Land Acquisition Act
LBMC	Law Books Management Commission
LWF	Lutheran World Federation
MoE	Ministry of Environment
NHEL	Nepal Hydro and Electric Limited
NGOs	Nepal Government Organizations
UMN	United Mission to Nepal
UNDP	United Nation Development Programme

Chapter One: Introduction

1.1UMN and HP in Nepal

United Mission to Nepal (UMN) and Himal Partner (HP) are Christian Faith based missionary humanitarian organizations. Both have been working in Nepal since 1954 as international organizations. With the inspiration of Jesus Christ life and teaching, they have been serving the Nepalese society through health, education, hydropower, engineering, industrial and economic development projects.

Albeit they have vivid Christian profile, the government of Nepal officially acknowledges them as international non-governmental organizations (INGOs) for social welfare work in Nepal, for instance, Dr Suresh Raj Sharma, vice chancellor of Kathmandu University levels UMN and its members as " the most experienced and effective INGO groups perennially working in Nepal with their missionary enthusiasm" (Sharma 2003:50).They have been carrying out social welfare works under successive five year agreement with the government of Nepal and have renewed their agreement with their new welfare strategies and plans.

1.1.1 United Mission to Nepal

UMN is a 'Joint Mission Agency' of a number of different Christian faith based organization s. UMN currently is a joint mission of 19 distinctive supporting partner organizations from nearly 20 countries throughout the world (UMN undated). UMN defines itself as an international Christian Faith based humanitarian missionary organization which is evident by "To minister to the needs of the people of Nepal in the name and spirit of Jesus Christ" (UMN 2015). UMN is a cooperative venture between the citizens of Nepal and large number of Christian organizations from the globe.

UMN, with its Christian profile, conducts under a General Agreement and Project Agreement with the Social Welfare Council of the Government of Nepal. Besides, UMN is an active member of the Association of International NGOs in Nepal (AIN) and follows their basic operation guidelines and code of conducts (UMN undated).

Nepal was a closed country until 1951 to the foreigners. Feudalistic ruling system with legacy to the Rana family of hereditary Prime Ministers was the practice. Common people suffered an unbelievable hardship with limited access to education, health care and very few facilities. When democracy came and new historical era began in 1950, Nepal became open to

international communities; as a result, a group of Christian missions got formal invitation to conduct health and education services from the government of Nepal in 1954.

In March 1954, representatives from eight mission organizations and churches came together in Nagpur, India, and created the united Mission to Nepal in response to the invitation from the government of Nepal to open medical clinics in Kathmandu and Tansen (UMN 2015). They came in Nepal being united as UMN in1954.

Albeit UMN got invitation to provide health service, it in an amazingly short period managed to initiate new type of practical services and development activities in coordination with its founders, the mission organizations in Nepal.

The missionary organizations are heavily supporting Nepal's sustainable development drive with UMN in the forefront, in line with the significant focus on sustainable livelihood by the promotion of hydro industry to the economic and small scale business development for tangible socio-economic changes of Nepalese communities.

Wondering on why people are poor even in the country with full of natural resources to meet the basic needs of all, UMN/HP committed to

> working towards fullness of life for all … special emphasis on … value of care for the environment … relates strongly to several of other core values … Equity and Social Justice, Love and Services, Innovative and Creative (UMN 2012:2) .

Envisioning sustainability of individual and community life as an aspect of fullness of life UMN strives "helping communities to live within and nurture a healthy and resilient environment, ensuring resources are used fairly in the present and are maintained for the future." (ibid: 2). With respect to the UMN Environment and Climate Change Policy 2012, in this master thesis the focus will be primarily on a community resilience.

1.1.2 Himal Partner

Himal partner (HP), Norwegian mission organization, is working in collaboration with UMN. HP has been contributing to the development through working mission of professionals. HP, with engineers, doctors, nurses, and technical expertise, has contributed to address the wide range needs of Nepal. Along with social work and health care HP has worked much with industrial and hydropower development. Besides, assisting Nepal with professional expertise of different fields, HP has supported the development of Nepal logistically and financially.

With the funding from Norwegian Government Aid, HP is helping to build hydropower plants in addition to train human capitals with technical and industrial competence. By identifying and acknowledging the local needs, HP is contributing to build capacity of local communities and enhance the dignified existence in negotiation with the nature/ecology as reflected in respectful, reading (extract): "Respect for all people, regardless of faith and position in society and respect for nature, the environment and the local culture." http://www.himalpartner.no/omoss/in-english/. What this respectful extract reflects is Himal Partner's advocacy on the dignified co-existence between human and environment.

1.2 Research question and assumptions

My thesis is about UMN and HP's contribution to the development of hydro industry in Nepal and its effects on the environment. UMN and HP are contributing more to the development of schools, hospitals but my inquiry goes to illustrate hydropower industry and its effect on socio-economy and environment exploring the answer of the research question:
How have UMN and Himal Partner supported hydro-energy projects affected the socio-economic conditions and the environment?

The first assumption is UMN and HP have engaged in Hydropower development because Nepalese authorities have invited them to involve in developmental activities to harbor tangible change in the communities and the competency, knowledge and experiences from their homeland have contributed to reduce the negative environmental effect while developing the hydropower plants in Nepal.

Likewise, another assumption is that UMN and HP have been cautious to bring changes in the livelihood of the affected communities avoiding negative ecological impacts and down scaled project in order to achieve this goal.

The last assumption is that, UMN and HP have contributed positively to bring desired socio-economic improvement to the district people while the directly affected communities might have experienced something negative.

1.3 Contribution in Hydro power by HP/UMN

How has HP/UMN contributed to hydropower? To explore the answer of the question I will emphasize the three dimensions of the work: T. I. B.

Training: HP representative, the visionary missionary Odd Hoftun acknowledged the possibility of hydropower in Nepal when he saw the potentials of the natural energy of the Tinau River and due to the natural proximity between Nepal and Norway (Svalheim 2015). So as to harness Nepal's tremendous hydro potential he envisioned a technical workshop with apprentices (16 in annual intake) who got some kind of salary (Svalheim 2015) and learn the training skills for the development of hydropower and their country. That technical workshop was born as Butwal Technical Institute (BTI) in 1963. To run BTI, he raised fund and instrument from his homeland Norway. Tinau Hydropower was achieved exploiting human capitals produced by BTI.

BTI produced the mechanics and the technicians in the field of mechanical and electrical engineering. HP is perennially contributing to the development hydropower through BTI producing technical human capitals.

Installations: Butwal Power Company (BPC); Odd Huftun/HP UMN initiated, strengthened, and finally privatized and commercialized enterprise; contributed to the national energy by installing hydropower plants. BPC (1966) together with UMN constructed three hydropower stations like Tinau, Andhikhola and, Jhimruk, and collaborated with other four plants like Khimti, Khundi, Kabeli, and Nyadi. BPC and its sister companies particularly the Himal Hydro and The Hydro-Electric Company, are contributing significantly to hydroelectricity in Nepal. UMN and partners installed power projects contribution in total national electricity production (770MW) is 17.1(MW), in figure 2.2% but UMN initiated, empowered and privatized companies contribution approximately is 75(MW), in figure 9.74% of total hydropower generation.

1.5MW Tinau hydropower in 1970 and handed over to the government in 1980, Andhikhola 5.1MW (1991) and Jhimruk 12.3MW (1994), are multi- purpose rural electrification projects, Khimti Hydropower Project (60 MW), Khudi Hydro power project (4.2MW) and Andhikhola Upgraded Hydropower project (9.4 MW) are the most important power plants initiated and empowered by UMN and HP companies.

Business: BPC pioneered Himal Hydro and General Construction Company (HHGCC), Nepal Hydro and Electric Ltd (NHE), Hydro Lab (HL), Hydro-consult Engineering (HCE), BPC Services Limited (BPCSL) and Butwal Engineering Works (BEW) initiated mechanical hydro engineering related businesses.

These aforementioned institutions play instrumental role to promote different hydro-mechanical businesses through the services like "the research in the area of hydraulics and sedimentation, engineering, construction, operation, maintenance and manufacturing of hydroelectric tools" (http://www.bpc.com.np/index.php?option=com_page&task=details&id).

Hence, through TIB concept HP/UMN has been contributing a lot to the development of hydropower in Nepal.

1.4 Environment Assessment to the Development of Hydropower in Nepal

Development of hydropower has to satisfy various contradictory and complex criteria in Nepal: environmental friendliness, socio-economic opportunities, and technological reliability.

Environment Assessment (EA) is inevitable to examine the impacts of any developmental projects on the various aspects of environment. EA studies about the consequences on biological, physical, socio-economic and cultural aspects of environment in advance that eases decision making process assessing both positive and adverse effects of the proposed projects.

Sustainable development to some extent rests on how a company carries and implements its corporate social responsibility. Implementing EA is indeed a corporate social responsibility which enhances value to society that will help ensure sustainable development.

Making IEE and EIA obligatory in regard to the development of hydropower Nepal has framed the following legal frame work.

1.4.1 Legal frame works

Nepal, recognizing the significance of EA in the development of hydropower and with the enforcement of the Environment Protection Act (EPA),1996 and Environment Protection Rules (EPR), 1997; made two forms of EA- Initial Environmental Examination (IEE) or

Environmental Impact Assessment (EIA) obligatory to the proposed hydropower projects to make them environment friendly, socially acceptable and sustainable.

1.4.1a Environment Protection Act (EPA), 1996 and Rules (EPR), 1997

EPA(1996) and EPR(1997) state that no development activities shall take place without conducting Initial Environment Examination(IEE) or Environment Impact Assessment (EIA) as per schedule 1 and 2 of the environment protection rule.

EPA obliges the proponent to prepare IEE or EIA on the implementation of any proposed proposals. Implementation of proposed projects is only possible upon the approval of IEE /EIA by the concerned Governmental agencies (secretarial ministry) and the Ministry of Environment (MOE).

1.4.1b Land Acquisition Act (LAA), 1977

All land acquiring process required during hydropower projects and other developmental activities come under this Act. This Act must be strictly followed while acquiring lands for the projects either on short-term or long-term. It includes the process of land acquisition and that must be given to the parties who are directly or indirectly affected by the development of the projects. Regarding land acquisition, Government must be notified and requested.

Nepal has passed other Acts regarding Environment Protection: Electricity Act (1992), The Electricity regulation (1993), Forest Act (1993), Forest Regulation (1995), Water Resources Act (1993), Water Resources Regulation (1993), Local Self- Governance Act (1998), The Explosive Act (1962), The Aquatics Life Protection Act(1961) and Labour Act (1991). Besides, Nepal is practicing other environment related policies, Guidelines, Manuals and Institutional frameworks.

In regard to the right of indigenous people Nepal has ratified ILO 169 and accepted the broad participation, land rights including introduction of consent in case of relocation of the people having attachment with the land. But Andhikhola and Jhimruk affected area there are not issues of indigenous people, so I will not analyse this further.

I will discuss how the HP& UMN supported hydropower projects particularly Andhikhola and Jhimruk (see appendix: 2) have addressed the biological, physical, socio economic and cultural environment of the area on the basis of EIA parameters to find out what effect positive or negative.

1.5 Motivation

UMN/HP, Christian faith based missionary international non-governmental humanitarian organizations, have been involving in the industrial and economic development of Nepal. Despite the fact of socio-cultural, geo-climatic and environmental challenges to work, they have been incessantly involving not only to promote livelihood of poor and marginalized communities but also to assist the Government of Nepal in its nation development plan. Even the complex conditions and legal adversities do not discourage to build up the competence, enhance local indigenous knowledge, and socio-economic empowerment of Nepali communities through vocational education, employment and industrial development. What motivates to be engaged with the Nepali people's socio-economic status changing strategy? What is the role of engineering, skill based technical education, vocational training, industrial and business development in the hydro industrial development strategy and their effect upon environment?

Nepal is potentially very rich country in hydro power yet Nepali people are facing the pre-hydro industrial social challenges even in the twenty first century. Cities are facing with incredible black out / load shedding and remote areas do not have electricity access. "With a quarter of Nepal's population deprived of access to electricity, access to energy has become a critical barrier to long-term development". (UNDP 2016:31).Unimaginable power cut discourages people's spontaneous economic development venture resulting rampant poverty. "70 percent of Nepal's population depends upon agriculture and even slight changes in environment or climatic conditions can have a major impact on their lives and livelihoods."(ibid: 26).

Agro based life directly or indirectly depend on environment. In the rampant poverty and sizable agro-based Nepalese livelihood context, UMN/HP socio-economic status changing vision through education, health, engineering and particularly economic development by hydro-industrial promotion to sustainable livelihood is praiseworthy. But economic development is not solely responsible for sustainable livelihood. Another equally significant part is environment. Environmental sustainability and sustainable livelihood compliments each other.

UMN and HP hydro industry promoting vision in conventional agro based poor country to harbor desired socio-economic changes motivate to know how socio-economic changes affect

environment. How do UMN and Himal Partner hydro industrial and economic development strategies address environmental/ ecological vulnerability?

1.6 Delimitation

This thesis will be descriptive and analytical account about UMN/ HP contribution to the development of hydro industry and HP/ UMN supported hydro powers' effect on socio economic conditions and environment. The description of contribution will rest on available books and documents whereas the effect will be analyzed on the basis of informants' opinion.

What this thesis will not cover is whether UMN/HP contribution (working/technical mission) to building schools, hospitals, hydro industry, providing skills promoting technical education, vocational training and engineering; is only a strategy of evangelizing in order to expand to their colonial version of Christianity in Nepal as claimed by social and political critic senior Dr. Sundarmani (Dixit 2014, at 25:55) or true social work as they agreed with the government of Nepal.

Similarly, this thesis will not incorporate policy and legal framework for licensing, biding, application for generation, transmission, distribution, electricity marketing and so on except some environment assessment provisions.

The bulk of findings will basically be based on the information, opinions, views, and perceptions provided by the 11 individuals interviewed in Nepal and Norway as representatives of beneficiaries or affected community people, agencies /donor and local partners and reading of available documents of respective arenas.

1.7 Structure of the Thesis

First chapter is the introduction and outline of the thesis as it introduces what the thesis is about and outline of the thesis by presenting the research question along with reflecting on EIA, Motivation and Delimitation.
Chapter Two will present and discuss the method exploited to collect and analyze information with an emphasis on how data, information or resource materials were collected.
The successive chapter Three will reflect on theories to be used for analysing the data. It will discuss Diaconia and Resilience theories. Diaconal theory of empowerment and caring for creation will be in focus. Similarly, community resilience will be in emphasis to reflect on resilience theoretical concept.

Next section Four will transform and present the raw forms of data collected from interview into information as informants views and respective chapter five discusses and analyses on those information applying the theories illustrated in chapter Three so as to get or find the answer of research question.

The last chapter Six will conclude the finding regarding the UMN/HP contributed hydropower effect on socio/economic and environmental conditions and community resiliency.

Chapter Two: Methodology

2.1 Introduction

This chapter will present the procedure/ method of data collection and analysis. Procedure will reflect on what researcher did and how the researcher collected data. What research method researcher used to gather information? This chapter also reflects on how the researcher analyse the gathered data and assess the research topic. Besides, this section will describe about how and what ethical considerations the researcher gives rise during data collection and assessment.

2.2 Research Question

The research studies on *how have UMN and HP supported hydropower projects affected the socio- economic conditions and the environment?* by concentrating to explore various environments affecting complex set of factors from context based experiences. For this both staff and community people were interviewed which will help to explore various perspectives of affected people and agencies.

2.3 Research Design

Researcher chose qualitative study than quantitative/mixed due to the nature of the research phenomena. Relatively small number of people of affected area and related field participated in the interview and researcher was seeking to obtain the information on various aspects of physical, biological, socio-economic and cultural environments while developing hydro industry. Therefore, quality came before quantity to mean more characteristics. The focus was to get rich explanations rather than narrow structure categories. Researcher's intention thus was to get wide range of themes/ideas on the topic rather than particular view on the topic.

2.3.1 Qualitative Research

General methodology exploited in this thesis will be based on Creswell's Qualitative research process of "emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particular to general themes, and the researcher making interpretation of the meaning of the data"(Creswell 2009:4).

So as to examine the research question I need most preferably primary data. To get primary data I prepared first three set of questions targeting beneficiaries, stake holders and donors for

interview. But, with the suggestion of supervisor Hans Morten Haugen, I downsized into two sets focusing beneficiaries and donors/agencies (See appendix: 3).

With some revision and agreement, we finalized the questionnaire and sent to Norwegian Social Science Data Service (NSD) for approval; and more in-depth ethical reflections will come in chapter 2.5. After that I sent interview guides to Contract person Gopal Chandra Subedi Joshi for interviews. He contacted with the projects periphery people, UMN/HP and BPC employees for the reliable data from real setting.

The process which I followed such as making research question, interview guides for collecting data through participants' real situation, inductive data discussion by interpretation and making meaning of respondents experiences or stories of natural setting come in qualitative research. I sought to answer the research question focusing on the theme/meaning that the participants expressed in the interviews about environmental effect than the meaning that I had on the issue.

Qualitative research covers a wide arena of social science ranging from scholarly inquiry to philosophy. Likewise, multiple sources of data support to the rich description and explore the problem raised in the research question. In this connection Creswell argues "qualitative researcher collects data themselves through examining documents, observing behavior, or interviewing participants" (Creswell 2014:185). What he illustrates is that in qualitative research the researchers have wide access to gather information for inquiry.

Qualitative research allows researchers to study informant's experiences in-depth. It helps to researchers to examine information from the perspective of participants on their own context. In this regard, Creswell opines "… information gathered by actually talking directly to people and seeing them behave and act within their context is a major characteristic of qualitative research"(ibid: 185).

In this research process the researcher identify issues how informants understand and interpret them. For example, I will identify the effect of UMN and HP supported hydropower upon environment by analysing the information given by the participants via interview. I will analyse the behaviour of respondents with their surrounding through the interpretation and examination of the meaning and intention of their response.

Qualitative, as an interpretive approach, interprets information or data given by participants on the basis of the socio- economic, cultural, environmental and physical context of the

participants. Since it interprets issues from participant perspectives relying on their natural setting, it is also known as participant approach. In this approach, the researcher requires to be open-minded, flexible, and curious to opinion of participants to get the information as their contexts influence them. The researchers focus on to get the meaning of an issue that the informants hold on the issue.

In qualitative research the researcher has significant role to study on the behaviour of participants for reliable information associating them with their context and to collect the data. To understand the behaviour of participants the researchers need to be well trained and experienced

It inculcates both features of positivism and interpretivism. Positivism speaks for ontological truth, fact and reality while interpretivism stands for subjective reality as it is. Positivistic though also sometime can't reflect objective reality as it should do and interpretivism does not always reflect absolutely individual or personal/subjective thought as it is criticized. Similarly, it focuses on ontological, epistemological, and methodological assumption for information. It means how the informants understand issues of the world can be studied by collecting information associated with the knowledge of participants by exploiting certain tools like questionnaire, interview, and biography.

So, qualitative researchers always want to decipher participants ontological or lived experiences from the point of view of participants themselves so as to dig out the subjective meanings (knowledge) which participants hold to their experiences in connection with context.

In this thesis to interpret the participants or informants knowledge or opinion/view diaconal theory of empowerment, transformation and care for creation; and community resilience theory will be used. By applying these theories what informants hold on regarding the socio-economic conditions and environmental effect of power plants will be judged. To discuss what informants hold on power plants effect, their ontological experiences will primarily emphasised than the data processor.

2.3.2 Data Collector's Role

To a data collector's role and biases should be taken into consideration in this study for impartiality and neutrality or empirical finding. I chose my brother in law Gopal Chandra Joshi Subedi to collect data instead of involving myself because of financial constraint. The data collector worked in Andhikhola and Jhimruk Hydropower as a project officer during construction period and later as a chief distribution officer in BPC. But he is no more employee of BPC so researcher felt that he does not have any obligation to his previous working company.

Selecting him as a data collector may have both advantage and disadvantage. Being an ex-insider or project officer of Andhikhola and Jhimruk, he knew the most affected communities and Nepali UMN employee working as a representative of agencies as well as partners too. He could choose the right interviewee. Similarly, he understood the theme of interview guide and conducted interview effectively.

He chose most of the interviewee whether from the precisely affected area but dwelling in the capital city for their profession. Regarding those interviewee I was initially not satisfied but he convinced me that to get real information, informants must have general knowledge about the topic/issue. He further told me if informants did not have general knowledge, how they would respond to the questions. Then, we agreed. Later, while presenting and discussing data I became fully convinced why my contract person chose those informants. Informants' ideas to the topic found to be surprisingly impressive. He selected knowledgeable interviewee to the topic from affected community so that they opened up more than unknowledgeable.

2.4 Required Data and Collecting Procedure

Both primary and secondary data will be used to prepare this thesis. Interviews were conducted to collect primary data. If necessary, some of required secondary data will be gathered through document analysis. The environmental and UMN/HP supported hydropower especially Andhikhola and Jhimruk related documents will be focused. Some of primary information in terms of contribution to the development of hydropower relevant to the thesis topic was collected by visiting HP head office in Oslo, Norway.

In addition visual images like the pictures of hydropower affected area, dams and plants will be used. If more secondary data required, they will be collected through surfing the internet and websites adapting desk study method and visiting concerned agencies.

With the care of supervisor Haugen, the researcher reported to NSD with filling form and submitting three party (Project Responsible: Hans Morten Haugen, Data Collector: Gopal Chandra Joshi Subedi, and Data Processor: Rumakanta Kafley) agreements signed document under the Norwegians Personal Data Act and The Personal Data Regulations (See appendix 1). On 2nd of March 2016 NSD approved the Project application.

With the support of supervisor Professor Hans Morten Haugen researcher edited semi structured interview guides and sent to the contract person/data collector Gopal Chandra Subedi Joshi who conducted semi-structured interview with 10 interviewees: four from each projects (Andhikhola and Jhimruk) affected community and rest two are agency and partner. Then he sent back all Nepali language audiotaped interview recordings through email which researcher transcribed and translated in to English.

2.5 Ethical Issues and Informants Permission

Being comply with relevant Norwegian laws and Research ethics, the research project will move ahead.

Data collector Gopal Chandra Joshi Subedi informed about the voluntary participation and choice to withdraw consent without stating reasons if informants want; and the goal of the study to find out the effect on environments due to plantation of hydropower plant with the support of UMN and HP. He informed them what the research was for and researcher's inability to take interview himself so on behalf of researcher and being comply with Norwegian laws, he was conducting interviews.

He notified them their experiences and stories would be of great significance to the researcher and asked respondents' permission to record their interview with the assurance of confidentiality. He assured them that their opinions or experiences or stories will be presented anonymously.

The data processing agreement Letter to NSD; see in the appendix One, evidently comprised how he would be impartial, neutral, unbiased during data collection. Fabrication and falsifying stories of respondents would be deadly unethical. So twist in respondents' stories would be avoided during transcription and translation.

For data protection computers will be kept in locked room; the printed interviews and the consent form will be stored separately without any identifiable information in locked location's shelves. Interviews and consent form will be given same identifiable number.

The risk of someone tapping the data will be reduced by imparting each interview a neutral title with different numbers. The information on relevant personal details of the respondent to be included in this thesis will be provided from ordinary post by the data collector.

Consent letters will be separated and locked separately until the submission of thesis. After the submission of thesis separately locked letters will be destroyed. Regarding recorded interviews, the collector already deleted from his mail when he sent to the researcher and the researcher will delete after the submission of his thesis on may.

Most importantly, during the interpretation of data, I will be conscious towards informants' biasness and impartiality because all respondents are not equally benefited and affected by the projects. Some might be multi-dimensionally benefited and others severely affected. Informants might twist the truth and be biased. Equal justice to all informants is almost impossible.

2.6 Presentations of Informants

Informants	**Affected Project sites and organization**	**Categories**
1) Informant A	Andhikhola/BPC	Beneficiary/affected
2) Informant B	Andhikhola/BPC	Beneficiary/affected
3) Informant C	Andhikhola/BPC	Beneficiary/affected
4) Informant D	Andhikhola/BPC	Beneficiary/affected
5) Informant E	Jhimruk/BPC	Beneficiary/affected
6) Informant F	Jhimruk/BPC	Beneficiary/affected
7) Informant G	Jhimruk/BPC	Beneficiary/affected

8) Informant H	Jhimruk/BPC	Beneficiary/affected
9) Informant I	UMN	Agency/partner
10) Informant J	Andhikhola/Jhimruk/BPC	Partner/Aency
11) Informant K	HP	Agency

Chapter Three: Theoretical Model

3.1 Introduction

This chapter discusses about Resilience and Diakonal theoretical frameworks focusing on community resilience, empowerment, caring for creation and adaptive capacities that I am going to use for the empirical study of the research question: *How have UMN/HP supported hydropower plants affected the socio-economic conditions and the environment?*

UMN/HP hydropower development contributions open up opportunities like employments, entrepreneurship, income generative activities, diversifying economic resources etc. which empower the community and enhance capacities to adapt the changes and care for creation at the face of effect/adversities or stressor.

So, diaconal theory of empowerment will be used to discuss how UMN/HP contributions help to build strength, skills, knowledge, capacities, assets that make the community people able to relate each other and to the creation; and resilience to reflect how such empowerment promotes communities' capacities to adapt the changes brought by hydropower plants in the context of an ecologically most variable and vulnerable country, Nepal. "Nepal is amongst the most vulnerable countries in the world to both natural disaster and the effects of climate change" (UNDP 2016:26).

Resilience is discussed through a reflection of origin and its extrapolation into different disciplines and providing introductions to Community Resilience (CR) with the primary focus on the capacities of the community in the process of adaptation at the face of adversities, difficulties, disturbances or disasters etc. Likewise, Diakonia is through a reflection of theological, empowerment, inclusive, and caring perspectives. These two theories seem to be different but co-ordinate in the fundamental ideas i.e. empowerment and adaptation via capacity building.

3.2 Resilience

According to Matyas and Pelling (2012) the conceptual origins of resilience are possibly more diverse and problematic since they inculcate incongruous viewpoints. Engineering, psychology, disaster studies and social ecological systems have all given significant interpretations of resilience that perpetuate to effect existing understandings of the term.

From engineering resilience perspective, resilience is the process of bouncing back to pre-event environment/state without any alteration. No matters how long the stressed material takes to bounce back to equilibrium but what matters is bouncing back rather than break. The resilience concept first emerged in the psychological discipline and extrapolated into other discipline of social sciences. Since 1970s the interest in resilience has been increasing with growing interest in development, health, disaster, war, free market etc.

From the social–ecological systems aspect, resilience is the capacity of the system to continually change and adapt and yet remain within critical thresholds (Berkes and Ross 2013). Further, the more formal definition is "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks" (Walker et al. 2004 cited in Berkes and Ross 2013:6).

From community level, resilience is defined as "The ability of individuals and communities to deal with a state of continuous, long term stress; the ability to find unknown inner strengths and resources in order to cope effectively; the measure of adaptation and flexibility" (Ganor 2003 cited in Norris et al. 2007: 129).

Yet "most of definition emphasize capacity for successful adaptation in the face of disturbances, stress, or adversity" (Norris et al. 2007:129), and "consistent in their focus on the adaptive capacity of a system (individuals, communities, larger societies, corporations, social–ecological systems, ecosystems) in the face of change" (Berkes and Ross 2013:7).

Kirmayer et al. (2009) regards the concept of resilience as a technical term having wide currency in developmental psychology, ecology and organizational studies with the common element of the ability of an individual, system or organization to meet challenges survive and do well despite adversity. Resilience can occur at the level of the individual, family, community, nation, or global system as well as in ecosystems.

Albeit distinctive schools of thought generate distinctive meanings, resilience refers to kinds of capacity, skills, resources and tools that give a sense of mastery a management of difficulties, disturbances and adversities. In other words, resilience is the process of building capacity to grow strong enough experiencing the adversity and hardship or challenge; and embracing the challenge and framing it as learning experiences.

Resilience, in today's rapid changes and challenges era, is exploited to study how an individual, society, community, ecological system and so on adapt and resist the changes to bounce bake the previous state or pre-event environment or adapt the new state or post-event new environment. My focus in this study will be on community resilience.

3.2.1 Community Resilience

Community resilience is the extrapolation of psychological thought in community level: "the work on individual resilience, especially in relation to child development, has recently been extended to community level, particularly in relation to disaster management and recovery" (Paton and Johnston 2001 cited in Berkes and Ross 2013:10). Berkes and Ross quote Magis's (2010:401) idea to understand community resilience as "the existence, development and engagement of community resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability and surprise.''(ibid: 6).

Similarly, Kirmayer et al. (2009) illustrates: a new body of work is endeavouring to enlarge the concentration on resilience as a characteristic of the individual to one of resilience as a community and cultural process. This new attention on "community resilience" looks at how people overcome stress, trauma and other life challenges by drawing from the social and cultural networks and practices that constitute communities. At the same time, it draws attention to the resilience of the community itself.

There are two aspects of community resilience: how the people living in the particular geography and sharing common tradition, cultures utilize the cultural and social network resources to overcome stress, adversity, trauma, difficulties and other life challenges; and at the mean time they highlight how the community itself become resilient. The discussion over culture reflects that culture can help to unpack collective decisions about what to fear and what not to fear (Douglas and Wildavsky 1982 cited in Matyas and Pelling 2012:14). At the same time, cultural values can impede actors from switching activities or capitals, thus limiting coping capacity (de Haan and Zoomers 2005 cited in Matyas and Pelling 2012:14). In the longer term, reluctance to grapple with underlying cultural values can seriously limit the scope of adaptation/resilience policy (Handmer and Dovers, 1996, O'Brien 2011, Pelling 2011 cited in Matyas and Pelling 2012).

Kirmayer et al. (2009) argues: resilience of the community itself involves the dynamics of the social response to challenges that threaten to damage or destroy the community. These dynamics may involve adaptations and adjustments of individuals, groups and organizations with the community (seen as components of the community as a system) as well as interactions of the whole community with its surrounding environment, including especially other social, economic and political entities.

Individual and community resilience compliment with each other; if many individuals are resilient in a community then this helps the community to perform resilience since all resilient individuals work together more easily to react to stresses and challenges. Conversely, if community has resilient traits may help to intensify the resilience of its individual members. Community resilience perceives the interconnectedness between individuals, family units, community, organizations and larger environment; and factors from each realm contribute to stress and adversity countering processes. A resilient community provides individuals, families with new opportunities to deal with difficulties and develop the idea that people can harness their surrounding resources creatively to build capacity to encounter adversities. "Community Resilience is a process linking a set of networked adaptive capacities to a positive trajectory of functioning and adaptation in constituent population after a disturbance" (Norris et al. 2008: 131). What they argue is that community becomes resilient when community resources are robust, redundant, or rapid to lessen the effects of the stressor i.e. a return to functioning, adapted to the altered environment in a positive way.

3.2.2 Crucial Capacities for Community Resilience

Norris and colleagues (2008) argue communities have potential to function effectively and adapt successfully after disturbance. Such a positive trajectory of functioning and adaptation emerges from both the resources themselves and dynamic attributes of those resources (robustness, redundancy, and rapidity). The combination of these resources intensifies adaptive capacity. Adaptation is manifested in terms of community wellness; defined as "high and non-disparate level of behavioural health, functioning and quality of life" (Norris et al. 2008:127).

What they reflected is that the affected communities can function in a positive/effective way and adjust or adapt the changes caused by the disturbances if the communities have resources with dynamic attributes.

With reference to Goodman et al. (1998) Norris et al. (2008) argue that capacity becomes adaptive when they are robust, redundant and rapidly accessible and then able to offset a new stressor, danger or surprise. Likewise, community resilience initiates with the stressors i.e. disaster whether natural, technological, or man-made. Stressors are pungent circumstances that beaks/discontinue the well-being or functioning of the individuals, community or society (Norris et al. 2008). Severity, duration, surprise etc. are the types of stressors.

With reference to Lonstaff (2005) Norris et al. (2008) discussed that some stressors are familiar but unpredictable as to where and when they will happen (known unknown) but some dangers are new: we don't known about these until they happen (unknown unknown). Surprise stressors reflects discrepancy between what is expected and what is experienced. According to Alleney and Fink (2005) surprises are nearly impossible to predict or prepare, and call for broad resilience strategies.

Does resilience prevent distress caused by stressors? Resilience does not prevent distress; however distress or dysfunction can be transient followed by a return to functioning. Albeit, the post-event functioning may not be qualitative equivalent or equilibrium of the pre-event functioning when there is need to adapt to an alter environment (Norris et al.2008). By this discussion what is extracted is that resilience is a process of returning back to the pre-event functioning (but not exactly the same) from post-event functioning through adaptation of changed/altered environment of post disaster context.

What is the indicator that indicates adapted outcome? 'Wellness' is the manifestation of adaptation. With reference to Zautra and Bachrach (2000), Norris et al. (2008) discussed that wellness as how people generally feel about their lives as a whole and in domains of work, family life, health, leisure etc. reflecting the traits of high quality of life. Norris et al.(2008) further argued that "a criterion of wellness serves to remind us that we must attend to disaster victims' abundant problems in living that may interfere with their quality of life"(133).

The concept of psychological wellness has been extended in the community level which Norris et al. termed as 'population wellness.' By operationalizing psychological wellness, Norris et al.(2008) defined community wellness as "high and non-desperate level of mental and behavioural health, role functioning, and quality of life in constituent population" (133).

With the reference of (Galea et al. 2005) Norris et al. (2008:134) argue that community/population level wellness is not scaled fully by average behavioural health or quality of life. The wellness of the community rests on, according to Norris et al. (2008:134), resources. Host of objects, conditions, characteristics, and energies that people value – that is resources (Hobfoll 1988, 2006 cited in Norris et al. 2008). What they view regarding the determinant of population wellness is the availability, accessibility, and mobility of resources. The availability, accessibility and mobility of resources condition the wellness by reducing or buffering the stress or pressure and accentuating resilience.

Similarly, on the basis of Goodman et al. (1998) dimensions of community capacity; Norris et al. (2008:136) identified four primary sets of networked resources: Economic development, Social Capital, Information & Communication, and community competence which together provide a strategy to be resilient with risks readiness. But I will focus only viable strategy for the discussion

3.2.2.1 Economic development

Norris et al. (2008:136) view communities as "subject to larger Sociological and economic forces" and with reference to Adger (2000) present a set of key parameters to observe the 'social resilience'.

Communities are network of socio-economic forces since community activities intertwined with the social economic resources. The community resiliency depends on the economic growth, sustainable livelihoods, and equitable distribution of income and assets with in population (Adger 2000 cited in Norris et al. 2008:136). Similarly, Norris et al. (2008:136) further studied (Godschalk 2003; Pfefferbaum et al. 2005) and underlined land and raw materials, physical capital, accessible housing, health services, schools and employment opportunities as the essential resource base of a resilient community.

Economic resources and post disaster wellness are mutually reinforcing. The past literature on social class and disaster stressors reflect that the socio-economically lower participants have more adversely suffering experiences than higher class participants. Such tendency can be seen in income inequities context.

Community Resilience depends not only on the volume of economic resources but also on their diversity. Limited choice of natural resources can decrease social resilience (Adger 2006 cited in Norris et al. 2008). Extreme events such as droughts, floods, or infestations, increase the risk of being depended on particular resources and therefore decrease resilience.

Societies do not allocate environmental risk equally often making the poorest communities the weakest links in hazard mitigation (Cutter et al. 2003, cited in Norris et al. 2007:137). With reference Wisner (2001) Norris et al. (2008) argued that the mitigation plans in developing countries often fail to address the root causes of disaster vulnerability, namely the economic and political marginality of much of the population and environmental degradation.

Poor communities are not only less capable to avoid greater risk of death and sever damage but they often are less successful in mobilizing the support after disaster (Norris et al. 2008). They, further, discussed that the allocation of external support follow the 'rule of relative advantage' instead of 'rule of need'. Those who are privileged and have access to community politics get access to support resource letting a vast population aside in vulnerability.

What Norris et al. (2008) highlight is the capacity to distribute post disaster resources on the basis of 'rule of need' at the cost of 'rule of relative' advantage' seems enormously significant for community resilience. Community resilience is inextricably interconnected with the complex socio-politico-economic and environmental interdependency.

3.2.2.2 Social Capital

Social capital, an umbrella term, stands for the vast social networks, relations, trust, supports etc. Conceptually it was developed to enhance the urban and suburban communities' capacities to adapt the effect of rapid development. But, today it has been operationalized in villages, communities, neighbourhoods, networks and other levels of social organizations.

Kirmayer et al. (2009:73) defined social capital as the degree to which community resources (physical, symbolic, financial, human or natural) are reinvested in social relations. Mignone and O'Neile (2005) referenced in Kirmayer (2009:73) argue that "social capital offers a dynamic metaphor for characterizing the internal and external relationships of communities" capturing the core social elements i.e. sharing and reciprocity. Social capital inculcates social relationships, networks and reciprocity, shared norms and values and culture of trust, collective participation and access to resources.

In this connection Norris et al.(2008:138) expressed that one dimension of community capacity, according to Goodman et al. (1998) is the presence of inter-organizational networks that are characterized by reciprocal links, frequent supportive interactions, overlap with other networks, the ability to form new associations, and cooperative decision-making processes. Likewise, (Kirmayer et al. 2009:73) explained that social capital, as networks or relations, encompasses bonding relations or intra-community connections; bridging relations or inter-community connections, and linkage relation between communities and government institutions and other official bodies.
Conceptually social capital stands for the nature and extent of linkage between individuals, communities and institutions while social support reflects the emotional, instrumental and

material assistance that community received or can potentially receive from other communities in daily activities or in the time of crisis. Much literature on disaster reflects that social support can buffer the effect of crises.
According to (Barrera 1986 cited in Norris et al. 2008:138), social support is social dealings that provide "individuals with actual help and set them into a network of social relationships perceived to be loving, caring and readily available in times of need".

Social support, whether received (enacted) or perceived (expected), varies on two critical dimensions (Kanisty and Norris 2000 cited in Norris et al. 2008:138). The first dimension, Source, is reflected in the overall pattern of help utilization. This pattern resembles a pyramid with its broad foundation being the family followed by other primary support groups such as friends, neighbours, and co-workers; followed by formal agencies and other persons outside of the victim's immediate circle (Norris et al.2008:138). The second dimension, type, differentiates between emotional, informational and tangible.

3.2.2.3 Information and Communication

Information and communication is essential to enhance the adaptive performance of community. Communities with accurate and trusted information and communication systems and infrastructures perform adaptation more easily than the community with feeble information and communication system.With reference to Ressiman et al. (2005) Norris et al. (2008:140) discussed that "information and communication become vital in emergencies" to avoid the potential risk. "People want accurate information about the danger/risk and public possibilities, and they need it fast". Pfefferbaum et al. (2005) referred in Norris et al. (2008:140) explained that "good communication is crucial for community resilience".

Norris et al. (2008) reflected that communication as creation of holistic meanings and understandings and the provision of opportunities for members to express their needs, articulate experiences, opinions, perspectives, attitudes etc. Likewise, by referring to Lonstaff (2005) Norris et al. (2008:140) discussed that information intensifies survival only if it is correct and correctly transmitted. "When there is very short time to check information, it is also important that the source of the information must be trusted". Closer, local sources of information are more trusted than distant sources which are quite unfamiliar.

Norris et al.(2008:140) referring (Paton and Johnson 2001) reflected that the past literature much concerned only about how to communicate risks and validation most effectively to the

public , but the connection between information facility and risk preparedness remains questionable.

Norris et al. (2008) further stressed that the way information and communication are significant, the way communication infrastructures are significant for community resilience. For example, hotlines system and medias can be used to mobilize volunteers and to educate people how to react the stresses.

Another dispensable aspect of information and communication for community resilience is community narratives which provide the insight into how communities perceive themselves and others and community members' shared understandings of reality contribute to a sense of place and connectedness, which in turn affect resilience.

Norris et al. (2008) cites Landau and Saul (2004) conclusion that community resilience rests partly on collectively telling the story of the community's experience and response.

Hence, information and communication as a crucial set of resource can play the positive role to boost up community resilience by controlling false information, imparting trusted information and making aware about stress thereby spreading hope with amplifying public stories.

3.2.2.4 Community Competence

Competence, not innate but acquired, is a tool to deal with challenges creatively. Competence imparts a sense of mastery a management of adversities. Similarly, community competence refers to the skills, abilities or to engage constructively in group decision making to encounter adversities and resist opposing or undesirable effects (Goodman et al. 1998 cited in Norris et al. 2008: 141).

Norris et al. (2008:141) with reference to Longstaff (2005) argued that the capacity to acquire trusted and accurate information, to reflect on that information critically, and to solve the emerging problems is far more important for community resilience than established security plan that hardly predict potential danger or disaster.

Risk prone communities must be capable enough to learn about their risk and possibility; and work together flexibly and creatively so as to solve problems thereby emphasizing the principle of equitable distribution of resources.

Community competence, hence, refers to the needs and problems identifying, analysing and solving capacities of the community by encountering the challenges on the basis of collective action and decision making at the backdrop of social capital, community efficacy and empowerment.

‘Collective efficacy’ reflects trust in the effectiveness of organized community action (Perkins and Longs 2002 cited in Norris et al. 2008).(Sampson et al.1997 cited in Norris et al. 2008) defined collective efficacy as a composite of mutual trust and shared willingness to work for the common good of the neighbourhood.

Norris et al. (2008) argue collective efficacy bridges the domains of social capital and community competence but is placed under the latter because of its fundamental role in facilitating community action. (Benight 2004 cited in Norris et al. 2008:142) defined a slightly different way community efficacy as shared belief that a group can effectively meet environmental demands and improve their lives through connected effort.

Collective efficacy is highly related to empowerment (Perkins et al. 2000 referred in Norris et al. 2008:142), a process through which people lacking an equal share of valued resources gain greater access to and control over these resources (Rappaport 1995 referred in Norris et al. 2008:142).

Since, community efficacy related to local people’s increase participation in local associations, trust in the community confidence, the local institutions and pattern of reciprocity, community efficacy empowers local people enhancing their capacity to identify needs and problems.

3.2.3 What Undermines Community Resilience?

“The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard” (UNISD undated cited in Matyas and Pelling 2012:3). Vulnerability is the state of inadequate capacity of community, system or asset to response, resist and cope with natural hazards. Similarly, it is situation of powerlessness, defencelessness, and having limited access to resources, power structure, economic system etc.

Moreover, vulnerability is an inability of an individual or communities/ groups whether to cope or resist any crisis. In this regard, International Federation of Red Cross and Red Crescent Societies illustrate vulnerability as “the characteristics of a person or group in terms of their capacity to anticipate, to cope with, resist and recover from the impact of a natural or man-made hazards” (IFRC 2006:11).

Similarly, with reference to Luthar a Ciccheti (2000) Kirmayaer et al. (2009), differentiate between ‘risk’ ‘vulnerability’ and ‘protection’, arguing that vulnerability factors are

adversities which intensify the effect of risk. Adversely, protective factors mitigate risk and promote resilience.

Vulnerability and protective factors can be found in individual, family and community level. For example, poor impulse, control, learning difficulties etc. are vulnerabilities existed in individual level whereas sense of efficacy could be protective factor.

Norris et al. (2008) expresses when resources are not sufficiently robust, redundant, or rapid, Vulnerability occurs resulting in persistent dysfunction. The more severe, enduring and surprising the stressor, the stronger the resources must be to create resistance or resilience. Likewise, "vulnerability is generally greater where poverty and/or inadequate social protection make people less capable of resisting hazards. Work on poverty reduction is, therefore, vital." (IFRC 2006:9). Poverty is one of the internal stressor prevalent in community level. Moreover, opine "vulnerability is connected conceptually to external stresses and shocks and internal coping capacity" (Matyas and Pelling 2012:2).

Poverty, risk or stressor, makes communities and individuals less capable to resist adversities and cope the change.

3.3 Diakonia

The historical development of the concept "diakonia" goes back to the mid-ninetieth century from Germany as fellowship of deaconesses and deacons who were trained as nurses, teachers, and social workers to serve the poor, affected, and needy people. With being highly challenged by the pathetic suffering of the poorest in the time of growing industrialization and social marginalization (Nordostokke 2014), the protestants pioneered the practice of diakonia by establishing homes to the homeless, poor, and orphans; training institutions to train deaconess and hospitals to the sick.

The inception of diakonia reflects the charity to the suffering. But the diaconal practice remains shifted in time span. Now, diakonia is emerging as ecumenical concept focusing its ecclesial, missionlogical and prophetic dimensions letting the lasting impact on the development of today's public welfare system.

The paradigm shift in diaconal practice reflects the fundamental move from the paradigm of charity to paradigm of reciprocity model of partnership and empowerment at the backdrop of Christian faith. The charity model was based on the Top Down practice whereas the

reciprocity model is exploiting Bottom Up approach. The humble service based more formal diaconal activities turn to be need based more empowering and inclusive in reciprocity model.

"Diakonia is the caring ministry of the Church. It is the Gospel in action and is expressed through loving your neighbour, creating inclusive communities, caring for creation and struggling for justice" (Church of Norway 2008:5).

This definition reflects ecclesial dimension by questioning on top-down diaconal approach of charity model by professional diaconal workers and agencies; and introducing where, what and how diakonia should focus on in the days to come. The diakonia should be attentive to the problems of God's integrated creation through service, advocacy, caring etc. for inclusiveness, solidarity, and sustainability.

Similarly, with the entry of Teresa Joan White's article 'Diakonia' the *Dictionary of the Ecumenical Movement* defines diakonia as "responsible service of the Gospel by deeds and by words performed by Christians in response to the needs of people."(WCC 2002:305). This reflects the services to the human beings who are in need by Christian faith based actors. It is not merely good intention and works but responsible services. Diakonia is not only for the sake of doing well but for change.

"… diakonia belongs to the nature and the mission of 'being church' … stronger focus on the biblical and dogmatic foundation on diakonia, and its link to missiological themes" (Dietrich et al. 2014:2). This view reflects the missological theme of diaconal service on theological and biblical foundation highlighting the concept of human dignity and its application to other fellow creatures of God's creation.

Likewise, the significant LWF document *Diakonia in Context (2009)* reflects the fundamental assumptions on the understanding of Diakonia

> One is that diakonia is a theological concept that points to the very identity and mission of the church. Another is its practical implication in the sense that diakonia is a call to action, as a response to challenges of human suffering, injustice and care for creation (LWF 2009:8).

Diakonia expresses biblical call for action responding to the human suffering, injustice and care for creation in reciprocity model. Similarly,

> Diaconal action, understood as integral to the church's mission in today's world, is also conditioned and challenged by concrete contexts. In order to be relevant,

> diakonia requires prayerful discernment of the signs of the times and a faithful reading of the contexts (ibid 12).

Sufferings are contextual; hence, to be relevant missionary actions need to be context or local or community needs based in association with local/community resources and possibilities. Diakonia needs to have pro-active initiatives rather than simply being responsive so as to maximize the local level potentiality to reshape and transform communities facing with inequality, injustice, poverty etc.

Similarly, Dangsung and Phiri (2014) in elucidates that the word diakonia offers theological dimension to service as a care and advocacy for human dignity, autonomy and sustainability of God's creation.

3.3.1 Diakonia as community empowerment

Empowerment, a core theme of diaconal theory and practice, "… refers to the biblical understanding of creation that every human being is created in the image of God with capacities and abilities of their apparent social situation" (LWF 2009:45). With the application of this biblical or theological understanding of the concept empowerment into community level, the diakonia today is more concerned about recognising and promoting the inherent community capacities and abilities in their specific contexts so as to enhance the living conditions of human beings together with the God's creation which consolidates the harmony between human and environment thereby intensifying the idea of ingenuity, dignity and autonomy to be respected equally irrespective of poverty, vulnerability.

Dietrich (2014) emphasizes the concept of mutual autonomy, communality, and interdependency to the understanding of the theory and practice of empowerment. Through empowerment powerless becomes powerful; vulnerable turns to be strong and realize dignity of equality and autonomous existence.

Rappaport claims the term (Empowerment) suggests a sense of control over one's life in personality, thought and enthusiasm. It expresses itself at the level of feelings, at the level of ideas about self-worth, at the level of being to make a difference in the world around us… we all have it as a potential (Rappaport 1985: 16 cited in Dietrich et al. 2014:21).

Empowerment is a practice that nurtures power in community people for using in their own lives, their communities, and in their society acting on the significant matters. What empowerment values is self- dignity; the fight against injustice, discrimination, inequality and inequity recognizing self- worth and potential.

B. Solomon (1976) cited in Dietrich et al. (2014) argues a process to reduce powerlessness state of the client through a set of social works. Such social work practices involve

recognizing the power blocks and aim at reducing power blocks. Poverty, injustice; biased, corrupted and vertical power practice, discriminations reduce the individuals power (capacity). With reference to Johannes Nissen, Dietrich et al. (2014) focuses on diakonia should practise horizontal power but not vertical power or 'power to', 'power with' rather than 'power over'.

Similarly, "empowerment should be seen as a process of mutual transformation which emerges from within and from below. The process of empowerment also includes and requires a shift of power (Nordstokke 2013:19 cited in Dietrich et al. 2014:23). What Nordostokke focuses is that empowerment as a process of transformation of and from the ground level entity (country, community and people).

LWF reflects "transformation is closely related to what also may be defined as social change, progress or development" (LWF 2009:44).

In the two Lutheran documents on Mission and Diakonia empowerment is listed together with reconciliation and transformation thereby including the link between the three- and, by the same token, rejecting such expression of power as coercion, the use of force, and manipulation(Jørgensen 2014:99). He views that empowerment is the first step of the transformation of the community through capacity building to readdressing the imbalances of power in a society governed by oppressive power and caught in the poverty set-up.

"…empowerment becomes a core value and method in capacity building for diakonia". (ibid: 99).

Carlos E Ham (2014) views "empowerment is a dynamic process that enables and inspires, that enhances people's skills and self- confidence; … develop the power within in order to unlock their immense potential and to boost their skills, self-confidence and self-assertion … promote collective resistance, challenge and mobilization against basic power relation and systematic forces that impoverish and exclude the vulnerable.

Hence, vulnerability, poverty, powerlessness, marginalized etc. are not inborn characteristics but created or made by socio-political system. To make rise from such status what one needs is empowering mutual support which helps to release the entangled immense potentiality from the web of poverty, vulnerability and powerlessness.

3.3.2 Diakonia as Caring for Creation

Church of Norway's vision "the love of God for all people and the whole of Creation revealed through our life and service" (unspecified page) reflects the tremendous all- encompassing,

loving and caring spirit of diaconal ministry of today's church. The vision operationalizes the concept of human dignity to the whole creation by underscoring the interconnectedness of human dignity with the dignity of all creations. What the vision accentuates is 'respect other to be respected.' In other words, the dignified existence of human is only possible if there is equal existence of other creations of God.

Similarly, Dangsung et al. (2014) reviewed care and advocacy for creation – one of the most significant dimensions of diakonia today – "just as the churches are concerned about the dignity of humanity through care for the needy and advocacy on the issues that undermine quality of life for humanity, the same applies to God's Creations." (257). What Dangsung et al. (2014) focused is the urgency of care and advocacy for the God's creation.

Likewise, Church of Norway underlines the diaconal accountability of today's church as "a special responsibility in cases where nobody else takes care."(Church of Norway 2008:5); defining diakonia as "the gospels in action and is expressed through loving your neighbour, creating inclusive communities, caring for creation, and struggling for justice."(ibid: 5).What this definition stresses is wide horizon of the diakonia beyond the human realm to the realm of whole creation reflecting inseparably interdependent relation between the human and non-human realms.

Dangsung et al. (2014) reviewed that the word diakonia provides a theological dimension to service as care and advocacy for human dignity and sustainability of god's creation. Likewise, Toroitich et al. (2014) expressed

> the diaconal work of the churches … has aimed at enhancing the living conditions of the people, especially the poor and more vulnerable … looking not only at human beings but at the whole creation, which is under threat, threat being climate change. (Dansung et al. 2014:288).

What Toroitich et al. discussed about the diaconal responsibility today is bridging the discrepancy between development and God's creation status.

The ecumenical movement advocates on the right to development for all, and economy for all and life. The present development and economic growth models of the globe have separated development/economic growth and care for creation. Since "care for creation is a global and a local responsibility" (Church of Norway 2008: 5). "In the 1960s and 1970s, the ecumenical movement had already started to grapple with the issue of sustainability." (Dangsung et al. 2014:289).

A WCC statement from 2007 stressed that

> the Bible teaches the wholeness of Creation: Life is created, sustained, and made whole by the power of God's Holy Spirit(Gnesis 1; Romans 8). When Creation is threatened… we are called to speak out and act as an expression of our commitment to life, justice and love (WCC 2007 cited in Toroitich et al. 2014:298).

The statement asserts integrity of creation and imperatives of caring for the integrated creation of god. God has created the humanity to live in harmony with God's self, other humanity, and the creation. Church of Norway (2008) discusses

> Care for the created world is part of our God-given mission as stewards, and involves the responsibility to preserve the integrity of the entire creation … The Church needs to emphasise its conviction that human beings are dependent on their many relationships - to God, to their fellow human beings, to themselves and to the rest of creation (7).

Such integrated chain confirms sustainability if human beings correct their superiority complex of lordship and maser mentality over other innocent creatures; and greed driven irrational consuming of natural resources letting irreversible damages on environment in no time if not the abuse of creation leads to the devastation of humanity in the days to come. Church of Norway (2008) explains

> today we can see how human activity and our greed in consuming resources are threatening many species of animals and plants and entire ecosystems. The idea that human beings are the lords and masters of creation needs to be corrected". (ibid: 7).

In the triangular system (God, Human, and Environment) God has given caring responsibility to the human beings for His creation which "concerns everything that God has created; the earth with its plants, animals and human beings, the oceans and the air and the entire ecological system" (church of Norway 2008:19).

Church of Norway (2008) further explains on how to accomplish the God-given responsibility: being prophetic, self- critical; and creative and inventive.

Similarly, self-critical strategy involves "to challenge a lifestyle that involves excessive consumption" (ibid: 19) which inspires "self-denial and renunciation can relate directly to love for one's neighbour" (ibid: 19) by questioning on "our own personal consumption and life-style" (ibid: 18).

Creative and inventive strategy involves in pro-active activities of struggling for justice (for) “a just distribution of the world’s resources… and … to support the people who feel that their dignity is being violated” (ibid: 21) so as to “… find sustainable solutions to the real needs of individuals and society” (ibid: 19).

3.3.3 Diakonia as Inclusiveness Community

Church of Norway underlines "… we are dependent one another and all living - beings. None of us can live totally by him- or herself or entirely for him- or herself .we have been set to serve one another and to care for one another"(Church of Norway 2008:6). The very definition discusses what Dangsung and Phiri (2014) reviewed: God created humanity to live in harmony with God self, with other humans and with creation. One can find intrinsic interconnectedness of all biotic and non-biotic, living and non-living, human and non-human, human and animals, human and plants; and animals and plants of the universe. The global context causes diakonia changing from humble service 'for people' to working 'with people' for the sake of entire God’s creation.

Moreover, in today's world diakonia is not solely limited within human colony rather accountability spreads to all the spheres of God’s Creation. The shifting diaconal responsibility focuses on 'Bottom Up' approach. In another words, the diaconal plans motivated with the genuine local needs of "human beings and the created world" (ibid: 5). Church of Norway has specified four areas “loving your neighbour, creating inclusive society, caring for creation and struggling for justice” (ibid: 12) to create inclusive society where Diakonal actions play the connective role to connect the isolated or alienated parts into the Whole through love, cares for all advocating on their rights of equal existence, dignity and autonomy within interconnectedness; and struggles for the justice against inequalities, exploitation, violence, discrimination etc..

" The art and practice of living together …living together in solidarity, in sharing resources and in the joint struggle for human dignity and sustainable community of life"(LWF 2014:4) is foundation for inclusive and sustainable community. Diakonia today aims at improving living conditions of people particularly poor, marginalized, and vulnerable by enhancing present environmental status through the practice of the art of working and living together so as to fight against violence and destruction of environment, ecology, or ecosystem due to current development and economic growth models.

The current economic growth model has been separated from the weak, poor, and vulnerable parts of God's creation making them weakest. Diakonia today is grappling with "the human right based sustainability or sustainable development… sustainable development is seen as a right for very one …" (Toroitich et al. 2014:292).

With the practice of 'Go between' method, diaconal practices value participation, solidarity, inclusion etc. merging the distances between 'we' and 'they' for inclusive society. The dichotomy between 'we' and 'they' intensifies vulnerability, poverty, marginalization, fragmentation whereas inclusive concept dismantles binary oppositions to build solidarity empowering vulnerable, poor, marginalized etc.

Solidarity must not be parochial rather all-encompassing with the realization of multi-layered human relationships. Human beings are dependent on their many relationships- to god, to their fellow human beings, to themselves and to the rest of creation. Human beings are not exclusively accountable to themselves yet mutually responsible to the entire creation.

What solidarity does is empowering, building capacity to adapt or resist changes, accentuating hope etc. to the human beings and dependent.

3.4 Conclusion

This chapter has introduced Resilience and Diakonal theoretical concepts by discussing on them being based on Norris et al. (2008) community resilience theory and Diakonia in Context and other literatures. The researcher will use resilience and diaconal theoretical concepts to discuss on the UMN/HP contribution to hydropower and environmental effects. The contribution is not solely to develop power plants but more for economic and capacity building besides empowering the local communities for the adaptation of the changes by the utilization of resources.

On the basis of the community resilience theoretical assumption I will discuss how the UMN/HP supported Andhikhola and Jhimruk Hydropower plants' affected communities are functioning after the installation of respective power plants focusing on environmental issues

Since economic parameters are the basic standard to measure the social/community resilience, the research will explore the affected communities' peoples' pre and post hydropower installation economic experiences on the basis of the analysis of collected interviews and questionnaire. Furthermore, the study will assess projects' economic contribution to explore community as well as environmental resiliency.

Furthermore, the study will emphasise how UMN/HP supported plants contribute to diversify economic resources; and affect economic and community resilient. Besides, study will illustrate whether Andhikhola and Jhimruk caused any disaster like flood, landslide, decadence of natural species, destruction of fertile land, agriculture and flora and fauna or not.

To build collective resilience the affected community must be aware of the risks caused by the construction of hydropower plants. To reduce risks communities must reduce inequalities, engages local people, develop organizational linkage, boost and perfect social supports, decision making skills trusted sources of information that function in the face of unknown.

By the exploitation of community resilience theoretical theme the study will explore how UMN/HP empower the affected community people to grow strong enough to response the consequences induced by the construction of hydropower plants.

Similarly, UMN/HP contribution to the development of hydropower is propelled by the diaconal aesthetic "there are periods in life when we have the ability and possibility to give, at the other times we need receive. Reciprocity is a key word. Conditions we live under are different. Some people experiences greater difficulties than others" (church of Norway 2008:7). This diaconal spirit resembles with child developmental psychological resilience theory: why some children do well than other despite serious adversity. Such individual resilience has recently been extended in community resilience. Similarly, to say, ''diakonia empowers and transforms the marginalized community'' is not very different from saying ''social support promotes community resilience.''(Norris et al. 2008).
UMN/HP hydropower development drive resonated with the diaconal inspiration of "care for the created world … God given Mission as stewards and involves the responsibility to preserve the integrity of the entire creation" since "human activities and greed in consuming resources is threatening many species of animals and plants and entire ecosystem"(ibid:7)

Hence, with application of heterogeneously homogeneous schools of thoughts' theoretical concepts (Community Resilience and Diakonia) the study will discuss on how the affected communities are functioning after the installation of hydropower plants so as to adapt the change and caring for the God's creation (environment).

Chapter Four: How are the hydropower projects and their effects perceived?

4.1 Background of Study

Nepal is one of the hydropower potential and environmentally/ecologically most diversified and vulnerable countries in the world. Nepal has diverse geography and climate since it has 8 of the highest permanent snow -capped mountain peaks of the world including Mt. Everest and 80 meters low lying areas from the sea level. Extreme geographic and climate variations tropical to artic climate with in only 200 km spatial gap intensify environmental/ecological vulnerability.

However, inextricable interconnectedness between hydropower and environment due to zero carbon emission or clean/green energy characteristics, the production is far below the potentiality. UMN/HP has been contributing to the development of hydropower focusing on 'rural electrification projects' which both positively and negatively affect the local communities in the diversified environmental/ecological context.

The community/ population, depending upon agro-based livelihood, have already been affected by environmental variability and vulnerability; and additionally the hydropower construction affects. But the rural electrification projects promotes employment, the small scale businesses, interprenuireship, and income generative activities letting opportunities to develop rural industries like grinding mill, saw mill, bakery industry, poultry farming etc. The rural electrification projects laid the option to switch on different resources of livelihood.

UMN/HP contributing to develop rural hydropower projects hope to buffer community's much dependency on nature based livelihood resources thereby strengthening/ empowering community capacity to switch on optional livelihood resources so as to cope with current environmental adversities or adapt new one.

At this background I will present my empirical findings on the basis of the positive and negatives responses on the effect of hydropower as perceived by the informants. I will introduce the most relevant questions from the interview guide at the start of each section so as to present informants perception.

4.2 Informant's Views

In this section I will present informant's view in regard to Andhikhola and Jhimruk hydropower plants' effect to the socio-economic, livelihood and at a large environmental part. Presentation of informants views' will be done on the basis of tendency associating with benefits and defects or positive and negative effects of the respective power plants.

4.2.1 Benefits from hydropower: electricity

To study about the informants' view in regard to the benefits of electricity on the basis of their real life experiences I used the following question from interview guide: What practical differences do you experience without (before) and with (after) electricity?

Responding the aforementioned question all of the informants focus on the lighting and its immediate effects in the community such as time saving, job creation, income generation, employment, education, health etc., half of them focus on information and communication; and none of them focus on the negative effect of electricity to the environment albeit the hydropower plants cause some tolerable/reversible damage on the environment.

The first benefit from hydropower is electricity. Electricity, as such, is a clean energy which helps the community people to encounter/tackle against the environmental/ ecological stresses by offering green energy to power homes and businesses.
The first tangible benefit of electricity is lighting which alone carries many benefits like increasing study time, improving study environment to the school children, reducing time allocation for firewood collection, grinding, health and extended hours for small scale businesses, cooperatives, income generative activities and greater security. In short, electricity benefits the community people improving quality of life. Electrification does not only bring lighting benefit but more than this.
For example, one of the Informants said that before electricity life was very difficult: it was very hard to school children to study in the kerosene lighting, whether children had to complete their homework in day time or they had to wait next morning no option study at the evening if there was shortage of fossil fuel; housewife had to walk at least 2-3 hours distanced for grinding mill run by diesel; for simple health check-up we had to travel 30- 40 km. For cooking there was no alternative to firewood as well as animal feeding too. Due to maximum use of 'fossil and wood fuel' health and environment both were heavily challenged.

But after electrification, life has become very comfortable, we have electricity for lighting, children can read and write any time even in the evening and night, electricity displaced kerosene, house wives can grind nearby in their village in electricity run grinding mill, well facilitated community hospital and clinics can be visited with in couples of minutes, every house has rice cooker, electric kettle, informant family use firewood only for small number animal feeding.

Another informant also said almost same regarding pre and post electrification experiences. Before electricity it was hard to study to the children in the kerosene lighting, it was hard for grinding, difficult for health services, communication; biogas was in use to cook for them but for animal feeding there was no alternative of wood.

After electricity everything has drastically changed, children can study in the electricity light without any harm to their health; housewives can grind in the electricity run grinding mill in their surroundings.

What these two informants said is electricity displaced CO_2 gas emission petrol, diesel and kerosene run lighting and grinding obligations from the community which protects environment from co_2 effect. Likewise, these informants said that electricity reduced the firewood consumption which conserves the environment. We see that the emphasis is on the households and less was told about the larger environmental effect by these informants.

Another the most common benefit is entertainment, communication and information. What entertainment does is buffering the boredom of routine /repetitive activities for subsistence livelihood accentuating hope to new creativity. Similarly, communication and information helps to widen the local level's interconnectedness with outside world and promote awareness through knowledge. Knowledge not only promotes awareness but also boosts up job creation and employment. It means electricity supports for job creation and economic growth in the local level. Job creation reduces unemployment and opens up the opportunities that promote economies of the local community.

Three of the informants said that after the installation of electricity, community people have access to the means of information and communication like TV, computer, internet, and mobile by which they know about commercial agriculture and animal farming. They said "after installation of electricity, the information and communication has affected every level

of community livelihood". Commercialization of agriculture and animal farming promote subsistence livelihood into sustainable one.

Similar stories were told by informants. Not telling about pre electricity experiences one of the informants said that electricity has brought many changes in the sector of entertainment by promoting TV networking, news update etc.

The benefit of enhanced communication connecting to the outside world was also emphasized. For example one of the informants responded that before electricity he himself used to study in whether Jharro or kerosene lighting without laptop, computer, internet, websites etc. Now, students can use electric gadgets like laptops, computers, tabs, and internet for their education. They can update themselves with present global information and enhance their communicative skills. Similarly, there was no technical education, not good health services, even no transportation in local level. But after electricity, there is technical education, health service, job opportunities, transportation. Electricity has become boon to the community. Respondent E said "If there was no Jhimruk hydropower he would not be who he is at present."

Additionally, another benefit of electricity is that eletricity outperforms fossil fuels lessening air pollution, warming emission and firewood consumption thereby improving the quality of life. Improved quality of life refers the improved health, education, communication and information and healthy co-existence with environment. So, electricity benefits range from households to interconnectedness to outside world. In other words, benefits range from micro to macro level or households to global. In community level it has good impact of strengthening economic status and improving livelihood of people.

For example, another informant said that there is more attraction towards electricity as it has eased life style facilitating the services like education, health, communication and so on. Family members especially housewives have not been suffered by smoke affected diseases.

Other informants' information reported the problem with kerosene under which other household activities had to perform. The practice of firewood in their house was a serious problem. There was much problem in respiration; community people were suffered by lungs cancer, bronchitis, tuberculosis etc. Similarly, they said that good hospitals were far away. Even for simple test like urine, stool, blood, x-ray respondents' community people had to go away.

After electricity, everything has become very easy. Electricity has replaced kerosene but they did not tell anything about the effect of kerosene on environment. They said that electricity has made the access to good health services in the community level. Studying after electrification has become easy for the children. Firewood consumption reduction protects forest.

Thus, hydropower has become boon to the community since it has heralded every facilities required to improve quality of life. It has driven the community from darkness to the light with the facilitation for education, health, economy, employment and so on.

4.2.2 Benefits from Hydropower/electricity: Livelihood

The following questions from interview guides are relevant: what is your main resource for your livelihood? Wage income or harvesting from the nature? How has electricity improved your income source?

Most of the respondents are professionals or wage earner living in the capital city but their family members live in the hydropower affected rural area involving both agriculture and animal farming. So, the main livelihood resource for respondents is both wage and agriculture. The community people exploited electricity to diversify their income sources to be capable enough to adjust the new and unforeseen challenges which will be further explained in section 4.3 below.

All of the informants said that they and their family members have not involved directly in the industrial, interprenuireship and other activities exploiting electricity but in their community many people involved in the economy generative activities by utilizing electricity. They said that hydropower plants have helped their community to be capable and sustainable by promoting income generative small scale business, industries and interprenuireship.

Two of them said that after the installation of electricity, community people have access to the means of information and communication like TV, computer, internet, and mobile by which they know about commercial agriculture and animal farming. They said “after installation of electricity, the information and communication has affected every level of community livelihood”. Commercialization of agriculture and animal farming promote subsistence livelihood into sustainable one.

Next two of the informants said that during construction period projects provided training to the community people which empower to involve in the sustainable livelihood. For example informant B said:

> His family livelihood depends upon agriculture (50%), animal farming (5%) and wage (45%). He has not run any income generative business yet and thinking to run after retirement. But, community people have run small scale industries like grinding and beaten rice mill, grill industry, cookies industry after being trained by the projects. Electricity has supported to diversify the income sources in my community.

One of the informants responded that there was no direct link between electricity and individual's economy but electricity has indirectly affected to individuals income through time management, shortening time for household activities like grinding, cooking etc. and extending hours for creative activities such as taking part in income generative training, involving in co-operative and other meetings. So, in his community, after the installation of electricity, he saw two major effects: improvement in livelihood/ lifestyle and strengthened economic status.

Almost close to the former informant but having seen the direct link between electricity and economy another two informants said that electricity has provided opportunities for the development of small scale of industries and businesses in the community. It has supported to shorten grinding time allocation thereby encouraging community women to involve in other income generative activities through cooperatives. It has equally supported to improve agro-production of the community people. For instance, informant E said:

> His own brother has grinding mill which not only supported for his income generation but also buffer community peoples' difficulties to go 2 or 3 hours whether up or down distanced grinding mill by carrying more than 50 kg load at the back. Moreover, the grinding mill has supported community women to involve in other income generative activities through cooperatives. Grinding mill has saved their time and encouraged to involve in different agro- animal co-operatives.

On the basis of these informants' response we see that electricity has provided opportunities to the community people to switch from one livelihood source to another and become able to face any unforeseen future environmental stresses.

Similarly, rest informants expressed that hydropower has contributed a lot to diversify economic activities for the livelihood of community people. Before electricity whole community was involved in the substantial agriculture and animal farming but now some are

running grill industry, ice cream factory etc. and other are running poultry farming. In the same fashion, informant G responded that

> After electrification community people shifted their income sources from subsistence to commercial for example, mobile repair center and juice shop nearby hospital, poultry farming etc. Continuing on the positive effect of hydro energy/electricity to the community, he said that community people have promoted milk dairy, furniture industry and business.

On the basis of the survey of all informants view what is found is electricity helped community people to diversify income source which promotes sustainable livelihood.

4.2.3 Benefits from Hydropower: Health

The following question from the interview guide is relevant to present informants view on health benefits from hydropower. What changes have you noticed in the health status of your family after the installation of electricity?

Answering the question all the informants said that electricity is directly strengthening and improving community health facilities in various ways like by reducing distance and travelling hours and extending opening hours, having equipment that needs electricity, availability of medicines that need to be kept cold and displacing the use of fuel wood for cooking and kerosene for lighting.
Responding the question, respondents not only expressed the health status of their family but also what health facilities the community people have been enjoying after the installation of electricity in their community which can be categorized under the categories of smoke reduction, storage of medicine, promotion of communication and information, and reduction of distance to hospital.

Electricity is helping to improve family health by reducing let's say almost displacing indoor smoke. For example one of the informants expressed that when his grandmother was taken to the hospital for her health checked up, doctor asked if she smoked. Her lungs were affected like a smoking person even though she never smoked. Cooking firewood's smoke badly affected her. She had asthma. Likewise, children were affected by CO_2 gas emitting kerosene lamp which they had to use to study in the evening.

Now firewood smoke, kerosene lamp CO_2 gas and darkness have almost been reduced due to electricity, biogas. As a result, health status is improved.

Similarly, electricity has heralded the facility of medicine storage which significantly helped to improve community health. For instance, more than half of the informants emphasized on the electricity's more pressure in the increment of health facilities and less costly immunization with refrigeration of sensitive vaccine, medicines, injections etc. in the community level. For example informant D said:

> Pre-electricity community did not have any clinic. After electrification there are quality clinics in the community. Electrified clinics with refrigeration can provide even sensitive medicines and instruments that need to be kept cold.

One third informants' stories reflect the improvement of community health due to electricity's contribution to connect the community with the outside world by the promotion of media, information and communication. Informant E said

> Unknown disease killed our two grandfathers. While analyzing the symptoms, we knew our grandfathers were killed by tuberculosis (TB). But, now in family no one has to die by such disease which killed grandfathers. At present, due to electricity people have connectivity with the world which on the one hand make people aware and on the other hand educate how to get rid of the diseases and support to be safe.

What informant E focuses is that electricity is contributing to multiply the improvement of health status of his family and community by widening the access to the outer world through the means of communication which help to intensify level of health knowledge, consciousness and adapt preventive measures.

Electricity promoted media in the community and media promoted health consciousness. Similarly, electricity facilitated to conduct and protect the electrified health equipment diversifying the health clinics in the community.

Hydropower/electricity has reduced the distance between the community and well facilitated hospitals. Making inaccessible accessible electricity has supported to improve the community health.

Many of the informants' stories reflect that reducing distance, electricity has brought the modern services in the community with less pressure to walk long distance. Community hospital conducted in the village has all facilities CT scanning, x-ray, urine and stool test. Before electricity to take such services community people had to walk far away. In this connection informant G said:

> Electricity has reduced respiratory problems of my family. Similarly electricity has improved health of the community, for example, for general health checkup we had to

> go 5 /6 km away but now we have almost every service in our door. Health related electrical appliances reduce community health vulnerability. Even CT scanning facilities can be taken within 500 meters distance for which we had to travel at least 200 km.

Similarly, informants B said:

> Because of electricity we do not have to go far away to get health services like ex-ray, video x-ray, fracture plaster, lab test and simple operation as in the past. Similarly, electricity has contributed to establish well facilitated hospital nearby the community. The distanced health has become accessible in the facilitated hospital with facilitated equipment.

What informants G and B are stressing is that electricity has tremendous effect in the improvement of community health by the reduction of both distance and travelling hours, bringing modern facilities and medicines.

Hydropower is found to have significant health impact in the community by heralding advanced health facilities and improving them, reducing indoor air polluting fuels for cooking, lighting and heating, improving health knowledge through access to TV, information and communication, internet, and making availability of sensitive medicine and nutritious food through refrigeration.

Regarding the health and hydropower, what is found here is hydropower promotes community health which enhance community capacity to adapt the consequences resulted by the environmental effect/change.

4.2.4 Benefits from Hydropower: less pressure on forest

Hydropower and forest are like inseparable but totally different parts of a coin in regard to the contribution for the protection of environment. Both of them play the significant role to preserve environment yet the relation between them is researchable. So to study the informants' opinions regarding the relation between hydropower and forest, I used the following relevant question from interview guide: Is forest area increasing or pressure of decreasing after the construction of hydropower?

Albeit different informants expressed different opinions, these can be categorized into three categories: less pressure, no change, and more pressure. It means hydropower does have little pressure whether to increasing or decreasing the forest, hydropower does not have any pressure to increase, and hydropower does have more pressure to increasing the forest.

Half of the informants saw hydropower leading to less pressure on forest by helping to increase the forest. Two of them saw less effect to increase the forest; one of the informants saw no change in the forest, and one of them saw the more pressure to decrease the forest.

One of the informants saw the increment of forest after the construction of hydropower. He said that electricity has direct and indirect role to preserve the forest. For example, electricity has reduced the firewood consumption in household activities and small scale industrial production such as cooking, heating, baking etc. Reduction in Firewood consumption directly stands for the increment of the forest.

Similarly, he said that electricity indirectly helped to make community people aware about the importance of forest by providing access to the means of communication such as TV, Radio, and Internet. With these examples, what he opine is the increment of forest after the construction of hydropower.

Another informant saw hydropower's more effect to increase forest by improving household tradition of the community people. Informant D said

> Community people have been attracted to electricity which has significantly improved household tradition of using firewood. Firewood reduction directly refers to the conservation of forest. Using less firewood means to halt forest from being destroyed and conserving forest means to protecting environment.

Another respondent also said that hydropower reduced the firewood consumption and what it is doing next is increasing awareness to plant the trees. To preserve dwindling drinking water sources, people being united involved in plantation. Reforestation definitely maintains environmental balance. He also saw the increment of forest due to electricity.

Stressing on the more limited effect of hydropower to preserve the forest, two of the respondents opine that the community forest program is helping to increase the nearby forest than hydropower plants. They saw government's 'community forest' programme is extending forest by controlling deforestation and promoting reforestation but not the power plants even though they contribute a lot to preserve the ecology/environment.

But, another two of the informants saw more effect of hydropower to extend the forest because project itself has planted trees around project's areas. It has equally motivated and encouraged the community people involving in reforestation. In addition, due to increasing awareness and irrigation availability the forest area is increasing.

But one of the respondents saw no change on the forest although hydropower has positive effect on forest; he said that there is not any significant change in his nearby forest after the electrification. Rather he indicated that during construction phase forest was destroyed to construct small huts for workers and to hoard construction materials. He saw no effect on the increment of forest.

Only one informants opined that hydropower had led to more pressure to decrease the forest because during construction and distribution power plants cut down so many tresses.

On the basis of the responses it is found that hydropower is supporting to increase the forest area by improving the household tradition, reducing the firewood consumption and plantation. Similarly, with power supply hydropower helps community people to be connected with outer world and be aware of the environmental issues.

4.3 Negative effects from Hydropower: Environment

Broadly speaking hydropower imparts more benefits to the environment by offering clean energy and reducing the use of warm increasing and CO_2 gas emitting fossils fuel. Similarly, it helps to preserve and extend the forest area by reducing the consumption of fuel woods for cooking, animal feeding and running small scale industries. Electricity promotes environmental preservation through enhancing access to the means of communication and information, TV, internet and so on; and increasing the knowledge about the importance of environment through awareness programme.

At a larger environmental level hydropower does have positive impact yet to study about its effect at the local environment I asked the following questions to the affected area people: What changes do you see in your surrounding after hydropower and electricity installation? Or what sorts of impacts to the environment have you experienced from the projects? Or what is the relationship between hydropower and environment?

Different informants responded these questions differently. Most of the informants focus on the post construction effect than pre-construction effect. In course of responding post-construction effect, they focused on down- stream effect: landslide and flooding, water, fishery etc.

Out of eight affected communities' informants, four responded that the landslide and flooding is increasing in the down-stream due to flushing. Hydropower has different structures and to

reserve water in the dam doors are closed in the dry season. But during rainy season if flood comes with boulders and to flush such boulders project opens all the doors which caused destruction of the ecosystem badly affecting the down-stream people, agricultural land and environment.

One of the informants said that landslide and flood totally collapsed three plain fertile agricultural lands which are "Dhaerebagar, Rumdi phat, and Parsangawali". Desertification of fertile land is the tangible evidence of project's adverse effect. He further added that during dry season project totally blocked water flow and sent to turbine through tunnel but during rainy/wet season it opens all the doors to clean boulders which caused flooding and flood caused landslide and soil erosion. Boulders, eroded soil and byproduct of landslide altogether piled up in the narrow course of the stream and forced to change its course which caused the destruction of fertile land of the stream side. Likewise, respondent C also said "there is still landslide effect in the eastern part of the dam site".

But three of the informants said that there was no landslide and flood because of hydropower but because of global warming, climate change, temperature rising, untimely, heavy or low rain etc.

Similarly they focused that due to tunnel, community peoples' drinking water sources have been dwindled. Such problem has been seen in the downstream but not upstream particularly in the dry season. During dry season less amount of water flows in the stream but power plants needs more water so all water is sent to the cemented tunnel which does not let single drop to be spilled out. As a result, down steam drinking water sources declined. Due to drinking water problem in the community, UMN has supported the 'pure drinking water project' which provides water supply to the community.

Furthermore, three of the informants responded that hydro plants have badly affected the fishery in the down- stream especially in the dry season. They said that there used to be a lot of fish in the stream in all seasons during pre-construction but we cannot find any fish in downstream after the construction of power plant particularly in the dry season albeit fish protection measurement such as fish laddering, net, ponding are adapted. During dry season all water has to be sent through the tunnel to the turbines so the natural water flows are brought to halt in these periods that caused fishery problem.

Respondent E said:

> As long as I remember, before the construction of hydro power the community people did not have to buy much to eat but after the construction of hydropower, it totally destroyed fishery particularly in the downstream, affected irrigation and agriculture, drinking water sources, reduced production and vanished the traditional way of production.

Regarding post-construction effect, next informant said that the community people have experienced such environmental effects at present that were not in the past. For example, soil erosion, landslide, flooding, lack of drinking water, fishery problem etc. are some of rising problems.

Respondent I said:

> Albeit, we broadly discussed about the potential effect during the construction period, now we see the effect. The flushing water has changed the total environmental or ecological system of the Andhikhola stream.

Similarly, another informant highlighted the effect on wild animals and surrounding houses due to blasting, vibration of heavy machines, and means of transportation; and land slide due to flushing are common problems during and after the construction of hydropower plants.

In the contrary to this another informant K said "most of the projects were inside the mountains and there was not much impact on the environment." He further focusing on equal distribution of resources said that in Andhikhola water was redistributed and electricity was also distributed.

What he reflects is that since project is constructed in between the mountains, there is less chance for environmental destruction. At the same time he says community people are double benefitted by the project i.e. irrigation and electricity. Irrigation promotes the productivity and fertility of the land on which community people depend on.

Notwithstanding these diverse views, there seems to be the negative effect of hydropower plant in the downstream environment. What informants opine is Andhikhola and Jhimruk hydropower plants do more good to larger environment except downstream effect. Visibly, these power plants have reduced the consumption of warm intensifying CO_2 gas emitting fossils energy, extended knowledge on the importance of environment through the access to the means of communication and information, improved health status and diversified economic resources which preserve the environment.

But, still there is much difficult environmental situation in the downstream, for example, UMN/HP motivated and trained community people involve in interprenuireship and promoted poultry farming, pig farming, duck farming etc. but in the downstream duck and pig farming have badly been affected whether due to lack of water in the dry season or flooding in rainy season. In the dry season there is no water in the stream for pigs and ducks to swim.

4.4 Views from former/present employees

To get employees view in regard to hydropower and environment I prepared different set of interview guides relating to hydropower and natural, socio-economic and cultural environment.

All of the employee informants opine that hydropower plants have contributed a lot to the development of the economy and diversify income sources of the local/community people and empower them. Power projects have developed economic resources and diversified income sources by empowering the community people through training and encouraging to initiate small scale businesses, entrepreneurship, industries and so on. For example, with UMN support community people could able to process their pigs' meat in international standard and export in the international market.

All of the informants said that projects prioritize local people's employment except some exceptional posts. Projects contributed a lot to create job opportunities to the local people. Projects gave more emphasis to the most affected people in employment. Projects compensated as well as employed those community people whose land had to be acquired. Ex-UMN employee informant I opined "Now who I am and what I am doing all due to Andhikhola hydropower project." He further said "project employed my family members to dig power house."

Most importantly, two of them said that communities get certain percentage of royalty from the projects which communities can utilize to develop their economic development.

One of them said that project's planning itself was environment friendly. We were high conscious for less than less effect on the environment: choosing the area where there was no dense forest, no fertile land, and no private properties.

We chose the space where there was less effect/harm to the flora and fauna or to the total ecological/environmental system. Two of them said if there was need of cutting down the

trees particularly animal feeding trees projects negotiate with owner and pay compensation. Similarly we were high conscious about the potential hunting of wild animals and bootlegging of rare species of plants and animals. So, coordinating with local government body, we avoided it.

Another employee informant said that power plants were made between the mountains so there was not any environmental effect. All of them said that there was no need to relocation the families because of the effect of the dams.

Respondent I said

> Although we carried EIA according to the then governmental law by having broad meetings and discussions with community people, and adapted protective measures; now we see some serious environmental problems particularly in downstream which were not in the past.

These problems are quite seasonal. Dwindling drinking water sources, fish, no water to irrigate for seasonal agriculture etc. are major problems appear in the dry season and increment of soil erosion, flooding and landslide due to flushing are another problems that the downstream people facing with in the rainy season. Informant J said "there is much more complain about the effect of vibration because of the use of heavy machinery, blasting, bombing etc. which intensifying landslide and sometime destroy the houses."

4.5 Conclusion

Albeit there is environmental disturbances particularly in the downstream, hydropower contribute to extend the forest area, promote community livelihood by diversifying income sources, enhancing education, and strengthening community health.

Improved health diversified economic resources and other job opportunities empower the community to be resilient and adapt the adversities caused by flushing in the downstream.

Chapter Five: Hydropower, a Characteristic of an Empowered and Resilient Community

5.1 Introduction

This chapter will present the discussion over informants view with the application of the diaconal and resilience theories. Under the spectacle of the diaconal theory of empowerment how the hydropower plants empower community will be discussed and with the resilience theory how such empowerment affect the community resilience will be analyzed. Focus will be on to discuss how do UMN/HP contributed hydropower plants empower and transform the community? How do power plants affect the environment? How do hydropower plants contribute to promote and strengthen the crucial capacities and intensify community resilience?

5.2. Hydropower as a response to the need of community empowerment and transformation

Diakonia, with its paradigm shift moves from offering humble services to working with in mutuality to human sufferings for the sustainability of God's creation, focuses on prevalent needs of the local/grass root level so as to dig out the power/hidden potentialities which empower and transform the local people and their community.

Diakonia today is more concerned to recognize and meet the needs of the people in their own local context. The distinctive contexts have distinctive needs and to address/meet those needs today's diaconia applies distinctive approaches that help to build up capacities, strengthen resources thereby empowering and improving existing status of the people so as to transform communities.

Today's diaconia, acknowledging its accountability towards human sufferings, powerlessness, self- humiliation and worthlessness, tends to support people to buffer sense of powerlessness and worthless to promote their dignity through social support and interaction, public participation, inclusion and advocacy.

Human dignity is always threatened by poverty, injustice, discrimination, inequality etc. since these accentuate marginalization, exclusion and vulnerability. So how diakonia at present work is to identify and work with the crucial needs of the people.

With the understanding that needs always intensifies sufferings and powerlessness that challenge human dignity, diakonia contributes to promote such catalyst which catalyzes the socio-economic, educational, health, household and larger environmental status thereby challenging human dignity challenging forces on the basis of equality, equity, justice, rights etc.

Under the spectacle of aforementioned diaconal theory of human dignity, empowerment, and transformation, UMN/HP contributed Andhikhola and Jhmiruk are essentially need based actions that they catalyze the holistic development and transformation of respective communities and people thereby improving their status ranging from household to international network level.

With the electrification UMN/HP has promoted the biblical understanding of Creation that "every human being is created in the image of God with capacities and abilities, independent of their apparent social situation" (LWF 2009:45). In household level electricity has reduced the discrimination between male and female thereby reducing time allocation to collect firewood, travelling hours for grinding and improving their health. Likewise, in community level, through time saving electricity has motivated to involve in different cooperatives which on the one hand enhance their abilities of leadership and encourage for their public participation to discuss about their rights and health against household and social discrimination; and on other hand it has strengthened economic status of the women.

The aforementioned example of the effect of hydropower reflects what empowerment at personal level is as "the experience of gaining increasing control and influence in daily life" (Dietrich et al. 2014:22) and at community level is as

> … is a process of renegotiating power in order to gain more control… address the social, cultural, political and economic determinants that underpin health, and seeks to build partnership with other sectors in finding solution. (WHO 2013 cited in Dietrich et al. 2014:22).

In Nepalese communities, on the basis of positive discrimination, women are limited within household activities with limited access to economy which obstructs them to be independent and promote their abilities. Along with electrification they have been encouraged to be independent, to speak about their rights, health and promote their social exposure with

externalizing their internal feelings, ideas, views against systematic/social injustice, discrimination, exploitation etc.

Besides, women's empowerment against apparent social situation, electrification has promoted children's right to study in healthy environment with the access to the facilities catered by modern technological advancement.

Electrification has reduced the compulsion of using fossil fuel like kerosene to study for the school children. Reduction in the consumption of fossil fuel helps to increase better study environment in the house thereby reducing the inside CO_2 gas prone air pollution. In addition, electricity has extended the studying hours to the children with the facility of online study resources as well. Electricity has facilitated a lot to enhance the quality of education to children by the exploitation of computers, laptops, tabs, mobiles etc.

With electrification enhancing quality of study environment and education, UMN/HP is envisioning the long-term empowerment of the affected communities so as to promote the concept of human dignity by reducing human dignity threatening factors such as discrimination, deprivation, exclusion, marginalization, injustice, and inequality and transform those communities. Improved education will increases level of understanding, thinking, consciousness, knowledge etc. which automatically makes change in every practices of community life.

Similarly, UMN/HP supported Andhikhola and Jhimruk have contributed a lot to foster power in community people to gain control of various aspects of their lives through job creation, employment; and diversifying income generative activities and economic resources.

For example, with the exploitation of electricity community people have been running small scale industries like rice beaten mill, saw mill, furniture and ice-cream industry; businesses like dairy, fruit/juice shop, and interprenuireship like poultry farming, duck farming, pig farming etc. which support to increase their income and reduce the level of their poverty. Rising from the poverty means to rising from the state of powerlessness to the power to control the life in their way.

Community empowerment is "... process by which they increase their assets and attributes and build capacities to gain access, partners, networks or a voice…" (ibid: 22). Electricity has tremendously empowered the community by helping to increase assets of community people and building the capacities to diversify economic sources. Involving themselves in

cooperatives many females enabled themselves to take the position in decision making level in the community.

UMN/HP supported Andhikhola and Jhimruk have been successful in transforming affected communities from the subsistence to sustainable livelihood by maintaining the balance between three building blocks of sustainable livelihood: Economy, Community/Society and Environment.

Andhikhola and Jhimruk produced electricity has been contributing to increase income in communities with the opportunities of employment, job creation and most importantly opportunities for small scale businesses, interprenuireship and industries. The aforementioned opportunities contributed a lot to raising income. In addition, UMN's technical training to process the meat of animals from their animal farming like pigs, chicken and marketing in to international market excitedly increase income and contributed towards the sustainability of their farming.

The marginalized people were encouraged to participate in the income generating training and the exposure visits between groups (group already involved in income generative activity and the group intended to involve) enable to build up with the sharing of experiences. UMN/HP with the installation of electricity improved the economic development of communities by mobilizing community resources and co-ordinating with government agencies to easy access for local productions into national and international market.

Electrification has tremendously improved the community health, being particular, improved the respiratory health of housewives. Similarly, electricity installation has reduced the consumption of CO_2 gas emitting fossils and wood fuel for cooking, lighting, heating, baking and grinding by contributing to a reduction of pressure on the forest which protects environment.

Power plants, improving the environmental as well as economic status, contributed a lot to the transformation of community people from subsistence to the sustainable livelihood.

5.3 How does Hydropower contribute to improve post- construction environment?

All rich or poor people tangibly or intangibly depend on the environment for life and livelihood. But, the most directly depend on natural/environmental resources are the poorest people in the poorest community. The natural resources and assets, on which the poorest

depend, have been the most degraded and depleted because poor more think about their needs than the needs of nature.

Similarly, the poorest mostly depend on the natural resources to live the life and are excluded from the decision/policy making level. Not only this, they are in exclusion from access to shared environmental resources. So, the poorest are the most vulnerable to all kind of environmental degradation. Unequal and unjust social and political practices intensify decadence of environment, environmental resources and the species of flora and fauna.

Dangsung et al. (2014) reviewed care and advocacy for creation – one of the most significant dimensions of diakonia today –

> just as the churches are concerned about the dignity of humanity through care for the needy and advocacy on the issues that undermine quality of life for humanity, the same applies to God's Creations. (257).

Diakonia today, underscoring on the faithful conservation and nurture of the environment and making sustainable use of natural resources; advocates on the equal and equitable distribution of natural resources and power sharing. Advocacy focuses on the right of marginalized, excluded, and vulnerable on the basis of the concept of human dignity.

Since everyone is created in the image of God, everyone is equal irrespective of his/her birth, gender, class, age etc. No one is vulnerable, poor, fragile etc. by birth but it is unjust and unequal socio-economic and political practices that make people vulnerable and undermines the quality of life.

For the preservation of environment what are urgent today are the fair and just socio-economic and political practices thereby giving the space to those who are in the margin, exclusion and edge and vast change in the currently practiced developmental models. Furthermore, diakonia today advocates on the equitable and justifiable sharing of gifts of Creation i.e. environmental common of land, air and water. Hence diakonia focuses on care for the environment, equity and social justice. Struggling with the issues of sustainability, diakonia believes that albeit human are God's supreme creation and creative stewards to the rest of the God's creation, we have also clear limitations in the sustainable use of natural resources.

Diakonia, focusing on the sustainable development, advocates on the balance between economic growth and development for the sake of sustainable environment. For, the sake of creation there must be balance among production, consumption, and the exploitation of

natural resources. The development and economic growth should be eco-friendly or green economy for the sustainability of God's Creation.

Wondering on why people are poor even in the country with full of natural resources to meet the basic needs of all, UMN/HP committed to

> working towards fullness of life for all … special emphasis on … value of care for the environment … relates strongly to several of other core values … Equity and Social Justice, Love and Services, Innovative and Creative" (UMN 2012:2) .

Envisioning sustainability of individual and community life as an aspect of fullness of life UMN/HP strive "helping communities to live within and nurture a healthy and resilient environment, ensuring resources are used fairly in the present and are maintained for the future." (ibid: 2).

So as to actualize the vision UMN/HP contributing to the development of hydropower and through rural electrification empowered community people to initiate businesses in an innovative and creative way that one the one hand supports environmental sustainability and on the other care the creations. Through the equitable distribution of the electricity and diversifying sustainable economic sources of the community people, UMN/HP is seeking reduce the unforeseen risk of environmental hazards to the vulnerable and to have equitable and sustainable access to shared natural resources.

Hydropower improves environment by producing eco-friendly clean energy i.e. electricity. Electricity, as a green energy, reduces the consumption of CO_2 gas emitting fossil and wood fuels that badly affects the environment and devastates environment depending species of flora and fauna.

UMN/HP supported Andhikhola and Jhimruk are solely propelled by diaconal spirit of caring and loving for all creation of the God by maintaining mutual existence between all biotic and non-biotic or living and non-living beings and human and non-human via reducing people's much dependency on the environmental resources and increasing their capacities to be innovative and creative to shift resources for their livelihood which is considered to have a positive impact on Creation care.

The dignity of one component of the environment is inextricably linked with another one. It means human dignity is linked with the rest of non-human and non-living beings and vice-versa. So, there is reciprocity between human and environment. Conservation of environment

is the preservation of human dignity and dignified human existence is only possible when there is dignified existence of environment. Andhikhola and Jhimruk power plants, whether by contributing to diversify economic sources of the community people and lessening people's much dependency on the nature for their livelihood or by reducing the use of kerosene, diesel and firewood, are contributing to preserve the environment and the creatures living on that environment.

The diaconal concept of human dignity has been applied to all the creations of God. Not only human being but all the creatures have been created by the God though different from human beings, so every creature has equal right to live and exist. As all humans are equal irrespective of their class, gender, sex, birth etc., the way every creature is equal to human.

Andhikhola and Jhimruk are the perfect examples of the reflection of spirit of the vision one the one hand UMN/HP support play the role to empower the marginalized, poor, edged people through the economic activities and employment/job creations and improve a reduction of discrimination, injustice through opportunities; and on the other hand protect the environment and all the creatures.

Andhikhola and Jhmiruk are concerned about the care and love to the community people by improving quality of life undermining issues such as health, educational environment, reducing the time allocated to firewood collection and grinding, extending the hours to involve in income generative activities and empowerment programme like trainings, meetings, and discussion; and reducing the structural/systematic inequalities and injustices of the community.

UMN/HP rural electrification mission seems to be inspiring by the ecumenical movement's advocacy on the right to development for all, and economy for all and life for all to sustainability. In the modern context of the separation between development or economic growth model and God's creation, the development of Andhikhola and Jhimruk power plants significantly bridge the gap between divorced edges through the equal distribution of electricity, employment, potential opportunities and job creations; and transforming community

Electricity, employment, job creation, and other potential opportunities reduce poverty and increase access to outer world. Poverty reduction helps to reduce community dependency on the nature which increases the preservation of the environment. At the meantime, access to

outer world increases knowledge and awareness which also helps to diversify the economic sources and preserve nature and creatures.

UMN/HP hydropower developing contribution is the application of God given responsibility of stewardship so as to preserve the integrity of entire world. Realizing the relationship and responsibility to neighbour, UMN/HP carried their stewardship through the development of Andhikhola and Jhimruk which not only empower community people but also inspire them to realize their responsibility to other creatures and fellow beings so as to acknowledge the value of integrity and its preservation.

5.4 How is hydropower leading to depleted resources?

To maintain environmental sustainability and perpetuation of community hope has become one of the key challenges to the UMN/HP initiated and strengthened Andhikhola and Jhimruk, since they caused the depletion of natural resources like drinking water, soil, and fish particularly in the downstream.

Respective projects have adapted preventive measures for these potential effects but not prove to be effective. “We believe that though we are called to be productive stewards, there are clear limits (both given in Scripture and experienced in practice) to sustainable human use of natural resources”. (ibid: 2). What is reflected in the aforementioned citation is that even though we believe ourselves as the rational/ creative protector of the God’s Creation, we have our limitations that hinder us to be true preserver of the environment and to live a resilient life. Though we are rational, we cannot think about future generation as we pretend/plan and preserve the environment because of our inherent limitations.

UMN/HP supported power plants planned to minimize if can’t be avoided post construction negative environmental effects, but in long run the negative effects on water, fish, and soil; have been emerging in rising tendency as environmental stressor threatening respective communities resiliency. Those effects are summarised in the following stories.

The downstream community people have been affected due to the dwindling of drinking water sources. They suffered a lot in the dry season. During dry season the quantity of water flow naturally reduces but project needs more water consequently projects halt natural water flow and send into turbines through tunnel. This caused the dwindling of the drinking water sources. The halt of the natural water flow affects the downstream irrigation, too.

The downstream people cannot plant seasonal vegetables in their fields due to lack of water to irrigate. Seasonal vegetable farming could be one of good sources of income to the community people but power plant affected it.

Similarly, power projects lead to the depletion of fish resource of the community. The problem of depletion of the fish increases in dry season in the downstream. Fish resource depending livelihood of the community group has been affected and the bio-diversity of the stream has also been affected. In regard to this effect informant E said that "before the construction of hydropower community people did not have to buy food to eat but after construction they have to buy more than 35% of their food from market".

Furthermore, the problem of soil erosion and the destruction of fertile agricultural land are increasing because of the flushing during rainy season in the downstream. During rainy season the quantity of the water increases unexpectedly. The flood carries the boulders and piles up in the dam which needs to be cleared. To clear boulders of the dam, project opens doors which cause the heavy flood in the downstream. The heavy flood increases the soil erosion and landslide. Sometime, the accumulated boulders pileup in the narrow course of the stream and changes the natural course devastating fertile agricultural land at the bank.

Flood, soil erosion, land slide not only destroy agricultural land but also disturbs the natural set-up of the stream. The increased floods with boulders affect the hydro-creatures, too. These problems were not seen in the past but in the recent years these have been increasing affecting the community.

These aforementioned stories reflect the negative effects of the hydropower. These effects challenge the UMN/HP effort to maintain environmental sustainability and sustainable livelihood. Since, sustainable livelihood is one of the building blocks of community resilience and sustainable livelihood rests on the improvement of financial, natural, and social capital which are the indispensable characteristics of community resilience, too. So, sustainable livelihood and community resilience are compatible entities. Hence, the challenge to sustainable environment means the challenge to community resilience.

According to Norris and colleagues communities have potential to function effectively and adapt successfully even after disturbance. Such a positive trajectory of functioning and adaptation emerges from both the resources themselves and dynamic attributes of those resources (robustness, redundancy, and rapidity). The combination of these resources intensifies adaptive capacity. (Norris et al. 2007:131).

What they opine is that communities have capacities to function even after stress or disturbances or challenges if the community have resources with dynamic attributes. The

dynamic attribute stands for perfect, developed, well improved socio-economic, natural and human capitals.

Despite the fact of having some negative effects, UMN/HP supported Andhikhola and Jhimruk do have more positive effects on the environment and community resilience. Theses power plants contribute to increase the forest by reducing the firewood consumption and community people's much dependency for their livelihood on the natural resources like selling fire woods in the nearby town. Power plants have also reduced the number of domestic animals in each house of the community which need to be fed exploiting forest resources. Reduction in domestic animals' number particularly buffaloes, cows, goats for livelihood increases the forest area.

Power plants have supported community people to shift their income sources from traditional agro- based subsistence to creative, innovative and commercial income sources by initiating businesses, interprenuireship, and commercial animal farming. Shift from agro-based subsistence livelihood income sources to commercial resources improve the economic growth and sustainable livelihood of the community to face with the difficulties created by the loss of water, soil, and fish.

Similarly, power projects pay certain percentage of royalty to the community which supports job creation and improves employment thereby increasing individuals' income. Paying royalty is distribution of income. Income distribution and individual's income increment are some of significant building blocks of the economic growth and sustainable livelihood of the community and to be resilient "the community resiliency depends on the economic growth, sustainable livelihoods, and equitable distribution of income and assets with in population." (Adger 2000 cited in Norris et al. 2007:136). Electricity's contribution to make community economy better is to enhance community capacity to response environmental stress fostered by the negative effects.

Likewise, power projects support to have positive impact on community education, health, employment, empowerment and access to transportation/road through extending study hours, reducing the travel hours or improving health services, constructing road and providing the employment to the local people during and after the construction.

Improved health, education, employment opportunities and so on are some of the essential resource base of a resilient community: "land and raw materials, physical capital, accessible housing, health services, schools and employment opportunities as the essential resource base of a resilient community" (Godschalk 2003; Pfefferbaum et al. 2005 cited in Norris et al. 2007: 136).

In the similar fashion, electricity's contribution to strengthen community communication and information is no less significant as it widens community networks with external/outer larger world and enhances community competence "the skills, abilities, or to engage constructively in group decision making to encounter adversities and resist opposing or undesirable effects."(Goodman et al. 1998 cited in Norris et al. 2008:). Along with the installation of electricity, community people build up their capacity to use phone and internet.

Access to phone and internet proved to be boon as it jeopardizes community people's subsistence based rural knowledge with the latest creative and critical knowledge of the sustainable use of resources to be resilient being competent enough to gather the trusted and accurate information and analyses critically to find the solution and halt the unforeseen effect of potential stresses.

In addition, community's connection/network with the outer larger world i.e. technological ingenuity of UMN/HP reinforced parochial local/communal understanding of life, livelihood, environment/nature, culture and economic activities with the broad knowledge of global trend. The strengthened knowledge intensifies community competence building decision making and problem solving capacity with trust validation.

The strengthened community network with improved communication and enhanced competence empowered affected community people to take action against the negative effect/stress on drinking water sources. Consequently, UMN/HP supported to community pure drinking water project by which Andhikhola hydropower affected community has become resilient.

5.5 Conclusion

This chapter throws the light on the contribution of hydropower plants discussing the positive and negative effects on the environment and community by the application of diaconal theory of empowerment & caring for creation; and the community resilience theory.

Despite the fact of having some negative stresses on the environment, hydropower plants do a lot good to the environment whether reducing firewood consumption and extending forest area, displacing the use of CO_2 gas emitting fossil fuels, minimizing the dependency on nature/environment for livelihood or maximizing economic power to the community through creative and innovative small scale business, entrepreneurship, commercial farming.

Intensified community competence in t network with the larger community through the enhanced communication is the dispensable part of a resilient community. What to talk about

employment, job, health, education, equal and equitable distribution of resources and opportunities which are already in the rising trend of improved social ladder. So, electricity causing the improvement of the bases of community has intensified community empowerment and resilience at once.

Chapter Six: Conclusion

This thesis explores about the UMN/HP supported hydropower plants' socio-economic and environmental effect thereby revolving around the study of how UMN/HP supported hydro-energy projects have affected the socio-economic conditions of the community people and environment.

With the application of two theories: diaconal theory of empowerment & care for creation, and the community resilience theory; on both of primary and secondary data, this thesis illustrates Andhikhola and Jhmiruk power plants' contribution to the socio-economic enhancement, community empowerment and its role to promote the community resilience on the basis of informants opinions, responses, views and information collected through semi-structured interview.

UMN/HP has perennially been struggling to promote all the aspects of 'fullness of life' for a resilient life and livelihood. "Environmental sustainability is one of the key areas of individual and community life which, in UMN's vision, represents an aspect of "fullness of life."(UMN 2012: 2). All individuals and communities visibly or invisibly depend on environment for life and livelihood.

To preserve and nurture the environment; and to live sustainable life and livelihood, it is necessary to make sustainable use of the environmental resources. But, unjust socio-economic and political system unfairly promotes exclusion, vulnerability, and poverty which heavily threaten environmental sustainability and community resilience.

The poor, excluded, and vulnerable individuals, groups and communities directly depend on the environment to earn their life and livelihood which questions on the sustainable use of the natural resources and environmental sustainability and resiliency.

In such context, responding the need of community, UMN/HP has been contributing to rural electrification so as to "helping communities to live within and nurture a healthy and resilient environment, ensuring resources are used fairly in the present and are maintained for the future." (UMN 2012:3).The output of the electricity seems to be quite sustainable and environment friendly.

The promotion of rural electrification has had positive effect to the improvement of socio-economic status of rural people. Equal distribution of resource i.e. electricity has helped to empower the community poor people whether by improving health, education, increasing employment, job opportunities, social network and community competence or by diversifying

income and economic resources. In other words, electricity has contributed to promote sustainable livelihood thereby enhancing economic sources and making them diverse and eco-friendly.

Electricity helped to promote small scale businesses, industries and interprenuireship in the community which supported to increase community people income and at the mean time those businesses, industries and interprenuireship promote community resilience thereby strengthening community people's capacities to adapt environmental stress intensified by loss of fish, water sources and soil erosion.

Albeit hydropower construction increases the stress to the downstream people with negative effect to water, fish, and soil; electricity has strengthened capacities to manage the stress by improving resilience characteristics. Education, health, communication, access to market, community well-being, employment, job creation etc. are significant resilience characteristics in Andhikhola and Jhimruk affected community context.

Electricity has contributed to enhance community resilience by improving all aspects of community like physical, human, financial, natural and social. Electricity has supported to improve community people access to the means of transportation, roads and good communication by enhancing community network with outer larger community and intensifying community competence.

Similarly, electricity has had positive effect to the access into computer, laptop, tab which support to increase skill, knowledge and improve distinctive strategies to livelihood in the community level.

With the reduction of time allocation to collect wood fuel and grinding; and extending hours to involve in cash generative activities and saving through cooperatives, electricity has improved the financial capitals of the community which helped them to adapt different ways to their livelihood.

Similarly, reduction in firewood consumption and increment in awareness due to the access of communication and TV, forest area is increasing which will ultimately support to improve water sources though this is affected by tunnel and preserve soil erosion enabling community to carry natural resource based activities i.e. farming, in the days to come.

Electricity has contributed to improve community access to the networks of UMN/HP ingenuity which enabled community to plan, mobilize and manage resources; and empowered women to take leadership by participating in cooperatives.

Thus, what this study concludes is that Andhikhola and Jhmiruk hydropower plants' have heralded more positive effects in the respective communities by supporting to improve the required significant characteristics of sustainable environment/ecology and resilient community.

Despite the fact of having some negative effects to the downstream environment and livelihood, electricity has been contributing to improve the education, health, communication, transportation, employment, economy, justice, forest area etc.; and reduce the consumption of CO_2 gas emitting fossils and wood fuel by maximising equal distribution of opportunities and resources along with diversifying economic sources.

Creation of self-employment, through the promotion of small scale businesses, interprenuireship, commercial farming, cooperatives etc. help to increase community people's capacity building, strengthen power to function properly; and shifting the way of living with the exploitation of their competency and network to adapt the changes or stresses. So, Hydropower plants empowering self-employment strategies help to promote resilient eco-friendly livelihood resources by intensifying community resilience despite having some negative environmental stresses.

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Appendix-1

Agreement to NSD

Data processor agreement pursuant to the Norwegian Personal Data Act

Data processor agreement

in accordance with Section 13, cf. Section 15 of the Personal Data Act and Chapter 2 of the Personal Data Regulations

by and between

Hans Morten Haugen	Rumakanta Kafley	Gopal Chandra Joshi Subedi
Professor	Master Student	Ex. Chief Distribution Manager
~~Data controller~~	Data processor	Data collector
Project Responsible		

1. Intention of the agreement
The intention of the agreement is to regulate rights and obligations pursuant to the Act of 14 April 2000 No. 31 relating to the processing of personal data (the Personal Data Act) and the Regulations of 15 December 2000 No. 1265 (the Personal Data Regulations). The agreement shall ensure that personal information relating to the data subjects is not used unlawfully or comes into the hands of a third party.

The agreement concerns the processor's use of personal data on behalf of the controller, including collection, recording, alignment, storage and disclosure or a combination of such uses.

2. Purpose
The Agreement is concerned with the collection of data via interviews and questionnaire for the writing of the 30 ECTS master thesis "UMN and Himal Partners' contribution on the development of Hydro power in Nepal and its effect on the environment", at VID Specialized University, Oslo, Norway, for the completion of the 120 ECTS master in Diaconia and Christian Social Practice.

3. The processor's obligations
When processing personal data on behalf of the controller, the processor becomes obliged to follow the routines and instructions stipulated by the controller at any given time.

The processor is obliged to give the controller access to his written technical and organizational security measures and to provide assistance so that the controller can fulfil his responsibilities pursuant to the Act and the Regulations.

Unless otherwise agreed or pursuant to statutory regulations, the controller is entitled to access all personal data being processed on behalf of the controller and the systems used for this purpose. The processor shall provide the necessary assistance for this.

The processor must observe professional secrecy in regard to the documentation and personal data to which he has access in accordance with this agreement. This provision also applies after the agreement has been discontinued.

4. Use of a subcontractor
If the processor uses a subcontractor or others not normally employed by the processor, this shall be agreed in writing with the controller prior to starting the processing of personal data.

Agreement with subcontractor
The agreement signed by Gopal Chandra Joshi Subedi is attached to this agreement. By the signing of that agreement Gopal Chandra Subedi is familiar with his contractual and legal obligations and will act accordingly.

5. Security
The processor shall fulfill the requirements for security measures stipulated in the Personal

Data Act and the Personal Data Regulations, in particular Sections 13 – 15 of the Personal Data Act and Regulations thereto. The documentation shall be available upon the controller's request.
The processor shall report to the controller all discrepancies according to Section 2-6. The controller is responsible for reporting the discrepancy to the Data Inspectorate.

6. Security audit
The implementation of regular security audits for systems etc. covered by this agreement shall be agreed by the controller and processor.

Audit
The audit may include a review of routines, random checks, more extensive site inspections and other suitable control measures.

7. Duration of the agreement
The agreement is valid until 15 June 2016.

In the event of breach of this agreement or the Personal Data Act, the controller can instruct the processor to stop further handling of the information with immediate effect.

The agreement can be terminated by both parties with a mutual period of notice of 1 month, cf. Clause 8 of this agreement.

8. Termination
The parties shall agree that the processor shall delete or destroy in a secure and definite/irreversible manner all documents, data, diskettes, CDs, etc. that contain information covered under this agreement. This also applies to any back-up copies.

The agreement should specify in which manner deletion or destruction is to take place upon termination of the agreement.

The processor shall document in writing that deletion or destruction has taken place in accordance with the agreement within a reasonable period of time after termination of the agreement.

9. Notifications
Notifications under this agreement shall be submitted in writing to: haugen@diakonhjemmet.no

10. Choice of law and legal venue
The agreement is subject to Norwegian jurisdiction and the parties agree on Oslo District Court as the legal venue. This also applies after termination of the agreement.

This agreement has been drawn up in 3 – three copies, of which the parties retain one copy each.

Oslo, Norway and Kathmandu, Nepal
26/JAN/2016

Controller	Processor	Collector
Hans Morten Haugen	T.J.	
(signature)	(signature)	(signature)

Concerning interviews and questionnaire for master thesis in Diakonia and Christian Social Practice

With due honesty, I would like to inform the inability of my brother Rumakanta Kafley's arrival in Nepal, who is progressing his master at Vid specialized University in Oslo, Norway, to collect the data for the required information to write thesis entitled "UMN and Himal partner's contribution on the development of Hydro Powers in Nepal and its effect on the Environment".

Rumakanta has requested me to take 4 interviews with beneficiaries/ affected communities at two different projects sites as well as interviews two HP staffs/partner and two UMN staff/ partner. This is very sensitive responsibility so I am very much conscious to transmit the views of the respondents to ensure truthfulness, reliability, impatiality and neutrality of information.

I assure you that I will initiate project only after making vivid explanation about the purpose of the master thesis project and with the consenment of respondents with high confidentiality. I will conduct interviews only with the voluentarily participated respondents. During transcribing interviews I will be highly counscious to avoid falsifying and fabricating informations. I will send transcribed interviews to Rumakanta via email and release the letter of consent from each interviewee with corresponding number on consengt letters and interview. These will be kept lockedand seprate. Similarly, I assure you to destroy separetely collected consent letter form and delete interviews when Rumakanta sumits his thesis. I will be ready to provide any required information regading interview situation in the time of necessity.

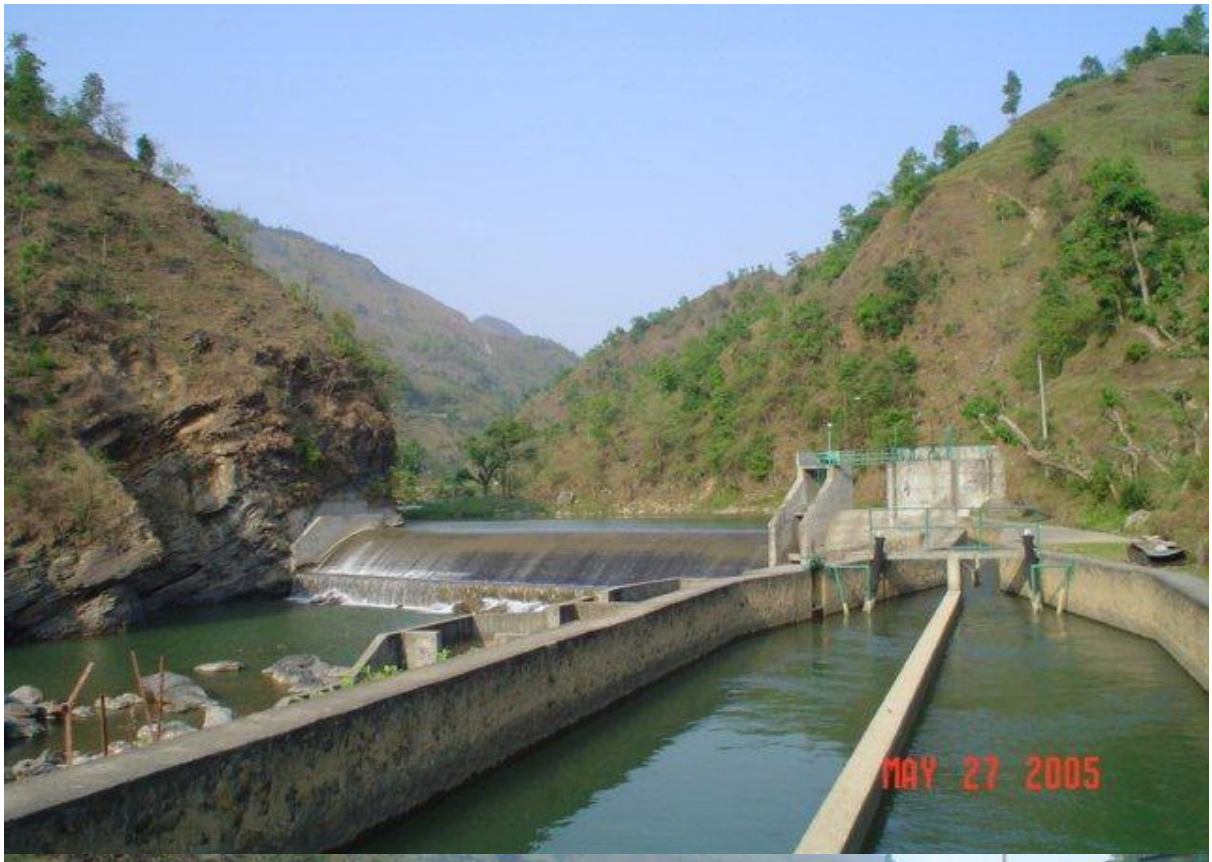
I hereby, with strong commitment for confidentiality, impartiality, neutrality and voluentary participation with consenment, solemnly urge you to grant me permission to collect data to my brother Rumakanta's thesis writing.

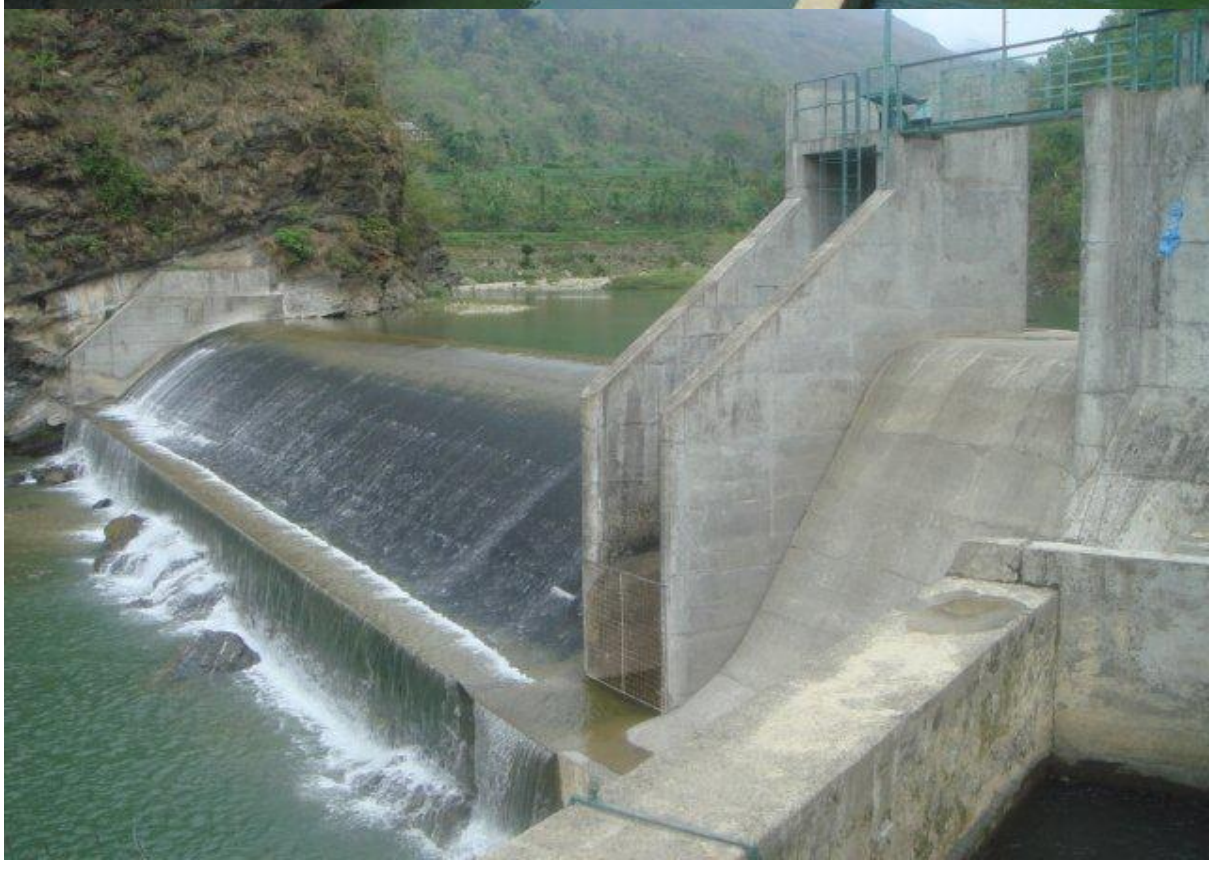
Joshi DATE: 16 February 2016

Gopal Chandra Joshi Subedi
E-post:gcjsubedi18@gmail.com
Ph.No:00977-9851142097
Kathmandu, Nepal.

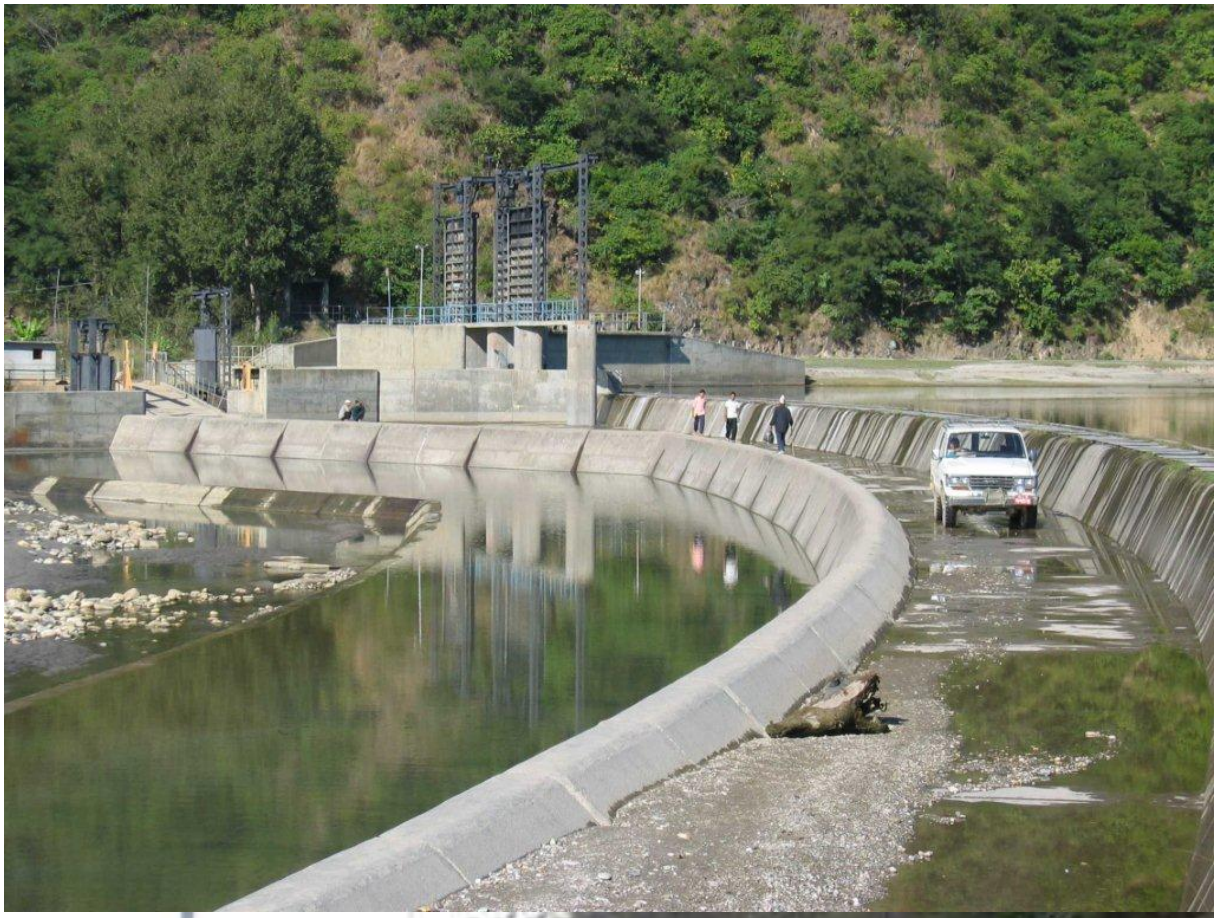
Appendix-2

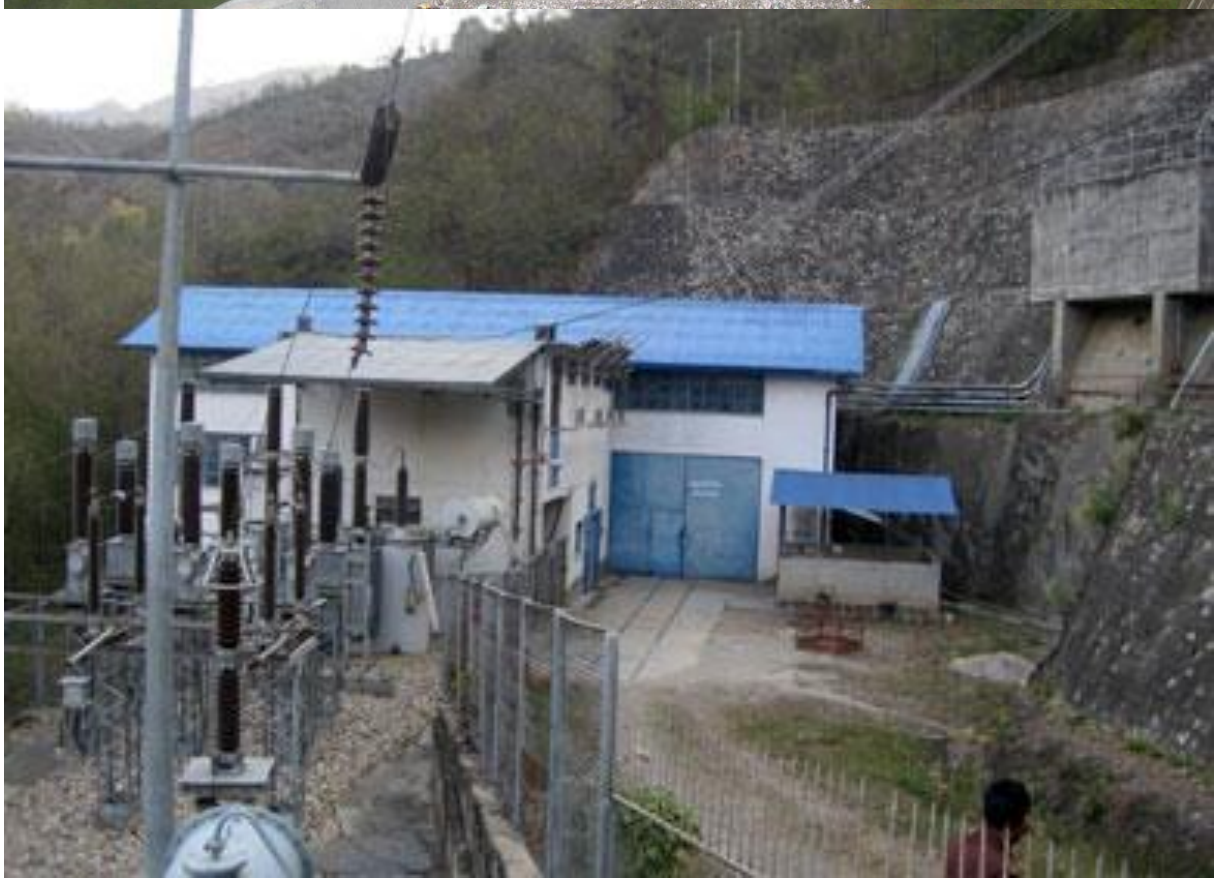
Andhikhola Diversion and Intake





Jhimruk Intake and Power house





Appendix-3

Questions for affected people

1) What do you use electricity for?
2) What practical differences do you experience with/after and without /before electricity?
3) How has hydro power brought change in your daily life?
4) Do you use electricity or firewood to cook food your family?
5) How often do you go to forest to collect firewood before and after the installation of electricity?
6) Are you aware of environmental challenges in Nepal?
7) Is electricity contributing to conserve or destroy the environment?
8) What changes do you see in your surrounding after hydro power and electricity installation?
9) What is your main resource for your livelihood? Wage income or harvesting from nature?
10) How has electricity improved your income source?
11) Do you have animal farming? If have, what number and how do you feed them?
12) How often do you watch television? a. Daily b. twice a week c. once a week. Do you watch any environment preserving programme in your TV set?
13) Do you watch any environment preserving programme in your TV set?
14) Do you have any idea regarding what causes flooding and landslide in your surrounding?
15) Is hydropower good to the environment or bad in your view?
16) Is forest area increasing or pressure of the forest decreasing after construction of hydropower?
17) Have you noticed any change in the health status of your family members after using electricity for cooking?
18) Are you running small scale industries such as knitting, making handy-craft in your spare time?

Questions for Agencies and Partners

1) How are you concerned with the environment while supporting the construction of hydro power in Nepal?
2) What environmental requirements do you specify for your partners when carrying out hydropower project?
3) How do you carry out environmental impact assessment?
4) What do you think about the relation between environment and hydropower?
5) What difficulties did you face while developing hydropower?
6) How do you involve the local people while carrying environmental impact assessment? What difficulties, if any, have you faced in this attempt of involvement?
7) What sort of impact to the environment have you experienced from the project?
8) How did you respect local people's property in the project site?
9) Does the project affect wild animals in the project site? How?
10) Have you ever decided, in consultation with partners and / or affected peoples to scale down or cancel proposed hydropower project? Why?
11) Are you giving employment to national workers in all levels or hire from abroad?
12) How does electricity from hydro power contribute to conserve the bio diversity?
13) How does the project contribute to decrease poverty of Nepal?
14) Are you running micro level project to increase local people's income?
15) What is the share of the production from your hydropower projects in proportion to the national hydro production?