EARTHQUAKE INDUCED DISPLACEMENT AND LIVELIHOODS: THE CASE OF SEVERELY AFFECTED DISTRICTS OF NEPAL

A Dissertation

Submitted to the Faculty of Humanities and Social Sciences of Tribhuvan University in Fulfillment of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

in

Population Studies

BY

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LETTER OF RECOMMENDATION

This is to recommend that **Madan Gopal Shrestha** has carried out research entitled **"Earthquake Induced Displacement and Livelihoods: The Case of Severely Affected Districts of Nepal"** for the award of Doctor of Philosophy (Ph.D.) in Population Studies under our supervision. To our knowledge, this work has not been submitted for any other degree. He has fulfilled all the requirements laid down by the Dean Office Faculty of Humanities and Social Sciences, Tribhuvan University, Kirtipur, for the submission of the thesis for the award of a Ph.D. degree.

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Date: March, 2022

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APPROVAL LETTER

This dissertation entitled **Earthquake Induced Displacement and Livelihoods: The Case of Severely Affected Districts of Nepal** was submitted by **Madan Gopal Shrestha** for final examination to the Research Committee of the Faculty of Humanities and Social Sciences, Tribhuvan University, in fulfillment of the requirements for the degree of **Doctor of Philosophy** in **Population Studies**. I, hereby, certify that the Research Committee of the Faculty has found this dissertation satisfactory in scope and quality and has therefore accepted for the degree.

Prof. Kushum Shakya, PhD
Dean and Chairperson
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Date:

DECLARATION

Thesis entitled "**Earthquake Induced Displacement and Livelihoods: The Case of Severely Affected Districts of Nepal,"** submitted to the Dean, Office of the Faculty of Humanities and Social Sciences, Tribhuvan University, Nepal for the award of the Degree of Doctor of Philosophy (Ph.D.), is a research work carried out by me under the supervision of Prof. Dr. Govind Subedi, Central Department of Population Studies, Tribhuvan University and co-supervised by Prof. Dr. Keshab Prashad Adhikari.

This research is original and has not been submitted earlier in part or full in this or any other form to any university or institute, here or elsewhere, for the award of any degree.

Madan Gopal Shrestha

Date: March, 2022

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Madan Gopal Shrestha
22 March 2022

ABSTRACT

The overall objective of the study is to understand and examine how humans react to a disaster situation like earthquake (EQ) and how they cope with the situation that prevailed in the 2015 Nepal earthquake induced displacement and followed by several subsequent aftershocks. The specific objectives were to study the processes of earthquake induced displacement and forced mobility and examine the shift in livelihood patterns due to the earthquake.

For this study, the sampling involved three stages. In the first stage, the two heavily affected districts i.e. Sindhupalchok and Rasuwa from central mountain of Nepal were purposively selected. In the second stage, the relocated settlements of the earthquake induced displaced households were selected. Finally, in the third stage, individual households were selected using a systematic sampling procedure, and the total of 735 households were interviewed for this study. The study collected both quantitative and qualitative data using the structured survey questionnaire and qualitative information collection tools. The key finding of the study revealed that displaced households were already deprived and from socially disadvantaged groups. And still, they are vulnerable. The study examined that the root cause of displacement was the earthquake, but still they are prone to secondary disasters such as landslides, floods, and crake.

The study concludes that earthquake generates a stream of displacement at the intra and inter-district and inter-intra Rural Municipality/ Municipality levels temporarily and permanently. There is clear evidence of livelihood shifts from better to the worsen situation. In an earthquake situation, there have been significant changes in livelihood capital assets namely - natural capital, human capital, physical capital, and social capital but not seemed significant change is evident in financial capital. The significant change in social capital is due to the loss of social networking at the new place of residence and a reduction in social and cultural rituals and participation. Significant changes in physical capital assets appear as loss of household assets these are used in daily livelihoods. In the case of human capital assets, there were significant changes after the earthquake and in some cases; positive changes were evident as some members of the affected households learn vocational skills and earthquake preparedness training, showing the fact that disasters may not always have negative impacts on livelihoods.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADB	:	Asian Development Bank
AEQ	:	After the Earthquake
ANC	:	Antenatal care
APEC	:	Asia-Pacific Economic Cooperation
ARI	:	Acute Respiratory Infection
BEQ	:	Before the Earthquake
BFI	:	Banking, Finance, Insurance and Securities
CBO	:	Community Based Organization
CBS	:	Central Bureau of Statistics
CDC Nepal	:	Community Development Center
CDCF	:	Child Development and Concern Foundation
CDO	:	Chief District Officer
CDPS	:	Central Department of Population Studies
CDRC	:	Central Disaster Relief Committee
CEO	:	Chief Executive Officer
DDC	:	District Development Committee
DDRC	:	District Disaster Relief Committee
DFID	:	Department for International Development of United Kingdom
DPNet-Nepal	:	Disaster Preparedness Network-Nepal
DRR	:	Disaster Risk Reduction
DRRC	:	Disaster Risk Reduction Committee
ECHO	:	Humanitarian Aid department of the European Commission
EOCS	:	Emergency Operations Centers

EOI	:	Expression of Interest
EQ	:	Earthquake
FAO	:	Food and Agriculture Organization
FGD	:	Focus Group Discussion
GDP	:	Gross Domestic Product
GFDRR	:	Global Facility Disaster Reduction and Recovery
GLOF	:	Glacial Lake Outburst Flood
GNP	:	Gross National Product
GPS	:	Global Positioning System
HHs	:	Households
HP	:	Health post
I/NGO	:	International/ Non-Governmental Organization
IASC	:	International Accounting Standards Committee
ICIMOD	:	International Centre for Integrated Mountain Development
IDMC	:	Internal Displacement Monitoring Centre
IDPs	:	Internally displaced persons
IEC	:	Information Education and Communication
IFRC	:	International Federation of Red Cross
IFRC	:	International Federation of Red Crescent cross Society
IG	:	Income generation
IM	:	Induced Migration
IOM	:	International Organization of Migration
ISF	:	Importer Security Filing
ISOT	:	International Search and Operation Teams
JICA	:	Japan International Cooperation Agency

KII	:	Key Informants' Interview
MOF	:	Ministry of Finance
MOHA	:	Ministry of Home Affairs
MOPH	:	Ministry of Population and Health
MPI	:	Multidimensional Poverty Index
NA	:	Not available
NFIP	:	National Flood Insurance Program
NHRC	:	National Human Rights Commission
NPC	:	National Planning Commission
NRA	:	Nepal Reconstruction Authority
PDNA	:	Post Disaster Need Assessment
PLWDs	:	People Living with Disabilities
PTSR	:	Profound Post-Traumatic Stress Reactivity
RRP	:	Rehabilitation and Recovery Plan
Rs	:	Nepalese rupees
RUDEK	:	Rural Development and Empowerment Center
SAARC	:	South Asian Association for Regional Cooperation
SAR	:	Search and Rescue
SGBV	:	Sexual and Gender-Based Violence
SLA	:	Sustainable Livelihood Approach
TDH	:	Texas Department of Health
TU	:	Tribhuvan University
UNFPA	:	United Nation Population Funds
UNICEF	:	The United Nations Children's Fund
UNISDR	:	United Nations Office for Disaster Risk Reduction
USD	:	United States Dollar

WASH	:	Water, Sanitation and Hygiene
WFP	:	World Food Program
WHO	:	World Health Organization

Chapter 1

INTRODUCTION

This chapter establishes the context of the study. It describes the research problems, objectives, and its structure. The main argument of this research work is to address the vulnerability that comes with calamity and disaster like earthquakes. Because of their relocation, forced migration, and disruption in livelihood patterns, earthquakes can have far-reaching implications for impacted households. There are both good and bad outcomes to the earthquake.

1.1 The context

Nepal suffered a massive loss of lives and property on 25 April 2015 when the devastating earthquake magnitude of 7.6 struck the country. Subsequent aftershocks, including one magnitude of 7.3 near the Chinese border on 12 May in the same year caused additional losses of life and property. The earthquake had triggered avalanches on Mount Everest and in the Langtang valley. Villages and towns were flattened and people were made homeless across 31 districts with 14 districts of central hills and mountains of Nepal suffering the highest impact. The earthquake's magnitude was hit in Nepal, and it was felt beyond the country's border, especially in Tibet, China's autonomous province. The earthquake had a wide range of consequences throughout the country, including damage to infrastructure and deterioration of people's health in the impacted areas.

According to the Ministry of Finance (Ministry of Finance [MOF], 2015), a total of 8,790 people have been killed, 22,300 injured, while about 300 people are estimated to have been missing. Likewise, 507,017 houses have been destroyed and 269,190 are found partially damaged. The tremor is estimated to have affected about one third (8 million) of the total population. The estimated damaged/destroyed property is equivalent to Rs.706.5 billion. The Ministry also estimated Rs. 669.5 billion (the equivalent of $ 5.57) is required for the recovery and reconstruction of private houses of the affected population. Infrastructure was damaged throughout the earthquake zone. Historical heritage sites were destroyed in Kathmandu Valley. Assessments showed that at least 498,852 private houses and 2,656 government buildings were destroyed. Several 256,697 private houses and 3,622 government buildings were partially damaged. Besides, 19,000 classrooms of schools were destroyed and 11,000

damaged. The earthquake equally affected manufacturing, production and trade in agriculture and tourism and other areas of the service sector that negatively affected the national economy. Of this total estimate of the loss, the social sector may require the highest amount of Rs.407.7 billion (60.9 %), followed by the production sector with Rs.115.6 billion (17.3%), infrastructure sector Rs.74.3 billion (11.1 %) and other sectors 71.9 billion (10.7%) (Ministry of Finance [MOF], 2016).

The government produced a "White Paper" to inform the deteriorating national position and to discuss the broader public of the worsening economic crisis. The paper painted a bleak image of the economy, predicting 2% growth instead of the anticipated 6% for FY 2015/16. (National Reconstruction Authority [NRA], 2016)

The devastating earthquake presented a humanitarian problem. Since thousands of people lost their livelihoods, residences were devastated, and people were afraid of coming aftershocks. Private property, including as residential and commercial structures, cropland, and livestock, has suffered the losses and damage. Roads, schools, historical monuments, and hospitals, among other public assets, were badly damaged. About a million children and more than 1.4 million females of reproductive age were estimated to be in the 14 districts. Approximately 138,000 of the female population are or will be pregnant in the next 12 months were victims of it. Of this figure, 18,600 would need obstetric care. The total value of disaster effects (damages and losses) caused by the earthquakes is estimated to be RS. 517 billion (or 76 percent of the total effects), with RS. 189 billion (or 24 percent of the total effects) representing the value of destroyed physical assets and RS. 189 billion (or 24 percent of the total effects) reflecting the losses and higher costs of production of goods and services resulting from the disaster (United Nations Fund for Population [UNFPA], 2016).

The National Planning Commission, 2015 produced a paper immediately following the earthquake and highlighted the aspects of inequities prevalent in Nepali society spanning geography, income and gender. The impoverished rural areas were more adversely affected than towns and cities due to low-tech built houses. More women and girls died or injured than men and boys, partly because of gendered roles that disproportionately assign indoor chores to women (National Planning Commission [NPC], 2015).

International experiences show that disaster generates a series of displacements. It causes involuntary and forced migration. All over the world, various international communities have been already addressing many aspects of disasters triggered by earthquake, landslide, high floods, hurricane and tsunami. They cause for as the human mobility to cope with different current and future challenges associated with the disaster. In 2015, India, China and Nepal accounted for highest numbers of displacement, with 3.7 million, 3.6 million and 2.6 million, respectively. Over the past eight years, 203.4 million displacements have been recorded, it is an average of 25.4 million each year. International Displacement Monitoring report states that, unlike like China and India, the number of people displaced in Nepal was also high in comparison to its population size, according to the (Bilak et al., 2016).

In 2020, conflict and disasters triggered 40.5 million new internal displacements across 149 countries and territories. "Conflict, violence and disasters continue to uproot millions of people from their homes every year" (Internal Displacement Monitoring Centre [IDMC] 2019). Estimated populations of 79.5 million have been forcibly displaced worldwide due to conflict, violence, human rights violations and events seriously disturbing public order (Lahn & Grafham, 2019).

Forced displacement due to natural hazard-induced disasters is large-scale and it is a global phenomenon. The UN Guiding Principles on Internal Displacement identify natural disasters is one of the leading causes of internal displacement along with conflict, infrastructural projects and human rights violations (United Nations Commission on Human Rights [UNCHR], 1998). Many countries are frequently confronting with emergencies such as natural disasters, civil wars and other social and political conflicts. These emergencies cause severe losses in social and productive assets, the displacement of people and enormous damages in infrastructure, resulting in the long-term stagnation of economic growth and worsening overall social development.

United Nations International Strategy for Disaster Reduction (UNSDRR, 2015) defines a disaster as 'a severe disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its resource'. The same report states that disaster like earthquake impacts include loss

of life, injury, disease and other adverse effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation. The potential disaster may impacts on several losses, human lives, health status, livelihoods, assets and services, and may occurs to a particular community or a society over some specified future period. Disaster risks comprise different types of potential losses, which are often difficult to quantify (Polenberg, 2015).

Similarly, the International Federation of Red Cross Society, (ICFC, 2016) defines disaster as a sudden, calamitous event that seriously disrupts a community or society's functioning and causes human, material'. Economic or environmental losses that exceed the community's or society's ability to cope with using its resources and disasters can have human origins. On the other hand, technological or manmade disasters are caused by humans and occur in or close to human settlements. It includes environmental degradation, pollution and accidents. There is a range of challenges, such as climate change, unplanned-urbanization, under-development/poverty as well as the threat of pandemics, that will shape humanitarian assistance in the future (Anhorn, Lennartz, & Nüsser, 2015).

According to the Global Report on Internal Displacement during the 2015 year alone, there were 27.8 million new displacements associated with conflict, violence and disasters in 127 countries, grabbing what they could carry and fleeing their homes in search of safety (Bilak et al., 2016). There were no overall global estimates for persons still affected by disasters in 2015, but hundreds of thousands were found to be living in some type of chronic displacement in a sample of instances. Disasters displaced around 19.2 million people across 113 countries in 2015, more than twice the number who fled conflict and violence. The great majority of people were displaced in developing nations, and tiny island countries were particularly badly struck due to their small size. South Asia accounted for almost one third of the world's new disaster displacements in 2020. In South Asia around 9.2 million displacements were recorded, an above-average figure for the second year in a row. Cyclone triggered nearly five million evacuations across Bangladesh, India, Myanmar and Bhutan in May, making it the largest disaster displacement event of the year globally. Monsoon rains and floods affected the whole region from June onwards, particularly Bangladesh. Europe and central Asia accounted for 234,000 new

displacements in 2020, the second highest figure on record for the region. New displacements by conflict and violence were also recorded, largely as a result of the fighting that broke out between Armenia and Azerbaijan in Nagorno Karabakh in September. Also it has shown the countries with the largest IDP populations were Syria (7.6 million), Colombia (6 million), Iraq (3.6 million), the Democratic Republic of the Congo (2.8 million), Sudan (2.2 million), South Sudan (1.9 million), Pakistan (1.4 million), Nigeria (1.2 million) and Somalia (1.1 million) (Internal Displacement Monitorimng Center [IDMC], 2021).

The International Migration (IOM) Report 2017 and the Global Report on Internal Displacement (GRID, 2019) cover the latest global migration and displacement trends highlights: There were 28 million new displacements associated with conflict and disaster across 148 countries and territories in 2018. Of these 10.8 million were caused by conflict and 17.2 million by disaster Nearly14 per cent of global internal displacement was recorded in South Asia caused by a series of floods, storms and droughts (IDMC, 2019).

Renaud, Dun, Warner, & Bogardi (2011) have concluded that natural and manmade disasters throughout history, humans have had to adapt to both short- and long-term environmental change. Adaptations have taken many forms, but migration, whether permanent or temporary, has always been a central response and survival strategy. It is argued that migration is a survival strategy of people confronting the prospect, impact, or aftermath of disasters. Therefore, migration can be centered as risk management and livelihood diversification strategy or ex-post and forced (where livelihoods are no longer plausible due to extreme conditions. Voluntary migration can occur where livelihoods are temporarily disrupted by sudden-onset disasters or are affected by the long-term deterioration of climate conditions—leading to gradual poverty. In contrast, forced migration can occur where immediate disasters (events) threaten the physical safety of populations or where long-term environmental changes (processes) lead to unfeasible livelihoods.

A joint study conducted by Hear, Bakewell & Long (2012) reveals that the drivers behind migration and displacement are complex and interrelated. The drivers can be grouped under predisposing (e.g. broad processes such as globalization, environmental change, urbanization, demographic change), proximate (e.g. decline in economic cycle, security threat to human rights), precipitating (e.g. financial collapse,

natural hazards), and mediating (e.g. transport, communication and information) drivers. Human mobility drivers are highly dependent on the localized context and can interact in different ways.

Migration and displacement are interlinked but are different, however. Displaced population leaves their homes in groups and they usually intend to return home. Displaced populations usually need relief aiming at collective and lasting solutions while migration usually involves more individual social assistance, legal protection and personal support and it may be voluntary. When the rapid onset of disasters occurs, people often leave the affected area to avoid physical harm or loss of life (McLeman & Smit, 2006). Displaced populations are especially vulnerable and need support. Displaced people leaving the homes seek relief to get rid of the seriously disrupted functioning of a community or society, then migration is the ultimate decision to adopt livelihood sustainability. Finally, the displacement often leads people to move further and to become migrants. For people who are affected by disasters and other environmental changes, displacement and resettlement constitute the second disaster in their lives. The impact of an initial disaster intensifies in the aftermaths, both in that people's experience and recovery. Severe disasters inflict terrible losses on people and communities, often breaking up families and uprooting communities to relocate in radically changed and new environments. Many of the damages experienced in a disaster are made permanent by the displacement of both compounds. Even under the most difficult of situations, individuals who can rebuild their position have a higher chance of recovering. Migration typologies often characterise population movements by the degree of choice involved spectrum, "voluntary" migrants exercise maximum choice when they head for new horizons, other end, "involuntary" migrants exercise no choice when they are forced out of their homes. Over time, however, this bipolar view of population flows has been deemed overly simplistic. Almost all migration involves some kind of compulsion; and choices." Forced migration flows occur because of a variety of causal factors, including persecution, natural and industrial disasters, development projects, environmental degradation, war and conflict, ethnic discrimination (Hear, 2004).

Among natural disasters, an earthquake is considered irregular and the most destructive. It has almost no onset time which causes massive and widespread damage to life and property in a few seconds. It can also induce several secondary disasters

like floods, fire landslides, land subsidence, tsunami, etc. Moreover, the other damage is the loss of houses that force people to migrate from their entitled pact to other places to feel safe. The present loss due to the earthquake's hazard is more than other calamities in the country. The detail of the people's displacement is unknown, but some glimpses of migration are found. Here, this study attempts to show the relationship between the earthquake, displacement and migration impacting on livelihoods patterns of the affected households.

Several works of literature as discussed above suggest that disasters generate migration and internal displacement searching for the safe settlement and basic needs of the people. In the case of Nepal, there are a few research studies that deal with how devastating disasters like the earthquake of April 2015 and its subsequent shocks generated displacements and forced mobility. How people cope with the situation? What livelihood patterns were mainly affected by the earthquake? What would be the implications for their forced mobility in their social and economic development? Evidence showed that deaths, injuries and displacement, losses of private and public properties create the overwhelming long-lasting impacts in the whole society.

1.2 Definition and conceptualization

Disaster - "disaster has been defined as a sudden accident or a natural catastrophe that causes great damage or loss of life" (Ritter, 2014, p. 214). International Federation of Red Cross Society (IFRC) defines the disaster as a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material and economic or environmental losses that exceed the community's or society's ability to cope using its resources (IFRC, 2016) . Though often caused by nature, disasters can have human origins. The combination of hazards, vulnerability and inability to reduce the potential negative consequences of risk results in disaster (Cipullo, Le Ngoc, Bannon, & Picard, 2016). That can be presented as;

$$Disaster = \frac{Vulnerability + Hazard}{\text{Capacity}}$$

Natural disaster is a naturally occurring physical phenomenon caused either by rapid or slow onset events, which can be; geophysical (earthquakes, landslides, tsunamis and volcanic activity), hydrological (avalanches and floods), climatological (extreme temperatures, drought and floods), meteorological(cyclones and storms/wave

surges) or biological (disease epidemics and insect/animal plagues) and affect livelihoods.

Forced migration - According to the Institute of Migration (IOM, 2015), forced migration is “a migratory movement in which an element of coercion exists, including threats to life and livelihoods, whether arising from natural or human-made causes (e.g., movements of refugees and internally displaced persons as well as people displaced by natural or environmental disasters, chemical or nuclear disasters, famine, or development projects). A forced migrant is any person who migrates to "escape persecution, conflict, repression, natural and human-made disasters, ecological degradation, or other situations that endanger their lives, freedom or livelihood".

Migration - It is to be noted that throughout the article the term “migration” is used IOM’s definition of the migration. It includes all aspects of human mobility, including forced migration such as internal displacement, or planned solutions such as relocation. Migration can be defined as “the movement of a person or a group of persons, either across an international border or within a country. It is a movement of population that encompasses any movement of people, whatever its length, composition and causes; it includes migration of displaced persons, economic migration, the person moving to escape different disasters, including earthquakes, landslide.

Disaster has the profound post-traumatic stress reactivity (PTSR)

According to Hilhorst (2003), a natural disaster is a major adverse event resulting from natural processes of the earth: include floods, hurricanes, tornadoes, volcanic eruptions, earthquakes, tsunamis and other geologic processes. A natural disaster can cause loss of life or property damage and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience or ability to recover and the infrastructure available (Hilhorst, 2003).

The post- Tsunami study in Indonesia found that individual exposure to trauma was strongly related to post-traumatic stress reactivity (PTSR), regardless of the time of measurement, but the effect attenuates over time. The magnitude of the individual exposure effect is the greatest for the measure of PTSR at its maximum level between the tsunami and the first follow-up interview

(Frankenberg, Nobles, & Sumantri, 2012). The finding of the same study discussed above shows that women have higher PTSR scores than men. Scores for older adults are higher than for younger adults. The results provide strong evidence that mental health after a disaster is affected by individuals' own experiences and what happens in the community around them. PTSR appears to be strongly influenced by the economic resources at the community level that was in place when the disaster occurred. Net of household resources, respondents from the most impoverished communities before the disaster exhibit PTSR levels half a point higher than respondents from better-off communities. This impact implies that stress reactions of different traumatic experiences at the individual level are dampened when the community has been sober.

Earthquake-induced displacement – It is the process of people displacement due to the earthquake and not tends to go back at the origin again and not any property at the origin or likely to sell the properties at the origin after migrating at the destination (Central Department of Population [CDPS], 2016).

Displaced persons - Internally displaced persons (IDPs) are defined as "persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters and who have not crossed an internationally recognized State border (Deng & Francis, 1998). The IDPs categorized as following who tends of back to origin after certain time latter, mobility of displaced population within the territory of the origin, mobility of displaced population outsides the territory of the origin, which tends of back to origin after particular time latter and mobility within and outsides the district during the survey

Livelihoods - Livelihood is a means of subsistence, comprising a complex and diverse set of economic, social and physical strategies. These strategies are realized through the activities, assets and entitlements by which individuals make a living United Nations Development Program [UNDP], 1991)

Chamber and Conway (1992) explains that a rural livelihood comprises several activities, which provide food, cash and other goods to satisfy a wide variety of human needs. A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is

sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.

According to Chambers and Conway (1992), livelihoods comprises five capitals such as ; 1. Natural / biological (i.e., land, water, common-property resources). 2. Social, community, family, social networks, participation, empowerment), 3. Human (i.e., education, labour, health, nutrition), 4. Physical (i.e., roads, clinics, markets, schools, bridges) and 5. Financial (*i.e.*, jobs, saving, credit).

Livelihoods are defined as the means of survival and income of the families. In the context of earthquake affected families, restoration of livelihood can be examined through examining the: i) diversification of sources of livelihood and ii) livelihood assistance for the vulnerable population. Global report on internal displacement explains a livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living; a livelihood is sustainable which can be managed and recovered from stress and shocks, maintain or enhance its capabilities and assets and provide sustainable livelihood opportunities for the next generation (Solesbury, 2003)

Vulnerability - The vulnerability can be defined as "factors that determine the degree to which someone's life, livelihood, property, assets are put at risk due to natural hazards and their capacity to anticipate, cope with, resist and recover from the impact of the disasters (Wisner, Blaikie,, Cannon & Davis, 2004).

1.3 Statement of problem

Disaster induces human motilities and most of these phenomena are universal. Hugo (1996) argued that migration is a survival strategy of people confronting the prospect, impact, or aftermath of disasters (Hugo, 1996). It is very interesting to see the migration pattern of the earthquake affected people. In contrast, argued that forced migration can occur where immediate disasters (events) threaten the physical safety of populations or where long-term environmental changes (processes) lead to unfeasible livelihood. The proposed research is to see and understand the migration patterns after the earthquake and to see how the migration impacted the livelihood of the migrated people.

People and academicians are less interested in disasters of limited scale, scope, and longevity. However, a disaster with a high magnitude like the mega earthquake like the 2015 earthquake in Nepal is one of the significant academic concerns from Social Sciences to Natural and Engineering sciences. The massive earthquake of 25 April 2015 rocked the different parts of the country that has challenged the existing knowledge of Social and Natural scientists. The earthquake became a significant force to initiate the movement/migration of almost 800,000 people to nearby places. As a result, among the various aspects of the study, migration is a significant phenomenon that crops up after the earthquake. The impacts of the disaster on human mobility are complex and often long-lasting. However, due to a lack of other infrastructure and other facilities, people live in displaced locations. While disaster occurs, people generally leave their home country until they get a choice, the origin people suffer and move, the sufferers face different kinds of positive and negative human social behaviors. It invites changes in socio-economy in their livelihoods and the surrounding environments also affect similarly. Displacement or forced migration becomes significant phenomena because of the consequences of the result of the earthquake. Reportedly, “Calamities like floods, landslide, earthquake, etc., also force the people to leave their birthplace to other potential areas for their livelihood."

According to Grindle and Thompson (1988), migration is a key component of the household economic strategy in disaster conditions. Those issues were mostly related to government-induced migration. Some of them were also related to Ridge Valley migration, rural-urban migration.

The contemporary theories like Ravenstein (1885), Ziff, Schmid, Lewis, & Tanner, (1958) and Plender (1988) explained with the help of existing laws of migration, conceptual theory and migration models propounded. These academic exercises were highly conceptualized and used in various empirical studies of different countries. Many issues within the migration framework were entirely dependent on existing knowledge of theory and models. The mode have given less importance to migration induced by a natural disaster, especially the earthquake.

As discussed above in the context section, some studies were conducted immediately after the earthquake of April 2015 in Nepal to identify the earthquake's impact. In collaboration with the UNDP, NPC estimated the earthquake's overall impact

concerning poverty, employment, health, schooling and the affected people's overall well-being. The NPC (2015) assessment covers 31 districts affected by the earthquakes, of which 14 districts are the worst affected. All concerned sector teams assessed damages, losses and needs in these 14 districts. The aggregate worth of damages, losses, and qualitative data obtained from a household survey has aided in the calculation of macro and microeconomic impacts, as well as human development. Similarly, (National Human Rights Commission, 2016) National Report on Trafficking in persons by (National Human Rights Commission [NHRC], 2016) indicated that 17% of the total Migrant workers for foreign countries were from the 14 most earthquake-affected Nepal districts during 2007/08 to 2015/16 and nearly 42 percent of the documented women migrant workers originated from these districts. This follows that there are family networks established and due to the effects of earthquakes, the likelihood of unsafe migration would increase for livelihoods.

Many women and men would seek employment opportunities abroad and some might want to end being trafficked at some point (United Nations Children Education Funds [UNICEF], 2016). A study by UNFPA suggested that Nepal's post-earthquake environment is different in many ways than its pre-earthquake environment. It has not only worsened specific pre-existing vulnerabilities but also created entirely new ones. The earthquakes have damaged a considerable amount of private property; people suddenly slipped into poverty and losing well-being and employment opportunities. This leads to difficulties in livelihoods at home and forces people to migrate for livelihoods. There is a high likelihood that such migration would be unsafe due to stress, lack of proper funds (UNICEF, 2018).

A study on the earthquake risk perception among people in Kathmandu valley where a total of 420 households were surveyed, drawing data from old and new settlements – namely, Yatkha, Shantinagar, Bhaktapur and Patan – the core areas of Kathmandu valley showed -an overwhelming majority of respondents (91.1%) had experienced an earthquake in their lifetime while 8.9 percent had no experience and 92.6 percent of respondents were concerned about future earthquake damage while 7.4 percent were not concerned. Only half of the respondents were prepared for an impending earthquake, while the rest half did not. A very high proportion (92.6%) of respondents with the earthquake experience also expressed their concern about damage. They found a statistically significant relationship between earthquake and damage concern

experience, meaning that earthquake experience and concern about damage are dependent events (Uprety & Poudel, 2012).

CDPS (2016) carried out a study about the demographic and social impact of the 2015 earthquake, drawing the sample from the 14 most earthquake-affected districts. The fieldwork was carried out from 20 November – 15 December 2015 and a total of 3,000 households were surveyed. The study's key findings were - The marital status of 88 household members changed following the earthquake: the majority of married women (59.1%) turned to be either widow or divorced/separated. Nearly 3 percent of the household members reported suffering from psycho-social problems. Many household members (88.5%) reported having a citizenship card (males 92 percent and females 85%) and the remaining were having their citizenship lost. 3 percent of the household survey said their family members had been relocated as a result of the earthquake. More than 7 percent of the families stated that at least one family member had left for overseas job prior to the earthquake and had not returned even once. Following the earthquake, a rising tendency of labor movement overseas in pursuit of better job was noted (Central Department of Population Studies, [CDPS], 2016).

The NPC report 'Post Disaster Need Assessment' identified 14 severely affected districts (NPC, 2015). It comprises of Gorkha, Dhading, Rasuwa, Sindhupalchok, Kavre, Nuwakot, Dolakha, Kathmandu, Lalitpur, Bhaktapur, Ramechhap, Okhaldhunga, Sindhuli and Makwanpur districts. All these districts fall under the central hills of Nepal and the Tamang community in huge number are the most affected and vulnerable population in these districts.

Existing academic research indicates that disasters can be caused by natural factors beyond human beings' control (such as earthquakes, climate change and high floods, landslides) and human actions (such as political movements, religion and social isolation). One way human beings react to disasters is migration (as relocation). Sometimes perceptions of an upcoming hazard may prompt people to leave; other times, people must leave when a hazard suddenly hits. The latter is known as forced evacuation. Leaving voluntarily before a disaster is part of a 'normal' migration process as people have time to weigh their options before making a decision. In contrast, forced evacuation is forced migrations and in such condition, people did not plan to move but must do so to escape danger from a disaster's impact. It invites a major negative impact on the economy and livelihoods of the affected people.

Livelihood strategies provide a useful key to interpreting the linkages between risk and mobility.

Disaster destroys entire societal production and infrastructure systems and it seriously interferes with daily life and reduces opportunities to earn income in earthquake-affected areas. An internal conflict such as race, religion, politics and natural disasters such as an earthquake and floods are the major areas of the researcher to cover recent devastation. Hunter (2012) argued that moreover it is devastating to reflect the cause and effects of disasters. Hence, migration opens various scopes that begin after forced displacement. It is possible to view displacement from a different lens. Many arguments, perspectives, theories and essays are possible to make after studying the migration process.

In this study, using the recent earthquake of Nepal as an example, we examine earthquake-induced migration and internal displacement, qualitative and quantitative data of the affected areas. The study result expects that studying household livelihood is relatively vulnerable in the earthquake-affected area of the districts.

There is a significant relationship between the damage in question and earthquake readiness, suggesting that earthquake damage and preparedness are linked phenomena. In addition, there is a strong link between earthquake experience and earthquake readiness. The major cause for affected families' high degree of vulnerability is a lack of income or loss of economic opportunity; due to a lack of household income, impacted households' capability to manage the aftermath of an earthquake is poor. Improving the income allocation and transformation level and expanding earning income methods effectively affect the affected households to decrease livelihood vulnerability in earthquake-prone areas. This can be a guideline to the planner and it will also emit additional research gaps for further for upcoming scholars for new research.

Although few preliminary studies during the emergency were made, no other detailed studies have been done. The subject has a great scope because it certainly opens different doors in the academic field. Various views can be developed and originated studying migration in the context of a particular society. Finally, this study is to make different discourses on migration and livelihoods resources of strategies due to the displacement of people because of the earthquake. It will also create an additional

opportunity for scholars who are interested in this issue. Therefore, this study tries to explore Earthquake-induced Displacement and Livelihoods shift in post-earthquake days.

1.4 Research gaps

The earthquakes in 2015, Nepal, caused widespread destruction throughout 31districts of the country. The 2015 earthquake in Nepal was serious academic concerns from the different perspective like -sociocultural, engineering, urban planning and other disciplines. Numbers of studies have been carried out, and major concerns are;

Research Conducted by	Methodology	Findings	Gap
Nepal government (PDNA) National Planning Commission (NPC) of the Government of Nepal (GoN)	The Post Disaster Needs Assessment (PDNA) of Nepal Earthquake 2015	Report was based on the estimate rather than the observed data. The Nepal government (GoN) conducted a Post Disaster Needs Assessment, which assessed the damages of houses and post-earthquake needs. Destruction of houses and household assets negatively impacted gender equality and social inclusion. Loss in crop productivity,	PDNA did not focus on the socio-demographic impacts of the earthquake. Which was produced for recovery of the population affected by the earthquake in practice, but was not academic report.

		loss of livestock and small-scale enterprises. Women income and burden to women domestic work, limited access to economic resources and lack of alternate livelihoods."	
UNFPA (2015)	The study was based on media reporting	. Study was about women and girl. Nepal earthquake humanitarian response was the agenda implemented action programs joining hands with different donor agencies.	It was based on the project reports and the study shows there is lack of academic search, and not any linkages with socioeconomic nexus.
(Shrestha, A. B., Bajracharya, S. R., Jeffrey S. Kargel, U. of A., & Khanal, N. R. *(2016).*)	The study was conducted in two of the most heavily earthquake-affected districts	Migration and the 2015 Gorkha Earthquake in Nepal – Effect on rescue and relief processes and lessons for the future. , found that the migration from the villages had both positive and	

		negative effects at different stages after the disaster. Discussed about relief, earthquake resistant housing technology, Ease of remittance, acquired skills of migrants and returnees, low-cost migration policy, demand of labour and place based skills training. And gender considerations in disaster preparedness. The study showed that in places with high male out-migration, the population is highly skewed.	
CDPS(2016) (*Nepal Earthquake 2015: A Socio-Demographic Impact Study*	drawing the sample from the 14 most earthquake-affected districts.	UNFPA facilitated CDPS and carried out a study about the demographic and social impact of the 2015 earthquake,	It was pioneer study, but lacking displacement process, even it was not the time to see impacts which has been conducted one year after the 2015 earthquake.

Introduction to the Study, n.d.)			
NHRC (2016) (*Nepal : Human Rights Impact of the Post-Earthquake Disaster Response A Preliminary Report*, 2016)	This preliminary report is based on field research and information gathered by the ICJ and the NBA between August and October 2015. visited three of the 14 "highly affected districts" - Dolakha, Gorkha and Okhaldhunga –	Human Rights Impact of the Post-Earthquake Disaster ResponseThe research focused on the most urgent human rights issues observed in the three emblematic districts surveyed, supplemented by a review of available reports by the Nepal Government, the National Human Rights Commission of Nepal (NHRC), the UN and non-governmental humanitarian aid agencies on the progress of post-earthquake recovery.	This was like a report prepared belonging to human rights. Not as academic study
(Sapkota & Neupane,	This was the first study to analyze the academic	The Academic Impacts of 2015 Nepal	First, the sample size is small, and cannot be generalize the findings for

2021)	impacts of the 2015 Nepal earthquake using first-hand data. The primary data were collected through a questionnaire survey of students in two secondary schools in one of the hardest-hit rural villages. Evidence from Two Secondary Schools in Sindhupalchok	Earthquake: District. Shown the result that indicates that there is a large variation among students' academic performance as well as the impact of earthquake on them.	large cities, such as Kathmandu city. Therefore, further investigations are needed to understand the long-term academic impacts of the earthquake. This study belongs belong academic impacts. Therefore, this study recommends further investigations are needed to understand the long-term academic impacts of the earthquake in different areas.

This matrix displays samples of accessible literature related to the 2015 earthquake nexus. There is substantial evidence in the literature review that disasters have an influence on migration and human mobility. The study will examine the consequences of Nepal's earthquakes on mobility and migration. The earthquake disrupted everyday life by destroying social production and infrastructure systems, forcing people to flee their homes and reducing employment prospects in earthquake-affected areas

There have been more than years of the earthquake while evolved the idea about this study, the literatures shows all the previous researches have the limitations, that has created the present gap in the study. In this context, there is a need to assess earthquake-induced internal displacement in Nepal, especially focusing on the impact on demography, migration, displacement and livelihoods by drawing the case from the affected households and individuals.

In this regard, this study tries to explore the earthquake-induced internal displacement and Livelihoods shift in post-earthquake. Therefore, this study is to make different discourses on migration and livelihoods resources of strategies due to the displacement of people because of earthquake aiming to examine the socio-economic and demographic context of the affected population, the process of displacement/ mobility and shift. Therefore, this situation there is needed to address quarries like: what was the socioeconomic situation of the community? What livelihood patterns were mainly affected by the earthquake? What would be the implications for their forced mobility in their social and economic development?

1.5 Research questions

The earthquake has huge dispersion in livelihoods of the affected community. The research looked into what happened to the individual, family, and community of the study area. What, how and which were the impacts of the earthquake on individuals, families, and community, the research faced to explore with following research quarries.

1. What are demographic and socio economic condition of the communities?
2. How were displacement and migration processes caused by the earthquake taken place?
3. What are the process, pattern and shift of livelihood after the earthquake in the study area?

1.6 Objectives

The overall objective of the study is to understand how human react to the disaster situation like the earthquake and how they cope with the situation drawing on the case of Nepal. The specific objectives of this study are the following:

1. To examine the socio economic and demographic context of the affected population.
2. To explore the processes of earthquake induced displacement and coping strategy.
3. To explore the shift in the livelihood patterns before and after the earthquake due to displacement.

1.7 Significances of the study

This research will contribute to knowledge on disaster like earthquake induced displacement at a global and national level, in particular the implementation of the action projects to prevent frequent mobility in post disaster. It can be illustrated as a model and a lesson for people preparedness and mitigation of disaster. From that point, the benefits will expand to people‘s communities who live in disaster-prone areas and are affected by disasters like Earthquake. In addition to it, this study findings can be a good source of learning to the other countries, which have similar socio economic context. Displacement changes several places of choice before arriving to permanent place of residence. They are mostly reliant on local economic base where they are residing, therefore it is important to keep local economy functioning through creating employment opportunities.

This research adds new information and makes several significant contributions to the theories and mitigation practice of earthquake induced displacement. It has identified an emerging field of research, interconnection of the earthquake induced displacement, which responds to improve the efficiency to cope and response the immediate and long term impacts of the earthquake induced displacement.

This study contributes to the literature of earthquake-induced displacement and migration and its shifting patterns of livelihood after the earthquake on natural assets, human capital, financial capital, physical capital, and social capital. These are

considered interconnected variables that need to be understood for understanding the dynamics of displacement due to disaster.

To provide benefit to the disaster response planners at the national and local level to strengthening to build knowledge of risks, increase skills and improve awareness concerning disaster risks. The insights may help in formulating policies and designing program on disaster management. The affected confined population becomes particularly vulnerable as they stay and starve in the unsafe location facing post natural consequences like a landslide, flooding, social form of problem, discrimination, etc. The state should have a mechanism to respond quickly for planning and supporting such unsafe populations suffered by the disasters.

Design the economic aspects of livelihood recovery and resettlement plans, as well as the experiences and problems that communities confront during and after resettlement and relocation, local governments, as well as national and international development partners, should take a more holistic approach to understanding these patterns and incorporating them into programs and policies designed to address the issues. This research is not free from constraints and limitations; therefore, it will also create an additional opportunity for scholars those who are interested in this issue.

This study's findings have several important implications for the academic institutions, development partners, emergency relief and development organizations, and their concerned employees. Further exploration may be the remedial study to avoid frequent mobility after the disaster, so that the study can aware government, people and development agencies on sustainable livelihoods as soon as disaster has been taken place.

The publicly and available literature does not clearly discuss the different ongoing approaches to identifying and targeting marginalized groups – and their respective advantages and challenges. Therefore, longitudinal research regarding to this issue seemed need of the research area.

There is extensive literature on the impacts of the disaster on women but currently, there is analysis gap of long-term impacts. Therefore, it may be a further long term (longitudinal study) research on psychological, sociocultural impacts can be conducted.

The impact of earthquake can have considerable differences in terms of gender therefore further studies can have link with their changes in livelihoods and impact on the individual, adults, children, and elderly.

This study was carried out for the selective population who has received government support for the purpose of purchasing land and house construction and those located households by NRA which was not the final data of the affected households' as it was the midterm data provided by NRA. And does not include the other affected population who did not get such support, and were not displaced. Therefore, further study may require examining the overall impact and current livelihood situation differences due the earthquake of those populations who are still at the origin.

Although there are some studies made by NHRC, there was a gap of the gender nexus livelihoods with respect to the general socioeconomic variables, still this study is also not in position to fill the gap which may be a scope of further study.

1.8 Limitations of the study

Every research has its limitation; similarly this study is also not free from limitations and constraints. One, this is the micro-level study and aims to limit the severely affected highest numbers of the population of affected districts from earthquake defined by NRA such as Rasuwa and Sindhupalchok. The study is limited to within selected areas in the temporary and permanently government relocations and hence the households affected by the earthquake but living in the same place/house/retrofitted house, the tent could not be covered. All relocated areas are taken and the information derived from the qualitative study was carried out into consideration. Although, it has studies two districts, the objectives of it does not focus comparison analyses of those districts as it might be next study.

This study was carried out for the selective population who has received government support for the purpose of purchasing land and house construction and those located households by NRA which was not the final data of the affected households'. Because it was the midterm data provided by NRA head office Singha Durbar on 13 September 2018.

Two, there is no baseline information regarding the families' livelihoods before the earthquake and hence, the research used retrospective information, which may not be robust as the pre-test and post-test research design.

1.9 Organization of the dissertation

This thesis is structured into seven chapters.

Chapter one deals with the introduction and statement of the problem including this section.

Chapter two gives the critical reviews the existing works of literature related to earthquake induced displacement and migration and shifting livelihood patterns. Both theoretical and empirical literature was reviewed to come to a conceptual framework of the study.

Chapter three dealt with the study's methodology reflecting the entire research process including research design, sampling procedures and determination of MPIfor classifyimng households by economic strata.

Chapter four examines the general overview of study area with natural and socio-economic context of the study area/population and the processes of displacement and forced mobility how within a few years of displacement the affected population was forced to move from one place to another in the absence of an appropriate rehabilitation package.

Chapter five analyzes of the earthquake induced displacement and mobility. on livelihoods and

Chapter six dealt with shift in livelihoods taking into consideration of the livelihood patterns framework of five forms of capital – the physical capital, the social capital, the financial capital, the natural capital, and the human capital.

The final chapter summarizes the findings summary, discussion, and conclusions of the earlier chapters, compares and contrasts the findings with other studies and draws conclusions.

1.10 Summary

This chapter sets the context of the study. It outlines the context, research problem, objectives, limitation and organization of the study. The key argument of this thesis is that disasters like an earthquake can have far-reaching consequences on the affected households. The three objectives set up in this study are; to examine the socio Economic and demographic context of the affected population, to explore the

processes of earthquake induced displacement and cooping strategy and to explore the shift in the livelihood patterns before and after the earthquake due to displacement.

Nepal suffered a massive loss of lives and property on 25 April 2015, when a devastating earthquake magnitude of 7.6 struck the country. Subsequent aftershocks, including one magnitude which was 7.3 near the Chinese border on 12 May caused additional losses of life and property. It was a challenge to humanitarians, as millions of people whose livelihood fell into a disaster due to whose houses were either destroyed or who were fearful of imminent aftershocks. Overwhelming of the estimated losses and damages have been to private property such as residential buildings, commercial buildings, farmland, and livestock. The affected public property was, such as; roads, schools, utilities, heritage monuments, and hospitals. There are studies revealing the impact of the earthquake of mid-2015 in Nepal, they were carried out immediately after the earthquakes and they would not sufficiently address the long-term impact of the earthquake.

In this context, it is necessary to examine earthquake-induced displacement in Nepal, with a particular emphasis on the impact on demographics, migration, and livelihoods, by interviewing impacted families and individuals. Because the earthquake occurred more than three years ago, it was an excellent chance to analyze how well people managed their livelihoods and coped with the circumstances, as well as the extent to which government rehabilitation plans reached the impacted households. In this regard, the goal of this research is to look at Earthquake-Induced Displacement and Changes in Livelihoods after two years. As a result, the purpose of this research is to develop various discourses on migration and livelihood options as a result of people being displaced due to earthquakes. Similarly, it intends to examine the socio-economic and demographic context of the affected population, the process of displacement, and livelihoods shift. This research is not free from constraints and limitations therefore, it will also create additional opportunities for the scholars who are interested in similar aspects.

Chapter 2

LITERATURE REVIEW

The review focuses on the discussion of the history of the recorded earthquake in Nepal, and the impact of the earthquake on social sectors like health/hygiene and nutrition, education, cultural heritage, economic sectors (income and employment), agriculture, commerce, and industry, financial sectors, infrastructure sectors, communication and transport, women and children and environment. It has also discussed the impacts on livelihood measures and coping strategies. Drawing upon the previous literature review and the researcher's own field experiences, the final section proposes the conceptual and analytical framework of this study.

There is a global increase in the collective displacement of populations due to natural disasters, wars, and development projects. This research examines the social and economic ramifications of displacement and the displacement process, as well as the corollary process of resettlement, with a focus on two study districts. The relationship between the causes and effects of displacement and their historical contexts is highlighted in this study, and choosing the proper unit of analysis is critical in constructing an effective framework of. In this context, both empirical and theoretical reviews have been conducted.

2.1 Theoretical review

According to Freudian psychology, displacement is an unconscious process. It happens within and the transference of emotions, ideas, and information happens to alleviate fretfulness. The displacement theory changes the idea of the mind mechanism of keeping or disposing of information in the human mind.

2.1.1 Displacement effect theory

Displacement effects theory says that human beings have an original defense mechanism. The displacement effects of an individual or anything which is felt unacceptable to another situation which the mind distinguished as more acceptable. The displacement is always created in the cycle process. It is natural that the human mind unconsciously solves any problems which cause stress and to alleviate the situation the displacement occurs to a situation or to an entity that can be of little or no relevance. The consequences of displacement may be evident in situations that

lead to anger. They can only be resolved via rage. The effects might expand over time. In most circumstances, the emotion's influence is directed at the target or a safer alternative. Displacement effects can be a common issue in many cases and the effects can be minor in most cases. But the extreme effects of displacement effects can be dangerous and are considered a psychotic problem that may need to be seriously evaluated and treated. Psychologists are able to treat with methods to control emotions with more effective ways of dealing with and overcoming this situation.

Several studies have been conducted at the international level on how disasters can impact people's lives, including children and the disabled population.

2.1.2 The most vulnerable population to disasters

A study made by Peek and Stough (2010) examined how children with disabilities can be too vulnerable in a disaster context. Children with disabilities may be expected to show higher poverty rates, elevated exposure to hazards, a greater vulnerability in the context of traumatic loss or separation from caregivers, more strain on parents and worse post-disaster outcomes unless special medical, familial, social and educational protections are in place, disaster is one more risk factor that can lead to unfolding adverse consequences as these children develop.

2.1.3 Forecasting of the impact of the earthquake on human populations

Doocy, Daniels, Packer, Dick, & Kirsch (2013) have warned us that earthquakes would impact human populations increase in the coming decades. Recent large scale earthquakes affecting large populations in Japan, Haiti, Chile and New Zealand are evidence of this trend and illustrate significant variations in outcomes such as damage and mortality levels. The study described the impact of earthquakes on human populations in terms of mortality, injury and displacement and identified risk factors associated with these outcomes. The data on earthquakes' impact was compiled using two methods, a historical review from 1980 to mid-2009 of earthquake events from multiple databases and a systematic literature review. The analysis included descriptive statistics and bivariate tests for associations between earthquake mortality and victim characteristic. This study shows (from 1980 through 2009) that there were 372,634 deaths, 995,219 injuries and more than 61 million people were affected by the earthquakes and mortality was most significant in Asia. The findings indicated that the primary cause of earthquake-related death was trauma due to building

collapse and, the very young and the elderly were at increased mortality risk, while gender was not consistently associated with mortality risks. Moreover, it argues that strategies to mitigate future earthquakes' impact should include improvements to the built environment and a focus on populations most vulnerable to mortality and injury .

2.1.4 Poverty, culture, and disasters

Some disaster researchers suggested policymakers should be cognizant that susceptibility to disasters is determined by biophysical factors and the social characteristics of communities (Candice & Myers, 2008). Further, increased population density, haphazard distribution of population, and urbanization have increased vulnerability to disasters. Along with focusing on preventing disasters and coping with their aftermath, reducing the size of vulnerable targets from risk areas can be a significant step to reduce the impacts of disaster. For example, reducing the population in flood plains, coastal areas and other regions vulnerable to natural hazards can reduce the number of people and structures at risk. People living in poverty are less likely to carry out necessary actions to mitigate hazardous effects (Vaughan, 1995). Thus, culture is essential as a risk factor in terms of disaster; however, poverty acts as a primary factor that portrays how individuals perceive risk similarly, their understanding, and their response towards disaster while examining the effects of hurricanes Katerina and Rita, found a tremendous population shift in the gulf coast region following Hurricanes Katrina and Rita.

2.1.5 Developments and secondary disasters

A study of Musikot showed that how rapidly urban growth led to more susceptibility to earthquake risk drawing a case of western hills of Nepal. He has shown that population growth and improved road accessibility have led to increased construction and an expansion and alteration of the built environment. The growing availability of modern construction materials like concrete and steel allows for new architectural designs and the erection of other stories on existing buildings, which contributes to the instability of the building stock. The risks to the local community are increased by a lack of implementation and enforcement of regulatory frameworks for building construction and spatial planning (Anhorn, Lennartz & Nüsser, 2015).

2.1.6 **Disaster, migration and displacement**

A study on the cyclone side of Bangladesh have argued that the natural and human-induced disasters such as floods, cyclones, droughts, river erosion, earthquakes often generate, migration, either permanent or temporary is a traditional strategy undertaken by victims for survival, as victims are bound to migrate after the disaster, many problems such as discrimination between the migrated and slum dwellers, assaults by terrorist groups, sexual harassment, disregarding their needs and requirements were common problems faced by the victims leading to social conflict and other problems (Bashir, Hassan, & Mohammad, 2014).

Studies from Bangladesh showed that disasters usually cause mass displacement thus forcing people to undergo routine economic migration at first, followed later by permanent migration (Shamsuddoha, Munjurul, Khan, & Raihan, 2012). Similarly, chronic, long-term issues emerging from extreme weather events people to migrate, especially during the post-disaster response and recovery phase when governance mechanisms often fail to respond adequately to the situation. People with greater social and human capital, as well as those with more social and human capital, migrate in a planned manner. These folks are frequently caught in dangerous situations. Basic necessities like as food, water, and sanitation are in short supply for displaced and trapped individuals. People frequently shift to surrounding chars or embankments for short- to medium-term migration, especially when essential services are no longer accessible. In the case of long-distance repetitive economic migration, people suffer lack of basic services. Another study that examined the 2011 earthquake in Tohoku, Japan, revealed that it was the first-ever triple combined disaster as the earthquake caused a tsunami-damaged Fukushima Dai-ichi Nuclear Power Station causing leakage of radiation materials. The case study provides us with information on the understanding of the disasters and their impact on the Japanese community and explains the patterns of forced migration (Usami, Ikehara, Kanamatsu, & McHugh, 2018).

2.1.7 Disaster and livelihoods conditions

Krishnamurthy (2012) has assessed the impact of extreme weather events on livelihoods conditions and argued that people are obliged to leave their habitual homes move either within their territory or abroad due to sudden or progressive

changes in the environment adversely affecting their living conditions. The impact of climate change plays a negative role in the displacement of populations. It creates the pressures for migration as climatic changes bring up problems such as storms, droughts, and floods affecting the agricultural cycles, weather events and ultimately disrupting the livelihoods of people. Thus, in an extreme climate-related event, a secure livelihood may no longer be feasible, environmental circumstances can exacerbate social and economic conditions under which households choose to move from their place of origin.

A study attempted to show that the relationship between livelihoods risk and corresponding livelihood capitals always complex. While the status of financial and physical capitals may be noticeable, human and social capitals are important variables in livelihood risk management. Gender role, community network, social relation, social unity, community linkage have important role falling livelihoods. The commonly-used classification of livelihood capitals comprises five categories-human capital, physical capital, natural capital, financial capital and social capital-as outlined in the following. In this analysis, a sixth category is called information capital. The information provides strong leverage to secure access to other forms of capital. Information as a livelihood capital is such a fundamental and vital livelihood asset/resource that it should integrate into the sustainable livelihoods framework (Fang, Saikia & Hay, 2018).

The research uses a livelihood capital index methodology with five aspects (by Chamber Conway) and twenty specific variables to assess the link between livelihood hazards and livelihood capital. These are brought together through a sustainable livelihood framework with an "Index system of livelihood risk". Fang, Saikia and Hay (2018) added one more aspect that was Information Capital.

Table 2. 1 Relation between livelihood risk and livelihood capital

Types of Livelihood Capitals	**Definition**	**Corresponding Livelihood Risks**
Human Capital	Personal development ability, including education level, technical competence and health status	Health Risk
Natural Capital	As the basis of human survival, environmental conditions in which farmers engaged in agricultural production activities are including soil quality, shortage of water resources.	Environmental Risk
Financial Capital	The money is used for purchasing productive Financial Capital materials or consumer goods, including personal credit.	Financial Risk
Physical Capital	Assets that are used in the economic production process, such as some agricultural machinery.	Physical
Social Capital	The social network is formed by people who have a common interest, generally, it can be understood as trust, cooperation and participation in various associations.	Social Risk
Information Capital	Access to data information is required for people to make decisions in pursuit of their livelihood objectives.	Information and Connectivity Risk

Source: Fang, Saikia & Hay, 2018

2.1.8 Relation between disaster and livelihoods

Here the following text tried to explore studies / theoretical works that show the linkage between disaster and also the livelihoods of the affected population.

A study made on the risk of disaster-induced displacement, human displacement risk thanks to disasters and global climate change has been estimated as a magnitude'"

index expressed because the number of persons expected to be displaced on the average per annum (Lavell & Ginnetti,2013). Ashley and Carney (1999) both have discussed the key ways within which sustainable livelihoods (SL) approaches are used and located useful include: supporting systematic analysis of poverty and its causes, in a very way that's holistic hence more realistic but also manageable; promoting a wider and better-informed view of the opportunities for development activities and also their likely impact; and placing people and the priorities they define firmly at the middle of research and objective-setting.

Hirsh with his team developed a brand new Conceptual Framework for Understanding Displacement: Bridging the Gaps in Displacement Literature between the world South and therefore the Global North, during this article the researcher critically reviews the literature on urban displacement and discerns two divides, associated with terminology and therefore the Global North-South divide to beat these gaps, they propose a replacement conceptual framework of urban displacement that positions the experience of being displaced at the middle. These framework shows that while urban displacement has different economic, social, and political contexts, the experience of being displaced has shared global qualities (Hirsh, Eizenberg & Jabareen, 2020).

Scholar have explained about Livelihood Resilience Measurement (LRM) Framework for Dam-Induced Displacement and Resettlement. In this idea of resilience and livelihood resilience is growing in prominence with water resource development that aims to live and builds resilience to specific disturbances and shocks. In this paper, he introduced the livelihood resilience measurement framework, which attracts on Hooke's law; uses the state vector method to calculate livelihood resilience scores; and test the effectiveness of the strategy by correlation analysis. Besides illustrating the way to apply the LRM framework in an exceedingly practical case, we discuss the way to communicate with stakeholders to spot and strengthen the factors that build resilience (Gong, Zhang, Yao, Wang & Liu, 2020).

Better understanding of the obstacles to pursuing long-term solutions that continues to shape the fact of life for urban internally displaced people in Kathmandu Valley. i take advantage of the concepts of 'fields of practice' and would disaster justice' to produce insights into the theorization of the links between social inequality, structural kinds of governance, and also the reconstruction process itself. Findings demonstrate that the appliance of those concepts has great potential to expand our understanding of

area laities of life' and practices of IDPs, and thus contribute to a more differentiated evidence base for the event and implementation of appropriate disaster risk reduction policies and practices (Titz, 2021). The study of Food and Agriculture Organization shows people migrate for food security that determine the choice of rural people to migrate; including economic factors, and employment showing the relation between food security an migration. If people don't have food security, migration may also be indirect as a technique by households to deal with showing migration creates opportunities and challenges. Impact of migration on the countries of origin and destination, with a spotlight on rural areas these challenges and exploit the opportunities created by migration trends. A study of the Food and Agriculture Organization shows voluntary migration refers to a proactive and typically planned movement with the aim of improving livelihoods. Displacement may occur due to war or civil conflict, in response to extreme environmental events and natural hazards (e.g., floods, hurricanes, and earthquakes), or even the results of infrastructure and heavy mining industries such as, mining, large-scale agricultural production, deforestation, or the development of dams, ports, and airports as such (Food and Agriculture Organizatio [FAO], International Fund for Agricultural Development [IFAD], International Organization of Migration [IOM], & World Food Program [WFP], 2018).

A study of Vietnam shows that the marginalized social groups have an excellent difficulty of adjusting to those new 'rules of the game' in contemporary Vietnam. during this increasingly deregulated and mobile social environment, the receipt of remittances is, to some extent, offsetting adverse trends in social resilience. This study discovered the importance of migration effects on social resilience and therefore the natural environment in both sending and receiving areas, and shows that these effects will be positive or negative. Enhancing social resilience and promoting sustainable resource use is a crucial policy goal, particularly for societies increasingly hospitable the uncertainties of globalization and environmental change (Ellis, 1999).

A study declares that most internal and international migration are voluntary and in search of better economic opportunities, while also comprising an essential part of rural livelihoods in this part of the world (Adger et al., 2002).

Scoones, (1998), developed a concept of ‘sustainable rural livelihoods’ is increasingly central to the talk about rural development, poverty reduction and environmental

management. It tries to explore the central conceptual and methodological issues involved in investigating sustainable livelihood issues. The framework shows how, in several contexts, sustainable livelihoods are achieved through access to a variety of livelihood resources (natural, economic, human, and social capitals. The mixture of livelihood resources ends up in the flexibility to follow the mixture of livelihood strategies with agricultural intensification/intensification, livelihood diversification and migration. The framework mentioned the institutional, which mediates the power to hold out such strategies and achieve such outcomes. The model created a debate about rural development, poverty reduction and environmental management.

2.1.9 The nature of human livelihoods: Practical concept for the 21st century

Chambers and Conway (1992) provoke a discussion on exploring and elaborating the concept of sustainable livelihoods. It's based normatively on the ideas of capability, equity, and sustainability, each of which is both end and means. A livelihood encompasses people, people's capabilities, and people's means of living, including food, income, and assets. Specializing in the future and considering the changing nature of resources and opportunities one has to consider the necessity to alter in terms of policy, research, and practical development.

Chamber and Conway further reveal that resources and stores are the tangible assets occupied by households like gold, jewelers, textiles, cash savings, and resources including land, water, livestock, farm equipment, domestic tools, and household amenities. Food, tools, loans, presents, and tasks that may be done by neighbors, patrons, social organizations or communities, Non-Government Organizations (NGOs) or Government Organizations (GOs), International Non-Government Organization (INGOs), and other relief items are samples of claims. Access is also the chance to own use of stores, or services, employment, food, or income and technologies. He also talks about the sustainability concerns linked with the environment and society and also the ability to address shocks, sustainability is thus a function of how assets and capabilities are utilized, maintained and promoted for better livelihoods. He further explained social sustainability, handling stress, and shocks.

2.1.10 Rural livelihood in developing countries

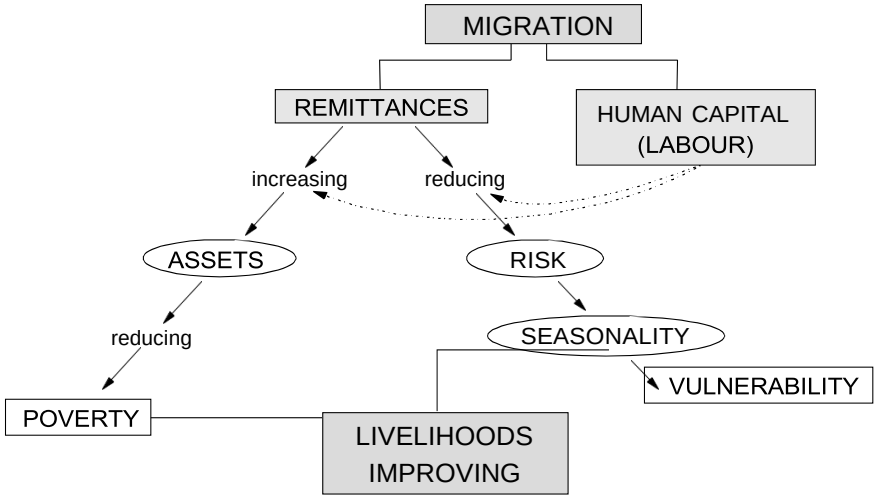
Ellis (1999) discussed three goals: first, to boost awareness of livelihood diversification in rural development approaches; second, to contemplate the interactions between livelihood diversification and poverty, farm productivity, natural resources management, and gender relations in rural areas; and third, to enhance policy understanding. In recent times, this has come to be called the sustainable livelihoods framework. It's viewed as equally applicable to urban on rural survival strategies. In line with the SL framework, a livelihood is defined here as 'the activities, the assets, and also the access that jointly determine the living gained by a private or household'. Rural livelihood diversification is, then, defined as 'the process by which households construct a various portfolio of activities and social support capabilities for survival and so as to boost their standard of living. Future rural poverty reduction policies have to be better informed on the character of those interactions.

The argument of this paper suggests that practical applications of the sustainable livelihood framework must place diversity high on the policy agenda. It is well to acknowledge that the advantages of diversity are context-specific. The connection between diversity and specialization is often explored further by recognizing the meaning of those changes at successively higher levels of social aggregation. On the one hand, the potential of people additionally as households 'to turn their hand to anything' confers the advantages of flexibility within the presence of risk already identified. It secures the flexibility at household level and accepts a degree of occupational rigidity at the individual level. These distinctions reveal that policies aimed toward making rural livelihoods more resilient or sustainable must take under consideration not only the positive aspects of diversity in achieving those goals, but also the differences within the nature of that diversity among individuals, households, and also the larger social or economic arena.

According to Ellis (1999) migration is an integral part of the livelihoods of the poor (and the not-so-poor) in low income countries, it is proved that migration in the developing country occurs for livelihood, migration can play in reducing the vulnerability and poverty of the resident group. Our literature identifies negative as well as positive attributes of migration. He has analyzed it through Sustainable Livelihood Approach as shown in the following figure, which helps to underpin that

how an individual and/or a household cope and mitigate with present vulnerability context of their livelihoods while making their living sustainable. It helps to find out that how individual and/or household is gaining or losing their livelihoods assets or capitals, while sustaining livelihoods. Assets are those resources which either an individual or household can make use of it.

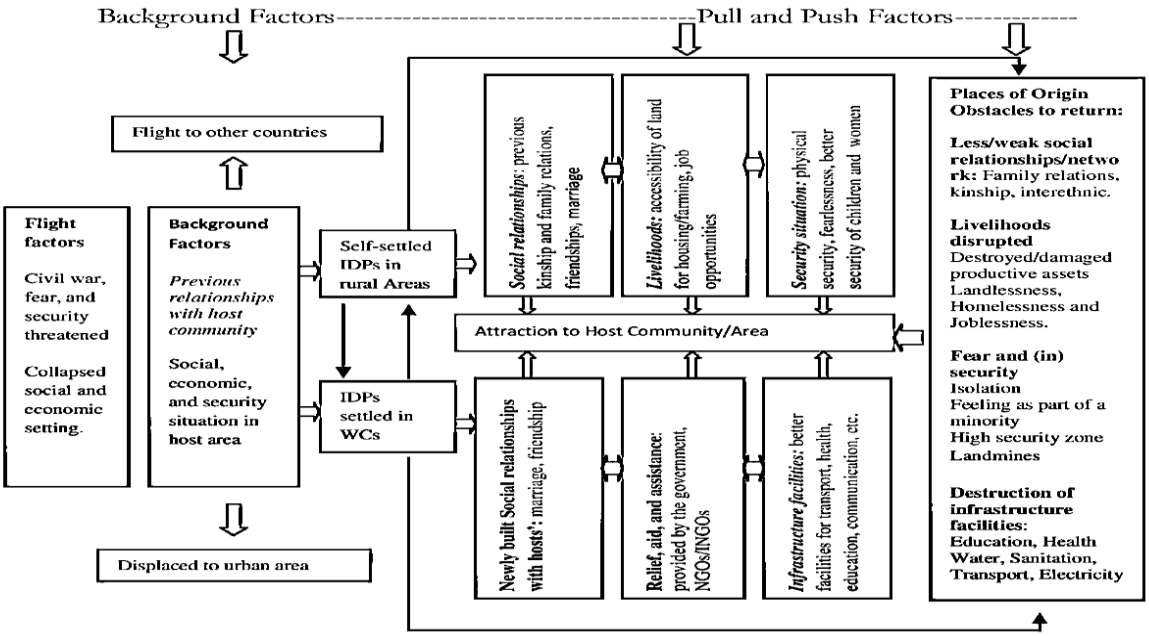
Figure 2. 1 Positive Links between Migration and Improving Livelihoods



Source: Ellis, 1999

Migration contributes positively to achieve of secure livelihoods and helps to get out of poverty. It reduces seasonality and risk, vulnerability, increases livelihood assets (land improvements, education, livestock, etc.), and provides the opportunity to poor with more opportunities to get out of poverty. However, its potential to contribute in all these ways is very considerably curtailed by the policy environment that typically surrounds it, and it is to this that we now turn. A study introduces factors that can influence the IDP's decision to return or remain in the host community after a long period of displacement. As Wanninayake (2019) conforms the primary reasons that include why IDPs are drawn to or incorporated into the host community in the area. And, include the challenges they encounter when they return to their former residences. One part of the figure shows the factors that shoot displacement, as its background factors. Next, the figure shows the factors that attract IDPs to the host community. Both the second and third sections show two sets of factors -push and pull- that influence.

The figure 2.2 illustrates the factors affecting the willingness to return to their places of origin with following reasons like; *Social* relationships, livelihoods: security situation: relief, aid, and assistance, and infrastructure facilities:



Source : Wanninayake, 2019

The above discussion contributes theoretically to building up a new conceptual framework/model of social relationships, livelihood strategies, and security perceptions through the use of existing literature and new practical knowledge. This model aware of the importance of motivation and expectations of migrants. Also, it has been closely linked to the familiarities and responses of people displaced or to be displaced in their movement. This framework is used for analyzing disaster-induced return and resettlement issues. And it emphasizes the linkages between internally displaced populations and original areas and host areas (destination).

2.1.11 Disaster-related displacement risk and risk measurement

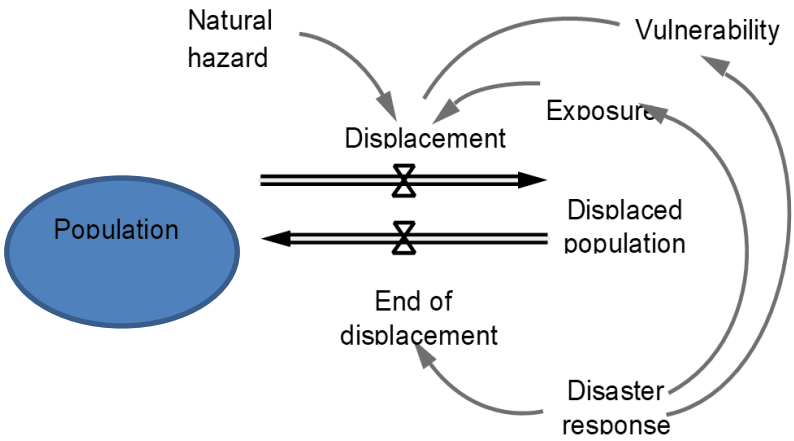
Ginetti, Lavell, and Franck (2014) applied the idea of the risk to disaster-related displacement that quantifies risk of human displacement around the world. General equation of disaster risk;

Risk = Hazard x Exposure x Vulnerability

A disaster happens when – and only when – vulnerable persons or assets are exposed to a specific hazard. Disaster risk is generally represented as the probability of a result

(e.g., loss of life, injury, or destroyed or damaged capital assets), which is the outcome of hazard, exposure, and vulnerability.

Figure 2. 2 Following figure shows new ways of understanding responses in relation to disaster risk.



Source: Ginetti, 2014

Displacement means forced movements irrespective of duration of displacement, distance relocated from place of origin and patterns of movement, including back to origin. Exposure refers to the location and number of people while 'Natural' hazards are events or conditions originating in the natural environment, which may affect people and critical assets located in exposed areas. Vulnerability is the propensity or predilection to be badly affected by a hazard.

2.2 Empirical review

2.2.1 Major earthquakes recorded in the world and their human costs

A major earthquake that occurred in the world since 1960 is summarized in this section to learn how earthquakes as a natural phenomenon frequently happened in the part of the world and their possibility of effects on the human population (Annex I). To date, the world cited major earthquakes that occurred on the earth over the last 100 years. On May 22, 1960, the most powerful earthquake in the recorded history-a magnitude of 9.5 -meter scale struck southern Chile.

On July 28, 1976, in the Chinese city of Tangshan, an earthquake killed at least 250,000 people. Examining the earthquake, it has resulted in significant societal

expenses, killing hundreds of thousands of people, inflicting injuries and missing persons, as well as the destruction of private and public property. Simultaneously, it appears that loss of life and property has a social dimension, the extent of preparedness, and awareness and are important to mitigate hazard conditions (Fang, 1979).

2.2.2 Historical background of the earthquake in Nepal

Studies show that Nepal is located in the middle of the Himalayan chain - an earthquake zone. The Himalayas are the result of a collision between the Indian subcontinent and the Eurasia / Tibetan plate. Global Positioning System (GPS), the Indian subcontinent drops 20 mm per year below the Tibetan Plate (Avouac, 2003). This reduction process creates a junction, which is absorbed by the junction across the plate leading to various earthquakes.

Nepal has a long history of destructive earthquakes. Therefore, studies reveal that Nepal is considered the eleventh most earthquake-prone country in the world because it lies within the high seismic region (MoHA & DPNet, 2009). It was said that high-intensity earthquakes occur about once every 75 years and lower intensity frequently occur during the rainy season (SAARC, 2009). Nepal has a history of devastating earthquakes. In the last 80 years, majorly four took place in 1934, 1980, 1988, and 2015 (magnitude 7.9) followed by a major aftershock of 7.3 rector scale on May 12, 2015. At least ten major earthquakes were recorded in the historical archives since the 13 century.

The Major General Brahmshamsher Jung Bahadur Rana's book, Nepal's Great Earthquake (1934) published in March 1991, contains a long account of 90 years of earthquakes: The historical events earthquake published by Brahmasamsher shown in Annex IV (I).

History reveals a great earthquake in Nepal and its impact on the border areas of neighboring countries such as India, Tibet and China. The data show that Kathmandu is one of the most frequent earthquakes since its history began in June 1255 (Table 2.2).

1255 AD: This is the first record of the great catastrophe in Kathmandu. On the Richter scale, the magnitude of an earthquake is estimated at 7.8. According to historical accounts, many Nepalese buildings and temples that fell after the 1255

earthquake lost much of its population, including King Abhaya Malla. 1260 AD: Information about this earthquake is very limited. It is well-known that these quakes have caused countless deaths, including epidemics and famines.

1408 AD: This earthquake damaged the temple of Rato Machendranath, and extensive damage and collapse of many ancient buildings and temples were recorded.

1681 AD: This earthquake destroys many homes and temples, including temples.

1767 AD: Information about the quake is limited, but the quake was widespread.

1823 AD: There is no record of the loss of human life or livestock, but seventeen medium-sized shocks were heard in Kathmandu village.

1833 AD: Two great shocks strike the Kathmandu district. The tower of Darahara was badly damaged. Most of the victims in Timi and Bhaktapur, 18,000 houses collapsed in the country, of which 4,214 came from Kathmandu village.

1834 AD: Four major earthquakes were reported annually. The Bagmati bridge is damaged.

1934 AD: This is known as the Greater Nepal Bihar Earthquake, the strongest earthquake of the 20th century and this earthquake has caused the largest death toll ever recorded in Nepal. A record of 8.1 Rs. the quake was located east of 9.5 miles [9.5 km] south of Mount Everest. More than 8,500 people were killed and more than 126,000 homes were demolished and more than 80,000 were completely destroyed.

1980 AD: A magnitude 6.5 earthquake shakes large parts of the far western part of Nepal. 125 were killed and 248 were seriously injured. 13,414 buildings were severely damaged and 11,604 buildings were destroyed.

During the last century, the Himalayan arc was hit by six devastating earthquakes e.g. Assam earthquake, 1988 (magnitude 6.6) Udayapur earthquake and 1991 (magnitude 6.9) Uttar Kashi earthquake that kills thousands of people in the area. As eastern Nepal witnessed two separate earthquakes namely the Bihar-Nepal earthquake (1934) and the Udayapur earthquake, hundreds of previous earthquakes erupted.

Major earthquakes occurring since 1960 are summarized in this section to learn that earthquakes as a natural phenomenon occur frequently in part of the earth and their potential effects on humans (Appendix I). So far, the earth has quoted the largest

earthquake in the last 100 years. On May 22, 1960, a magnitude 9.5 earthquake shook the region from southern Chile.

On July 28, 1976, in the Chinese city of Tangshan, an earthquake killed at least 250,000 people. Investigating the earthquake, it has resulted in huge social costs, killed hundreds of thousands of people, injured and lost people, and destroyed private and public property. At the same time, it seems that loss of life and property has a social status, a degree of readiness, awareness and it is important to reduce risk (Fang, 1979) .The historical background of the earthquake in Nepal.

During the last century, the Himalayan arc was hit by six devastating earthquakes e.g. Assam earthquake, 1988 (M6.6) Udayapur earthquake and 1991 (magnitude 6.9) Uttar Kashi earthquake that kills thousands of people in the area. As eastern Nepal witnessed two separate earthquakes namely the Bihar-Nepal earthquake (1934) and the Udayapur earthquake, between previous earthquakes exploded hundreds of kilometers east of Nepal causing widespread damage in the region (Government of Nepal [GON], Asian Disaster Preparedness Center [ADPC], Center for International Studies and Cooperation [CECI], & Norwegian Geotechnical Institute [NGI], 2011)

1988 AD: The earthquake in Udaipur averaged 6.9 magnitude and severely damaged the eastern part of the country. The quake killed 721 people, seriously injured 6,553, and damaged nearly 65,000 buildings.

1993 AD: The quake affected central and central western regions of the country, killing one person and injuring 11 and collapsing 72 buildings. The direct loss due to the earthquake was more than 48 million rupees.

1994 AD: The quake affected the western regions of the country, injuring 12 people and injuring more than 84,000 buildings and damaging 623 homes.

1997 AD: The quake affected central and western parts of the country. The quake caused 1 reported injuries, damage to more than 60 buildings and the collapse of 196 houses.

2011 AD: A magnitude 6.9 earthquake with a plot of land 272 km east of Kathmandu and a depth of 19.7 km caused widespread damage. Although the quake caused extensive damage to several buildings, only 3 people were reported dead as a result of the quake. The quake caused 164 injuries, 30 of them critical, more than 6,000 homes collapsed and more than 14,000 homes damaged.

Table 2. 2 Major earthquakes recorded, hit in Nepal 1205-2015 A.D.

Date	Place	Latitude ° N	Longitude	Estimated numbers of people's deaths	Magnitude rector scale
2015, 25 April	Kathmandu/India/Tibet	28.15° N	84.71 ° E	8,922	7.8
2015, 12 May	Nepal/China/India/Bangladesh	27.97° N	85.96 ° E	213	7.3
2011, 18 Sept	Sikkim, India	27.33° N	88.62 ° E	111	6.9
1997	Far western	-° N	-	-	-
1994	Western region	-° N	-	-	-
1993	Mid-western	-	-	-	-
1988, 20 Aug	Kathmandu/Bihar	26.78° N	86.62 ° E	1,091	6.6
1980, 29 July	Nepal/Pithoragarh	29.6 ° N	81.09 ° E	200	6.5
1966, 27 June	Nepal/India border	29.55 ° N	80.85 ° E	80	6.3
1934, 15 Jan	Nepal/India/Tibet	26.77 ° N	86.76 ° E	8,519	8.0
1916, 28 Aug	Nepal/Tibet	30 ° N	81° E	3,500	7.7
1869, 7 July	Kathmandu	27.7 ° N	85.3 ° E	750	6.5
1834 Jun	Kathmandu				
1833, 26 Aug	Kathmandu/Bihar	27.9 ° N	85.5 ° E	6,500	8.0
1767 July	Northern Bagmati zone	28 ° N	85.5 ° E	4,000	7.9
1681 Jan	Northern Kosi zone	27.6 ° N	87.1 ° E	4,500	8
1505, 6 June	Near Saldang, Karnali zone	29.5 ° N	83 ° E	6,000	8.8
1408 August	Near Nepal-Tibet Border, Bagmati	27.9 ° N	86° E	2,500	8.2
1344	Mechi	27.5 ° N	87.5° E	100	7.9
1260	Sagarmatha	27.1 ° N	86.8° E	100	7.1
1255, 7 June	Kathmandu	27.7 ° N	85.3° E	2,200	7.8

Source: - National Geophysical Data Center and Disaster Preparedness Network Nepal. Retrieved on 12/28/2017

2.2.3 Studies undertaken on impacts of Nepal's 2015 earthquake

An assessment of four districts (Sindhupalchok, Kavrepalanchowk, Dhading and Kathmandu) among the fourteen most affected districts was done to understand the coping mechanism and resilience of the households with internal and external migrants Sijapati, et al., (2015). Those homes with male migrants claimed that their absence damaged their families during and soon after the earthquake, according to the survey. According to the survey, 73 percent of families with external migrants said their absence damaged the household's post-earthquake coping processes, compared to only 44 percent of homes with internal migration. External migrants attempted to return but were unable to do so for a variety of reasons, including not receiving permission from their employers, not having enough money to purchase a ticket in time, and being told not to return by their families, as migrant earnings had become even more important in the post-disaster situation. (Please refer Annex IV, socioeconomic impacts of landslide).

Financial literacy in better management of remittances to fulfill immediate recovery needs and sustainable rehabilitation was recommended by the study. Similarly, better management of labor migration and information dissemination channels was important because many migrants were unaware of the return arrangement for migrants facilitated by the government post to the disaster. In terms of internal migrants, they are at risk of urban exclusion, fear of being evicted from transitional shelters, finding suitable rental accommodation and resuming their livelihoods has become a matter of concern for such households. Nevertheless, the same study argued that migration has become the only prominent option for the households of severely affected districts to recover from the ravages of the earthquake. The need and desperation for migration make the migrants vulnerable to forgery, abuse and exploitation. As families/households urge the migrant members not to return as their usual earnings are the only way of continuing their livelihoods, it is important to protect the rights of migrant workers.

United Nation Fund for Population Association [UNFPA], (2016) findings showed that 48 percent of women respondents feel they have not received any support in staying safe following the earthquake and as reported 48% of women have not been able to access services or information on their specific livelihood needs, reporting that their main needs are: how to stay safe during pregnancy and keep children safe,

proper sanitation practice and disposal of menstrual pads, news on government and NGOs services and decisions and shelter support. People in need safety assessments highlighted that 65 percent of women respondents reported feeling "unsafe" while changing their clothes and uncomforted using the toilets because of a superficial increased risk of SGBV. Two of the eleven schools surveyed lacked gender-segregated toilets for girls and an additional four had only one gender-segregated toilet for girls.

The report on Migration and Global Environment Change 2011 shows the relationship between global environmental change and migration. The key message of the report was that environmental change influences migration or displacement. The vulnerability may be increased if migration occurs in unplanned (London Government Office for Science & Foresight, 2011).

2.2.4 Impact of Nepal earthquake 2015

The earthquake that hit Nepal on April 25, 2015, is also called Gurkha Earthquake because its epicenter was Barpak, Gurkha. This place lies somewhat 85 kilometers west of Kathmandu valley.

(a) Studies regarding to impacts of the earthquake

A study showed the impact of the Gorkha earthquake in 2015 as landslides, river channel constriction and damming and avalanches with debris flow and airburst. The quakes of disaster shake the middle part of the country for 58 seconds (April 25, 2015) and 30 seconds (May 12, 2015). Within the 18 days from the first to the second earthquake, a total of 178 aftershocks with a magnitude of 4 Richter were recorded by the Department of Mines and Geology (DMG), while similar types of aftershocks were recorded only 130 during the period of 5 years (2010 to 2014). The recent 2015 Nepal earthquake is one of the most destructive earthquakes in human history. The important concern is unavoidable emerging diseases after the earthquake (Shrestha & Pathranarakul, 2018)

The same study revealed several secondary earthquake effects practiced in Nepal. The study revealed that almost all the rivers along the wide of the earthquake hit zone were blocked by the floods (Please refer Annex II and III for earthquake induced avalanches and Land slide Dams). The rivers like Tadi, Trisuli, Daraudi, Buddhi Gandaki, Kali Gandaki, Sunkosi, Tomkhola, Ponokhola, Marsyangdi, etc. have been

blocked or landslide, or collecting of debris and deaths of human threats. Mount Everest was also affected due to avalanches. Similarly, several hydro projects and transportation, schools' irrigation systems health facilities were also partially or entirely damaged. The most affected sectors like housing and settlements. About 50 percent of the damage and production dropped due to the disaster, followed by tourism at 11 percent. The environment, education, finance and agriculture sectors represent between 4-5 percent each of the total disaster effects (NRA, 2016).

According to NPC (2015), a total loss of Rs. 9,284 million was estimated due to the damage to heritage sites in the 16 earthquake-affected districts. The estimated damage of Rs. 7,875 million and a complete loss of Rs. 1,409 million were seen. In the case of monasteries and historic structures that were more than a hundred years old; there was a loss of Rs. 530 million, with an estimated damage of Rs. 5,300 million was seen leading to a total loss of Rs. 5,830 million.

Similarly, in the case of monasteries and historic structures (less than a hundred years old), there was a total loss of Rs. 5,830 million. With the report on the case of temples in remote areas, Rs. 900 million was damaged with a complete loss of Rs. 90 million to a total loss of Rs 990 million.

(b) Impact on Social Sector

The country faced the loss of Rs. 408,625 million in terms of the social sector. A total of 498,853 houses were damaged beyond repair, 256,697 houses were partially damaged and the total damages and losses amounted to Rs. 303,631 million and Rs. 46, 748 million respectively as per the post-disaster assessment 2015. The same scenario took place after the earthquake; damage to a large number of healthcare facilities, over 80 % of damaged health facilities from most affected districts ceased the health care needs of all the victims across the country. According to PDNA, 446 public health facilities were destroyed, including five hospitals, 12 primary health care centers, 147 health posts (HPs) and 12 others, and 16 health facilities were destroyed. The estimated damage of Rs. 7,544 million was calculated, 85.1 % of which constitutes damages and 14.9 percent amount to losses leading to many long-term problems and impacting the developmental goal (NPC, 2015).

A higher rate of mental disorders was noted in the ensuing months and there was a need to develop psycho-social interventions, especially for those with poor mental

health literacy. Acceptable, affordable and accessible mental health awareness programs were required. Through examples of strategies adopted by the author, this article asserts that the aftermath of natural disasters can give mental health professionals opportunities to improve mental health literacy.

Similarly, approximately 73,000 pregnant women and 62,000 lactating women suffered from reduced food intake, dietary diversity and trauma caused by the disaster. In addition, the disrupted water supply systems and sanitation caused outbreaks of various water and airborne diseases such as diarrhea, majorly impacting the nutritional status of children. In the 14 most-affected districts around 250,000 children of ages, six months to 59 months and 135,000 pregnant and lactating women were estimated to have been affected by the earthquake.

A research paper entitled ‘the Nepal earthquake: use of a disaster to improve mental health literacy, he explored a higher rate of mental disorder and shown a need to develop psycho-social interventions, especially for those with poor mental health literacy. Further he recommended that acceptable, affordable and accessible mental health awareness programs were required. Through examples of strategies adopted, his article asserts that the aftermath of natural disasters can give mental health professionals opportunities to improve mental health (Shakya, 2016).

The highest extent of damage was faced by the education sector with a total of 88.8 percent, an estimated Rs. 31317.9 million of damage and loss of which more than 80 percent of the damages and losses were in the 14 most-affected districts. The highly-affected districts did not hold full-day classes for at least one month. More importantly, the destruction of houses and the displacement of families had a severe negative impact on the learning environment of children as they reported that they had lost the motivation and confidence to study.

Table 2.4 shows the disaster effects summary of both in the private and public sectors (in Rs. million).

Sector	Damage	Loss	Total
Social Sectors	**355028**	**53597**	**408625**
Health and Population	6422	1122	7544
Nutrition			
Education	28064	3254	31318
Cultural Heritage	16910	2313	19223
Economic Sector			
Productive Sectors	58074	120046	178120
Agriculture	16405	11962	28367
Irrigation	383		383
Commerce and Industry	17409	18825	36234
Tourism	18863	62379	81242
Financial Sector	5015	26890	31905
Infrastructure Sectors	52460	14323	66783
Electricity	17807	3435	21242
Communication	36010	5985	41995
Community Infrastructure	3349		3349
Transport	17188	49300	66488
Water, sanitation and hygiene	10506	873	11379
Cross cutting Sectors	51872	1061	52933
Employment and Livelihoods			
Impacts on gender and social inclusion			
Governance issues	18757		18757
Sexual and gender-based Violence			
Human Trafficking of women and Children			
Child protection			
Environment and Forestry	32960	1061	34021
People living with Disabilities (PLWDs) and Senior Citizens			

Source: NPC, 2015.

(c) Impact on Economic Sector

With a Gross Domestic Product (GDP) less than 700 $ per capita in 2015, the earthquake has further pushed 700,000 people below the poverty line. The damages and losses in the agricultural sector were estimated at Rs. 28, 366 million, nearly 3.5 million people were considered vulnerable with immediate food needs, out of which 1.4 million people were considered highly vulnerable requiring immediate food assistance. Damage to livestock shelters, death and injury of livestock, malnutrition and the risk of animal and zoonotic disease epidemics due to insufficient feed, fodder and animal health support largely affected the productivity of the livestock affecting the production of meat and milk products. As a result, commercial farming was largely disrupted. An estimated amount of Rs. 4, 024 million of loss appeared due to damaged irrigation infrastructure that has been faced after the disaster. The irrigational infrastructure loss directly affected the agricultural production and

reduction in ISF collection. An approx. 8,295 hectares of agricultural land was reported without irrigation.

Nepal faced total damage of Rs. 17,408 million and loss of Rs. 18,815 million in the field of commerce and industry. The most affected 14 districts have faced damage of Rs. 15,611 million and loss was of Rs. 16,873 million due to the earthquake. The earthquake disrupted the functioning of enterprises, damaged the premises, equipment, raw materials, finished goods and many more, which led people to lose 100 percent of their revenues for at least two months and other financial losses. Various tourist areas were hampered along with tourist accommodation facilities which were damaged in touristic sectors leading to a huge amount of loss. The tourism sector had sustained damages of approximately RS. 18,862.8 million, the majority of which (86 %) used to come from hotel accommodations and homestays (9 %). There was a decrease in the number of tourists by 90 percent.

(d) Impact on Financial Sector

In the case of financial sector, losses were seen more prominent in the most affected areas than outside of the affected areas; a total loss of RS. 31, 905 million was lost. BFIs and the microfinance sector suffered significant losses due to damage to physical infrastructure and Annoted Terminal Machine (ATM) networks in the affected areas. Many banks also went through severe damage to physical infrastructure however, most depositors regained access to their accounts, which had been key in maintaining public confidence towards the banking system.

(e) Impact on Infrastructure Sectors

A total loss of RS. 66,783 million was allocated in which the private sector faced the loss of Rs. 17,281 million whereas a higher loss was faced by the public sector of Rs. 49,502 million. A huge loss of RS. 21, 242 million was estimated. The hydropower plants; Kulekhani, Upper Marshyangdi and Kaligandaki have significantly damaged affecting about 600,000 households from loss of electricity services depriving people of income-generating activities, particularly rural communities engaged in small- and medium-scale enterprises. However, all transmission lines are in service as it was before the earthquake. An estimated sum of Rs. 17,807 million was required for the maintenance of damaged hydro-power plants.

Similarly, the mobile base transceiver stations (BTS), television and radio broadcasters were damaged and significant communication network congestion and server down was experienced for 7 days. In addition, infrastructures and equipment were damaged and the overall cost of damages and losses in the communications sector was estimated at Rs. 3610.2 million and Rs. 5,084.6 million.

The 14 afflicted districts suffered the most serious infrastructural damage in their communities, including supplies of drinking water, power, walking routes, agricultural fields, and crops, resulting in a total loss of Rs. 3,349 million and negatively impacting people's social and economic lives. Women and girls especially, who are responsible for household chores faced more an impact as fetching water, grazing livestock, increasing their physical burden.

The number of landslides took place in various parts of the country. It led to blockage of roads, hindering road accessibilities in different parts of the country, obstructing the transport of goods, relief materials, food supply, and many more. In addition, a major disruption of the Araniko Highway caused an interruption of trade flows between Nepal and China. The overall damages and losses of the transport sector amounted to Rs. 17,188 million and Rs. 4,930 million.

More than 90 percent of water sources were damaged in the rural areas. Among 11,288 water systems in the 14 most-affected districts, 1,570 systems were totally damaged, and 3,663 systems were partially damaged, amounting to the loss of Rs. 873 million and Rs.10 million respectively. Besides, water sources were drying up, and turbidity was present in the water, making it difficult for them to access drinking water. In the case of sanitation, 220,000 toilets had been completely or partially damaged in the 14 most affected districts and it restricted the people from maintaining hygienic behaviors.

(f) Impact on Cultural heritage

Many government, religious and private building were destroyed (Floerchinger, Andreas, Kit, & Gfz, 2015). Major monuments in Kathmandu's Seven World Heritage Monument Zones were severely damaged and many collapsed completely. Similarly, in more than 20 districts, thousands of private residents built on traditional lines, historic public buildings, ancient and recently built temples and monasteries, were affected by the disaster, 25 percent of which were destroyed completely. The PDNA's

study published in NPC (2015a), the overall assessed losses to tangible assets are RS. 16.9 billion (US$ 169 million), impacting 2,900 cultural, historical, and religious heritage sites. The earthquake damaged a large number of cultural and heritage sites in Nepal. Outside Kathmandu, a number of such sites and structures survived the earthquake and its aftershocks, including Boudhanath and Swayambhunath. Within Kathmandu in Durbar Square, a large number of iconic sites and structures were destroyed, though a few survived, including Taleju and Jagannath temples, the Kumari house and the Pashupatinath Temple. The list of destroyed cultural and historic structures been reported to have been completely destroyed include Kasthamandap, Maju Dega and Narayan Vishnu Temples, Trailokya Mohan, Krishna (Chasin Dega), Dharahara (Bhimsen Tower), Hari Shankar, Jagan Narayan, Fesidega Temple, and Vatsala Durga Temple (United Nations Office for Disaster Risk Reduction, [UNDRR], 2015).

(g) Impact on livelihoods and food security

Important cross-cutting sectors included were employment and livelihoods, gender and social inclusion, governance, human trafficking, gender-based violence, environment and forestry, people living with a disability.

Regarding the loss of employment and livelihoods, the earthquakes affected the livelihoods of 2.29 million households and 5.6 million workers across 31 districts, in which 14 districts are highlt affected, of which 51 percent are women. This resulted in the loss of 94 million workdays and Rs. 17 billion of personal income in FY 2015-2016. The highest losses occurred in Kathmandu followed by Sindhupalchok and Rasuwa.

The impact like loss of forests, damage in water sources, and damage in agricultural fields has created an extra burden on women and girls as they are responsible for the management of all household chores. Households work, including cooking, fetching water, grazing livestock, etc., has negatively impacted their capacity to engage in outdoor activities such as natural resource management, recovery activities, etc. This reflects how the women lag from creative opportunities as they are always attached to responsibilities bounded inside the house.

In terms of environment and forestry, various types of damages were encountered. A total of 23,375 hectares of forest area was damaged. Seven Protected Areas were

affected by the earthquake. APEC and its partner network estimate emissions (United Nations Economic and Social Commission for Asia & the Pacific, 2017) that 70,000 solar installations, 16,721 biogas installations were destroyed. Due to their environmentally favorable technology, it was projected that if the damages were not repaired promptly, a variety of environmental consequences, including CO2 emissions, would result. Similarly, more than a billion bricks were required for rebuilding efforts, directly increasing the workload in brick manufacturers and raising air pollution and mercury. Due to the earthquake and frequent aftershocks, an indicator of the significant risk of Glacial Lake Outburst Flood (GLOF) was also expected. People living with disabilities (PLWDs) and senior citizens - The disaster brought up a challenging condition for the PLWDs and the senior citizens. As they required proper care, assistance, proper dietary intake and safety, the occurrence of the disaster made it very difficult for them to survive in such a critical condition.

The food security situation was seriously deteriorated with the significant damage to household food stocks and a fall in incomes in Nepal. Agricultural output plummeted, and local markets were initially closed or just partially functional in many places, resulting in limited accessible goods and increased prices, as well as interruptions to road and trail networks and supply chains. As a result of these conditions, food access was limited in the early aftermath of the earthquakes. Regarding food access, a post-earthquake assessment confirmed that the there was widespread losses of household food stocks, seeds and agricultural tools, affecting food security prospects in the immediate as well as longer-term (NPC & WFP, 2019) . Almost 70 percent of households indicated the partial or total loss of their food stock space (Reddy, Singh & Anbumozhi, 2016).

(h) Conflict after the earthquake

The disaster also highlighted aspects of inequities in Nepali society spanning geography, income and gender. Poorer rural areas were more adversely affected than towns and cities due to their inferior quality of houses. More women and girls died than men and boys, partly because of gendered roles that disproportionately assign indoor chores to women.

A study conducted by Shrestha and Pathranarakul (2018) using a series of focus group discussions and key informant interviews shared that respondents saw political actors

as responsible for managing aid, including the distribution of relief. Many of them expressed disappointment in these politicians and administrators, accusing them of channeling aid and support toward those who were aligned to them politically. The study identified that identity-based tensions as a source of conflict have remained relatively dormant after the earthquake in all three studied districts. There was an increase in religious proselytization. It was reported that caste-based discrimination was the second-most discussed issue by communities. Both women and men raised examples of how caste hierarchy played out when it came to sharing resources or helping each other in the immediate aftermath of the earthquake. For them, caste and ethnicity were secondary factors in determining the distribution of aid by both the government and civil society groups. In Dhading for example community members felt that while the 'untouchability' issue had always existed in their village after the earthquake people felt obliged to make compromises to help each.

The study claimed that the main factor determining the distribution of aid was access to political actors and elites who controlled its distribution. In Sindhupalchok after the earthquake, a local dispute arose over access to a shared river between an upstream village, mostly inhabited by the Tamang community and a downstream village mostly inhabited by Chhetri, Brahmin and Newar. The conflict arose due to the shortage of water which had begun to decline after the earthquake. As a result, the Tamang community was accused of preventing the river water from reaching the downstream villages. This led to physical altercations between the men of these villages. Reportedly the respondents mentioned that the actual cause of the dispute was linked to identity rifts, causing resentment towards the Chhetri and Brahmin villages over the arbitrary manner in which they destroyed the alcohol production and banned the Tamang village from producing.

In a report of International Centre for Integrated Mountain Development (ICIMOD) to study to complement the Post Disaster Need Assessment (PDNA) report of the Government of Nepal by providing insights into the livelihood dimensions of the earthquake and its socio-economic and livelihood impacts. The study focuses mainly on the 14 most severely affected districts. In these districts livelihoods of 5.4 million people (over 66 percent of the total affected population) lost about 135,200 tons of foodstuff, 16,399 large livestock and 36,819 small livestock. More than 3.5 million

people remained in incurred and some 180,000 people engaged in tourism were extremely vulnerable (Rasul, 2015).

The study showed that the agriculture sector suffered total damage and loss of Rs. 25.5 billion, with maximum losses in Nepal's mountains and hills. The per capita disaster effect was found to be negatively correlated with the Human Development Index and positively correlated with poverty indicating that less developed and poor communities experienced a larger portion of disaster impacts about 26 percent of the damaged houses belonging to women-headed households and 41 percent of Dalit's and indigenous communities. Women-headed households suffered the largest damage, followed by those from Janajati communities. Poor women and disadvantaged groups suffered more in terms of death, person-years of life lost, injury, displacement and impacts on other livelihood assets.

The study recommends strengthening the skills and capacity of affected people by integrating skill development and vocational training into livelihood recovery programs and by building the capacity of local experts to maximize the use of local expertise in the reconstruction and recovery process. It also recommends promoting community empowerment through building the capacity of local communities, community-based organizations, local government organizations, cooperatives and government agencies. It also suggests revitalizing micro, small and medium-sized enterprises by providing loans at low-interest rates, simplifying processes and mechanisms and providing to support start-up businesses, as well as by facilitating insurance mechanisms with public-private partnerships to mitigate risk.

They agreed that despite these challenges brought by the earthquake, the earthquake and subsequent humanitarian response, has created opportunities for some.

A study conducted by Mitchell on community resilience in Bhaktapur district and surrounding areas following the 2015 earthquake in Nepal. The study findings were obtained through the brief community interviews and have been augmented with newspaper reports and some descriptive data from our disaster mental health intervention research projects in earthquake-affected communities in Bhaktapur district of Nepal. Focusing on culturally specific disaster attributions; among the 238 respondents, 43 percent of them indicated that earthquake occurred due to the" will of God", 22 percent stated that it was as a result of previous actions, even some

indicated that the past actions were the reason why people died. The earthquake, according to some younger and more educated members of the community, was caused by the shifting of rocks beneath the ground. In terms of psychological discomfort, it was shown that they were always afraid of another earthquake, which resulted in sleeping difficulties, even among the children. Several interviewees characterized their future as dismal, since they had been psychologically traumatized to continue collecting cash crops. In addition, 21% said they used alcohol or other drugs to cope with the stress caused by the earthquake (Welton, Awale, James & Khanal, 2018).

(i) Impacts on women and girls

A review in gender and disaster was made. There is a differential impact that disasters have on women and girls. It seeks to emphasize that there may be 'secondary' impacts for women and girls through changes to wellbeing or increased time burden, for example and highlights that they then may face a 'double disaster'. It takes into consideration how the specific needs and vulnerability of women and girls are considered throughout the disaster risk management cycle by looking at the current response from key international agencies and organizations to address the issues (Bradshaw & Fordham, 2015).

During the cyclone disaster in Bangladesh in 1991, it was reported that 90 percent of the 140,000 fatalities were women (Ikeda, 1995) and recent Global Facility Disaster Reduction and Recovery (GFDRR) data suggests, women accounted for 61 percent of fatalities in Burma as a result of Hurricane Naris and in Banda Aceh, the Indian Ocean Tsunami affected the figure was 67 percent but with some locations showing a much higher rate. In other words, the major limits are socially created roles of women and men, as well as the social norms that control their conduct, rather than biology. Since the Indian Ocean Tsunami, it has been widely assumed that women and girls will be more vulnerable to disasters, but it is now known that this sensitivity is due to societal conceptions of gender rather than biological differences. Gendered ideology and gendered practice give rise to systematic gender differences in the perception of (Gustafson, 1998) and men may display more risk-taking behavior than women explaining why men accounted for 7 percent of all road traffic deaths in 2002 (Waldron, McCloskey and Earle, 2005).

When presented with a perceived risk, women frequently do not know when or how to act on warnings due to a lack of knowledge, education, and participation in preparedness efforts (Tyler & Fairbrother, 2013). Christina Raj Bhandari examined the impact of the earthquake on women. Among the populations that suffer, women and children are the most vulnerable to a natural disaster and that the impact of disasters is more on women (Rajbhandari, 2016). Also, women, old age and children are the ones to be most affected differentiated impact of disasters on men and women is primarily caused by the existing gender inequalities manifested.

Nature of vulnerability in terms of gender is explained in three main overlapping causes. They are biological and physiological, social norms and role and exacerbation of gender discrimination due to aggravated post-disaster conditions. According to the first cause, the physiology of men and women differ which might affect their self-rescue capacity like running, climbing, swimming. Yet, according to a study, learned skill is more accountable in terms of self-rescue than the physiological condition (Oxfam, 2005). Women are vulnerable to incidences of domestic and sexual violence after a disaster event ((Bradshaw, 2004). In the case of Nepal, factors like gendered roles in households, social and cultural norms and gender discrimination are the causes of women's vulnerability (Rajbhandari, 2016).

In the study of found that women lost more lives in comparison to men and that natural disaster differently affect the life expectancy of men and women. It was observed that the difference in mortality of male and females are higher in the developing countries (Neumayer & Plümper, 2007). Direct correlation with the exposure to risks associated with the gender-based roles; the difference in gender roles constructed by the society is the reason for the difference in gender mortality (Rivers, 1982). Likewise, women with a poor economic background are more vulnerable to the effects of disasters as they are likely to reside in disaster-prone areas; for example with weak housing infrastructure (Parkinson, 2011). Women affected by poverty had limited access to resources to run away from disasters putting them in danger (Jane, Henrici, Allison, & Jackie, 2010). Women and children are at the greatest risk and most susceptible to trafficking and exploitation in times of disasters (Nellemann, , Verma & Hislop, 2011).Children are pulled from schools to maintain the stability of the household to take care of siblings. Natural disasters, such as earthquakes, tsunamis, climate-related disasters, such as floods or famine crises,

disrupt local security and safety increasing levels of stress, family conflict and mental health issues. Therefore, they contribute to the neglect of children (Bartlett, 2008). To survive families with inadequate crop yields ad income-generating opportunities are forced to send their children to other countries for work hence, many young sex workers of Bombay are from poor villages of Nepal. Economic and security challenges may lead women and children to seek better living conditions, shelter and safe housing, making them potential targets for gender-based violence, exploitation and human trafficking, after a climate-related disaster. The disasters that lead to increased physical and economic insecurity for the most vulnerable individuals i.e. women and children are among push factors for human trafficking. In the developing countries, the women and children are lured by false hopes of remunerated employment either directly to them or their guardians to leave their houses and travel to have a so-called better life. The making of false travel documents through organized networks provides transportation to the destination countries where they are forced into sexual slavery held against their will in brutal conditions leading them to suffer psychological trauma. Likewise, the commercial and sexual exploitation of children in tourism has been apparent in Asia.

Women were subjected to sexual assaults. They could not maintain their privacy due to the cramped shelter areas in the 2010 Haitian Earthquake Disaster (Bookey, 2011). The process of migration due to displacement has ultimately an increase in the numbers of women and girls into sexual exploitation. This research mainly focuses on the finding how the internal displacement in the Chiapas state of Mexico forcing the people especially women to migrate and making them vulnerable towards trafficking with the pattern of trafficking and consequences on health. Data has been collected from both primary and secondary sources. The primary information is obtained from interviewing 40 trafficked women in the Tapachula City of Chiapas, Mexico using a semi-structured questionnaire. Apart from that 10 in-depth interviews were conducted to get the life history of displaced-trafficked women. Trafficking of displaced women is deeply embedded in cultures around the world where a lot of them have chosen it as a way of life. Although the government of Mexico is trying to rehabilitate and re-house displaced persons and is trying to provide a new home for affected communities, displaced women are still as vulnerable to trafficking. As this issue is of global importance, it requires a comprehensive approach to solve this issue and to

deal with the perpetrators, as well as assist the victims of trafficking in Mexico (Acharya, 2009).

2.2.5 Defining livelihoods

Here following texts shows defining the livelihoods by different social scientists and institutions and social scientists.

Chambers and Conway (1992) defined - A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base. Natural / biological (*i.e.*, land, water, common-property resources, Social (*i.e.*, community, family, social networks, participation, empowerment, Human (*i.e.*, education, labour, health, nutrition, Physical (*i.e.*, roads, clinics, markets, schools, bridges and Financial (*i.e.*, jobs, saving, credit). Oxford Advanced Learner's Dictionary of Current English VIII Edition states that the fact livelihood as "a means of earning money in order to live."The Dorling Kindersley Oxford Dictionary writes - livelihood as "a means of living; sustenance". A livelihood as "the mix of individual and household survival strategies, developed over a given period of time that seeks to mobilize available resources and opportunities.

Authors like Ellis 2000, and Scoones, (1998) writes livelihood can be defined as a measure of the set of actions taken by people within their capacity and capitals to make a living by maintaining highly diverse portfolio of activities, while livelihood capitals cover natural, physical, human, social and financial resources that are critical to the survival of people in response to stresses and shocks while not compromising the natural resource base.

Mutenje, Ortmann, Ferrer and Darroch (2010) livelihood entails not only the activities that make up how people live, but also the resources that guarantee their satisfactory living, the risk involved in managing those resources, and the policies that supports or oppose their pursuit of good living.

Olivier Serrat (2008) says - A livelihood comprises the capabilities, assets, and activities required for a means of living. It is deemed sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities,

assets, and activities both now and in the future, while not undermining the natural resource base.

2.2.6 Livelihood and risk and mobility

According to Visser and Sen (1999) state that "the livelihood strategies provide a useful key to interpreting the linkages between risk and mobility. Livelihood choices are based on individual capacities to access human, social, physical, financial and natural resources; and they are parts of complex well-being strategies defined at the level of more or less large households. The options concretely available to individuals and households are constrained by social and environmental factors: legal and political frameworks, economic dynamics, cultural specificities and ecosystem features determine whether people are allowed or denied access to capital and opportunities and define the boundaries of the choices they have concretely available.

Labor migration has turned out to be an important livelihood strategy for households in the 'crisis-hit' districts. It would be interesting to study the effect of labor migration on post-earthquake response and reconstruction plans. Theoretically, it is believed that migration and remittances help to increase the resilience of households coping with disasters. But media coverage was conflicting about the effect of migration on post-earthquake response (Le De, Gaillard, Friesen and Smith, 2015).

2.2.7 Disaster management

The primary cause of climate change in Nepal is due to the geography, geological position, and the disasters in the country. Rapid urbanization without any plan and ruin environmental has further increased the disaster risk in Nepal. Therefore, Nepal is one of the most disaster prone countries in the Asia. Frequent earthquakes, flooding, and landslides and are common disasters arresting every year.

In 2015, two powerful earthquakes hit Nepal, 75 percent of the disaster was due to the flood and land slide in Nepal, it make up almost 75% of disasters in Nepal. Nepal needs strong disaster management.

Disaster Management can be the organization and management of resources and responsibilities for dealing with all humanitarian aspects like preparedness, response, and recovery in order to lessen the impact of disasters.

In the aftermath of the Earthquakes of 2015, the government of Nepal and development partners agencies introduced short-term and long-term reconstruction efforts following the Post Disaster Needs Assessment led by the National Planning Commission. The technical experts are from national experts and institutions, assisting countries, and developing partners as well as humanitarian assistances were mobilized from all parts of the country and outsides the country.

Nepal has made significant achievements in terms of the legal framework, policy instruments, and institutional arrangements for disaster risk management which are guided by the Constitution of Nepal 2072 (2015), the Disaster Risk Reduction and Management (DRRM) act 2074 (2017), and Local Government Operation Act, 2074 (2017).

Nepal's government has DRRM Act 2074 (2017), in which Ministry of Health Affairs (MoHA) is leading the ongoing efforts to operationalize the Nepal's DRRM Act. The Disaster Risk Reduction (DRR) policies and practices are fostered through DRM initiatives at global, national, and sub-national levels. The general objectives of the Disaster Management Policy were to avoid loss of human life and destruction of property by natural disasters.

2.2.8 Coping strategies of affected communities

Coping strategies have often been defined as a short-term and immediate response or reaction to unusual events or habitual stress or decline in access to food (Davies, 1993). External factors are dominated by household activities applying coping strategies. According to various disaster-related literature (Chhetri and Maharjan 2006); (Hadley et al, 2011), and (Maxwell & Foundation, 2008), households adopt both ex-ante and ex-post coping strategies in their endeavor to be food secure. There are four categories of strategies defined below (Sonshine, Caldwell, Gosselin, Born and Coughlin, 2012).

Buying food on credit, relying on less-preferred food substitutes, reducing the number of meals eaten per day, regularly skipping meals for an entire day, eating only vegetables, eating unusual wild foods, restricting adult consumption so children can eat normally, and feeding working members at the expense of non-working members are all examples of consumption strategies. Expenditure strategies include the use of savings and avoiding health care or education costs to buy food.

Income strategies include the use of pensions, small businesses, and selling household and livelihood assets such as livestock.

(a) Relief and recovery program by government and NGOs;

According to the Government of Nepal Ministry of Home Affairs [MoHA] (2015) to handle a post-earthquake disaster, Central Natural Disaster Relief Committee (NDRC) meeting was held on 25 April 2015 just two hours after the major hit of the earthquake as mandated by disaster Relief Act 1982 and recommended to Government of Nepal to declare an emergency for 1 month to highly affected districts and the cabinet declared an emergency to 14 districts: Gorkha, Sindhupalchok, Dhading, Kavre, Dolakha, Nuwakot, Ramechhap, Sindhuli, Rasuwa, Kathmandu, Lalitpur, Bhaktapur, Makwanpur and Okhaldhunga.

There were several NGOs and INGOs played to support the community to rescue and relief efforts. The personnel involved in the rescue and in relief efforts were volunteer groups, youth professionals, doctors, and engineers. They were active in treating the wounded, setting up temporary shelters, supplying food, and attending to vital needs.

(b) The establishment of the national reconstruction committee (NRA)

After the earthquake of 2015, the Government of Nepal has established Government mechanisms to respond to the earthquake crisis and humanitarian issues. On 25 December 2015, the government established the Nepal Reconstruction Authority (NRA). The Legislature-Parliament passed the Reconstruction Act that provides the creation of NRA for the period of five years. The Reconstruction Act establishes several bodies to support the work of the NRA. The body includes The National Reconstruction Council, chaired by the Prime Minister, which advises the Steering Committee on the formulation of reconstruction policies and plans. The Steering Committee approves the authority's organizational structure its budget, approves plans and policies, and guides for effective reconstruction. The Executive Committee is chaired by the NRA Chief Executive Officer (CEO). The CEO is appointed for five years and he is responsible for drafting policies and plans, coordinating partners, managing NRA, and hence removing obstacles to reconstruction. The District Coordination Committee coordinates, evaluates, and monitors NRA activities, as well as reporting any irregularities. The NRA can impose regulations and delegate

authority to the CEO, members, Secretary, or any other government official. National Reconstruction Authority (NRA) is the legally mandated agency for leading and managing the earthquake recovery and reconstruction in Nepal. NRA provides strategic guidance to identify and address to the priorities for recovery and reconstruction, taking into account of both urgent needs as well as those of a medium- to long-term nature. The key objectives of establishing the NRA were to i) reconstruct, retrofit, and restore partially- and completely-damaged residential, community, and government buildings and heritage sites, to make them disaster-resistant using local technologies as needed; ii) reconstruct (restore) damaged cities and ancient villages to their original form while improving the resilience of the structures; iii) build resilience among people and communities at risk in the earthquake-affected districts; iv) develop new opportunities by revitalizing the productive sector for economic opportunities and livelihoods; v) study and research the science of earthquakes, their impact including damages and effects, and post-earthquake recovery, including reconstruction, resettlement, rehabilitation, and disaster risk reduction; and vii) resettle the affected communities by identifying appropriate sites.

In addition to these objectives, in terms of rebuilding, the NRA is also in charge of coordinating and partnering with non-governmental groups, the commercial sector, and communities. It is also empowered to raise financial resources for reconstruction and to make arrangements for effective use. The Authority is responsible for carrying out technical reviews of damaged or unsafe physical structures and ordering safe demolition, where required. For all practical purposes, it is the one-stop institution to oversee, coordinate, and facilitate Nepal's effort to build back better – that underpins the reconstruction policy.

(c) Responses by different I/NGOs and UN organizations

Altogether 76 international search and rescue teams and 87 international medical teams were involved in search and rescue operations (MoHA and DPNet-Nepal 2015). Besides, more than 300 international organizations working in various sectors (including health, shelter, water and sanitation, early recovery, protection, education, child care) were actively providing relief support in the 14 most-affected districts (Shrestha, Bajracharya, Jeffre, Kargel, & Khanal [2016]). These efforts were complemented by those of the private sector and the local population, particularly

youth groups, who were working voluntarily and on an ad-hoc basis through informal networks.

Ministry of Health, Ministry of Home Affairs, Ministry of Urban Development, Ministry of Education, and various governmental organizations actively worked for the recovery and reestablishment of the damages faced by the country. The recovery works was supplied by World Health Organization, UNDP, UNICEF, WFP, DFID, ECHO, USAID, SDC and JICA.

The meticulous support of organizations in providing funds, equipment, materials, and human resources made a huge contribution to the reconstruction of various infrastructures such as schools, buildings, cultural heritage sites, sectors such as agriculture and tourism. Hence, the assistance provided by the organizations has helped the country to recover from the disaster.

(d) Gaps in relief and recovery

The gaps in relief and recovery can be felt at different levels. At the preparedness level, the gap is seen from local levels to the district level. The local levels are lacking in emergency operation Centre (EOCs). The absence of a district integrated disaster response system and the ineffective and inefficient development of logistics management mechanism was felt at the district level. Similarly, the reconstruction, as well as the relief and recovery efforts, have been put on hold since the donor agencies' financial and technical assurances have yet to be released. Likewise, the gap has been resulted due to the lack of allocation of resources and a lack of sustainable funding mechanisms. The awareness-raising programs concerning disaster risk reduction and preparedness at all levels in the districts are lacking. The development and the implementation of the preparedness or the relief programs could not focus on the most vulnerable groups of Nepalese society i.e. the marginalized, *Dalits*, women, handicapped, disadvantaged, children and elderly people. The lack of skilled full and trained volunteers during the emergency period had affected the preparedness mechanism. There is a lack of disaster risk reduction planning and execution in infrastructure construction, which has resulted in a gap in relief and recovery. The preparedness mechanism during the earthquake response was not satisfactory as a result the affected families and survivors could not be attended to and helped immediately. The stock of tools, equipment, materials was not available in the district.

The earthquake survivors could not get the tarpaulins and other relief materials for several days in some affected districts (Wendelbo et al., 2016).

Similarly, in the same study, they claimed that the coordination mechanism was found to be inadequate and lacking in many terms that have created the gap in relief and recovery. Most of the organizations or sectors were found to be working independently without coordination during the time of emergency response. The coordination gaps were seen among the government sector including security forces, foreign search and rescue (SAR) teams, humanitarian and supporting organizations, civil society organizations, and the communities in the district. The emergency activities operated during the time of disaster tend to be unplanned and were not done systematically. However, at the time of relief Distribution and search and rescue immense support was gained on the part of I/NGOs and humanitarian organizations. The transparency in distribution and management of the supporting organization seemed doubtful. Communication is the prerequisite to addressing the situation at the time of emergency operations or the disaster preparedness phase. The lack of establishment and institutionalization of an authentic, open, and GIS-based Disaster Information Management System (DIMS) resulted in a lack of authentic and unreliable information during search and rescue and relief distribution. In the 14 hardest-hit districts, there is a lack of risk monitoring and early warning of specific hazards, as well as early warning training for security officers, key stakeholders, and community members.

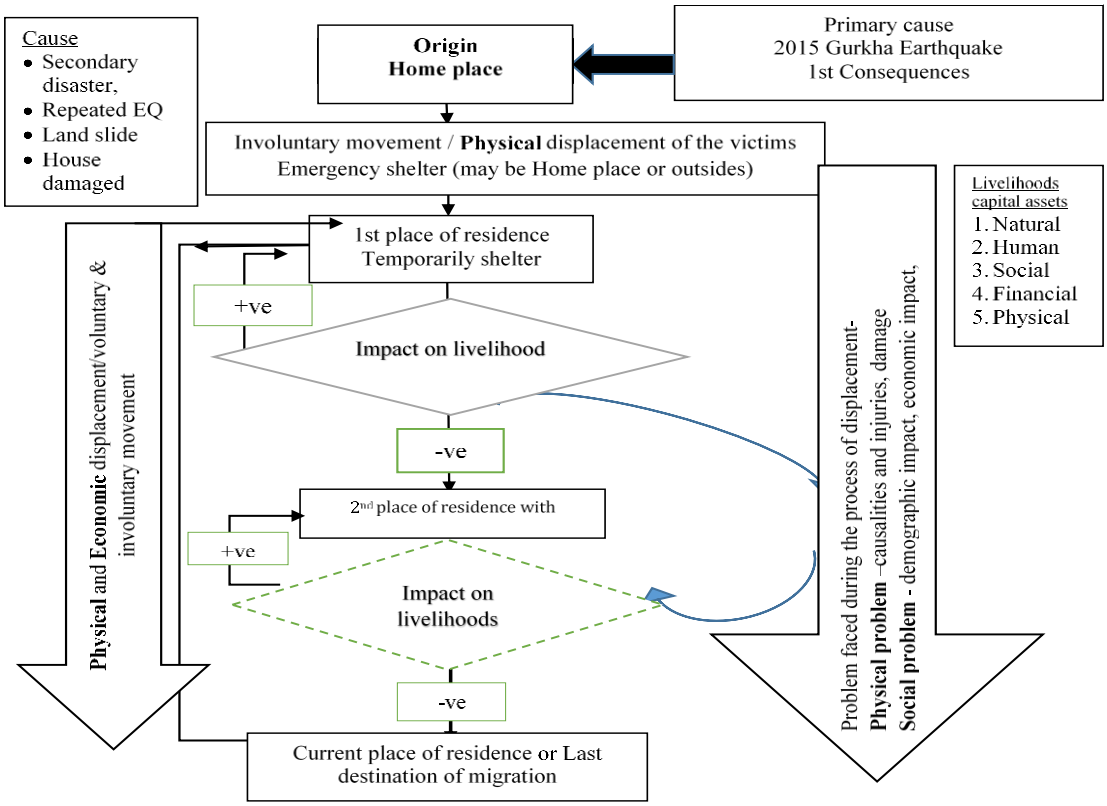
2.3 Link between natural disasters and displacement

There is strong evidence that natural catastrophes affect migration and human mobility. The relationship between natural catastrophes and displacement is generally accepted in the media, as well as among humanitarian, development, and migration groups and academics (Barman, Majumder, Rahaman & Sarke., 2012). Despite the fact that post-disaster relocation may not involve a permanent change of residence, some disaster-affected residents do opt to migrate, resulting in involuntary migration. Another potential migratory effect of natural disasters is the wholesale migration of communities, which can potentially serve as a more permanent residential site. Mandatory (and hence forced) migration is common in this situation.

2.4 Analytical framework of the research

Based on the existing literature review an analytical framework was developed. Following the displacement process, cause and consequences in the livelihood and continuous process of the affected people feel safe life at the ends to migration (Figure 2.4).

Figure 2. 3 Impact analysis frame



Source: Developed based on previous literature reviewed

Physical Displacement: When individuals or communities can no longer physically inhabit an area and must transfer to a new location and displacement happens, whether it is complete or partial, permanent or temporary. Physical displacement is involuntary and rarely voluntary whereby people are forcedly leaving their homes or places of habitual residence in the cast involuntary.

Economic Displacement: Displacement that occurs when individuals or communities are restricted, partially or fully, in their access to land or resources that are important

to their means of livelihood or economic well-being and, as a result, more limited in their ability to exist in or effort in a given location.

Livelihood: People's necessities of life – are food, water, shelter, clothing, and medicine – as well as wage-based income, agriculture, farming, foraging, and other natural resource-based occupations, as well as commerce and exchanging.

2.5 Conceptual framework

Conceptual framework on earthquake induced displacement and livelihood shift has been developed based on the review of the theories on earthquake induced displacement. Studies conducted outsides Nepal have revealed that linkage between disaster and shift in livelihood pattern. Based on the above literatures and the frameworks, this study has developed a concept shown in following figure that clearly simplifies the status of the affected population vulnerable to displacement/migration depending on the positive or negative effects on the livelihood variables (the independent variables) due to the earthquake. The concept describes the 2015 earthquake ultimately impacted to the livelihoods and resulted seen livelihood shift.

Independent variables: This study covers some part of the social capital related are independent variables like, a place of origin, caste/ethnicity, residence, sex, religion.

Dependent variables: considers five dimensions of livelihood capitals included are remittances, credits, monthly income/employment and bank accounts/savings, the physical capitals such as livelihoods facilities, basic amenities, and place of destination are the dependent variable in this study.

Exposure refers: Location (Geography of the origin, how was the difficulties living there), People (Population characteristics, social, networking), infrastructure (facilities at the origin, road and transport, health institutes, education institutes) and homes (style, structure, composition)

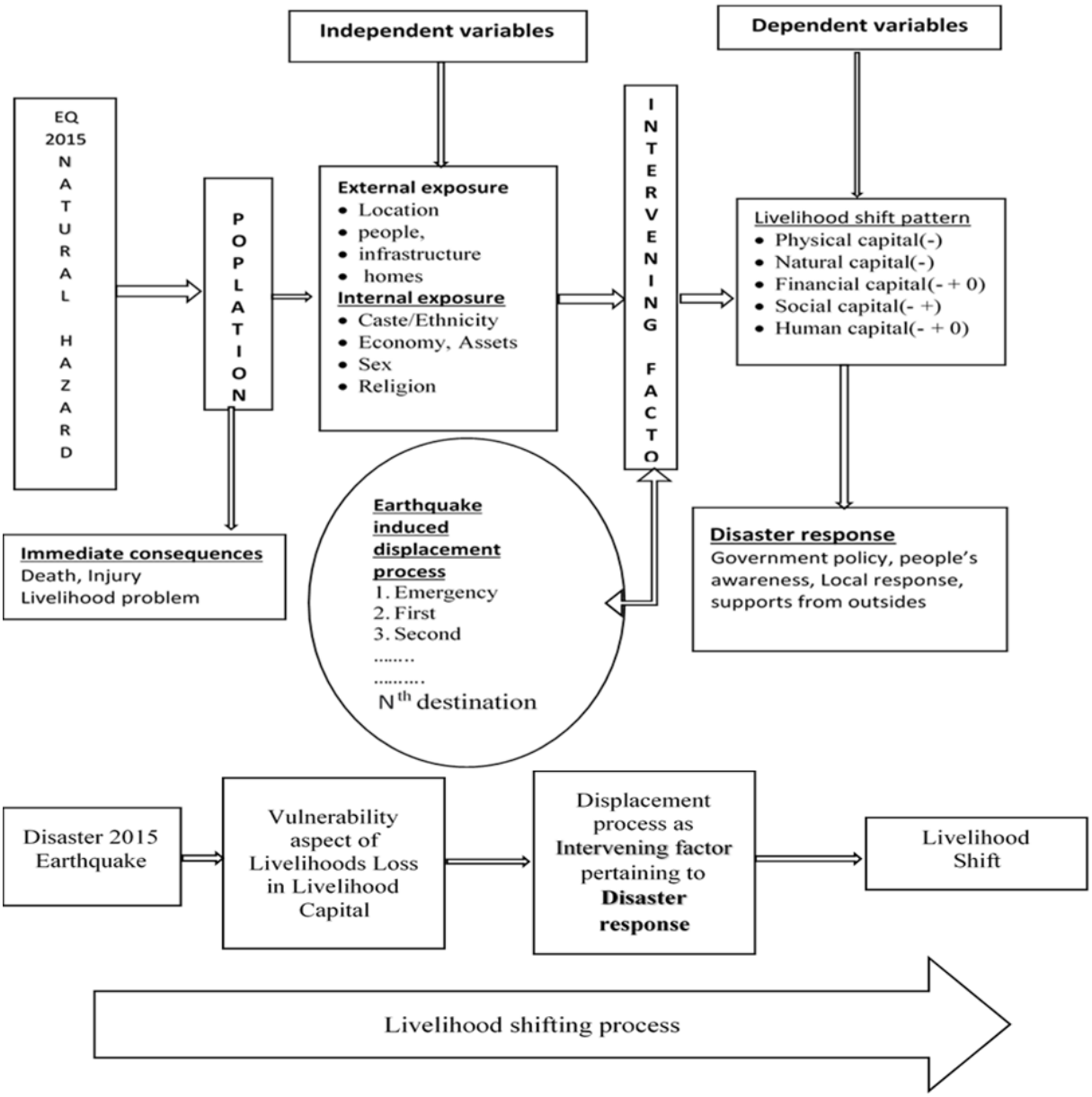
Immediate consequences faced are death, Injury as well as problem in Livelihood such as at the location, to the people and infrastructure and homes less made.

Vulnerability aspect: Vulnerabilities according to the caste/ethnicity, economy, assets, sex and religion.

Livelihood shift pattern, the intervening factors of livelihood shift in brief five capitals physical, natural, human, financial, and social. Details are explained in the

Annex: IX. The concept describes the 2015 Earthquake ultimately impacted to the livelihoods and ultimately resulted livelihood shift of the affected population. On choosing place of destination weather the displacement ultimately ends they can decide based on their probability of improved and sustainable livelihoods in comparison to before the earthquake they can trust.

Figure 2. 4 Conceptual framework



Source; Source: Developed based on previous literature reviewed

Process of displacement has been taken as intervening factors affecting livelihoods. The natural response as such; the first move starts from emergency place to first, second, third…..and last nth destination (more than third destinations)In our study nth means 4th mobility. Livelihoods of affected population are influenced by Government recovery program too. They have been influenced by disaster response of the Government policy; facilitation, support, people's awareness (Percussion made pre-disaster and post disaster), local response (how themselves prepared, community efforts made), and supports from outsides (responses from supporting agencies INGOs like Red Cross).

2.6 Summary

This review defines the conceptual model for the study. It also discusses the conceptualization of the keywords and their interrelationships, dimension and magnitude of the displacement, migration and earthquake Impacts on- Livelihoods and overall mitigation of the impacts. Hundreds of literature were reviewed to be aware of earthquake induced displacement and livelihoods. The objective of this review was to revise past studies (national and international studies made) on the situation of the impact of earthquake /disaster-induced displacement and livelihoods.

From different angles, my study topic is relevant to these studies such as – relation between the earthquakes, migration, vs. displacement. And dynamism of the impacts on the social, economy, demographic, infrastructure, gender, trafficking, conflicts and so on. It has helped me to explore the impact from and from different angles. It describes the human population to see the changes in its demography in terms of mortality, injury and displacement and, to the extent possible, identify risk factors associated with these outcomes and finally see the analysis made on the impact of the earthquake on livelihoods. There is compelling evidence that disasters have an impact on migration and human mobility. The link between natural disasters and displacement vs. migration is common for academics working on humanitarian, development, or migration issues. Therefore, the review feeds me to explore and analyze my topic from multiple angles of human livings after the disaster.

The earthquake and associated damages have had a major socioeconomic impact in Nepal; almost all aspects of life have been affected and the lives and livelihoods of 8 million people have directly threatened. According to the NPC report, the total value

of the damages and losses to the education is estimated to Rs 31,317. More than 80 percent of the damages and losses were in the 14 most-affected districts, with the damages amounting to Rs. 22.375. Considering the health risk of epidemic and disease outbreak, Health Emergency Operation Center established a hospital-based post-earthquake surveillance system to cover public and private hospitals in the 14 highly affected districts. According to the report of PDNA published in NPC, the total estimated damages to tangible heritage are Rs 16.9 billion million. The earthquake damaged a large number of cultural and heritage sites in Nepal. The estimates of the value of losses and damages in the agriculture sector amount to about Rs 28,366 million. Similarly, the commerce and industry sectors too are affected severely and are one of the major sectors play a key role in the economy. The PDNA Team has published a summary of disaster effect after earthquake where the social, cultural and economic sectors and sub-sectors losses are presented. It is shows the losses in the social, environmental and economic sectors of Nepal and it requires millions of US Dollars to recover the losses.

The revision shows the human population to see the changes in its demography in terms of mortality, injury and displacement and, to an extent identify risk factors associated with these outcomes, finally receive the analysis made on the impact of the earthquake on livelihoods caused by earthquake induced displacement. This revision was also learning about dimension and magnitude as well as the impacts of the earthquake from different countries. It has helped me to explore the impact from different angles. Evidences show that a consequence of disaster has direct implication on migration and human mobility. The link between natural disasters and displacement vs. migration is common in the academic field working on humanitarian, development, or migration issues. A research framework has been developed to guide the entire research process.

Chapter 3

METHODOLOGY

This chapter deals with the methodology of the study adopted. The chapter begins by dealing with the research philosophy of this research and moves on dealing with research design, research sites, sampling procedures and sample size allocation, sources of data. It also deals with the validity issue, potential bias and ways to mitigation of such biases.

3.1 Research design

This was a basic research design is both exploratory and explanatory. It has mapped the impact of the earthquake on the livelihoods of people as well as migration patterns. The impact was assessed by obtaining retrospective information of the households before the earthquake on different indicators and was compared with the present situation of those households. Quantitative information, as well as the narratives of the earthquake victims, was developed to assess the impact of the earthquake. Secondary information about the earthquake-affected population was obtained from the National Reconstruction Authority (NRA), District Reconstruction Committee (DRC), Local Governments and other relevant line agencies in the districts.

3.2 Source of data

Secondary data

This study was done using primary and secondary data. Secondary data consists of Journal articles, newspapers, research reports. Secondary data was collected from various sources such as National Reconstruction Authority (NRA), Central Bureau of Statistics (CBS), Institute of Migration (IOM) and other relevant sources regarding the recent earthquake. Besides, the Report of the National Planning Commission, UNDP on earthquake has been the source for review to understand the Government of Nepal's present policy to address the problem. Further, the progress report and policy of the Earthquake Reconstruction National Committee were extensively and critically reviewed.

The primary data

Once the primary field was carried out in a rapid survey, an in-depth analysis was carried out as an outline for further surveys for both quantities and qualitative surveys. Guided by the primary analysis report, a structured questionnaire and a checklist of the qualitative information were prepared to focus on the objectives of this study. About three months were spent in the study field for both qualitative and quantitative surveys before the quantitative survey structure questionnaire was developed and a detailed survey conducted after the pretest of the questionnaire and gap in the questionnaire was filled. After the tentative and rapid analysis of the collected data, the checklist prepared for qualitative information was revived based on the rapid analysis report. As the KoBo Toolbox was used to collect structured data, it was easier to see the immediate report of the data analysis. Finally the Key Informants Interview (KII), Case study, Focus Group Discussion (FGD) was conducted to fill the gap of the information collected from a structured questionnaire and additional proof/support evident to the structured data.

Primary data were collected using structured interviews with the affected households, key informants interview and through using the case study. The structured interview generated the quantitative data while the FGD and case study generated qualitative information.

Quantitative Data

For the affected households, a structured questionnaire was administered which captures the information such as background/basic information, households/demographic questionnaire such as age, sex, marital status, individual questionnaires, such as socio-economic and health, individual household impact questionnaires such as displacement and its process, and displacement and migration and migration trend (see Annex V, details of the questionnaire).

Qualitative Information

To supplement the information obtained from the household survey of the earthquake-affected households, qualitative information was collected using the tools including the participatory research method such as observation, FGDs, narratives. The researcher also observed the present situation of the research area during the field visit regarding the livelihood condition of the research site and its population to perceive

their actual situation. A standard format for the observation was developed and filled (Annex VIII shows details of respondents).

The researcher stayed for about three months in the field to gather the above-mentioned qualitative data. The researcher visited all the research areas during the entire process of writing the thesis and shared the findings of the study with the stakeholder like the district NRA office, ward chairman and validate the results. In each sampling district, at FGDs with the community people were conducted to understand the common impact that arose from the earthquake and the community coping mechanisms adopted. Similarly, in-depth interviews were conducted across the survey districts with the key district line agencies especially. In the case of studies, KII was collected (Annex VIII shows details of respondents).

3.3 Sampling procedure

The sampling procedure involves following three stage of selection at the beginning.

(a) In the first stage

Districts were purposively selected among the 14 hard-affected earthquake districts; these are Sindhupalchok and Rasuwa which lie in the central hills and mountain of Nepal. Research assumption was the selected district can represent all the 14 hard-hit districts because the social characteristics of the affected population are almost the same in all hard hit districts except the Kathmandu valley. The housing structures in those districts were almost the same and the same nature of impacts could be assumed.

(b) In the second stage

The NRA reallocated most earthquake affected communities within two selected districts were selected six rural municipalities from Rasuwa and 10 rural municipalities from Sindhupalchok.

(c) In the third stage

One household in each two affected households was systematically selected from each relocated settlements. The selected were (those who received Rs. 200,000 for purchasing land and Rs. 300,000 for construction of house from government to purchase land for house construction) government supported and relocated areas were

Nepal Government planned for permanent relocation of the households in those districts.

Sample selection process are respectively, numbering of the study households, simple random method was applied to select the households to be enumerated, and finally enumeration was done after the selection.

(d) Sample size determination

Selection processes are respectively, numbering of the study households, simple random method was applied to select the households to be enumerated, and finally enumeration was done after the selection. The universe for the study was the total number of relocated households by the Government of Nepal in the studied districts. According to Government record, there were 745 relocated households in Sindhupalchok district and 780 households in Rasuwa district – thus comprising of 1525 households as the universe for this study (NRA Head office recorded until the date of 13 Sept 2018).

Table 3.1: Distribution of households recorded by affected by earthquake in the study Districts

	%	N
Sindhupalchok	49	745
Rasuwa	51	780
Total	100	1525

Given this universe, the sample size was determined based on the following formula:

Sample size (n) = $\frac{z2*N*(1-P)}{ME^2(N-1)+(z2*P*(1-P))}$

With the probability of success 0.5 at a 95 percent confidence level for a 0.05 error margin Where, P = probability of success = 0.5, z^2 = square for the specified confidence level (95%) at 1 d.f = 3.841, N = Population size, ME = Desired Marginal error (expressed as a proportion) =0.05, n = required sample size, 9 to 10 percent extra data was collected for possible non-response error.

Following is the study samples selected using to Sample size distribution method according to municipalities included in the Study Survey District – Research municipalities.

Table 3.2: Proportion of sample determined

Sindhupalchok	Numbers of reallocated Households by NRA		Households Surveyed	
	Proportion			
	N	%	N	%
Belafi Municipality	19	1.2	8	1.22
Bhotekoshi Rural Municipality	14	1.0	6	0.95
Gati Rural Municipality	29	1.9	13	1.9
Gaumba Rural Municipality	27	1.8	12	1.77
Indrawoti Rural Municipality	212	13.9	93	13.9
Jugal Rural Municipality	23	1.5	10	1.5
Lampate Rural Municipality	13	0.8	6	0.82
Listikot Rural Municipality	226	14.8	99	14.8
Melamchi Municipality	168	11.0	74	11
Tatopani Rural Municipality	14	1.0	6	0.95
Total	745	48.8	327	48.81
Rasuwa				
Dadagaon Rural Municipality	210	13.7	92	13.7
Haku Rural Municipality	486	31.8	213	31.8
Kalika Rural Municipality	6	0.4	3	0.41
Kispang Rural Municipality	27	1.8	12	1.77
Lachyang Rural Municipality	41	2.7	18	2.72
Uttargaya Rural Municipality	10	0.7	5	0.68
Total	780	51.2	344	51.20
Grand Total	1525	100.0	671	100
Non response (9-10) %			64	
Total sample surveyed			735	

Note: The total number of households relocated was obtained from NRA Head office recorded until the date of 13 Sept 2018. The additional 64 HHs enumerated 4 hhs from each municipality.

(e) Qualitative information collection

Number of FGD, KII and Case study conducted according to study district (Table 3.3)

Following numbers of individuals have been selected based on the information saturation

Table 3.3: Qualitative information details

Types of tools	Sindhupalchok	Rasuwa	Total
FGD	3	4	7
KII	10	6	16
Case study	10	8	18

Annex VIII Details of participants

FGD = All together seven FGD implemented, three male and three female group and one mixed group. There was not any numbers of FGD fixed, based on the required

information sufficiency and repetition of information after reached seven groups, therefore, the number limited in seven.

KII = 11 male and 5 female, social worker, municipality secretary, campus chief, INGOs staff, NRA staff at local, vice chairperson of municipality. Numbers of KII determined based on the information sufficiency.

Cases studies = 7 female, 11 male, key persons from community, women group, cooperative, user's committee. . Numbers of case study was managed based on the information sufficiency.

- Selection of FGD participants; FGD need to be prepared carefully through identifying the main objective(s) of the meeting, developing key questions, developing an agenda, and planning how to record the session. The next steps were identified and invite suitable discussion participants; the ideal number is between six and eight.
- The applied (and simplest) method for selecting participants for focus groups was "purposive" or "convenience" sampling. Selected those members who will provide the; 1. Best information 2. Having exposure of community
- Selection of KII
- Selection of case study individuals

3.4 Pilot survey and training to the enumerators

In order to test the survey instruments and finalization of the methodology, the researcher visited some relocation areas in Sindhupalchok and Rasuwa districts. **The first visit** was made at the district headquarters and met with NRA staff. In some Rural municipalities, the chairperson of respective municipalities, ward chairperson and staff working at earthquake projects were met and discussed the situation and impacts of earthquake and took input for the proper survey (Please refer to Annex VI, VII, VIII)

Researcher has also visit to NRA office at the Singhadurbar on 11-29-2018 to obtain data of displaced population for which NRA was providing economic support and also collected data surveyed by CBS. CBS has conducted on June 11, 2017, the first phase survey in 11 most affected districts Dolakha, Ramechhap, Okhaldhunga, Sindhupalchok, Kavrepalanchok, Sindhuli, Makwanpur, Dhading, Nuwakot, Rasuwa and Gorkha. Adjoining districts Rasuwa and Sindhupalchok were selected as sample

districts as the most affected districts. With reference to the CBS data, a Pilot Study was carried out in November 18-21, 2017 in Rasuwa and in November 1-3, 2017 in Sindhupalchok. The pilot study facilitated us to identify the research sites, the number of families displaced, affected individuals and identification of stakeholders.

A second visit to the sending area or the origin of the victims was made. Basic information about their destination was noted based on the local information available and NRA data and a third visit was made at the current residence of the respondents. At the beginning of the third visit the researcher visited rural municipalities and consultations made with respective ward chairperson and ward members. Then, enumerators were recruited with consultation of the ward chairperson / members. Most of the enumerators hired were well experienced on a recent survey conducted by NRA. The training was designed and conducted at each district headquarter.

In each district, two enumerators were recruited and they were given orientation on the questionnaire and sampling method. Training for enumerators in Rasuwa was given in Betrawoti where Nepalseva Laghubitta office a microcredit bank helped for accommodation, training hall and refreshment. Training for enumerators for Sindhupalchok was conducted in Talamalang with the help of an NGO called Center For Energy and Environment Development.

The survey was conducted at the current residence where the individual families were residing coming from different affected communities of the study district.

3.5 Data management

Quantitative data was collected using KOBO Tool Box is a free open-source tool for mobile data collection) and pulled into Statistical Package for the Social Sciences (SPSS/PC) after recording the open-ended questions. Data was edited as required, checked for consistencies then analyzed as a requirement of the study objectives.

The final draft questionnaire was prepared after the pretest and final shape was inserted in the KOBO tool. A paper questionnaire was also printed for emergency use when mobile batteries did not work. KOBO tool was used for the survey of the research. KoBo Toolbox is a free open-source tool for mobile data collection, available to all. It allows us to collect data in the field using mobile devices such as mobile phones or tablets, as well as with paper or computers.

Data did not need to be transcribed from paper to computers before it can be analyzed. Some analyses can be applied within minutes of the data is collected directly. It is much more accurate. Enumeration errors are minimized because of the data validation that can occur in real-time as data is collected. Transcription errors were eliminated.

Selected affected families/households for developing narratives; Narratives of the victims of the earthquakes was developed to map the impact of the earthquake and coping strategies adopted. Narratives were developed from the family in which i) deaths occurred; ii) injured happened and those iii) abused, exploitation or violence.

3.5.1 Pretest and triangulation

Pretest of the questionnaire was made after the full structured questionnaire was developed and presented the questionnaire among the experts and supervisor; finally, the final questionnaire was printed and programmed into the KOBO TOOL Box. KOBO TOOLBOX is a free open-source tool for mobile data collection, available to all. It allows you to collect data in the field using mobile devices such as mobile phones or tablets, as well as with paper or computers. At the peak of the mountain, the mobile battery does not work due to low temperature, and then the printed questionnaire was used to collect the data.

This is a way of assuring the validity of research through the use of a variety of methods to collect data on the same topic, which involves different types of samples as well as methods of data collection. Methods triangulation was used for the consistency of findings by using different data-collection methods. The methods were all qualitative, for example, unstructured interviews and observation, were used.

The outcomes of the result were presented as well and collected the comments and inserted the comments for a relevant result.

3.5.2 Potential bias and limitation

There is some methodological limitation in the research such as sample and selection, which avoided using sampling techniques and statistical formula. Sample size determination also made using a sampling technique that has been used by Central Department of Population Studies (CDPS), Central Bureau of Statistics (CBS), etc. During the initiation of the study, there are rare studies made on these topics, but later on, studies made by CDPS, IOM (2016) other national and international research articles were reviewed. Some lack of previous academic research studies on the topic

was still there. The data used in this study was primary, there was limited secondary data regarding this topic was felt lacking therefore, felt limited access to data. The volume of data makes analysis and interpretation time-consuming. The researcher's presence during data gathering, which is often unavoidable in qualitative research, can affect the subjects' responses. Potential bias such as time constraints and funding constraints are the major challenges for this study, the 735 households surveyed were made much quality as far as possible. KOBO Toolbox was used during the survey mobile network and access to the network was challenging. It means potential bias does not mean that the work presented has been compromised.

3.5.3 Validity and reliability of findings

To increase the validity of the informants and findings, the research attempted to triangulate the information collection methods, that is, the same information was asked to different locations to different people by using different survey tools. Further, the researcher organized pilot test half-day sessions in each survey district to validate the findings of the study among the community people and the district level stakeholders.

The sample taken was 735 households among the 1525 households allocated by the NRA, which was more than 50 percent of the total Households allocated by NRA using the formula (in the paragraph of determination of sample). Therefore, the research result may generalize for other relocated areas including in the non-sample districts.

Both quantitative and qualitative methods used for analyzing the data. Structure questionnaire were pretested and data was analyzed in first phase, the result was compare with respect to the specific objective of the study then the questionnaires were managed and filled the gap then final questionnaire was designed. Enumerators transfer the data every day to the researcher and verified the tentative result every day as well proper instruction was given to the enumerators on the spot as required.

Data collected were analyzed and checked for unmeet information to meet the objective. Check list were prepared to gather the required qualitative information (using FGD, KII, Case studies), also in some instances similar quarries were used for cross verification. Methods of triangulation were used to support the output of

quantitative analysis. Observation and unstructured interviews helped for the cross verification of the output.

Measures of livelihood and Displacement were seriously reviewed, based on the livelihood components, Multidimensional Poverty Index (MPI) have been calculated using SPSS. Five capital indexes were developed and compare before and after the earthquake and measured using standards norms.

As explained earlier different statistical tests have been applied to understand level of significances.

3.5.4 Method of measurement and data analysis

SPSS/Pc + was used and analyzed data. During the entire span of all the processes above mentioned rigorous discussion with Co-supervisor and supervisor. Following the instruction of both the report was finalized and presented and submitted to the co-supervisor and then finally it was submitted to the supervisor. During the process, many revisions of the text were made and inserted the suggestions and comments instructed by the supervisor for final submission. Sources of data are primary, secondary, qualitative and quantities in nature.

The *independent variables* for this study considered are study district, caste/ethnic group, economic strata, and sex of the households.

The *dependent variables* in the study considered are five capital asset physical, natural, social, human capital and financial capital.

Simple statistics such as frequency, cross-tabulation, central tendency, scatter bar diagrams were used. If required, advanced statistical tools such as Chai square, t-test, were used to prove the outcomes of the study results.

(a) Chi-Square Test:

Cross tabulation and chi-square tests have been applied to examine the relationship between the status of migration and various independent socio-economic variables and household status categories and to test whether the interrelationship had been statistically significant or not. The mathematical form of Chi-square test is:

χ^2 = L (Oi-Ei) 2/El

Where, Oi = Observed frequencies, Ei = expected frequencies, i = 1, 2, ... n.

Null hypothesis (H_0}: The null hypothesis for the Chi-square test for independence states that two variables being measured are independent (It implies that there is no association between variables under considerations).

The alternative hypothesis (H_1): There is a consistent and predictable relationship between the two variables under study.

Decision rule: Accept the null hypothesis if the calculated value is less than or equal to the tabulated value and if the calculated value is greater than the tabulated value then reject the null hypothesis with (c-1) (r-1) degrees of freedom at a given level of significance.

The T-test (paired) and f-test were applied to check associations and significances.

"F Test" is a catch-all term for any test that uses the F-distribution. In most cases, when people talk about the F-Test, what they are actually talking about is The F-Test to Compare Two Variances. However, the f-statistic is used in a variety of tests including regression analysis, the Chow test and the Scheffe Test (a post-hoc ANOVA test).

A t-test is a type of inferential statistic used to determine if there is a significant difference between the means of two groups, which may be related in certain features. It is mostly used when the data sets, like the data set recorded as the outcome from flipping a coin 100 times, would follow a normal distribution and may have unknown variances. A t-test is used as a hypothesis testing tool, which allows testing of an assumption applicable to a population

(b) Multidimensional Poverty Index (MPI)

In order to classify the households by economic strata, this study used the Multidimensional Poverty Index (MPI) or level of economy. The MPI was calculated by following Oxford University (2010) measurement procedure. The MPI identifies multiple deprivations at the individual level in three dimensions i) education, ii) health and iii) standard of living. It uses micro data from household surveys and all the indicators needed to construct the measure must come from the same survey. In this measure, each person is assigned a deprivation score according to his or her household's deprivations in each of the 10 component indicators as listed in Table 3.4. The maximum score is 100 percent, with each dimension equally weighted; thus the maximum score in each dimension is 33.3 percent. The education and health

dimensions have two indicators each, so each component is worth 33/2, or 16.7 percent. The standard of living dimension has six indicators, so each component is worth 33.6/6, or 5.6 percent. The threshold indicators and weight of each indicators are presented in the table 3.4 thus,

Table 3.4: Theoretical assigned to indicators and weights calculate the MPI dimension

Indicator	Weights
A. Education	
1. No one has completed five years of schooling	1/3 ÷ 2 or 16.7%
2. At least one school-age child not enrolled in school	1/3 ÷ 2 or 16.7%
B. Health	
3. Having at least one household member who is sick during the past year	1/3 ÷ 2 or 16.7%
4. One or more children have died	1/3 ÷ 2 or 16.7%
C. Living conditions	
5. No electricity	1/3 ÷ 6 or 5.6%
6. No access to clean drinking water	1/3 ÷ 6 or 5.6%
7. No access to adequate sanitation	1/3 ÷ 6 or 5.6%
8. House has a dirt floor	1/3 ÷ 6 or 5.6%
9. Household uses –dirty cooking fuel (dung, firewood or charcoal)	1/3 ÷ 6 or 5.6%
10. Household has no car and owns at most one of a bicycle, motorcycle, radio, refrigerator, telephone or television	1/3 ÷ 6 or 5.6%

Source: University of Oxford, 2010

To identify the multidimensional poor, the deprivation scores for each household are summed to obtain the household deprivation, *c.* A cut-off of 33.3 percent, which is the equivalent of one-third of the weighted indicators, is used to distinguish between the poor and non-poor. If *c* is 33.3 percent, or greater, that household (and everyone in it) is multidimensionality poor. Households with a deprivation score greater than or equal to 20 percent, but less than 33.3 percent, are vulnerable to or at risk of becoming multidimensional poor. Households with a deprivation score of 50 percent or higher are severely multi-dimensionally poor.

The MPI value is the mean of deprivation scores *c* (above 33.3%) for the population and can be expressed as a product of two measures: the multidimensional headcount ratio and the intensity (or breadth) of poverty.

The headcount ratio, *H*, is the proportion of the population who are multidimensional poor:

$$H = \frac{q}{n}$$

Where *q* is the number of people who are multidimensionality poor and *n* is the total population.

The intensity of poverty, *A*, reflects the proportion of the weighted component indicators in which, on average, poor people are deprived. For poor households (*c* greater than or equal to 33.3%), the deprivation scores are summed and divided by the total number of poor persons:

$$A = \frac{\sum_1^q \mathrm{c}}{q}$$

Where *c* is the deprivation score that the poor experience.

The deprivation score *c* of a poor person can be expressed as the sum of deprivations in each dimension *j* (j = 1, 2, 3), $c = c_1 + c_2 + c_3$.

The contribution of dimension *j* to multidimensional poverty can be expressed as

$$Contrib_j = \frac{\left(\sum_1^q \mathrm{c_j}\right)/n}{MPI}$$

Note: 1 indicates deprivation in the indicator; 0 indicates non-deprivation.

Note 2: The two categories presented in the above paragraphs further can be separated in to four categories as following, Non poor category equivalent to Non poor plus vulnerable to poor, and the Non poor category equivalent to severely poor and poor category, therefore the shape of the table can be presented as following;

MPI dimension **(Economic strata)**
Total poor = Non- poor + Vulnerable to poor
Poor = Poor + Severely poor

(c) *Livelihood capital assets index development methodology*

Dart (2007) shows relative to the characteristic features of the study area regarding to five capitals, such as natural resources, human capital, natural capital, physical capital, financial capital, and social capital and literature search, an evaluation index system was designed as follows.

The first is the criterion section where the different types of capitals (human capital, natural capital, physical capital, financial capital, and social capital) considered in the system of evaluation index are listed. In this study total of 735 households are being enumerated the quarries regarding the natural resources, human capital, natural capital, physical capital, financial capital, and social capital before and after the 2015 earthquake was answered from the field.

1. Natural capital includes land uses and productivity, drinking water, agriculture scope
2. Human capital includes health status of household members, educational level of the household members and household labor capacity, sources of income;
3. Financial capital includes cash incomes and loan, bank access, bank saving, remittances
4. Physical capital includes livestock ownership, housing facilities
5. Social capital includes social networks, membership in social organization, supports from

Relative to the characteristic features of the study area, such as natural resources, human capital, natural capital, physical capital, financial capital, and social capital and literature search, an evaluation index system was designed as follows.

Following table shows reference indicator for five livelihood capital with evaluation indices followed by survey question for each indicators.

Development of the ***Livelihood capital assets index and*** Calculation of Combined Livelihood Asset Index

$$Weighted\ Average = \frac{Sum\ of\ Weighted\ Terms}{Total\ Number\ of\ Terms}$$

Table 3.5: Livelihood capital assets index

CAPITAL	Sub concepts	Indicators	Value	Code used in SPSS/PC directory
Natural	N1. Access to Natural Resources and farmland	□ Access to farm Land BEQ □ Access to farm Land AEQ	Less than 5 ropanies= 0 5 and above = 1	NI_1_BEQ NI_1_AEQ
	N2. State of Natural Resources Available to communities	□ Access to forest BEQ and AEQ	Yes = 1 No =0	NI_2_BEQ NI_2_AEQ
	N3. Access to kitchen gardening	□ Access to kitchen gardening BEQ and AEQ	Yes = 1 No =0	NI_3_BEQ NI_3_AEQ
	N4. Land Productivity	□ Families having production from Land cultivation BEQ	Yes = 1 No = 0	NI_4_BEQ NI_4_AEQ
	N5. Access to drinking water	□ Access to safe drinking water	Yes = 1 No = 0	NI_5_BEQ NI_5_BEQ
Natural capital index = SUM(REFERENCE INDICATORS N1: N5), Index value ranges for 0 to 5				
Human	HI1. Access to skill	□ Household's member having IG skilled or not how many skills and with whom?	Households having at least one member IG skilled = 1 Households having none members have any IG skill = 0	HI_Skill_BEQ and skill AEQ
	HI2. Source of income	□ Having one source of income and □ More than one source of income	Having => one source of income = 0 Having more than one source of income = 1	HI_7_Income_Source_index_BEQ HI_7_Income_Source_index_AEQ
	HI3. A household with economically active aged family member	□ Numbers of family members are aged 0-14, 15 59 and 15 +	Household having at least one family member economically active age = 1 Household having none family member economically active age = 0	HI_ecoactive_BEQ_4 HI_ecoactive_AEQ_4
	HI4.	□ If there are	Yes = 1	HI_5_BEQ_3

	Household having Disable person	disable in any households	No = 0	HI_5_AEQ_3
	HI5. Level of Education of each Household member	Households having at least one member is educated and level of education versus age	If anyone of the family member passed 10 or SEE is educated family = 1, If none of the family members passed 10 or higher = 0 score	HIEdu_Index_AEQ_5 HI_Edu_Index_AEQ_5
Human capital index = SUM (REFERENCE INDICATORS H1: H5), Index value ranges for 0 to 5				
Financial	F1. Access to credit	A household member having bank account vs. sex	Yes = 1 No = 0	FI_1_BEQ FI_1_AEQ
	F2. Level and form of savings	Households' members having cash saving amount	Saving AEQ 1. Yes = 1 2. No = 0	FI_2_BEQ FI_2_AEQ
	F3. Access to remittances	Migrant's households and receiving remittances access	Yes = 1 No = 0	FI_3_BEQ FI_3_AEQ
	F4. Monthly income	Monthly income amount BEQ and AEQ	Till Rs. 3000 = 0 More than 3000 = 1	FI_4_BEQ FI_4_AEQ
Financial capital index = SUM (REFERENCE INDICATORS F1: F4). Index value ranges for 0 to 4				
Physical	P1. Livestock ownership			
	P2. Source of light BEQ/AEQ	What source of light	Solar or electricity = 1, Others = 0	PI_2_BEQ
	P3. Source of cooking fuel BEQ/AEQ	What source of cooking energy	Electricity, Gas or solar = 1, Others = 0	PI_3_BEQ PI_3_AEQ
	P4. Access to toilet BEQ/AEQ	Open defecation or toilet	Yes = 1, No = 0	PI_4_AEQ PI_4_BEQ

	P5. Access to TV BEQ/AEQ	□ Households having Television	Yes = 1, No = 0	PI_television_5_BEQ PI_television_5_AEQ
	P6. Grinding tool	□ Households having daily using machined such as Grinding tools	Yes = 1, No = 0	PI_6_BEQ PI_6_AEQ
	P7. Almeria	□ Households having Almeria	Yes = 1, No = 0	PI_Almira_6_BEQ PI_Almira_6_AEQ
Physical capital index = SUM (REFERENCE INDICATORS P1: P7). Index value ranges for 0 to 7				
Social	Si_1. Religious and cultural insistence	□ Worship of god and goddess □ Yearly Cultural participation □ Traditional occupation □ Continuation of Traditional occupation	Question (1202+1203+1204+1207 +1208) Yes = 1 No = 0	Si1_1 Si1_2 Si1_3 Si1_4 Si1_5
	Si_2. Support received	□ From social organization/ GO/NGs et	Yes = 1 No = 0	Si1_6
	Si_3. Social participation	□ Membership in organizations (the type of organization, services, activities, organization sustainability)	Participation in social organization/GO/NGOs etc. = 1 No Participation in social organization/GO/NGOs etc. = 0	Si1_7
Social capital index = SUM (REFERENCE INDICATORS S1: S3). Index value ranges for 0 to 3				

3.6 Summary

This chapter deals with the methodology of the study adopted. The chapter begins by dealing with the research philosophy of this research and moves on dealing with research design, research sites, sampling procedures and sample size allocation, sources of data. It also deals with the validity issue, potential bias and ways to mitigation of such biases.

This is basic research design used was both exploratory and explanatory. This study was carried out using primary and secondary data used Quantitative data a structured questionnaire was administered which captures the information required. A pretest of the questionnaire was made after the full structured questionnaire was developed and presented the questionnaire among the experts and supervisor; finally, the final questionnaire was printed and programmed into the KOBO TOOL Box.

A pilot survey and training to the enumerators to collect quality information, to test the survey instruments and finalization of the methodology, the researcher visited several relocated (by NRA) areas in Sindhupalchok and Rasuwa and districts. Three stages of the sampling process were adopted. In the first stage, two districts Sindhupalchok and Rasuwa were purposively selected from 14 hard-affected earthquake districts in the second stage, the NRA reallocated most earthquake affected communities within the selected two district was selected and in the third stage, one household in every two affected households from relocated settlements was samples. Sample size determination was also made following the sampling technique used by other studies such as CDPS and CBS. Qualitative information was collected to supplement the information obtained from the household. Tools such as participatory research method such as observation, KII, FGD and case studies were used.

To increase the validity of the informants and findings, the research attempted to triangulate the information. Simple statistics such as frequency, cross-tabulation, central tendency, scatter bar diagrams were used. If required, advanced statistical tools such as Chi square, T-test, was used to conform the outcomes of the study results. MPI and livelihood capital assets index were developed using five capital as well as Combined Livelihood Asset Index.

Chapter 4

CHARACTERISTICS OF STUDY POPULATION

The aim of this chapter is to set the context of the earthquake-affected populations. It highlights the geography of Sindhupalchok and Rasuwa districts – the study districts including the socioeconomic characteristics of the study population. It particularly focuses on the age-sex distribution, marital status, marital age, sex ratio and ethnicity of the study population. It also discusses the economic strata of the study population and interface between caste/ethnic groups and economic strata and also outlines to what extent the affected households were dependent upon remittance income by examining the magnitude of migration for work. This will set the context of how the earthquake has impacted these households because the earthquake has interrupted largely the remittance income to these households.

4.1 Study area

Table 4.1 shows a comparison of some selected indicators of population, human development and casualties due to the earthquake in the study districts with Nepal. In the two districts of study area, although both are designed as the mountain ecological belts, the population size, and area are much larger of Sindhupalchok district compared to Rasuwa district. Rasuwa has a much sparse population settlement as reflected by 28 population density per square kilometer vis-à-vis 141 of Sindhupalchok district.

The number of casualties is also much larger in Sindhupalchok district compared to the Rasuwa district. Numerically, 681 people were reported to have been killed in Rasuwa district while it was recorded 1,561 in Sindhupalchok district. The number of injuries was also much higher in Sindhupalchok district compared to Rasuwa district.

Rasuwa district lies in the mountain ecological belt of Nepal and administratively it lies in the Bagmati Province. According to the 2011 population census, it experienced a negative population growth rate from 2001 to 2011. In terms of caste/ethnic groups, Tamang constituted the highest percentage (70%), followed by hill Brahmin (15 %) including a total of 26 different caste/ethnicities residing in the district.

The district, with Dhunche as its district headquarters, covers an area of 1,544 km2 (596 sq mi) and has a population (2011) of 43,300. As per census 2011 total

households in Rasuwa district is 9,778. It is the smallest district by area, among 16 districts in the Himalaya region of Nepal.

Map 4. 1 Map of Nepal, Province no. 3 showing study districts Sindhupalchok and Rasuwa

The livelihood system of Rasuwa is characterized by agriculture, livestock rearing and daily wage labor principally related to agricultural activities and unskilled work. In the visited villages, the key determinants of wealth are access to cultivable land, livestock possession, employment in the private and public sector and remittances from households working in Kathmandu or abroad. Access to irrigation (i.e. motorized pump or irrigation channels) and access to the market in urban and peri-urban areas allows better income-generating opportunities.

Table 4.1: Key population characteristics and casualties

Parameter	Rasuwa	Sindhupalchok	Nepal
An area in sq. km.	1544 sq km	2542 sq. km	147,181Sq.Km
Population size (2011)	43300	285,770	26,494,504
Population density per sq.km	28	141	203
Population growth in between 2001 and 2011 (%)	-0.3	1.6	1.35
Number of households	9778	66635	5,427,302
Average family size	4.43	43.2	4.88
Sex ratio (females per 100 males)	98.4	91.7	
Life expectancy at birth in years (Total)	NA	NA	71.9 (2018)
Male (Life expectancy)	55.35	67.97	64.94
Female (Life expectancy)	54.16	51.88	67.44
Causalities due to earthquake			
Deaths	681	3,573	8970
Injuries	771	1,569	22302
Number of private houses damaged	12,212	92,635	1,072,093
Number of public heritages damaged	NA	NA	6,463
Number of public infrastructures damaged	147	718	6463

Source: Data of casualties were obtained from MoHA2016.Note; NA refers for not available

Almost 100 percent of the households are involved in agricultural activities. Most of them fall under the poorest socio-economic groups as they are seasonally employed by middle and better-off groups. Middle and better-off households do provide agricultural services (land and cultivating) to the lowest group. The primary planting season occurs during the monsoon (June - August) when millet and rice are cultivated. Maize and wheat are cultivated and harvested just before the monsoon, taking advantage of the rain between December and February.

Income-generating activities are minimal, particularly in remote hilly areas. Very poor and poor household depends on daily wage farming and construction labor. Middle and better-off households– particularly in low land area- are involved in business farming, trading and employment in public and private sectors. Remittance plays an important role in their livelihood as they migrate to Kathmandu, India, Qatar, Dubai, etc. as temporary or seasonal migration. According to the new reconstruction of Local Level Governments, there exist Rural Municipalities. Among them, they are: Dadagaon Rural Municipality, Haku Rural Municipality, Kalika Rural Municipality,

Kispang Rural Municipality, Lachyang Rural Municipality and Uttargaya Rural Municipality.

Geographically it is remote area and its social, economic and developmental status is very low and from the last few years it is facing the terrible problem of landslide and through this more than 25 people has lost their life, many people have become homeless and have lost their property and fertile land. The living of northern and western part of this district has become very difficult and the people living in these regions are facing various problems as shortage of fuel, food etc. Rasuwa district is well known for religious places and tourism. For the religious importance Gosainkunda and other religious lakes lie in this district and also here are various temples of Hindus and Monasteries of Buddhists.

Langtang and Gosainkunda regions are well known important areas for tourism and many other trekking routes are found and are developing. Red panda, which can be found in the Langtang region in the world, Langtang and Ganesh Himal peak, are attracting more and more tourists day by day. Langtang national park, which covers an area of 1710 sq km area, lies mainly in this district and covers some area of Nuwakot and Sindhupalchok districts. In these park different types of pines, 32 types of rhododendron are found.

Natural resources

Forest - Forest is one of the important natural resources. It occupies about 31.9% of the total land of Rasuwa. Forest is the source of all wood-based industries. Industries like paper, furniture and timber are based on the forest. Forests are rich in herbs. The herbs have medicinal values. Many medicines are made from these herbs. Timber and herbs are valuable natural resources. The value of timber and herbs is very high in the world market.

There are many kinds of animals in the forests of Rasuwa. Forests provide food and shelter for these animals. Animals and birds add to the natural beauty of the country. People from many countries come to Nepal to see these beautiful birds and exotic wildlife. Many types of fruit and grasses grow in forests. People depend on them for their living and also to rear their livestock.

Forests support agriculture. It also causes rainfall. It keeps the soil tight. So, forests

help control soil erosion, landslides and floods. It has established Lamtang National Parks.

Water - Water is the most important natural resource of Rasuwa. Nature has been very kind to us by providing us with unlimited supply of water. Many rivers are following in the origin of Himalayas. Around 700 MG electricity are produced and many others hydroelectricity projects are under construction. This district is hub of electricity in Nepal.

Spring water is more useful water for drinking. Export quality of water is producing here. It is one of income sources of foreign currencies. Lakes are also important sources of water. Many lakes are here.

Land/soil - In Rasuwa district, most people depend on land. They do farming and earn their living from land. Land includes soil and minerals. The cultivable land in Nepal is about 6%. About 80% of the land is rocky and covered with snow.

Soil is an important factor for agriculture. It is not possible for people and animals to live on earth without soil. The land in Terai is very fertile. It is good for agriculture. So, the productivity of Terai is very high.

In the this district, the soil is not suitable for food and cash crops. The soil has less fertility so buckwheat, barley, maize and potato can be grown.

Minerals - Minerals like slate, stone, rock, iron, magnesite, mica etc. are natural resources.

Sindhupalchok district is located in the northeastern part of the Kathmandu valley. It covers 2542 area in square kilometer. Its land surface ranges from 850 meters above sea level to 7080 meters. Its border ranges from the Himalayas (bordering with Tibet Chaina) to Kathmandu Valley. Sindhupalchok district has 79 Village Development Committees (former VDCs). Currently there are 12 Municipalities, out of which three are urban municipalities and nine are rural municipalities

According to the census of 2011, it has a total of 2,85,770 populations with 141 population density. Though Sindhupalchok district is located near capital Kathmandu, many households' livelihoods are extremely poor due to low agricultural production,

poor infrastructural development, less and poor use of available local resources and absence of markets and poor health facilities. Agriculture and livestock rearing are major means of earning for the livelihoods of the communities. Brahmin, Chhetri, Tamang, Gurung, Rai, Newar, Magar, Danuwar, Majhi and other marginalized communities are the dominant caste/ethnic groups.

There is a 56 percent active population of age group 15-24 is literate, less than 36 percent female of ages 10-34 are literate, school enrolment of young girls is less than 6 percent in the secondary level and 27 percent of a household has access to electricity. Such conditions force the young and active population to migrate outside for an alternative income source to survive. Adverse effects of the above conditions are also resulting in trafficking (i.e. parents selling their children because of extreme poverty) of especially uneducated and poor young girls and also boys who are brought to work in carpet factories and/ or stone quarries and eventually end up in prostitution or on the streets of big cities in Nepal and India (Table 4.1).

The Human Development Index (HDI) of Sindhupalchok district is far lower than the national average (0.455 vs. 0.540 in 2014) with a population of 287,798 (in 66,688 Households). The PDNA estimated that the per capita value of losses in the disaster is Rs 233,370 in this district[1].

Plate Tectonic and Earthquakes

Nepal is situated between two giant plates. Tibetan plate in the north and Gondawana or Indian Plate in the south. Intermingle between these two was Tethesis Sea during the geological time . It is said that the southern plate is slowly moving towards the north at the rate of a little more than 56+_ mm/year. The whole range of the Himalaya is unstable which is being continuously pressed, rather squeezed by a clash between Gondawana or Indian plate and Tibet or mainland Asia. It is therefore strongly stressed state. Stress is built up where one rock piles are moving over other sliding past one another in the zone of under- thrusting and overriding nappies, and in the sheer zones of faults. Some of the faults are oriented towards the mountain trend. The buildup of strain is manifest in the movement that have taken place taking place on

[1] Dharel, M., Rai, W. B., & Thapa, N. (2015). *Understanding Vulnerabilities and Strengthening Response*. Sindhupalchok.

the east –west faults in the Tibet as well as on the multiplicity of faults and thrust in the Northern part of our Himalaya.

The plate movement in the Himalaya in the last 1.6 million year and hundred different types thrust and faults in the northern part of the Himalaya have not made the land extremely difficult but it is zone of most vulnerable from the point of view of earthquake. The study are of the present is exposed of the active faults showing vulnerability from the point of view of earthquake. Both Rasauwa and Sidndupalchowk fall under this system. The earthquake that hit the country during 2015 also damages the area more than other parts of the country. The present study concentrates on the major vulnerable area from the point of view of vulnerability and its migration in the other parts of the country.

4.2 Demographic characteristics

The sub section situation analysis of demographic characteristics involves Age and Sex Composition of the Study Population, Marital Status of Study Population, Marriage, Relation with the Household Head, Living Arrangement and Family Formation, Composition of the Headship of the Household, and Dependency ratio according to selected characteristics.

4.2.1 Age and sex composition of the study population

One-third of the population was the child (less than 14 years), nearly two-thirds (62.5%) is the working-age population and fewer (5.6%) elderly for both districts. Percentage of the economically active population (15-64 years) was found higher than the national average (62.5% vs. 60.9%). Elderly population 65 years and above comprised of 5.6 percent and child population (0-14 yrs) being nearly one-third (31.9%). 31.9 percent. Male female difference among these population is almost same for 0-14 and 15-64 years whereas more females (5.8%) were counted than males (5.3%) among the elderly. See details of the table (Annex X)

The proportion of the dependent population was much higher (53%). Population less than eighteen years was 40.5 with slight more female (41.0%). The population 18 years above was 59.5 percent, slightly more female (60.0%) than the male (59.0%).

The highest population was concentrated in the age group 10-14 that was 12.1 percent. The highest percentage of the male and female population in the same age

group was 10-14 years in male and female which were 12.2 percent and 11.9 percent respectively.

Nepal - Ratio of population aged 0-14 and 65+ per 100 population 15-64 years. In 2020, total dependency ratio (0-14 and 65+ per 15-64) for Nepal was 53 ratios. Total dependency ratio (0-14 and 65+ per 15-64) of Nepal fell gradually from 78.5 ratios in 1971 to 53 ratio in 2020 (Annex X).

4.2.2 Marital status of study population

The marital status is categorized as unmarried, married, polygamy, remarried widow/widower, divorced and separated.

Three-fifths (59.6 %) of the population was married and more than one-third (35.0 %) of the population was found unmarried. The percentage of widow/widower was below 4.1 percent. The percentage of polygamy was nearly one percent (1.1). The percentage of remarried, divorced and separated was below one percent. See details of the (Annex XI)

4.2.3 Marriage

The data reveals that the proportion of never-married varies simply by age group, with the highest in the age group 15 to 19 (60 %) and age group 20 to 24 (28%), while after 25 years, the proportion of never-married tends to decline dramatically.

Median age divides a population into two numerically equal groups - that is, half the people are younger than this age and half are older. It is a single index that summarizes the age distribution of a population. In the 2011 census, Nepal's population was approximately 26 million people with a population growth rate of 1.35% and a median age of 21.6 years. In 2016, the female median age was approximately 25 years old and the male median age was approximately 22 years old.

Our study estimated the median age of 23 years and mean 26.89, showing the greater than the national average as of the median age in Nepal was 24.6 in 2020. See details of the table (Annex XI)

4.2.4 Relation with the household head

Households are groups of people who live together and share some resources. In the welfare family, we can still find a joint family- is family in which there is not only parent and children but also brother sisters and sister-in-law and daughter in law.

Household head refers to household members' relationship to the first person reported on the questionnaire for the household, listed in number 1. Also, the question about the relationship of household members to the first person reported on the household questionnaire was called the first person. A household member may be related to first-person through blood, marriage, common-law, adoption, or a foster relationship or unrelated (e.g., lodger, room-mate, or employee).

This question was used to obtain information on families, as well as the family characteristics of individuals. Survey result shows that 19 percent of the population is related to a spouse, 27 percent son daughter. 22.4 percent household heads, 27.0 percent son/daughter is 12.6 percent Daughter-in-law /Son in law, 11.8 percent are Granddaughter/Grandson and fewer were other relations (Please refer the table Annex XIII).

4.2.5 Living arrangement and family formation

The household structure and the strength of the relationship depends on the institutional context that defines parental roles and stakes in their children's marital choice and fertility behavior.

The head is the one who makes the final decision or has the final say. Studies reveal that headship and relation with the head of the family have different meanings in family rights and duty, therefore might imply the daily livelihoods (Rosenthal & Marshall, 1986).

In Sindhupalchok district, 21.5 percent of the household head was the interviewee, 17.2 percent of the household’s head were spouse., 29.2 percent were son/daughter in law, 13.2 percent were daughter/ son in law, 1.5 percent were a mother in law/father in law, 4.3 percent were brother/ sister and 13.0 percent were granddaughter/grandson. In Rasuwa district, 23.5 percent of the household’s head were interviewee themselves, 20.9 percent were spouse, 24.8 percent were son/daughter in law, 12.1 percent were daughter/son in law, 0.7 percent were a mother in law/father in law, 7.3 percent were brother/sister, 10.7 percent were granddaughter/grandson.

In a household with a female head, 24.8 percent of the head were interviewee themselves, 14.8 percent were spouse, 27.4 percent were son/daughter in law, 10.6 percent were daughter/son in law, 1.9 percent were a mother in law/father in law, 6.3

percent were brother /sister and 14.3 percent were granddaughter/grandson. In a household with a male head, 22.0 percent of the head were interviewee themselves, 19.8 percent were spouse, 27.0 percent were son/daughter in law, 13.1 percent were daughter/son in law, 1.0 percent were a mother in law/ father in law, 5.7 percents were brother/sister and 11.4 percent were granddaughter/grandson. The survey reflects that male-headed households are the prime respondents of the survey as compared with female respondents. The reason is male availability and less burden of work on them than the female community. Hence, overall from the above table, we can see that the highest percentage of the household head were the interviewee themselves while the least ones were `the mother-in-law/father-in-law (Annex XIV).

4.2.6 Composition of the headship of the households

The household head till age 20 was only one person who is male. In the age group '20 to 39', 18.6 female and 81.4 percent are household head. According to the age group, the highest percentage of males (83%) was found in the age group 40-49 and a similar trend in the other age group was found. All together 20 percent female and 80 percent are male household heads observed in the study area.

District wise household head found different in two districts, the percentage of female household head in Sindhupalchok (26 %) is greater than of Rasuwa (14.3%). Interestingly, the household head scenario was different according to the social group, female household head found the highest percentage in Brahmin/Chettri (36%) followed by Janajati marginalized and Dalit (Annex XV).

4.2.7 Dependency ratio according to selected characteristics

Here, the male (61.6) dependency ratio is less than the female (57.9). Similarly, overall female, male, old and child dependency ratios are 57.9, 61.6, 8.9 and 50.9. The total dependency ratio was 59.8 percent. Showing the fact that a higher dependency ratio was seen in females than males.

Dependency ratio according to the district seemed huge variation 75.0 percent in Rasuwa while 47.5 percent in Sindhupalchok. A similar variation was found in male, female, old and child. There was a little difference among the old in two districts i.e. 0.5 percent higher in the Rasuwa district.

Total dependency ratio of the Janajati (65%), Janajati marginalized (66%) comparatively higher than of the Dalit (47.5 %^) and Brahmin/Chettri (43.7%). Even

in the case of male, female, old and child dependency ratio. And dependency ratio of non-poor (43.7%) is less than other economic groups ranging from 58to 72 percent, especially old dependency ratio seemed higher in the poor, severely poor than that of the non-poor similar trend found in the child care (Annex XVI).

In 2019, total dependency ratio (0-19 and 65+ per 20-64) for Nepal was 87.4 ratio. The total dependency ratio (0-19 and 65+ per 20-64) of Nepal fell gradually from 120.9 ratios in 1970 to 87.4 ratio in 2019. Here in our study overall dependency is less than the national figure is minus 27 percent.

4.3 Socio economic characteristics

In this section discussion about Socio economic characteristics such as caste/ethnic groups and religious characteristic, educational status by sex and economic strata, literacy status and education of study population, level of education according to age group, economic strata, interface between caste/ethnic group and economic strata, migration at work, and destination of the migrant.

4.3.1 Distribution of household's population by caste/ethnicity

Caste/ethnicity has been categorized into four groups, Janajati (Tamang, Gurung, Sherpa, Newar), Janajati marginalized (Magar, Danuwar, Majhi, Bhujel, Dalit (all the social oppressed ethnic group) and Brahmin/ Chettri. Dalit comprises Damai, Kami and Sarki.

In sample 735 households, the highest percentage of households was from Janajati (59%), followed by Dalit (18%), Janajati marginalized (16%) and least was from Brahmin/Chettries (7%). Janajati includes Tamang/Sherpa, Gurung and Newars. Marginalized Janajati includes Magar, Danuwar, Majhi and Bhujel. In terms of religion, the highest proportions of households are from Buddhism (61%), Hindu 32 percent and the rest were 7 percent.

The highest percent of Janajati found in Rasuwa (87%) than of Sindhupalchok (32%), the higher percentage of marginalized Janajati (21%) found in Sindhupalchok than of Rasuwa (11 %). Religiously Hindus are the majority of respondents in Sindhupalchok (63%) while in Rasuwa Buddhists are the majority group (93%). Christian is found in above 5 percent in non-poor while in poor there are around eight to nine percent Christians. The highest Christians found in Sindhupalchok (9%) than in Rasuwa (6%). (Table 4.2)

Table 4. 2: Distribution of household's population by caste/ethnicity

	Caste/Ethnicity				Religion			
	Janajati	Janajati marginalized	Dalit	Brahmin/ Chettri	Hindu	Buddhist	Christian	Total (100%)
Districts								
Sindhupalchok	32.0	21.3	34.1	12.7	63.5	27.8	8.7	1674
Rasuwa	87.2	11.2	1.2	0.3	1.5	92.6	5.9	1601
Economic strata								
Non poor	54.9	9.5	12.2	23.4	41.7	53.2	5.1	641
Vulnerable to poor	71.5	16.2	9.2	3.1	19.3	73.6	7.1	1370
Poor	57.1	21.7	18.5	2.7	35.2	55.9	8.9	897
Severely poor	24.3	15.8	59.9	0.0	65.4	26.4	8.2	367
Sex of households								
Female population	58.4	16.5	18.0	7.1	33.6	58.7	7.7	1609
Male population	59.5	16.3	18.1	6.1	32.8	60.3	7.0	1666
Total	**59.0**	**16.4**	**18.0**	**6.6**	**33.2**	**59.5**	**7.3**	**3275**

Source: Field Survey, 2018

4.3.2 Educational status by sex and economic strata

Basic education refers to attained formal education until grade seven, secondary refers to grade eight to ten and above grade ten, and all are higher education.

The first column shows the level of education according to sex. Then the row constitutes poor – non-poor, vulnerable to poor, poor and severely poor. The educational level is categorized as illiterate, basic education, secondary education and higher secondary and above. The poorness has been categorized as non-poor, vulnerable to poor, poor and severely poor.

In both districts, each level of education data shows similar, dropout is higher in Sindhupalchok than in Rasuwa. According to the caste/ethnicity, it was found that 77 percent of Janajati marginalize population acquire basic education, 14 percent secondary education and less than 6 percent have acquired above this level of education. Brahmin/Chettries are higher educated than other ethnic groups higher secondary and higher studies are respectively 22 and 9 percent found in this group. Dalit (72%) acquired basic education but very few Dalit (2.1%) acquired higher education.

Table 4. 3: Distribution of household's population by educational status

	Basic education	Secondary education	H. Secondary	Higher studies	Dropouts		Total N
Districts							
Sindhupalchok	65.5	16.2	10.3	3.6	4.4	100.0	947
Rasuwa	65.6	17.0	11.9	2.6	2.9	100.0	717
Caste/Ethnicity							
Janajati	64.0	16.9	12.1	2.9	4.1	100.0	942
Janajati marginalized	76.8	14.7	5.4	2.3	0.8	100.0	259
Dalit	72.0	14.0	7.6	2.1	4.3	100.0	328
Brahmin/Chhetri	38.5	23.7	22.2	9.6	5.9	100.0	135
Economic strata							
Non poor	40.9	21.4	23.9	7.6	6.2	100.0	406
Vulnerable to poor	69.4	15.5	9.4	1.8	3.8	100.0	709
Poor	76.5	15.5	4.1	2.1	1.8	100.0	388
Severely poor	83.9	11.2	1.9	0.6	2.5	100.0	161
Sex of households							
Female population	61.1	18.1	11.8	4.0	5.0	100.0	753
Male population	69.2	15.3	10.3	2.5	2.7	100.0	911
Total population	65.5	16.5	11.0	3.2	3.8	100.0	1664

Source: Field Survey, 2018 (illiterate and population below 6 years and above age are not counted)

The highest percentage (83.9%) of the severely poor was found acquired basic education and the lowest (0.6 % and 1.9%) higher secondary and higher study population found in this group. So, the data reveals that a higher percent (above 21 %) of non-poor queried higher education than other groups. The data reveals that the higher the degree of the poor, the lower the level of education and the high rate of illiteracy (Table 4.3).

4.3.3 Literacy status and education of study population

Here, Illiterate means the individuals who cannot read and write and literate means ranging from reading and write to higher-level education. In the entire surveyed population, the literacy query was asked with the population 10 years and above.

Table 4. 4: Distribution of study population by literacy status, according to sex

Literacy	Female		Male		Total	
	N	%	N	%	N	%
Illiterate	641	45.8	538	36.9	1179	41.3
Literate	752	54.2	912	63.1	1664	58.7
Total	1393	100.0	1450	100.0	2843	100.0

Source: Field Survey, 2018 "Table presents population aged 10 years and above"

In the sample of 2843 population above the age10 years and above, among them, 41percent were found to be illiterate and 59 percent are literate. The literacy rate was relatively higher for males (63%) than females (54%) (Table 4.4).

4.3.4 Level of education according to age group

The highest illiteracy was found in the age group 35-39 years (13.6%), and lowest in 5-9 years (0.6%). The highest rate of 29.2 percent in basic education was found in the age group 10-14 years, then followed by the age group 20-24, 15-19, 30-34 and so on. The highest percent of secondary education (40.4%) found in the age 15 to 19, then followed by the age groups 20-24 and so on. The highest percentage of higher education appeared in the age group 20-24 (37.7%) followed by the age group 15 to 19 and 25 to 29.

Table 4. 5: Distribution of household population by educational status

Age group	Illiterate	Basic Education	Secondary Education	Higher studies	Total	
	(%)	(%)	(%)	(%)	(%)	N
5-9	0.6	17.4	0.0	0.0	7.6	212
10-14	0.6	29.2	8.2	0.0	13.5	374
15-19	1.9	9.1	40.4	24.2	10.7	296
20-24	3.3	11.7	21.1	37.7	11.6	322
25-29	8.8	10.3	10.2	20.3	10.6	293
30-34	11.4	8.4	10.2	9.7	9.8	273
35-39	13.6	5.7	5.5	3.0	8.5	237
40-44	10.2	3.0	2.5	2.5	5.7	159
45-49	8.5	1.9	2.2	0.0	4.4	121
50-54	9.6	1.3	0.4	1.3	4.4	123
55-59	7.5	0.8	0.4	0.0	3.3	92
60-64	7.5	0.6	0.0	0.0	3.2	88
60>	16.3	0.4	0.4	0.0	6.6	182
Total	100.0	100.0	100.0	100.0	100.0	2772

Source: Field Survey, 2018, calculated only for population aged 5 years and above

Data reveals that the rate of the level of education differed according to the age group. For each level of education, until age group 20-24 we found in all attained level of education the percentage increasing then after this age group percentage of attained education level starts decreasing, e.g. there was 37.7 percent population attained higher studies in the age group 20-24, then in the age group 25-29 the percentage came down to 20.3 percent, similarly one can see in the table followed by the percentage 9.7 percent, 3 percent, 2.5 percent and so on. Therefore, a similar trend can be seen in all levels of education attained. After the age of 30-39, very little percent of people archived all level of education i.e. below the 5 percent (Table 4.5).

4.3.5 Economic strata

We have classified the household according to the economic strata. The classification was done with non-poor, vulnerable to poor, poor and severely poor. Calculation process was explained in chapter 3, Multidimensional Poverty Index (MPI).

The classification was done by using the following indicators of Multidimensional Poverty Index (MPI) as defined in chapter 3. According, to the sample, the majority (57.6 %) are severely poor, 27.9 percent are poor, 11.8 percent are vulnerable to poor and 2.7 percent are non-poor. Severely poor and poor both are poor (57.6+27.9=78.5%), which means 78.5 percent are in the poor category (Table 4.6).

Table 4. 6: Distribution of households by the level of multidimensional poverty

Economic strata	Number	Percent
Non-poor	20	2.7
Vulnerable to poor	87	11.8
Total Non-poor	**107**	**14.5**
Poor	205	27.9
Severely poor	423	57.6
Total Poor	**628**	**85.5**
G Total	735	100.0

Source: Field Survey, 2018

4.3.6 Interface between caste/ethnic group and economic strata

There is an association between caste/ethnic group and economic strata or economic level (Non poor, vulnerable to poor, poor and severely poor tend to be concentrated in among severely disadvantaged groups like Dalit and Janajati and marginalized groups, Janajati group compared to the socially non-disadvantaged group that is Brahmin/cherries.

Table 4. 7: Distribution of the surveyed population by social groups and MPI

Social group	**Non-poor**	**Vulnerable to poor**	**Poor**	**Severely poor**		**Total**
	(%)	**(%)**	**(%)**	**(%)**	**(%)**	**N**
Janajati	18.2	50.7	26.5	4.6	100.0	1932
Janajati marginalized group	11.4	41.4	36.4	10.8	100.0	536
Dalit	13.2	21.4	28.1	37.3	100.0	590
Brahmin/Chhetri	69.1	19.8	11.1	0.0	100.0	217
Total	19.6	41.8	27.4	11.2	100.0	3275
Chi-square	920.238					
Df.	9					
Sig.	0.00					

Source: Field Survey, 2018

It was found that nearly the majority (19.2%) among the Brahmin/Chhetri households were under the non-poor, vulnerable to the poor (40.45), poor (21.2%), and severely poor were (19.2%). There was no non-poor among the Dalit (0.0%), vulnerable to poor were (7.6%), poor (73.5%) and rest all are severely poor (73.5%) (Table 4.7).

4.3.7 Economic strata

Here economic strata or economic level of surveyed population exhibits two categories of poor ratio, the first category divided into four types non-poor, vulnerable to poor, poor and severely poor. The second category has been divided into two types Non-poor (non-poor + vulnerable to poor) and the second poor (poor + severely poor).

Table 4. 8: Poor ratio before and after the earthquake

	Janajati	Janajati marginalized	Dalit	Brahmin/ Chhetri	Total (% & N)	
Before the earthquake (BEQ)	**(%)**	**(%)**	**(%)**	**(%)**		
Non poor	16.4	11.9	9.1	63.5	17.7	130
Vulnerable to poor	49.9	39.0	18.9	25.0	40.8	300
Poor	27.7	38.1	31.1	11.5	28.8	212
Severely poor	6.0	11.0	40.9	0.0	12.7	93
	100.0	100.0	100.0	100.0	100.0	735
Total non-poor	66.3	50.8	28.0	88.5	58.5	430
Total poor	33.7	49.2	72.0	11.5	41.5	305
	100.0	100.0	100.0	100.0	100.0	735
After the earthquake (AEQ)						
Non poor	2.1	0.8	0.0	19.2	2.7	20
Vulnerable to poor	10.9	7.6	7.6	40.4	11.8	87
Poor	32.1	25.4	18.9	21.2	27.9	205
Severely poor	55.0	66.1	73.5	19.2	57.6	423
						735
Total non-poor	12.9	8.5	7.6	59.6	14.6	107
Total poor	87.1	91.5	92.4	40.4	85.4	628
Total	100.0	100.0	100.0	100.0	100.0	735

Source: Field Survey, 2018

The highest percentage of severely poor was found among the Dalit before and after the earthquake 40 and 73 percent respectively showing than rapidly increased after the earthquake. The total non-poor decreased from 58.5 to 14.6 percent after the earthquake. The total poor increased from 11.5 to 40.4 percent after the earthquake (Table 4.8).

4.3.8 Migration for work

A total of 454 individuals from the total 735 surveyed households were found migrants – considering migration as internal and international one. Migration appears

to be age selective –young people tends to migrants. For example, nearly 46 percent of the total migrants were in the range of 25-39 years. While in the case of the sex of the migrants, it is not sex-selective – both female migration and male migration were substantial although the share of female migration is 38 percent.

Table 4. 9: Distribution of migrants for work for the last-5 years of the survey

Selected characteristics	Male		Female		Total	
	(N)	(%)	(N)	(%)	(N)	(%)
Age group						
10-17	15	5.3	16	9.3	31	6.8
18-24	39	13.8	41	23.8	80	17.6
25-39	134	47.5	73	42.4	207	45.6
40-64	88	31.2	36	20.9	124	27.3
65 +	6	2.1	6	3.5	12	2.6
Caste/Ethnicity						
Janajati	147	52.1	91	52.9	238	52.4
Janajati marginalzed	25	8.9	18	10.5	43	9.5
Dalit	79	28.0	44	25.6	123	27.1
Brahmin/Chhetri	31	11.0	19	11.0	50	11.0
Relationship with the household head						
Head of Household self	153	54.3	38	22.1	191	42.1
Spouse	21	7.4	58	33.7	79	17.4
Son/Daughter in law	76	27.0	30	17.4	106	23.3
Daughter/Son in law	6	2.1	27	15.7	33	7.3
Mother/Father	0	0.0	0	0.0	0	0.0
Mother in law/ Father in law	7	2.5	1	0.6	8	1.8
Brother/sister	6	2.1	7	4.1	13	2.9
Granddaughter/Grand son	13	4.6	11	6.4	24	5.3
Marital status						
Unmarried	59	20.9	50	29.1	109	24.0
Married	210	74.5	109	63.4	319	70.3
Polygamy	5	1.8	1	0.6	6	1.3
Remarried	1	0.4	1	0.6	2	0.4
Widow/Widower	6	2.1	11	6.4	17	3.7
Divorce/Separated	1	0.4	0	0.0	1	0.2
Economic strata						
Non poor	64	22.7	50	29.1	114	25.1
Vulnerable to poor	107	37.9	55	32.0	162	35.7
Poor	73	25.9	45	26.2	118	26.0
Severely poor	38	13.5	22	12.8	60	13.2
Total	282	100.0	172	100.0	454	100.0

Source; Source: Field Survey, 2018

Among the migrants, more than one-half were Janajati (52.4%), followed by Janajati marginalize (9.5%), Dalit (27%), and Brahmin/Chhetri (11%). In terms of marital status, one-fourth of migrants were unmarried, while the rest 75 percent were ever married. Overall 42 percent of the migrants comprise head followed by husband and wife, son/daughter (23%), spouse (17%) and so on. It shows that the distance of

relationship with a household head is inversely proportional to the migration, the closer the relationship with the household head higher the probability of migration as it was easy to decide to migrate as support from the household head is easy while a relationship is closer. It is interesting to note that majority of migrants constituted head of the households for the last five-years (42%). This is followed by son and daughter-in-law (27%) and spouse (17%) (Table 4.9).

Among the migrant's 25 percent are non-poor, 36 percent vulnerable to poor, 26 percent poor and 13 are severely poor, showing that the higher the extent of poorness lower the trend of migration. The study found that the medium used were government, human resources, relatives, own brothers, *Dalal* and friends. It was found that the maximum use of the human resource agency (28%) and *Dalal* (23.4%) was a medium for migration. It was found that 45 percent of the migrants got information from relatives, 26 percent from friends and 18.7 percent neighbors, 26.7 percent from relatives and soon. 72 percent of migrants shown reason for the migration was for new work and better income, 4.1 percent for labor, 6.4 percent for higher studies.

4.3.9 Destination of the migrants

Internal migrants figured out 52 percent of all migrants, while overseas migrants made up 48 percent. Kathmandu is the major city for internal migration and it is for employment and small business. International migration was for employment. These two issues were particularly noticeable components on migrants in studied. It is interesting to note that female migration to foreign employment is equally important as of the males as reflected by the fact that of the total female migrants of 100 females, 45 percent were foreign labor migrants against nearly 50 percent for male foreign labor migrants (Table 4.10).

Table 4.10: Destination of migration

Destination of migration	**Male**		**Female**		**Total**	
	(N)	**(%)**	**(N)**	**(%)**	**(N)**	**(%)**
Kathmandu	102	36.2	57	33.1	159	35.0
Foreign countries	140	49.6	77	44.8	218	48.0
Elsewhere in Nepal	40	14.2	38	22.1	77	17.0
Total	282	100	172	100	454	100.0

Source: Field Survey, 2018

It was seen that in the study area migration as a livelihood strategy of the earthquake-affected population showing the fact that in overall migration became the livelihood strategy of the people of Nepal since decades.

4.4 Summary

This chapter dealt with the socioeconomic and demographic situation of the study population. It has set the context of the earthquake-affected populations. It highlights the geography of Sindhupalchok and Rasuwa districts including the socioeconomic characteristics of the study population. It particularly focuses on the age-sex distribution, marital status, and age at marriage, sex ratio and ethnicity of the study population. It also discusses the economic strata of the study population and interface between caste/ethnic groups and economic strata and also outlines to what extent the affected households were dependent upon remittance income by examining the magnitude of migration for work. This chapter has set the context of how the earthquake has impacted these households because the earthquake has interrupted largely the remittance income to these households.

The highest population was concentrated in the age group 10-14 that was 12.1 percent. The highest percentage of the male and female population in the same age group was 10-14 years in male and female which were 12.2 percent and 11.9 percent respectively. The median age of the study population was 23 years and the mean 26. Three-fifths of the population was married and the rest are unmarried. The percentage of widows/widower was below 4. Polygamy was nearly one percent and remarried, divorce, and separated were below one percent. The female mean age at marriage is under the age of 20 years and differs according to caste/ethnicity and education

Education: in the sample of 2843 population above the age10 years and above, among them, 41percent were found to be illiterate, and 59 percent are literate. Nearly one-third of the population was child population, 6 percent were elderly population and the overall dependency ratio was more than 60 percent. The 2012 Nepal earthquake has impacted livelihoods and economies (local and national). Regarding food sufficiency, 86 percent Households among the total sample 735 households have food deficit around the year,

The study categorized the economic level of the study population in four, like majority (57.6 %) are severely poor, 27.9 percent are poor, 11.8 percent are

vulnerable to poor and 4. 2.7 percent are non-poor. Severely poor and poor both are poor (57.6+27.9=85.5%), which means 78.5 percent are in the poor category. There is an association between caste/ethnic group and economic strata. The total non-poor decreased from 58.5 to 14.6 after the earthquake. The total poor increased from 11.5 to 40.4 after the earthquake.

The overall economic and social scenario of the study districts reveals that pre-earthquake migration of households, either internal or international, was from socially disadvantaged, relatively poor, illiterate, primarily dependent on agriculture, who had short of food throughout the year from their own production. The majority of the socially disadvantaged population is- Janajati, marginalized Janajati, and Dalit – and it has been discovered that poverty levels are higher among these successive categories.

Chapter 5

EARTHQUAKE INDUCED DISPLACEMENT AND MOBILITY

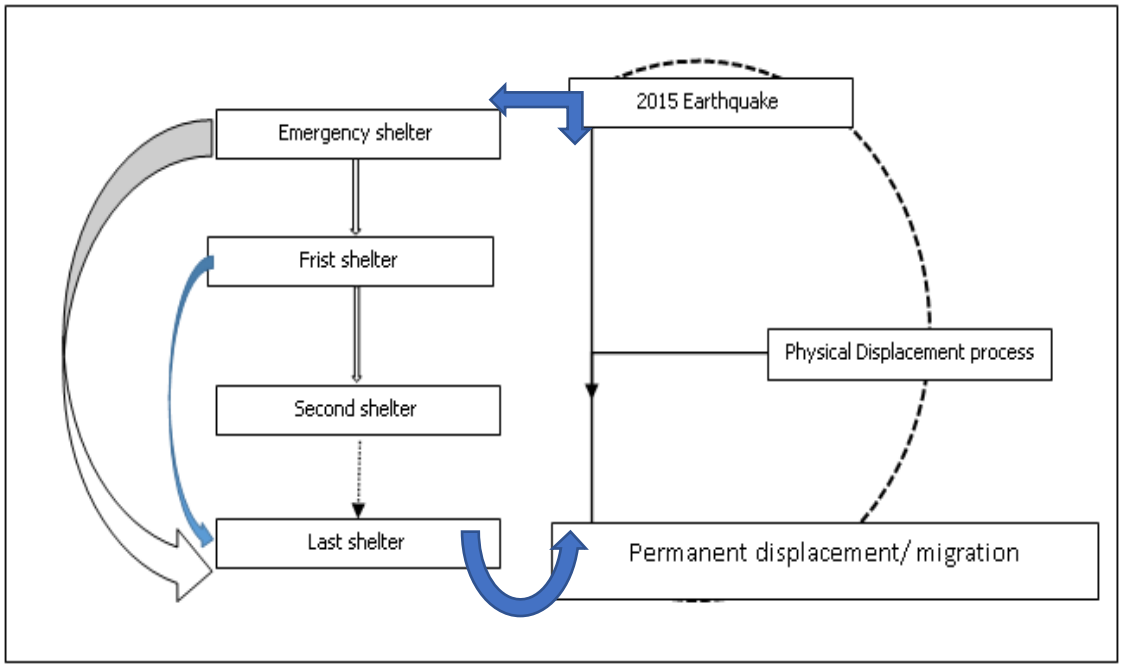
The main focus of this chapter concentrates on the second objective of the research. It focuses on how individuals were relocated as a result of an earthquake in this regard. The size and frequency of the displacement in terms of its direction and migration are referred to as the magnitude of displacement. After many displacements or involuntary movements, mobility has been considered the best solution. The displaced households' immediate response to the emergency shelter, as well as their transition to second and third shelters and how they cope with the circumstance, have all been examined in this conversation.

5.1 Process of displacement

After the Earthquake, people's involuntary movement starts an unconscious way for survival. The affected communities search for temporary shelter as an alternate place of residence. They choose an emergency place nearby houses where they could feel safe. The afflicted communities, whose homes have been entirely destroyed and are unable to be renovated or rebuilt and if their surroundings have had an effect of earthquake on land, soil, and geology, they opt to move from there. People are likely to leave their homes, either temporarily or permanently, and opt to be displaced. Affected community members who are unable to return to their homes must live in an emergency shelter for livelihoods. They must seek safe shelter until they feel secure in terms of sustainable livelihoods as well as protection from natural disasters such as landslides, earthquakes, floods, and other natural disasters. This is a displacement process in which the victim moves from one refuge to another until they find a safe location to live in terms of social, economic, and physical aspects.

There are various involuntary and intentional movement between the start and the ending of the duration until it terminates or the migration occurs. The first, second, third, and fourth movements, or the conclusion of the movement, are the first, second, third, and fourth movements, respectively. After they are relocated, the mobility phase of the displacement process finishes with migration. The phases of the movement are depicted in the diagram below. Affected people will go through multiple ups and downs in their hunt for a survival strategy (Figure 5.1).

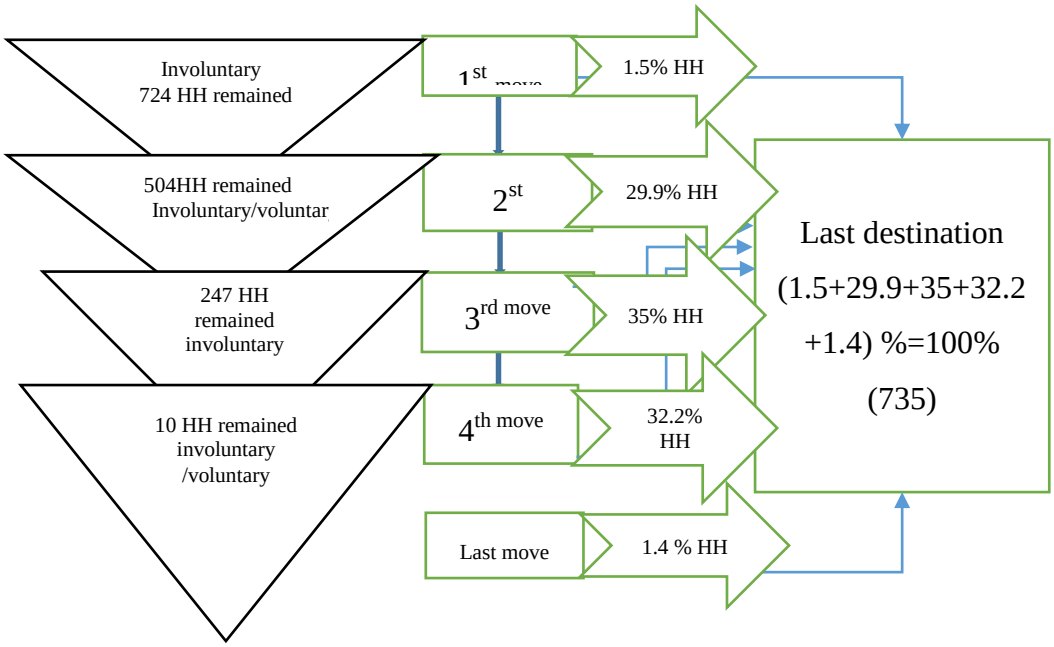
Figure 5.1: Process of movement and frequency of displacement



Source: Developed based on literature review

The field study captured the following flow movements of the people; emergency place, first movement (emergency place), second movement, third movement and fourth movement.

Figure 5.2: Process of displacement



At the same time, the period of stay at various locations was inquired about, as well as the reasons for leaving various destinations. The people who wish to reside at the location where the interview was conducted and those who still want to leave the present destination were asked the reason for further information. Number of displacement and number of households living at different destinations shows: 11 (1.5 %) households came directly from the origin, 220 (29.9%) households came crossing first destinations after the emergency place, 257 (35.0%) households came crossing the second destination from the emergency and origin and one more, 237 (32.2%) households came crossing the third destination from the origin and 10 (1.4%) households came crossing fourth place before arriving at the last destination (Figure 5.2).

The FGD from Bhotekoshi Municipality-2, Kaanglaang reveals how the displaced households were forced to change their settlement.

> Due to the increase risk of landslides and incision of land, the place where they used to live became unsafe for settlement. In this way, they had to shift to another village called Kanlang from a different place. Among 9 persons in the group, 6 persons were from a village, far about 3 kilometres, Because of floods and landslides in the past settlement area, Santaman Tamang and his family shifted before the earthquake from about 1 km from Kaanglung village. All of 9 participants believe that this village is safe for settlement.

A participant from this group Mr. Pemba Tchhiring Tamang, reports regarding the frequent changes of the place of residence.

> I with my family was under the plastic tunnel for a week after my house collapsed. It was difficult for me to decide where to move, finally one of my neighbors advised me to move a kilometer from my home place the last place which was 2 km from here and now I have been residing here. We have changed our place of residence three times till now reaching here. Because, the last place of residence was not good as no drinking water facilities, very cold during winter and waterfalls from upper slopes to living inside a tunnel during summer, sometimes stones would fall, therefore, there was a risk for a living.

The case of displacement, the first displacement is referred to as physical displacement, while the second and third displacements are referred to as economic

and social displacements respectively occur during natural disaster like earthquake. The practice continues until the victims believe that they have benefited economically and socially in their new place. Finally, displacement comes to an end when they are able to reconstruct their houses as a new one and recover the livelihood-damaged amenities. The victims will cease moving and return to their existing location if tey are able to settle everything for livelihood.

5.1.1 First move - immediately after the earthquake (emergency shelter)

According to survey reports, displaced families dispersed to other emergency locations as soon as they discovered their own house had entirely fallen due to the earthquake. If they began to stay in own land in tent, stay in neighbours' land in tent, stay in public land, or they were displaced to another village and public land, and stayed in rented land, stayed in the immediate vicinity of the own house or emergency safe areas such as schools, municipality buildings, and Nepal government land were only immediate emergency shelter area

5.1.2 Major types of displacements

In general, there were three major types of displacement found in the study area

Physical displacement – house collapsed, livelihood facilities damaged.

Economic displacement - loss of agricultural land, loss of employment and economic opportunity. When they were asked about the frequency of their movements until they reached a current place of residence, the response of Bahadur Tamang is as follows;

> Bir Bahadur Tamang says;“ I like this place because I can sell my skill here, the market is nearby. The previous place where I moved for the first time from the emergency place about a kilometer away from my origin place which was Bhalche, was not good because there was no good neighborhood like here, no relatives, no market, no school for children. Now we are even planning to build a house here for a permanent stay.

Social displacements it refers to damages of social network and cohesion, religion and education. The frequency of displacement occurs until the victims move to choose their permanent place of origin or until the displacement process turns into permanent settlement or migration. The most common causes for migration revealed

in this study are a lack of income/employment opportunities and educational opportunities. In terms of the displacement process, the researcher looked at the number of residence changes from the first place of residence to the final place of residence or the location where the interview was done. As discussed above the affected households crossed different places after they were displaced from their house of origin. With the collapse of houses, the victims' first displaced location becomes their places near their house as far as possible – as they finnd it is not possible to stay surrounding the house. Then they shifted to the next place for absolute security in different angles of livelihoods as involuntary or voluntary movement. They still moved from here and they are not feeling secure due to different reasons. We investigated that the displaced households moved even for three times from the origin to the place where they were living at that time permanently. In the study area frequencies of displacement (force-displacement) were the major challenges of the entire 735 victim families. It was found that victims are moving and changing the residences until they felt confident for better livelihoods in the future. There were several reasons responsible for such types and frequencies of displacement.

5.1.3 Core drivers of displacement

This study findings suggest four key drivers of displacement are; the collapse of houses, land swiped away/cracked, security problems and possible secondary disasters such as landslides and flooding. (Analyse all drivers together in a single table with main value of chi-square) (Table 5.1).

Data have revealed that 31 percent of the households reported they displaced due to collapse of houses; another 31 percent reported as land swiped away or cracked and the rest 26 percent reported as the fear of secondary disaster. Analysing the data, in Sindhupalchok highest percent (24.2 %) reported the root cause was possibilities of secondary disaster, then security problem (15.32%) and then the third cause was land swept and cracked (13.9 %), and then the last cause was house collapsed. In the Rasuwa district, the major root causes of displacement are land swept away of land (48%), then security problem (46%). The chi-square test shows there is an association between categorical variables.

Table 5.1: Drivers of displacement

District	House collapsed (%)	Land swiped by EQ (%)	Security problem (%)	Risk secondary disaster (%)	Total (N)
Sindhupalchok	13.9	15.3	24.2	46.5	359
Rasuwa	48.1	45.7	0.3	5.9	376
Chi-square =330.720, df=4, p-value=.000					
Economic strata					
Non-poor	34.2	35.8	12.1	17.9	430
Poor	27.5	23.9	11.8	36.7	305
Chi-square =43.401, df= 4, p-value=.000					
Caste and ethnicity					
Janajati	40.4	37.4	2.8	19.4	433
Janajati marginalized group	22.9	39.8	20.3	16.9	118
Dalit	14.4	8.3	27.3	50	132
Brahmin/Chhetri	19.2	13.5	30.8	36.5	52
Chi-square =207.319, df=4, p-value=.105					
Total	31.4	30.9	12	25.7	735

Source: Field Survey, 2018

While analysing the economic strata majority of both poor and non-poor said houses collapsed and land swept away. According to the data with respect to caste and ethnicity, Janajati and Janajati marginalized more suffered from house collapsed and land swept away. In the case of Brahmin/Chettri 31 and 47 percent reported security and secondary disaster respectively. The chi-square test shows there is an association between categorical variables. It was seen that there is a strong relationship between the district and the root cause of displacement (Chi-square =330.720, DF=4, p-value=.000) and a strong relationship between the poor. On poor and cause of the displacement (Chi-square =43.401, DF= 4, p-value=.000). But the relation between caste. Ethnicity, head of household with the causes of displacement have no, significant relationships (Table 5.1).

The key informant Bir Bahadur Tamang, a native of Balch, stated that he had to relocate to Simbutar with his eight family members after the devastating earthquake. Following the disaster, many people lost their houses, and the land was degraded. The dwelling was similarly filthy, but there was still potential land, and a drinking water supply had been lost, so we were pushed to the next location. He arrived to Simbutar after looking for a place to reside because it

was closer to the district headquarters, and he has still fear of the second earthquake.

5.1.4 Overview of emergency shelter

Investigation shows that the analysis of the distribution of households affected people by the earthquake. Their immediate place for emergency shelter according to selected characteristics of the households shows the following results.

Nearly one-third of the sample households surveyed were displaced to the next village, 27 percent reported that they settled in neighbour's land using Tripal (Plastic shade), 24 percent stayed in their land using Tripal (Plastic shade) and the rest of 16 percent landed in public /government land. They are taking emergency shelter after the earthquake, however, shows, a variation by respondents' district, caste, ethnicity, economic strata and even by sex of the households' heads.

Table 5.2: Earthquake affected households by their immediate place of residence

	Own land in tent (Plastic shade)	Neighbor land tent (Plastic shade)	Public land	Displaced to next village	Total	
Districts	**(%)**	**(%)**	**(%)**	**(%)**	**(N)**	**(%)**
Sindhupalchok	35.7	28.4	19.2	16.7	359	100.0
Rasuwa	13.3	26.1	13.3	47.3	376	100.0
Chi-square = 95.455, df=3 and, sig.= .000						
Caste and ethnicity						
Janajati	24.4	26.3	13	36.3	430	100.0
Janajati marginalized group	23.9	28.5	20.7	26.9	305	100.0
Dalit	24.2	27.2	16.2	32.4	735	100.0
Brahmin/Chhetri	17.8	29.1	14.5	38.6	433	100.0
Total	30.5	16.1	17.8	35.6	118	100.0
Chi-square= 11.631, df = 3, sig.= .000						
Economic strata						
Non-poor	13.6	40.2	24.2	22	132	100.0
Poor	90.4	3.8	5.8	0	52	100.0
Total	24.2	27.2	16.2	32.4	735	100.0
Chi-square = 170.348,df = 9, sig.=.000						
Total	**24.2**	**27.2**	**16.2**	**32.4**	**735**	**100.0**

Source: Field Survey, 2018

The survey data presents households affected by the earthquake according to the district, economic strata, social groups, and sex gives this results. Sindhupalchok has the highest percentage of displaced people living in their land in *Tripal* (Plastic shade), which is around 35.7 percent and 28.4 percent living in neighbour's land but in *Tripal* (Plastic shade). In Rasuwa 13.3 percent people stated that they were living in their land and 26.1 percent interviewed that they were living in neighbour's land using the *Tripal* (Plastic shade). Compared to the people leaving the village Rasuwa has a higher number than Sindhupalchok 47.3 percent stated that they were displaced in the other village in Rasuwa whereas 16.7 percent of respondents reported they were displaced to another village in Sindhupalchok. Considering the data review on the ethnicity of the displaced people 24.2 percent of the Janajati were living in their land in *Tripal* (Plastic shade) and 26.3 percent were living in neighbours' land in *Tripal*, 13.0 were living in government land and 36.3 percent were displaced to another village. The 90.4 percent of the total poor were living in their land, whereas 13.6 percent of non-poor were living in their land and 22 percent of the non-poor were displaced to the nearby village (Table 5.2).

5.1.5 Steps of mobility controlling for selected characteristics

Steps of mobility, stayed at origin (1.5 percent) after the earthquake, nearly 30 percent moved to the first place, 35 percent moved to the second-place and 33 percent moved to the third or current place.

Table 5.3: Households affected by the earthquake by their steps of mobility

District	Origin	1st place	2nd place	Current place	Total	
	(%)	(%)	(%)	(%)	(N)	(%)
Sindhupalchok	1.1	34.8	29	35.1	359	100.0
Rasuwa	1.9	25.3	40.7	32.2	376	100.0
Chi-square = 14.304, df = 4, P= .oo6						
Economic strata						
Non-poor	1.6	28.8	39.8	29.8	430	100.0
Poor	1.3	31.5	28.2	39	305	100.0
Chi-square = 11.923, df = 4 , P= .018						
Caste and ethnicity						
Janajati	1.6	20.8	41.6	33.6	433	100.0
Janajati marginalized group	1.7	45.8	26.3	33.6	118	100.0
Dalit	0	40.9	17.4	33.6	132	100.0
Brahmin/Chhetri	3.8	42.3	44.2	33.6	52	100.0
Chi-square = 77.584, df = 12, P= .000						
Sex of the household head						
Female	1.5	35.1	29.9	33.6	134	100.0
Male	1.5	28.8	36.1	33.6	601	100.0
Total	1.5	29.9	35	33.6	735	100.0
Chi-square = 5.991, df = 4, P = .200						

Source: Field Survey, 2018

However, the steps of the mobility of the displaced households vary by district, poverty status, caste ethnic group and headship of the households. For example, nearly, 35 percent of households in Sindhupalchok district moved to the first place from their place of origin, while the comparable figure – Rasuwa was 25 percent, conversely, 41 percent of household in Rasuwa moved to the second place from the first one while it was 29 percent in Sindhupalchok district.

The chi-square result also verifies that displaced household mobility differs by district level. It shows that comparing the mobility of poor and non-poor families, the poor households make more steps for mobility. For example, 37 percent of poor households had moved to the third place, while it was 29 percent for non-poor households. The chi-square result is, significant at 0.01 level reflecting the fact that the pre-earthquake economic status of the households also matters whether or not to move different places. In terms of caste/ethnic groups, the majority of Janajati had moved to at least second and third place while a majority of marginalized Janajati group moved to the first place (46%) from the origin and the same is true for Dalit. Brahmin/Chettri majority remained in the first and second place (88%) altogether. There is significant variation in steps of the displacement of the displaced, however, by the sex of the headship (Table 5.3).

5.1.6 Types of displacement: Intra-inter district and local levels

Findings show the types of the displacement of the displaced households like -I nter and Intra-district displacement, Inter and Intra-Local Levels, as well as Intra and Intra-Ward Levels.

Inter and Intra-district displacement

A large majority (80%) of the households in the third place were found to be in the same district while 20 percent of households moved to the side to their origin district. However, the population of displaced households moves to different districts varied by district, poverty status, caste/ethnicity significantly, while it was not, significantly different by sex of the household heads. In Rasuwa, 96 percent of the households, moved to another district, conversely to nearly two percent in the Sindhupalchok district. Among the poor and non-poor, 12 percent poor moved to another district against 25 percent non-poor moved to the one-fourth Janajati households and one fifth moved to the marginalized group households had to move to that another district

against in few households moving to other districts among Dalit and Brahmin/Chettri households.

As compared to Rasuwa, Sindhupalchok has a higher proportion of people being displaced in the same district in both second and third displacement, i.e. 91.6 percent and 97.8 percent. In the same time, a larger number of poor people displaced to the same district and the proportion of non-poor people were displaced to different districts. On the other hand, the proportion of the displacement of Brahmin/Chhetri to different 0 percent and 1.9 percent respectively and larger numbers of Janajati and Janajati marginal people displaced to different districts and this figure was 29.1 percent and 26.1 percent (Table 5.4).

Table 5.4: Inter and intra district displacement by earthquake

District	Second displacement				Third Displacement			
	Same district		Different district		Same district		Different district	
	(%)	(N)	(%)	(N)	(%)	(N)	(%)	(N)
Sindhupalchok	91.6	329	8.4	30	97.8	351	2.2	8
Rasuwa	70.2	264	29.8	112	64.1	241	35.9	135
Chi-square=54.113, df =1, P=000					Chi-square=132.9, df = 1, P=.000			
Economic strata								
Non poor	77.9	335	22.1	95	75.1	323	24.9	107
Poor	84.6	258	15.4	47	88.2	269	11.8	36
Chi-square=5.113, Df = 1, P = .024*					Chi-square=19.5, Df = 1, P =.000*			
Caste/ethnicity								
Janajati	70.9	307	29.1	126	73.9	320	26.1	113
Janajati marginalize	96.6	114	3.4	4	79.7	94	20.3	24
Dalit	90.9	120	9.1	12	96.2	127	3.8	5
Brahmin/Chettri	100	52	0	0	98.1	51	1.9	1
	Chi-square=67.091, df = 3, =.000				Chi-square=43.1, df= 3, P = .000			
Total	80.7	593	19.3	142	80.5	592	19.5	143

Source: Field Survey, 2018

5.1.7 Inter and intra-local levels displacement

The study summarizes that the inter-Sindhupalchok district displacement by Rural Municipality, 10 Rural Municipality received at least one displaced household. For example, there was the largest number of households from Listikot Rural Municipality in study sample sample. In this Rural Municipality, it was found that 97 households moved to Bhotekoshi Rural Municipality while only one household stayed in the same Rural Municipality. The sample included 102 displaced families in Indrawoti Rural Municipality, of which 84 families stayed in the same Rural

Municipality and the rest families transferred to another rural Municipality. In the instance of Helambu, the sample included 53 displaced households, 52 of which were relocated inside the same Rural Municipality, and just one household relocated to the next district. In this study, the study examined 28 displaced households in Melamchi municipality and the entire household was discovered to be in the same municipality. The Rural Municipality displacement indicates that few of the displaced families were not relocated too far from their place of origin, for the earthquake-affected households, short-distance displacement was common (Table 5.5). A Focus Group Discussion (FGD) was conducted among the women of the following community at Simbutar.

> The participants of Betrawoti, Rasuwa said that "though they were suffering from many problems at the destination they did not desire to go back to their village as they did not have any properties left back there and are looking for a permanent settlement so that they could live a prosperous life. One of them said, "We want to die here instead of going back and cannot get such facilities that we have in here, there will be no means of the living environment there."

Table 5.5: Frequencies of displacement of households from one Rural /Municipality to another

		Receiving Rural Municipality After the Earthquake										
		Belafi NP	**Bhotekoshi GP**	**Bidur NP**	**Chautara NP**	**Helambu**	**Indrawoti GP**	**Jugal GP**	**Listikot GP**	**Melamchi**	**Tatopani**	**Total**
		N	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
Sindhupalchok Municipality Before the Earthquake	Belafi UM	3						6				9
	Bhotekoshi GP		6	1								7
	Dadagaon GP											
	Gati GP	13	1									14
	Gumba GP	2						1	1			13
	Haku GP											
	Helambu			1		52						53
	Indrawoti GP	5			1		84	2		1		102
	Jugal GP	7						4				11
	Kalika GP											
	Kispang GP											
	Lachyang GP											
	Lampate GP	3	3									6
	Listikot GP		97	5				2	4		1	109
	Melamchi									28		28
	Tatopani		4	1							2	7
	Total	33	111	8	1	52	84	24	5	29	3	359

Source: Field Survey, 2018

Note: UM refers to urban municipality and GP refers to Rural Municipality

It was proved from the above explanation that the displacement of the people from one municipality to the next was high compared to the displacement within the municipality. There were two reasons behind it: it was felt that the probability of secondary disaster was high, and next it was not possible to bring back the original livelihoods in the same community it was because not only the living house had collapsed but the whole agricultural land was not suitable for production (Table 5.5).

5.1.8 Duration of stay in the second place and third place or current place

The households in the second and third places had been there for more than a year, with 8 percent of homes having been there for 6-12 months. The period of stay in the second location is reduced by district standard and caste/ethnic groupings, but it is unaffected by the socioeconomic level of the household or the sex of the household head. It shows that the distribution of households affected by earthquake who moved to second place and third place by their duration of stay (in months) is in accordance with their selected characteristics. Concerning the duration of stay in the third place on the temporary shelter, it was found that 47 percent of households were staying at third place for more than one year, 20 percent households between 6-12 months and 33 percent households less than six months (Table 5.6).

Table 5.6: Earthquake affected households who moved to different places by their duration of stay

	Duration of stay at 2nd temporary shelter			Duration of stay at 3rd temporary shelter			Total	
	Till 6 months	Till one year	More than one year	Till 6 months	Till one year	More than one year		
	%	%	%	%	%	%	%	N
District								
Sindhupalchok	12.8	16.2	71.0	33.1	17.3	49.6	100.0	359
Rasuwa	2.7	20.2	77.1	33.0	23.4	43.6	100.0	376
Chi-square =27.430, df=3, P .000				Chi-square=15.30157085, df=2, P=.091				
Economic strata								
Non-poor	6.0	19.1	74.9	27.9	20.0	52.1	100.0	430
Poor	9.8	17.0	73.1	40.3	21.0	38.7	100.0	305
Chi-square	Chi-square =3.838, df=2, P=.147			Chi-square =3.838, df =2, P= .000				
Caste/ethnicity								
Janajati	5.3	20.1	74.6	37.0	20.3	42.7	100.0	433
Janajati marginalized group	11.0	17.8	71.2	23.7	25.4	50.8	100.0	118
Dalit	12.9	13.6	73.5	39.4	14.4	46.2	100.0	132
Brahmin/Chettri	5.8	15.4	78.8	5.8	25.0	69.2	100.0	52
Chi-square =12.749df=6, P=.047				Chi-square =6,df=6, P=.313				
Sex of household head								
Female	9.7	17.2	73.1	33.6	18.7	47.8	100.0	134
Male	7.2	18.5	74.4	32.9	20.8	46.3	100.0	601
Total	7.6	18.2	74.1	33.1	20.4	46.5	100.0	735
Chi-square=1.058, df=2, p-value=.529				Chi-square =2,df=6, P=.855				

Source: Field Survey, 2018

5.2 Coping strategies adopted in the second place of displacement

A case study of Bir Bahadur Tamang, a resident of Balch before the earthquake had move to Simbutar with his eight family members after the earthquake. He is a mason by profession, Tamang was living a decent life working as a contractor and building houses for others, a job which he enjoyed working and worked with all his heart. After the earthquake, a dreadful event for all the Nepalese, many people lost their homes among which he is one. Losing his house and property was not an easy task to deal with. After searching for a place to live, he came to Simbutar, closer to the districts' headquarter. He says;

> Meanwhile, various organizations conducted training on masonry, which would provide certification of a trained mason after the completion of the training. He preferred working and earning instead of taking part in the training as he did not want to lose his incoming money for the training which would not provide him any money. He thrived for such training to be conducted now too as he believed many people like him did not take training at that time as they had to earn for their family but sadly are facing difficulties to get work now.

Overall, one-fourth of respondents reported that their family members did not have any income-generating activities and the rest of the three-fourth households were adapting at least one economic activity for survival. Overall, 41.5 percent of households adopted non-agricultural wage labour; 17% of households adopted wage labour; agriculture at 10 percent of households reported that they were doing the same economic activities that they were doing before the earthquake. Further, only a few households started a new business (4%), a new service (2%) in the second place of displacement. Thus, examining the livelihood strategies of these earthquake-affected households; their second displacement takes place; it appears that they spend a very measurable situation.

Table 5.7: Types of coping strategies adopted in the second place

	Not changed occupation	New business	New agriculture daily	Service new	Non-agriculture daily wage	No, income generation activities	Total
	(%)	%	%	%	%	%	N
District							
Sindhupalchok	19.5	8.1	24.2	3.3	18.4	26.5	359
Rasuwa	0.3	0.5	10.9	0.5	63.6	24.2	376
Chi-square =212.181, df = 5, P-value=.000							
Economic strata							
Non-poor	8.1	4.4	12.3	2.6	46.7	25.8	430
Poor	11.8	3.9	24.6	1	34.1	24.6	305
Chi-square=27.295, df=5, -value=.000							
Caste/ethnicity							
Janajati	8.5	4.2	13.9	2.8	49	21.7	433
Janajati marginalized group	8.5	0.8	15.3	0	44.1	31.4	118
Dalit	6.1	8.3	37.1	1.5	30.3	16.7	132
Brahmin/Chhetri	30.8	1.9	1.9	0	1.9	63.5	52
Chi-square=148.075. df=15, p-value=.000							
Sex of HH head							
Female	9.7	2.4	16.4	1.1	40.2	30.2	371
Male	9.6	6	18.4	2.7	42.9	20.3	364
Total	9.7	4.2	17.4	1.9	41.5	25.3	735
Chi-square=16.177, df=5, p-value=.006							

Source: Field Survey, 2018

After moving from Sindhupalchok the largest proportion (26.5 percent) got no income generation activity and 3.3 percent engaged in new service. In comparison, 63.6 percent people migrated from Rasuwa got engaged in non-agricultural daily wage activities. On the other hand, 0.3 percent did not change their occupation. Besides, 46.7percent of the non-poor and 34.1 percent of the poor population engaged in non-agriculture daily wage and 2.6 percent and 1 percent of them respectively engaged in new service. Also, 2.8 percent Janajati, 1.5 percent Dalit and none of the Janajati marginal and Brahmin/Chhetri engaged in new service while 49 percent Janajati and 44.1 percent Janajati marginal people engaged in non-agriculture daily wage activities. On the other hand, 63.5 percent of Brahmin/Chhetri did not involve in any income-generating activities while 30.8 percent of them engaged in the same occupation as before (Table 5.7).

> Betrawati, Rasuwa" a participant from the FGD shared that "Employment was the major challenging for us in the places where we have left the pst places, it is difficult for us to earn, also we cannot compromise on the education of our children, we don't want them to struggle for a good education as we did." Similarly, they focused on health access and facilities for their permanent shelter. Therefore, it seems that they have frequently moving emphasizing, employment, education, health access and facilities respectively.

5.2.1 Reasons for leaving the previous place

Seven reasons for leaving the previous place, the top three reasons indicated as no relatives (3.7%), political problem (1.2%), secondary disaster (30.2%). Remaining other reasons were responsible for leaving previous place, social/ religious problem (32.8%), no health access (3.1%), no education access (12.9%), and no better economic/ employment opportunity (16%).

The reasons for leaving of the previous place varied by district studied caste / ethnic groups, poverty levels and sex of the household head. The data shows that the top three reasons in Sindhupalchok districts were fear of secondary disaster (38%), social/religious problem (38%) and economic/employment opportunity (12.8) whether; Rasuwa, they were fearful of secondary disaster (25%), economic problem/employment (19%) and education problem (18%).

Table 5.8: Rreasons for leaving the previous place earthquake affected Households

District	No relatives	Political problem	Secondary disaster	Social/ religious problem	No Health access	No education access	No better economic/ employment opportunity	Total
Sindhupalchok	4.2	1.7	35.9	38.2	0.0	7.2	12.8	359
Rasuwa	3.2	0.8	24.7	27.7	6.1	18.4	19.1	376
Nnon-poor	4.0	1.4	31.4	29.1	3.5	14.2	16.5	430
Poor	3.3	1.0	28.5	38.0	2.6	11.1	15.4	305
Caste/ethnicity								
Janajati	2.3	0.7	30.5	24.5	4.6	16.9	20.6	433
Janajati marginalized	11.9	0.0	21.2	52.5	2.5	1.7	10.2	118
Dalit	1.5	0.0	25.0	53.8	0.0	10.6	9.1	132
Brahmin/Chhetri	1.9	11.5	61.5	3.8	0.0	11.5	9.6	52
Sex of HH head								
Female	3.7	2.2	28.4	39.6	3.0	7.5	15.7	134
Male	3.7	1.0	30.6	31.3	3.2	14.1	16.1	601
Total	3.7	1.2	30.2	32.8	3.1	12.9	16.1	735

Source: Field Survey, 2018

In Sindhupalchok no people migrate due to health problems, but 38.2 % of them migrate because of social and religious problems whereas the highest number (27.7%) of people migrated from Rasuwa due to social and religious problem but minimum (0.8%) due to political problem.

Also, the highest number (53.8%) of Dalit migrated due to social problem and 25 percent due to secondary disaster but none of them migrated due to cultural conflict, political, economic, health and religious problem (Table 5.8).

> In a Case study of Binod Sherpa, Sindhupalchok shares, "My family moved to this place from the place of origin, but it seemed none of my family members are happy with us moving here, it's very difficult to find a comfortable livelihood means such as jobs and other opportunities here as we dreamed is difficult to find, so we want to go back to our origin or move to elsewhere"

A study from "FGD "II" Betrawati, Rasuwa" a contributor from the FGD revealed that "Employment was the major challenge for us in the places in the past places we left, it was difficult for us to earn, also we couldn't compromise on the education of our children, we didn't want them to struggle for a good education as we did." Similarly, they focused on health access and facilities for their permanent shelter.

Therefore, it seems that they have frequently moving, emphasizing employment, education, health access and facilities respectively.

5.2.2 Facilities available in the second and third place

The facilities examined for the displaced people were; House rent or land, Medicine/health facilities, Clean Drinking water, Toilet, Electricity, Safe places for women and education access to children (School for children).

The figure shows differences in the second and third displaced areas. We can see the different figures as positive except few exceptions. It, showsmore facilities are available at the third place of residence than at the second ranging from 6.8 percent to 12.9 percent in totality. The movement of the earthquake-affected people to new place always inclines towards more facilities. The better the facilities has more attraction of the immigrants, lower the facilities has higher the strength of push factor. A participant from an FGD Mr. Pemba Tchhiring Tamang from the Male FGD group, Sindhupalchok, Bhotekoshi Municipality, reports regarding the frequent changes of the place of residence (Table 5.9).

Table 5.9: Earthquake affected households moved to 2nd and 3rd place by their facilities available

District	% House rent or land			% of medical/health facilities			% Clean Drinking water			Toilet		
	2nd	3rd	Difference	2nd	3rd	Difference	2nd	3rd	Difference	2nd	3rd	Difference
Sindhupalchok	31.0	44.6	13.6	41.9	52.0	10.1	44.4	53.6	9.3	41.5	57.3	15.8
Rasuwa	83.3	92.6	9.3	49.0	56.4	7.4	55.6	64.7	9.1	53.4	61.4	8.0
Caste/Ethnicity												
Janajati	74.3	83.2	8.9	48.0	52.4	4.3	53.2	63.1	9.9	52.2	63.1	10.9
Janajati marginalized group	38.5	64.8	26.3	43.8	62.1	18.3	45.8	51.1	5.3	47.9	53.8	5.9
Dalit	42.7	58.2	15.5	39.8	51.2	11.4	43.7	53.5	9.8	27.2	50.0	22.8
Brahmin/Chhetri	23.9	30.8	6.9	45.7	68.3	22.7	54.3	62.1	7.7	60.9	57.9	-3.0
Economic strata												
Non-poor	63.5	75.6	12.1	42.6	53.0	10.4	55.1	63.8	8.7	52.5	61.9	9.3
Poor	55.7	69.7	14.0	51.0	57.2	6.2	43.9	54.6	10.7	41.6	56.4	14.8

Cont.…	% Electricity			%A safe place for women			%School for children		
District									
Sindhupalchok	35.6	45.8	10.2	24.3	28.5	4.2	15.8	20.7	4.9
Rasuwa	21.6	36.5	14.9	32.6	40.7	8.1	21.6	29.3	7.7
Caste/Ethnicity									
Janajati	23.3	38.6	15.3	30.2	37.8	7.6	18.8	26.8	8.0
Janajati marginalized	37.5	41.5	4.0	32.3	41.5	9.2	22.9	26.4	3.5
Dalit	35.9	50.0	14.1	27.2	26.5	-0.7	12.6	18.2	5.6
Brahmin/Chhetri	28.3	35.0	6.7	15.2	26.7	11.4	28.3	30.8	2.6
Economic strata									
Non-poor	25.4	40.9	15.5	32.2	41.7	9.5	22.3	27.7	5.4
Poor	31.4	39.2	7.8	23.9	26.3	2.4	14.1	22.9	8.8
Total	27.7	40.2	12.5	29.0	35.8	6.8	19.1	25.9	6.8

Source: Field Survey, 2018

> It was difficult for me to decide where to move. Finally one of my neighbours advised me to move a kilometre away from my home place was and it is 2 km from away. The last place of residence was not good as lack of drinking water facilities, very cold place during winter and waterfalls from upper slopes during summer, sometimes stones are falling and I felt there was a risk for a living.

Therefore, the earthquake-induced displaced households' experiences reflect that they were in a position to choose better places while moving from the emergency place to other different places. The movement continues until they feel secure. This was the example of the above FGD discussion.

5.2.3 Perception on housing management

Table 5.10 shows the distribution of households affected by earthquake who moved to a second and third or current place by their perception of housing management, according to selected characteristics of the household.

Considering the respondents in second place, the perception was asked in five scales, 'very good', 'good', 'not bad' 'bad' and very bad. The data reveals that the 'housing management' was 'not bad' or appeared to be neutral, while 6 percent reported that it was very bad. Conversely, 9 percent of respondents perceived housing management as 'very good' and another 35 percent perceived it as 'good'. However, the proportion of respondents viewing housing management varies by district, economic status and caste/ethnic group, significantly. The X^2 - result confirms the fact that these variables are associated with the perception of housing management. Considering the respondents in third or current place, one-third of respondents regard housing management as 'bad' and another 8 percent regarded as 'very bad thus at least 4 in 10 households; respondents view that housing management in their current place is unsatisfactory. All the variables considered; such as district, caste/ ethnic group, have been found associated with the perception on housing management, as suggested by the significant value of X^2 -results (Table 5.10).

Table 5.10: Earthquake affected households who moved to a second and third or current place

	……Second place..….					……..Third place…….						
	Very good	Good	Not bad	Bad	very bad	Very good	Good	Not bad	Bad	Very bad		Total
District	%	%	%	%	%	%	%	%	%	%	%	N
Sindhupalchok	12.3	16.2	57.4	10.3	3.9	0.6	12.8	45.7	26.2	14.8	100	359
Rasuwa	5.6	52.7	40.4	1.1	0.3	0	17	41.5	40.2	1.3	100	376
Total	8.8	34.8	48.7	5.6	2	0.3	15	43.5	33.3	7.9	100	735
	Chi-square = 130.35, df= 4, p-value = .000					Chi-square=57.769, df=4, p-value= .000						
Economic strata												
Non-poor	9.3	37.2	48.1	4.4	0.9	0.5	15.8	45.8	32.6	5.3	100	430
Poor	8.2	31.5	49.5	7.2	3.6	0	13.8	40.3	34.4	11.5	100	305
Total	8.8	34.8	48.7	5.6	2	0.3	15	43.5	33.3	7.9	100	735
	Chi-square=10.76, df=4, -value= .029					Chi-square = 11.824, df = 4, p-value= .019						
Caste/ethnicity												
Janajati	8.3	43.6	42.3	5.8	0	0	16.9	37	40	6.2	100	433
Janajati marginalized group	6.8	32.2	50.8	5.1	5.1	0	12.7	61.9	15.3	10.2	100	118
Dalit	12.1	12.1	66.7	2.3	6.8	0	12.1	37.9	40.9	9.1	100	132
Brahmin/Chhetri	9.6	25	51.9	13.5	0	3.8	11.5	71.2	0	13.5	100	52
Total	8.8	34.8	48.7	5.6	2	0.3	15	43.5	33.3	7.9	100	735
	Chi-square =84.364, df=12,p-value=.000					Chi-square =93.762, df=12, p-value=.000						
Sex of household Head												
Female	9.7	37.7	45	5.9	1.6	0.3	16.4	50.7	24.8	7.8	100	371
Male	8	31.9	52.5	5.2	2.5	0.3	13.5	36.3	42	8	100	364
Total	8.8	34.8	48.7	5.6	2	0.3	15	43.5	33.3	7.9	100	735
	Chi-square =5.366, df=4, p-value=.252					Chi-square =26.233, df=4, -value=.000						

Source: Field Survey, 2018

Besides, 5.8 percent of Janajati found the second place unpleasant but 16.9 percent of them found a third place suitable, 32.2 percent of Janajati marginal people found second place good but 15.3 percent of them found third place bad, 66.7 percent and 37.9 percent of Dalit found second and third place average whereas, 9.6 percent of the Brahmin/Chhetri found second place very good but 13.5 percent of them found the third place to be worst. In a discussion with a female group in Bhotekoshi Municipality- 2, it was learned that;

> In the past, although the house was small, we had a separate toilet and it was far from the living house, separate kitchen for cooking; i.e. outsides the main door. There was a separate cowshed. Now we do not have such facilities. Living here in a group, still, all have not built houses and waiting for government instalment to build houses. Some are building houses.

5.2.4 Health problem faced at different places of the displacement

In Sindhupalchok, overall, respondents in the second place, realized that the family members' health condition was problematic (82.2 %); it is 18 percent of the respondents reported that health condition as well, which is reverse in at third/current place problematic of health reported by 20 percent and 80 percent reported no problem in the health. The same trend was also in the Rasuwa district. When looking at health problems among the Janajati, 75.5 percent reported a problem with their health at their second place of residence; the highest percentage of Dalits (96.0 %) reported a problem in their second place of residence, while the lowest percentage of Brahmin/Chettri (59 %) of the households reported a problem in their third/current place of residence. The poor (88 %) and non-poor (72.1 percent) both reported health problems, but the percentage of non-poor (3 percent) and poor (34 %) earthquake victims who had health problems was much lower at third place. Overall, 16 percent of earthquake victims had health problems at third place. Significant changes were seen among the castes and ethnic groups. A similar pattern has emerged among household heads' genders. (Table 5.11)

Table 5.11: Health problem faced by the displaced households after 2nd and 3rd movement

Districts	Second temporary place (%)		Third/current place (%)		Total
	Problem in health	No problem in health	Problem in health	No problem in health	
Sindhupalchok	82.2	17.8	20.1	79.9	100.0
Rasuwa	75.3	24.7	12.2	87.8	100.0
Chi-square= 5.215416, df =1, P=.022			Chi-square=8.336835 , df=1,P=.004		
Caste / ethnicity					
Janajati	75.5	24.5	8.5	91.5	100.0
Janajati marginal group	81.4	18.6	9.3	90.7	100.0
Dalit	96.2	3.80	52.3	47.7	100.0
Brahmin/Chhetri	53.8	46.2	1.9	98.1	100.0
Chi-square46.322, df =3, P=.000			Chi-square=158.272, df = 3, P .000		
Economic strata					
Non-poor	72.1	27.9	3.0	97.0	100.0
Poor	87.9	12.1	34.4	65.6	100.0
Chi-square=26.337 , df = 1 P = .000					
Sex of the household head					
Female population	82.1	17.9	11.9	88.1	100.0
Male population	77.9	22.1	17.0	83.0	100.0
Total	78.6	21.4	16.1	83.9	100.0
Chi-square = 1.161, df =1, P=.281			Chi-square=2.058, df=1, P=.151		

Source: Field Survey, 2018

A FGD conducted in Betrawoti revealed that the, access to health facilities and schools increased as their settlement was closer to the district headquarter. According to them, the children could get better education facilities here, which would not be possible in their village. Likewise, it had become much easier to get health facilities when they would face any health hazards.

Overall, there were health problems at the second place of residence which might cause them to push to the third or current place of residence, where more than 80 percent did not face the health problem.

5.2.5 Willingness of living in the current place

Willingness to stay permanent was an issue to be known whether they are willing to live at the current place or not.

Table 5.12: Households by whether or not willing to live in the current place

	Do you want to live here permanently?			
	Yes	**No**		**Total**
Districts	**(%)**	**(%)**	**(N)**	**(%)**
Sindhupalchok	71	29	359	100.0
Rasuwa	50	50	376	100.0
Total	60.3	39.7	735	100.0
Chi-square = 33.923, df = 1, P = .000				
Caste/Ethnicity				
Janajati	53.8	46.2	433	100.0
Janajati marginalized group	64.4	35.6	118	100.0
Dalit	62.9	37.1	132	100.0
Brahmin/Chhetri	98.1	1.9	52	100.0
Total	60.3	39.7	735	100.0
Chi-square = 39.804,df= 3, P = .000				39.804
Economic strata				
Non-poor	59.3	40.7	430	100.0
Poor	61.6	38.4	305	100.0
Total	60.3	39.7	735	100.0
Chi-square = 0.407, df = 1, P= .523				
Sex of the household head				
Female population	64.9	35.1	134	100.0
Male population	59.2	40.8	601	100.0
Total	60.3	39.7	735	100.0
Chi-square = 1.482,df = 1, P = .223				

Source: Field Survey, 2018

In the survey, the respondents were asked whether they would like to stay permanently in the current place where they were living or not. Data shows that 6 among 10 respondents would like to stay permanently in the current place. Among the caste/ethnic groups, it is the Brahmin/ Chhetri who almost wanted to live in the

current place permanently. On the other hand, 54 percent of Janajati respondents reported that they would like to live in their current places. Factors like economic strata and sex of the household head were not found to be, significantly associated with the perception of whether or not to live permanently in the current place.(Table 5.12)

> Kale Kami, "this is my third place for my settlement, at the first, we were in the emergency plastic sheets and then we moved to a temporary shelter where we were still in better shape than plastic sheets, and we were in the tent. NRA brought us here on the bank of the Tritely River, I am not still convinced that we will stay here, once we get the land, we either sale or go back to another village in Haku".

5.2.6 Linkage at the origin place

In the survey question, the purpose of visits of the origin was asked to the respondents and the main five types of purposes to visit the origin place were agriculture work, to celebrate the festivals, social work and religious/cultural work.

Table 5.13: Purpose of visit at the origin

	Agriculture		Festivals		Social works		Religious/ Cultural works		Total	
Districts	**(N)**	**(%)**	**(N)**	**(%)**	**(N)**	**(%)**	**(N)**	**(%)**	**(N)**	**(%)**
Sindhupalchok	14	22.2	7	11.1	7	11.1	35	55.6	63	100.0
Rasuwa	1	3.6	14	50.0	10	35.7	3	10.7	28	100.0
Caste/Ethnicity										
Janajati	5	11.6	17	39.5	14	32.6	7	16.3	43	100.0
Janajati marginal group	5	27.8	2	11.1	2	11.1	9	50.0	18	100.0
Dalit	5	17.9	2	7.1	1	3.6	20	71.4	28	100.0
Brahmin/Chhetri	0	0.0	0	0.0	0	0.0	2	100.0	2	100.0
Economic strata										
Non-poor	8	16.0	12	24.0	10	20.0	20	40.0	50	100.0
Poor	7	17.1	9	22.0	7	17.1	18	43.9	41	100.0
Sex of the household head										
Female population	2	9.5	9	42.9	2	9.5	8	38.1	21	100.0
Male population	13	18.6	12	17.1	15	21.4	30	42.9	70	100.0
Total	15	16.5	21	23.1	17	18.7	38	41.8	91	100.0

Source: Field Survey, 2018

From the survey conducted among those who intend to visit back to the origin shows this fact: the largest number 55.6 percent people from Sindhupalchok would like to visit back for religious work and 22.2 percent for agriculture, while 3.6 percent people from Rasuwa would visit their home for agriculture and 50 percent, would visit back for the festival. Besides, 11.6 percent of Janajati, 16 percent non-poor and

17.1 percent poor would visit back for agriculture. In comparison, 39.5 percent Janajati and 11.1 percent Janajati marginal people would go back for the festival, on the other hand, 50 percent Janajati marginal, 71.4 percent Dalit, 100 percent Brahmin/Chhetri, 40 percent non-poor and 43.9 percent poor would visit back for religious works (Table 5.13).

5.2.7 Pull-push factors at the current place

In our study, the reasons related to pull factors were the following: no home at origin (13.5%), no security at origin (6.8%), no land at origin (28%), soil erosion at origin (18.5%), no access to education (10.2%) and secondary disaster at origin (7.4%). On the other hand, reasons related to pull factors were -established good political relations in the current place (0.7%), better economic opportunities 94.1%), good living environment (2.7) and properly added in the current place (8.1%) (Table 5.14).

> FGD from Rasuwa, Betrawoti it is learnt that though the displaced households were suffering from many problems they did not desire to go back to their village as they did not have any properties left-back and asserted they would be grateful if the government would provide them a place for their permanent settlement so that they could live a prosperous life. One of the participants argued that they want to die here instead of going back and cannot get such facilities they have here, there will be no means of the living environment there.

The majority of respondents (84 percent) gave reasons for their willingness to return to the origin place based on pull factors. The remaining 16 percent gave reasons based on push factors. The six push factors were no land at the origin, no home and soil erosion, all relate to economic factors which is a barrier to returning to the origin place. The addition of property (8%) and greater economic prospects (4%) are, on the other hand, two of the most important first push causes (Table 5.14).

The X^{2-}result indicates that there is no significant association between the reasons for living and district of the respondents; between the reasons and caste/ethnic group; between reasons and economic strata and between the reasons and economic strata and between the reasons and sex of the household heads. One of the participants reported that ;

Table 5.14: Pull and push factors of Households expressed willingness to permanent stay at current place

Characteristics	Push factor						Pull factor				Total	
	No house at the origin	No security	No land at the origin	Soil erosion	No education access	Secondary disaster at the origin	Here good political relation	Better economy here	Good environment here	Added property here		
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(N)	(%)
Districts												
Sindhupalchok	12.2	8.1	20.3	20.3	8.1	11.0	0.6	4.7	4.7	9.9	172	100.0
Rasuwa	14.4	5.9	32.8	17.3	11.4	5.2	0.7	3.7	1.5	7.0	271	100.0
Caste/Ethnicity												
Janajati	14.8	6.3	29.9	18.6	11.3	7.2	0.6	3.5	1.6	6.3	318	100.0
Janajati marginalized group	7.5	5.7	35.8	9.4	3.8	13.2	1.9	5.7	5.7	11.3	53	100.0
Dalit	14.3	2.4	16.7	31.0	7.1	4.8	0.0	4.8	4.8	14.3	42	100.0
Brahmin/Chettri	10.0	20.0	10.0	16.7	13.3	3.3	0.0	6.7	6.7	13.3	30	100.0
Economic strata												
Non-poor	12.6	8.8	26.0	19.3	9.1	7.7	0.7	4.2	2.5	9.1	285	100.0
Poor	15.2	3.2	31.6	17.1	12.0	7.0	0.6	3.8	3.2	6.3	158	100.0
Sex of the household												
Female population	9.9	7.0	36.6	22.5	8.5	7.0	0.0	1.4	4.2	2.8	71	100.0
Male population	14.2	6.7	26.3	17.7	10.5	7.5	0.8	4.6	2.4	9.1	372	100.0
Total	13.5	6.8	28.0	18.5	10.2	7.4	0.7	4.1	2.7	8.1	443	100.0

Source: Field Survey, 2018

Coming here into the new residence was challenging, but we are doing better here. I have started a small khaja shop and I am earning better than before. So our family is happy, you know my children now go to boarding school here so they are happy too, back in the village life was very hard. Our kids were going to Nepali school walking almost 1 hour. Now we are satisfied. If the government supports us, we will build a permanent structure here and live happily.

5.3 Summary

The central aim of this chapter is to examine the objective two of this study set out in the introduction chapter. For this, it especially analyses how people were displaced by dint of the earthquake. Here, the magnitude of displacement refers to the size and frequency of the displacement concerning its direction and migration. Displacement has been treated as the ultimate option after several displacements or involuntary movements. The discussion has been made by examining how the displaced households immediately took the emergency shelter, and how they change second and third shelters and how they cope with the situation.

Information on current food sufficiency was collected in-comparison to before the earthquake, the current status of food sufficiency was scarce for 86 percent of households. By 90 percent of young women married in the age 15 to 24 years' age, 9 percent of married women had married before the age 18 and 68.6 percent married after 20 year. . We have also evaluated the literacy and educational attainment of the households and household

This chapter also discussed during the last three years after the earthquake, many displaced households moved to at least three places as temporary shelter. The first was (emergency shelter) while the second place and the third places were also chosen involuntarily to cope with the situation. The findings suggest that 98.5 percent of households first involved for involuntary mobility. Findings suggest that a few displacement streams generated a stream of migration intra and inter-district and inter-intra Rural Municipality/ Municipality. More than 80 percent of the households shifted within the district in the second displacement place and rest 20 households crossed the district for shelter.

The three-fourth of the households were found staying more than one-year in the second displaced shelter while the comparable figure was 46.6 percent for those who have enumerated in the third place as a temporary shelter. We have enquired the types of livelihood adopted by the displaced households. In the second place of displacement, we found that more than one-fourth of the households did not have any livelihood options they were completely dumb founded, and a tinny fraction of the households initiated a new business (4%) and services (2%)

The majority of households, in the second site of displacement, lacked those amenities, and many women and girls were susceptible to sexual assault due to the lack of safe and separate rooms to spend the nights. Health issues such as frequent illness among family members owing to inadequate sanitation and a lack of safe drinking water, as well as mental health issues among seniors and children, were documented. Despite this result, one in every five respondents stated that they were unaffected by the earthquake, while the remaining 80 percent believed that their health had deteriorated as a result of the disaster. In the third place of displacement, nearly 11 percent of the respondents said that their family members had no health problems. In the meantime remaining 89 percent reported that their family members were experiencing some health problems. And it was found that 60 percent of households would like to stay in the current place and they had no interest to return their place of origin.

After explaining the displacement process, we'll look at the changes in displaced households' livelihood plans as a result of the earthquake.. This is addressed in the next chapter.

Chapter 6

EARTHQUAKE INDUCED SHIFT IN LIVELIHOOD PATTERNS

This chapter is structured into five Sections. Section one deals with the natural capital, section two with physical capital, section three with human capitals; section four with the financial capital; section five deals with the social capitals; and section five attempts to combine all five capitals (natural, physical, human, financial and social) as an Index of Livelihood Capitals and final Section draws the major summary.

6.1 The natural capitals

The central objective of this section is to explore the situation in the natural capitals of the earthquake-affected households. What changes can be enumerated? Natural capital is defined as those natural resources - materials and substances that occur naturally and can be used for economic gain. They include access to land, forests and water, changes in production, access to safe drinking water, access to the kitchen garden, access to sources cooking and light energy.

6.1.1 Access to landholding

The term 'landholding' refers to the entire amount of land owned by a family. The land area is classified in this study based on comments from respondents and focus groups held in the study field. As a result, land volume has been divided into four categories: landless families having no land, small-size land holders having up to 5 ropanies, low medium-size holders with 5 to 9 *ropanies*, medium-size holders with land 10 -19 *ropanies*, and 20 *ropanies* – high economic respondents. Data reveal that the percentage of landless households has dramatically increased from 10.7 percentages before the earthquake to 58.0 percent after the earthquake. Similarly, the household with land less than 5 ropanies have declined from 32.9 percentages before the earthquake to 11.4 percent after the earthquake. The percent of households with land 5 to 9 ropanies has decreased from 19.2 percentages before the earthquake to 8.2 percent after the earthquake. The percentage of a household having 10 to 19 *ropanies* has decreased from 21.1 percentages before the earthquake to 13.9 percent after the earthquake. Likewise, the percentage of the household that has more than 20 ropanies has decreased from 16.1 percentages before the earthquake to 8.6 percentages after the earthquake (Annex XVII.1).

The proportions of landless dramatically increased after the earthquake.

After the earthquake, similar trend was seen and it increased the landless people 500 times. T area of land covered decreased and unequal distribution of land was observed like in the past before the earthquake.

A Focus Group Discussion among the displaced victims at Betrawoti reveals that the earthquake forced them to live in a temporary shelter built near the riverbank of Betrawoti. They reported that they were living in hardships without land for cultivation. It was found that there is a drastic decrease in the volume of land ownership after the earthquake. Land volume ownership varies according to the caste and ethnicity, marginal caste has a low volume of land and also Landless among the marginal caste is high (Annex XVII.1).

6.1.2 Average size of ownership of landholding before and after the earthquake

Overall, the number of landless people grew (10 % to 58 %) after the earthquake; it was five times higher among the non-poor, but there was a big difference in land less (seven times) from vulnerable to poor people. After the earthquake, the total mean value of land ownership plummeted by half. It has been shown that land value decreases with economic strata, and the mean value of land ownership varies. Moving to the social group, among the Janajati households the average land ownership declined (from 10 to 3 *ropanies*) after the earthquake and the landless household drastically increased from 44 before the earthquake to 328 after the earthquake. Among Janajati marginalized, the average household with land ownership declined (from 11 to 7 ropanies) after the earthquake while the landless households increased (from 12 to 118 *ropanies*) after the earthquake. In the Dalit group, average households having land ownership decreased slightly, while the landless household increased from 15 to 38 households. Among the Brahmin/Chettri group, the average household having land ownership decreased (from 20 to 13 *ropanies*) after the earthquake and the number of landless households after the earthquake. The F-test results indicate that the two means are significantly different suggesting that the earthquake has had a significant impact on landholding size. The average size of the land was significantly different by district, economic strata and castes/ethnic groups before the earthquake (Annex XVII.2).

> Case study Sanish Tamang from Listi, Sindhupalchok, share that "I own land and house where the earthquake has impacted ,there is a big landslide which may slide all my land and house. I am now on the street situation where I will have nothing left with the landslide."

Therefore, overall we can observe that the households with average land ownership decreased by half after the earthquake while the number of landless households increased by more than five-fold after the earthquake. The value change of the land ownership after the earthquake varies according to the economic strata, and caste/ethnicity.

6.1.3 Changes in cultivation status of land before and after the earthquake

No land cultivation status has increased drastically (from 11.6 % to 64.4 %) after the earthquake. The percentage of households having all land cultivation before the earthquake was 58.2 percent but after the earthquake, it has dramatically decreased to 12.7 percent. It has massively declined by 45.6 percent from before. In the same way, households having partial cultivable land have been decreased by 7.2 percent after the earthquake as we can see in the table before the earthquake it was 30.2 percent and after the earthquake, it is 23.0 percent (Annex XVII.3).

Case study Mangal Jai Tamang, from Sindhupalchok, shared that:

> My land was left barren as there were no people to support the cultivation; most of the land is cracked because of the earthquake. However, the relief packages were enough for me to take care of my kids and family for almost a year. However, after a year I have tried to do the cultivation but the irrigation and the risk of the landslide is making me vulnerable.

Table (Annex XVII.3) shows that, there has been a drastic decline in households with all land cultivation status resulting in the rise of households with no cultivation. This is also confirmed by the f-test. Among Janajati, 53.8 percent of households had cultivated before the earthquake which after the earthquake decreased to 1.8 percent. Among Janajati marginalized, after the earthquake, it decreased from 78.8 to 31.4 percent, after the earthquake. Similarly, among Dalit, half it decreased from 50 to 31.8 percent after the earthquake and no land farming increased by 21.97 percent after the earthquake among them. Among the Brahmin/Chettri, the percentage of

households with all land cultivation was 69.2 percent it declined to 11.5 percent after the earthquake.

Again table (Annex XVII.3) shows among the non-poor households cultivation status decreased (from 63.8 % to 11.5 %) after the earthquake, 19.2 percent had partial land cultivation which increased to 30.0 percent 16.9 percent had no farming that increased to 58.5 percent. Similar trend were found decreased cultivation after the earthquake (Annex XVII.3).

Before the earthquake, X^2- test shows a significant relationship between land cultivation and district; between land cultivation before the earthquake with social group and between land cultivation status before the earthquake and economic strata and of social groups. Similarly, there also exists a significant relationship between the cultivation status of the land after the earthquake and economic strata while X^2- test does not confirm the relationship between the cultivation status of the land before the earthquake and the sex of the household head (Annex XVII.3).

> One of the key informants in Rasuwa - Gyalmu Sherpa, 38 reported that "out of my cultivation land, after a year I started cultivating in partial land, however lack of irrigation, agriculture tools and Human resource, I am finding it difficult to cultivate the land.

According to the findings, the number of families with all land under cultivation has decreased dramatically, resulting in an increase in the number of households with no land under cultivation. The f-test confirms this up as well.

6.1.4 Reasons for not cultivation of land

Overall response regarding to reasons for not cultivation before and after the earthquake were: land fault and cracked (2.6 % to 48.3), lack of irrigation (69.4 - 15.6 %), lack of human resources (24.1 -2.), and lack of tools (3.9 – 0.7 %), showing the fact land cracked increased, irrigation decreased, lack of human resource after the earthquake. And 33 percent responded cause for not cultivation was fear of earthquake. While comparing with other characteristics of population similar increase in land fault and cracked was found as a reason for not cultivation (Annex XVII.4).

Our FGD in Simbutar, agriculture, the main source of livelihood of Nepalese shattered after the massive earthquake. People lost their houses and lands due to the

earthquake, recurrent aftershocks and earthquake-induced landslides. Before the earthquake, both male and female members were engaged in income-generating activities, females taking responsibility for the agricultural production and males engaging in other cash earning jobs. They are currently land less presently and no way going back for survival (Annex XVII.4).

6.1.5 Crops production after the earthquake

The study data indicates that more than 75 percent of households experienced a decrease in agricultural production, and 19 percent reported no change in crop production. five percentages of households reported that their crop production was increased than that of pre-earthquake situation. It was discovered what was behind the rise in crop yield among the few homes. They bought some land, in futile after the earthquake Annex (XVII.5).

Among the caste/ethnic group, the highest proportion of Janajati households (88.5 %) experienced a decrease in crop production followed by (Brahmin/Chettries (65.3 %)) marginalized group Janajati (65 %) and least for Dalit (48 %). Economic strata are more 'vulnerable to poor' and the 'poor' households that who experienced a decline in their crop production due to the effects of the earthquake. As a result of the earthquake, more male-headed families (78 %) and female-headed households (68 %) saw a decline in agricultural output. Comparatively, more male-headed households (78 %) and female-headed households (68 %) experienced a decrease in crop production as the consequences of the earthquake.

Nanimaya Tamang, one of our key informants, reported that her food security was dependent on relief and support from others, and that as a displaced person, she was unable to return to field cultivation because she was unable to make other arrangements for the cultivation of rice and other crops because she was displaced and living in a new location. One of the key informants in our field, Nanimaya Tamang, reported that food security for her was depending on relief and support from others and as displaced she could not go back to field cultivation, as being displaced and living in the new place, she could not make other arrangements for the cultivation of rice and other crops (Annex XVII.5).

6.1.6 Access to sources of drinking water before and after the earthquake

Five sources of drinking water were identified in this investigation.. Overall, there has been a minimum decline in the percentage of household using the source of drinking water from public tap/pipe before (91.3 %) and after the earthquake (87.6 %). The stored water and other open resources decreased from 2.6 to 1.1 percent and it was a slight increase in pond/ river sources from 6.1 to 11 percent depending on drinking water. The main source of drinking water remains unchanged even after the earthquake (Annex XVII.6).

In our field study, we found that some NGOs like the Red Cross, World Renew and Rural Municipality have provided drinking water in the relocated areas. In such settlements, there was a limited problem with drinking water and some were relocated in a place with extend access to water.

> A KII with Mr. Hari Bahadur Tamang, 46 years old man from Betrawati, Rasuwa, reports that "we are getting better drinking water than before, these drinking water schemes are supported by different organizations such as Red Cross, World Renew and ward of this municipality. Therefore, we have no problem of drinking water here. The natural river is a few minute distances from here but we have pipe water service.

6.1.7 Quality (safe or not) of drinking water

Here in this study, safe water refers to open sources, pond river canals and safe is private pipe water. There is no significant variation in access to safe drinking water before and after the earthquake. Nearly, two-thirds of the households before and after the earthquake reported having access to safe drinking water. The X^2-test also confirms the fact that there is no association of safe/unsafe drinking water before and after the earthquake (Annex XVII.7).

6.1.8 Access to forest/local resources before and after the earthquake

The study of 735 households shows that 63.55 households did not have access to forest/river resources prior to the earthquake. Almost all families did not have access to forest/river resources following the earthquake, according to the statistics (Annex XVII.8).

This decline was obvious after the earthquake. The households in their original place have destroyed the plantation in their farmland which could be the main source of farming to their animals and cattle. The displaced households are now living on public land, such as banks or riverbanks, with no private access to forest resources. Our observations in the Betrawoti displaced camps suggest that residents relied on riverbank fuel wood that would be soon depleted. In Dolakha, we noticed that the displaced families who had set up camp along the roadside depended on public forest/trees for feed and firewood. These sources were protected by the community and the displaced households are not free to use these resources as per their needs. Our quantitative data indicated that almost all households in the study lost their access to forest/local resources after the earthquake.

> One of the key informants, Santosh Tamang, 38, said, "I am out of the place of origin and is displaced, so being displaced there is no access to forest and other resources, you cannot just enter into others forest here in the place.

6.1.9 Access to kitchen gardening

Access to kitchen gardening is one of the major components of health security. It is a means to raise levels of nutrition and improve the living standards of the rural poor as recommended by the Food and Agriculture Organization of United Nations (1995). One of the easiest ways of ensuring access to a healthy diet that contains adequate macro-and micronutrients is to produce many different kinds of foods in the home garden. This is particularly significant in rural regions, where people have few options for generating money and have poor access to market-places. For disadvantaged families in peri-urban and metropolitan regions, home gardens are becoming an increasingly significant source of food and revenue.Data reveal that in both districts after the earthquake, the change is negative (ranging above 43 %) in all attributes of the selected characteristics, showing that most earthquake-affected families have lost their access to the kitchen garden (Annex XVII.9).

6.2 Physical capitals

Physical capital has been assessed by using indicators such as access to toilet facilities, sources of lighting, sources of cooking, access to household facilities, households having daily using a machine and livestock ownership.

6.2.1 Toilet facilities before and after the earthquake

Accesses to toilet facilities have declined substantially after the earthquake. For example, 78 percent of households have access to toilet facility before the earthquake and now it is 14 percent households have this facility after the earthquake. The data reveal that access to toilet facility decreased more than five times after the earthquake. The research found that most of the households who are living now in one cluster in group sharing toilet, one toile for each 3 to 4 households in temporarily living area. The households began to live permanently to build house and have their own family toilet (Annex XVII.10).

Qualitative information also confirms the fact that access to safe drinking water and sanitation facilities were largely affected due to the earthquake. A case study of Simbutar has been extracted to show how safe drinking water and access to toilet facility was affected by the earthquake:

> The displaced residents of Simbutar had lack of drinking water facilities in their residential area. Regarding to toilet facilities, the residents know the importance of toilet facilities for overall sanitation but they lacked toilet facilities even in the resettlement area. The displaced residents of Simbutar had a lack of water facilities in their residential area. When they had to suddenly be displaced from their original places to a new place, they had to suffer from the unavailability of toilet facilities. They have to walk to a nearby outlet from where they have to fill water in water buckets and carry it to their places. They don't have direct access to water facilities.

6.2.2 Main source of light energy

The data reveals that there has been a tremendous shift in the main source of lighting in earthquake-affected households as they shifted from electricity to coal use.

The table shows that 87 percent of households used electricity as the source of light before the earthquake, which declined to 54 percentages after the earthquake. On the other hand the users of solar light increased (10 to 42 %). It was reported that in many villages we have visited, solar panels were installed at current settlements with the support of different development agencies. There was shift in electricity to solar as the source of light has been evident in Rasuwa and Sindhupalchok district after the

earthquake. Further, after the earthquake, very few of the households using *Tukimara* as a source of light. The *Tukimara* is a small traditional oil lamp (Annex XVII.11).

6.2.3 Main source of cooking energy

The main sources of fuel forcooking are electricity, kerosene, Gobbar gas, wooden stuff, straw, charcoal, LP gas and others (straw, grass). Most of the households have used firewood as fuel for cooking food. 76.9 percent in Sindhupalchok and 94.1 percent reported that they used firewood as fuel after the earthquake. There was not much change in the use of electricity as cooking energy after the earthquake but in the users of LP gas increased from 25 percent to 64 percent after the earthquake. It seems that the users of wooden stuff as fuel figure out the same as in the past (not seen change).

Overall electricity and kerosene users were decreased by 1.4 percent and Gobbar users decreased by 1.6 percent. As this, wooden stuff, straw and charcoal users also were reduced after the earthquake. Our qualitative information proves that the earthquake affected peoples are out of right using the natural resource at the new residence. Therefore, they have no access to the forest to use wooden stuff, straw and charcoal. As they are displaced to the surroundings of the urban or central place of the district, access to the LP gas is easy for them; therefore, such users are increased after the earthquake. Figure shows that LP gas users are drastically increased (Annex XVII.12).

6.2.4 Household amenities/facilities

Basic household amenities / facilities categories in the study area include as - Basic amenities (grain store, bed, chair/sofa, table, drawer/wardrobe, clothes/carpets, sewing machine, traditional grinding tool), IEC material (television, VCR/VCD, telephone/ mobile phone, radio, tape, camera), Electric goods (electric fan, refrigerator, water pump, solar, rice cooker), Agriculture related (water mill, tractor, thresher, hoe) and Transportation goods (motorcycle, bicycle). And, an average weighted has been calculated for each of the amenities listed above. The weighted average is the sum of the product of each of the items in the group of amenities as show below:

$$Weighted\ Average = \frac{Sum\ of\ Weighted\ Terms}{Total\ Number\ of\ Terms}$$

The weighted arithmetic mean was introduced by Cotes, Roger in 1712. His work was published in 1722, six years after his death.

Data reveals household amenities such as basic amenities found decreased (21 %) after the earthquake, likewise agriculture related amenities (15 %) and electric goods (1.53 %) decreased than before the earthquake. However, IEC material and transportation items have risen in various ways after the disaster. The majority of the surveyed families live in one-story tin sheet roofed houses; as a result of their house collapsing due to the earthquake and their household amenities being destroyed. They are still in the process of managing basic amenities and barely living without daily necessities (Annex XVII.13).

A FGD of female group Bhotekoshi Municipality-2, Kaanglaang revealed the fact; -

> Although the house was small, we had a separate toilet and it was far from the living house. We had a separate kitchen for cooking; i.e. outsides the main door and separate cowshed before the earthquake. Now we do not have such facilities. Living here in a group, still, all have not built houses and waited for government installment to build houses. Some are building the house.

Therefore, their discussion clearly states they were lost of facilities after the earthquake except transportation and IEC materials.

6.2.5 Livestock ownership

After the earthquake, most of the respondents in the study area had access to grass and fodder, grassland, and woodland before the earthquake. Such access was lost after the earthquake, and they no longer had animals, with a few exceptions, after the earthquake. Data shows that most changes are seen with households having buffaloes and cows. In Sindhupalchok, more than two-thirds of households reported that they used to have buffaloes and cows whereas after the earthquake. The comparable figure was 37 percent. Similarly, in Rasuwa, 57 percent households owned buffaloes and cows against merely 2.3 percent now (Annex XVII.14).

One of the informants, Amrita Tamang from Rasuwa said,

> I used to have 2 buffaloes and 2 cows in our house before the earthquake, I used to get milk from the livestock and sell the milk for collecting income.

The earthquake killed all the livestock and I lost almost all of them and now I have no buffalo and cow at all, I lost my livestock.

6.2.6 Status of reconstruction of damaged houses

At the time of the survey, which was carried out after 3 years of the earthquake, one-fourth of the households' respondents reported that their houses were already constructed, while another one- fourth had done nothing to reconstruct houses, 29 percent were constructing and the rest 20 percent reported that they were yet to start.

In the field, it was reported that, many respondents have a delay in the construction of houses as it required long process and much time to purchase the land after received the said installment. Many reported that they could not follow the process and procedure put forward by the government of Nepal (Annex XVII.15).

6.3 Human capitals

The indicators of skills learned after the earthquake, income from skill learned, the main and secondary occupations of the family, and the main source of family income, health condition and deaths due to earthquake, including injuries caused by the earthquake, baby delivery, and child care and vaccinations are all studied here.

6.3.1 New skill

The study report reveals that nearly 17 percent of men and women have learned new skills after the earthquake. However, this proportion is much higher for males (28 %) against females (6 %), pointing out the gender bias in skill training provided by NGOs or the government. The major skills learned by them were mason (32.5 %), plumber (16.5 %), and carpenter (15 %). However, the types of skills learned are valued by sex. For females, micro industries (37 %), agriculture-related and tailoring were pronounced while for males, mason 38 %), plumber (18 %) and carpenter (17 %) were the top three new skill levels in the study (Annex XVII.16).

Few female informants from Rasuwa reported that they have received microfinance and mason training, which they considered a great opportunity to work as a mason and support people in building houses. Many females, it is argued, learn how to construct the earthquake resistance house and built them.

In Sindhupalchok, the highest percentage of females received training in micro industries while the lowest percentage received driver training. For males, the highest

percentage received training on Mason /Mason while the lowest in tailoring. On the other hand, in Betrawati, Rasuwa, the female FGD participants complained that training for men was conducted there hence; they didn't get any such training. They added if they had received any training, they may have been able to get some jobs and earn some money thus; their husbands wouldn't have to go through hardships alone (Annex XVII.16).

6.3.2 Types of skills learnt

Top-five skills learnt by the affected people include mason (33 %), plumber (16.5 %), carpenter (15 %), driving (9 %) and machinery (8 %). However, the types of skills learnt significantly vary by the selected characteristics of the households considered here like district, caste/ethnic group, economic strata and head of the households (Annex XVII.17).

Some of the respondents who claimed they received the masons training claimed that they did not know the earthquake resistance technology. After the earthquake, they learned new skills to make earthquake resistance houses. After the earthquake, there are many houses to be constructed and mansion training was important for livelihood in the relocated areas.

A case study of Shyam Tamang reflects how mason training was important for the earthquake-affected households:

> 'He received mason training provided by an NGO after the earthquake. After that, he was able to work in various construction sites. The construction works up to 2 years of the earthquake was massive in the locality. After two years, the construction work slowly declined and many people including him became unemployed. He had to struggle every day to find work. Before the earthquake, the scenario was different. He would work in the field for 3 months which would provide him food security for about six months.

6.3.3 Occupational shift before and after the earthquake

Here is a discussion about the distribution of household population aged 10 years and above by their main occupational shift before and after the earthquake. The main occupation is defined as the profession in which a person spent much time during the year. It is observed that a decline in the percentage of households having the main occupation as agriculture whereas the percentage of households with the main

occupation as non-agriculture has increased. Most of the respondents who said that they were doing agriculture before the earthquake changed their occupations as non-agriculture workers. There is a significant change in the agriculture area after the earthquake.

> Team members of FGD, Radhika Tamang, from Betrawati, Rasuwa age 26 shares that "My parents were actively involved in agriculture before the earthquake but after the earthquake, we left our house and community. Landslide affected our house and agriculture, but after we moved here we completely have no land for agriculture so we have to change the agriculture profession into another profession, I am now learning sewing class so that I can do something with sewing and my father is out in Betrawati restaurant as a cleaner and support person.

The data shows that agriculture was the predominant occupation prior to the earthquake, but after the earthquake, the majority of them switched to non-agricultural work (Annex XVII.18).

6.3.4 Monthly income of the households before and after the earthquake

In the study area entire affected respondents the average monthly income before the earthquake was Rs. 5, 987 with a standard deviation of 8,674.

The average income came down to Rs. 3,101 with a standard deviation of Rs. 3,374. After the earthquake huge variation was observed in monthly income of the family. A sharp variation, in average income, was found in Sindhupalchok (from Rs. 7,356 before and after the earthquake Rs. 3,474) compared to Rasuwa (before was Rs. 4,680 and after the earthquake Rs. 2,744). The maximum difference of average income was found among the Brahmin/ Chettri Rs. 14,790. Overall, there was a decline in income after the earthquake it is half of the income than before (Annex XVII.19).

As there were significant changes in the occupation, these changes have made changes in income.

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> Bahadur Tamang, 39 years old living with his wife and two children talks about changes in the occupation. He claimed that before the earthquake, he

had a nice income from the sales of Agriculture products. But, now his income declined as the earthquake spoiled his livestock and agriculture, his house was also collapsed. 'The land where I used to farm is now becoming a dry land as the source of water was lost; there are so many cracks too. My monthly average income was Rs.60000 but now it is almost zero".

6.3.5 Households distribution by their main sources of family's income before and after the earthquake

The analysis highlights the family's major sources of income prior to the earthquake. Salary and pay were the primary sources of income for 21.6 percent of families before the earthquake, and this figure has now dropped to 20.3 percent. After the earthquake, 59.9% indicated that their major source of income was farming and fruit farming, and this figure has dropped to 11.8 percent after the earthquake. (Annex XVII.20).

The data reveals that there has been a tremendous shift in main sources of cash income of the earthquake-affected households before and after the earthquake. The salary/wages, farming and fruit farming, business/industry, *Balighare*pratha, daily wages in agriculture and livestock's have declined after the earthquake. Daily wages in non-agricultural sectors has increased after the earthquake. In an FGD with the females in Bhotekoshi Municipality -2, Kaanglaang, it was reported that no agricultural land right now, whatever the income sources were in the past is completely changed to the new type of work. Relying on the saved money and doing new business, some have done small shops/hotels and daily wages on agriculture (Annex XVII.20).

6.3.6 Physical and mental health problems and child immunization coverage after the earthquake

In the survey of 735 households, at least 15 percent of the households' members reported that they felt fainting due to the fear of earthquake. They had other health problems like craping, crying, mental tension/stress and blood pressure.

A further question was asked about the current health condition and it was found that 75 percent reported being cured while the rest were still in the problem. Data reveal that 15.2 percent of the household reported that vomiting, which remained for 3 months. The problem of leg craping is seen among 8.3 percent. This problem remained for 3 months. Arm pain has been reported by 7.2 percent of the household

which remained 3 months on average. The problem of crying is among the 7.8 percent of households. The problem remained for 4 months. In terms of mental tension, 4.4 percent have this problem which remained for 4 months. Overall, two-thirds of the respondents reported that the health problems of the affected persons were cured while the rest one-thirds reported somewhat health problem related to the earthquake was still there even after the two years of the earthquake (Annex XVII.21).

6.3.7 Human losses due to earthquake

More than one-third of the deaths for the last 5 years were due to the earthquake. Many respondents reported that they were buried in the collapsed house. Around 31.1 percent of respondents reported that their loved one's death was in the house, whereas 6.3 percent stated they died in hospital. A maximum number of respondents reported that health workers cured them and 30 percent of the respondents reported that they were taken to Dhami and Jhakri for the traditional treatment method (Annex XVII.22).

One of the informants - Hombahadur Tamang from Rasuwa in the survey said,

> "I lost my mother, she got stuck in the house and was severely injured so, we took her to a hospital in Bidur. She recovered but, after she came back home she died. However, my daughter who was coming from her friend's house experienced the earthquake and as she had no support in Kharbari, she was mentally disturbed, I and my family did not understand her psychological problem, so we took her to the witch doctor – the traditional healer".

Out of the 735 a total of 24.9 percentages households' members were injured due to the earthquake. Among the injured, more than two-thirds had a simple or general injury while 11 percent had serious and another 22 percent had medium size injury. The injuries were reported in different parts of the body including in the heads, legs, chest and face. The majority of injuries happened due to running, hit by the collapsed houses and jumping (Annex XVII.22).

6.3.8 Categories of injuries due to the earthquake

Among the total 183 injured people, 93 peoples were in Sindhupalchok and 90 in Rasuwa district. The majority of injured people (66 %) were Janajati. The injury was reported mainly on hand (39 %), legs (27 %), and heads/chest (23 %). Two-third of the injury was due to running/escape during the earthquake while 28 percent injured

were due to their houses collapsing and the rest 5.5 percent was due to jumping from one place to another to escape from the earthquake (Annex XVII.23).

6.3.9 Households having disabled persons before and after the earthquake

Natural and human-induced disasters tend to have a disproportionate impact on people with disabilities. In emergencies, people with disabilities may encounter physical barriers, obstacles to communication and other barriers to accessing essential services. Hence, they may easily suffer greater discrimination, as well as lower levels of protection against disaster, than those offered to people without disabilities. And disabilities increases after the disaster in the affected communities which was the direct impact of the disaster, here our findings reflect the comparison of disabilities before and after the 2015 earthquake.

The total disables among the total households was 1.8 percent before the earthquake, then after the earthquake, it was increased to 4.1 percent. The last column of the table shows that the differences in disabilities after the earthquake, in every selected characteristic disable family members increased. There were no disables in Brahmin/Chettri families. After the earthquake, 5.8 percent of families have a disabled member. After male disabled (1.1 before after the earthquake 4.7 %) increased, this is higher than female disabled (2.4 % before the earthquake then after the earthquake 3.5 %) after the earthquake (Annex XVII.24).

6.3.10 Child birth and problem of delivery care

Study shows that overall, 18 percent of the households reported a baby's delivery in the family after the earthquake. Of the total households reporting deliveries, one-third of households reported that their babies were delivered at home, 65 percentages of households reported that it was in the hospital and 2 percent reported that the health workers carried it out. The proportion of households reporting babies' delivery after the earthquake is not very much different between survey districts. , It differs among caste/ethnic group and sex of the household heads distinctly. 6 percent of Brahmin/Chettri households reported babies born in their family after the earthquake. The comparable figure is highs 20 percent for the Dalit households. Among the households, that reported the delivery of babies 18 percent reported that it was difficult to take care of the delivery of women because of lack of adequate shelter, shortage of nutritious food, medicine, hot water (Annex XVII.25).

6.3.11 Timely vaccination of children before and after the earthquake

To reduce child mortality, morbidity and disability associated with vaccine-preventable diseases. There are some vaccination recommended in Nepal for children according to the Ministry of Health, National Immunization Program (NIP) such as Polio, Pneumococcal diseases (meninges, ear and chest infections), Tuberculosis, Diphtheria, Pertussis, DPT-HepB-HiB, Tetanus, Hepatitis B, Hemophilic influenza type B. Study survey has focused these vaccines were accessed during and aftermath the earthquake.

Immunization coverage of children under 5 years of age was dramatically affected by the earthquake. Whereas nearly 87 percent of the households reported that children in their families were immunized before the earthquake while the comparable figure after the earthquake was 28 percent (Annex XVII.26). This change was significant by district and by the head of the household while they are not significantly different by caste/ethnic groups and economic strata. Hence, in terms of timely vaccination of the children, we can see on the table before the earthquake, a higher percentage of children were timely vaccinated whereas, after the earthquake, the timely vaccination percentage is lower among those who have children.

The FGD participants in Fulpingkatti Municipality-2, Sindhupalchok, noted a general lack of proper healthcare, as well as insufficient medical supplies at dispensaries. Access to medical aid was also mentioned throughout the conversation. Some of the participants stated that they could not afford to pay for transportation to the doctor's office, nor could they afford to pay for recommended medicine. "Even though healthcare services were reported to be accessible at the local health post, shortage of medications as barriers to getting treatment," the complaints said. One of the complaints *that* –

> When I go to the doctor (in the health center), he gives me some tablets and does not know what medicine is. I was suffering from chronic disease; such medication can’t help.” (Mansing Tamang said)

When it came to health issues, the female FGD participants in Betrawoti said that they had to deal with obstacles. They talked about how they had to walk for hours just to go to health post in case the health post could not help them. They had to travel to the district headquarters and it took days and worsened their situation. They also

described how they had to carry patients and rush to health stations or district headquarters in order to obtain medical attention. They regarded it as extremely challenging when pregnancy issues appears. They expressed relief after looking the healthy children . They were happy that they could get instant facility when their children suffered from any bad health conditions (Annex XVII.26).

6.3.12 Schooling of children after the earthquake

More than 22 npercent of school-aged children were discovered to be out of school. After the earthquake, the majority of children were not attending to school due to economic fear of the frequent earthquakes. The road was also a reason for them not attaining to school. In the study, overall 22 percent of children aged from 5 to 18 years were not going school at the survey time. Males are somewhat more likely than females to miss school; Janajati has the greatest percentage of non-attendance (12%), and vulnerable to poor people have the highest rate of non-attendance. In addition, the kid group has the greatest rate of not going (15 %) (Annex XVII.27).

6.3.13 Reason for not going school (aged 5-18 years) after the earthquake

The study explored that the reason for not going to school aftermath of the 2015 earthquake. The reason reported of not going to schools were: repetition of the earthquake and collapses of school infrastructure (7.9 %), no good environment for education (15.9 %), facing economic problem (38.1 %), problems with parents death (6.3 %) and death of family member (23.8 %). Among them the data shows that the highest percentage suffered from the economic problem caused the children to discontinue the school education.

Among the 39 Janajati children who are not attending to school reported that the reason of not going to school was due to family member's death (40 % of out of 39 children), and 50 percent of marginalized Janajati children report the reason of not going to school was due to family members death.

Economic problem was a main threat for school dropout after the earthquake. The majority of Dalit children (64 percent) did not attend the school and 88 percent of Brahmin/ Chettri children dropped school education due to financial difficulties. In the case of the non-poor and poor students, the major reason for not attending the school was economic problem and the death of family correspondingly.

Qualitative information also confirms that for the short-time period, their children's schooling was restricted due to fear of earthquake. But as now they are residing near the district headquarter where schooling access is available (Annex XVII.28). (Annex XVII.28).

6.3.14 NGOs and government interventions and awareness raising

In several places, it is also reported that there has been an increase in awareness among the displaced population especially in sanitation, earthquake preparedness, the importance of schooling for children, and even an increase in the delivery at the hospital due to the several interventions run by NGOs. The knowledge on the importance of sanitation causes people to clean their surrounding environment to maintain sanitation and hygiene. The increased realization of the importance of encourage the people to send their children to school. Before the earthquake, household work was much more important than sending the children to schools. It showed increase in institutional delivery and before, the majority of the people practiced home delivery instead of institutional delivery. The Antinatal Care (ANC) visit rate which is 4 visits during pregnancy also increased.

6.4 Financial capital

The people collect income and economic sources like remittance, government benefits, and support through the account in a formal financial institution as one of the financial capitals. This section addresses the issues of the bank account access, saving levels and types, remittance access, and monthly income.

6.4.1 Access to the financial institutes before and after the earthquake

In the study area until now, however, indicators on the poor, women and young people's banking practices were lacking. To address this gap, the Government of Nepal introduced guidance to the earthquake-affected population to create an account at the nearby bank or a financial institution to save, borrow, make payments, and manage risk both inside and outside the formal financial sector, as well as transfer government-supported funds to the financial institution. Due to this reason, study data also shows that households having the access to bank account increased substantially after the earthquake.

The survey data shows out of the total surveyed households 62 percent households have bank account before the which increased to 83 percent after the earthquake

(increase for male 39 %, female 13%). The families having male and female account before the earthquake was 28 percent and which was increased to 40 percent after the earthquake (Annex XVII.29).

Thus, it appears that the earthquake resulted in a positive change in bank assess.

Sunita Tamang, from Sindhupalchok shared us:

> I used to have a cooperative account where I did savings and credits. I got a loan from the cooperative couple of time, but after the earthquake for the house construction I had to open the bank account as NRA had specified to open a bank account, so I maintained a bank account which was the first time in my life having a bank account.

6.4.2 Status of loan taken

Loan taken status, however, differ by the characteristics of respondents. By district, 28 percent in Sindhupalchok and 8 percent in Rasuwa respondents took loans for different purposes. The use of the loan in Sindhupalchok was construct house (58 %), purchase land (12 %) and micro business (4 %), but in Rasuwa use of loan for house construct (27 %) and micro business (30 %) and land purchase (13 %). While the loan is taken and use of loan among the caste/ethnicity, a higher percentage of loan use was found among Brahmin/Chettri (92 %) for house construct, then Dalit (64 %) and Janajati (52 %). eleven percent of Janajati marginalized used loans for house construction. Purchasing the land for house construction was found given second priority of loan use (Annex XVII.30).

From the qualitative information, it was found that some of the households could not be able to take the government's benefits timely to reconstruct the house and even if they took, the amount was not adequate. In Melamchi, one staff of the Reconstruction Committee of NRA reported that people who were not able to take loan could not construct the house, some of them got the government support Rs 200,000 for land purchase and the amount of the first installment 50,000 taken for house construction. They used the amount for another purpose instead of constructing the house. Most of the affected families who are not able to take the loan from the financial institutes are still not able to construct the house. Further, he said that about 50 percent of the affected families properly using the fund and the rest have misused it. Some of the

affected families could not manage the necessary documents to receive the loan from the Government (Annex XVII.30).

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6.4.3 Saving before and after the earthquake

Study revealed that there was a positive change in the households' saving patterns after the earthquake. Numbers of families having no bank saving account ((Before the earthquake, 35.5 %then after 14.8 %) decreased after the earthquake. It seems that the proportion of the household saving increased after the earthquake. It was because after the earthquake, the entire earthquake affected (GoN) supported families were instructed to open at least one bank account to receive the benefits provided by the NRA. After there was decrease in individuals saving amount mean (Rs 7370 to 5767 after the earthquake) (Annex XVII.31).

There were also negative changes in the saving amount observed for all the economic groups except in severely poor groups (increased Rs 3,239 in an average), a huge change after the earthquake was reported among the non-poor from Rs 10,022 to 5,768 after the earthquake. To signify the saving of different social groups, the t-test method was used to analyze. The value of 't' was 18.750 and the p-value was 0.000 which had clarified the significance of saving among different social groups. According to the economic strata, the highest percentage (60.0 %) of severely poor people saved in lower-income and the highest percentage (19.0 %) of the non-poor saved the higher amount (Annex XVII.31).

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6.4.4 Remittances receiving households according to selected characteristics

Remittance has been a major income in the study area since the beginning (before the earthquake). Because of the 2015 earthquake, the migration process was interrupted and remittance income was declined. Out of 735 study households, 164 households received remittance during the last five-year which accounts for 22 percent of the total households.

In an FGD with females in Bhotekoshi Municipality-2, Kaanglaang, reported that migration was common in their village for survival. The FGD participants reported that in their village, a participant Nima Sherpa was just back from foreign employment after the earthquake, he has invested the remit money for building own house in addition to the government-supported fund. As they reported overwhelming of the households at this community are dependent on remittances as there in no any income except the income from farm works.

> Tara from Gyalmu, from Rasuwa says how migration is important for them; My husband worked in Dubai for five years and is back and we are living together. My husband has two brothers and one sister. Now we have economic problems. Now, my husband cannot work as he has severe illness since he is back from Dubai. Instead, they fund their daughter but not me. Still, they were trying to send the daughter but not yet to me and now I am thinking I am unlucky and despised being a daughter-in-law of this house. This would not have been the case if I was born a son or a daughter at home.

An FGD a female group from, Bhotekoshi Municipality-2 reveals

> Migration is common in our village, most of our group members' house has at least one outside the country, most of the members here are back from foreign countries. They are saving money now and using it to build a house with the addition of the government-supported fund. Even in our home village where we left due to this earthquake, most of them were dependent on remittances. But, we don't have any income source in the past home village except for little grain income from farm works. Here we have a better income source than before but we have got our house collapsed and lost all our farmland.

Table shows that the distribution of households receiving remittances since last five years according to caste and ethnicity, economic strata and sex. Out of the total study households 22.3 (164 households) percent migrants' households receiving remittances, among them 40 percent receiving per year is till Rs. 30,000, 27 percent receiving till Rs. 100,000, 26 percent receiving till Rs. 150,000 and 7 percent receiving more than 150,000 Rs. per year. The average remittance was Rs. 74,055 and standard deviation is Rs. 65,916. The lowest average remittance received by Dalit (Rs 59,429), then Janajati (Rs 73,367) and Janajati marginalized (Rs 82,222) per year. The highest amount of remittances per year receiving was by Brahmin / Chettri amounting Rs 1, 073, 08. Among the total 164 families, the non-poor are 96 families and 68 families are poor families who receive remittances (Annex XVII.32).

Discussion with the earthquake victims tells that remittances have been used in building houses, health care, education, pay back the loan, go to a foreign country, invest in agriculture, microbusiness, saving and buy land. Remittances were found used in both productive and unproductive sectors.

6.5 Social capitals

In this section, we discuss the following contents: social security, social participation (membership in organizations), religious and cultural participation and support received from GOs/NGOs/private sector.

6.5.1 Social security

Social security of the people living in the state is one of the government's concerns and primary responsibilities. People's social security appears to be threatened greatly due to the earthquake. People stated that before the earthquake when it used to be

small calamities people have received support from the government of Nepal. However, after the earthquake, 6.7 percent of the respondent reports that they have received support. Social security provisions for natural calamity compensation, student scholarships, widow allowance, disabled and old people allowance, infant/delivery and different government scholarships for marginalized people have been greatly obstructed due to the earthquake at least temporarily (Annex XVII.33).

6.5.2 Religious and cultural participation and change after the earthquake

The data reveals that there has been a greater impact of the earthquake on the study community's religious rituals. More than 80 percent of the respondents reported that they used to worship the god/goddess before the earthquake. Now, this proportion fell down to 24 percent. The main reasons for the decline were changes of residence, far from their family deity where they pray daily, also they have different other burden coming to the new residence, some of them are temporarily living and some of them are trying to live permanently at the current place where they have not such environment to pray their deity.

In Sindhupalchok district, before the earthquake 77 Percent of the households daily worshipped God/Goddesses and after the earthquake, it decreased to 9.8 percent. In the Rasuwa district, before the earthquake, 89.4 percent of the households daily worshipped God/Goddesses while after the earthquake it decreased to 37.5 percent. Among Janajati, 90.1 percent of the households reported worshiping God/Goddesses before the earthquake against merely 30 percent after the earthquake. Among Dalit, 61.4 percent of the households worshipped God/Goddesses daily and after the earthquake, it declined to 9.1 percent. Among Brahmin/Chettri, before the earthquake, 100 percent of the households worshipped God/Goddesses daily and after the earthquake, it drastically declined to 9.6 percent (Annex XVII.34).

> Delay in cultural rituals, Buti Sherpa, shared that her daughter Ms. Pasang Sherpa had to postpone the marriage of her daughter which was scheduled on 29th April - The scheduled marriage plan for the marriage of my daughter in April end, was postponed for a year after the earthquake, I had to postpone the marriage, for another year, seeing people dying, I could not think of marriage, so we and family decided to push it for the next year.

6.5.3 Social participation before and after the earthquake

Data reveals that household members' affiliation in a social organization has drastically declined due to the earthquake. Social organizations in the villages are important community organizations like development user groups, women empowerment groups and poverty alleviation groups. There has been a dramatic reduction in family members' involvement in a social organization after the earthquake. For example, overall 74 percent of households family members were reported to have been engaged in different social organizations before the earthquake it decreased to 39 percent after the earthquake. The family members' participation status in social organizations has significantly declined in both districts, across the social groups, economic strata and head of the households. Affiliation of at least one household family members involved in social organization / social participation before and after the earthquake (Annex XVII.35).

In Sindhupalchok district, three fourth percent of the household before the earthquake had at least one of their family members involved in social organization. The social participation declined to 42.3 percent after the earthquake. In Rasuwa district, 68.1 percent of the household had at least one of their family members involved in social organization and social participation decreased to 36.4 percent after the earthquake. Among the Janajati group, 70.2 percent of the household had at least one of their members affiliated in the social organization which after the earthquake decreased to 37.2 percent. Among the Dalit group, 74.2 percent of the household had at least one of their family members affiliated with social organizations and decreased to 28.8 percent after the earthquake (Annex XVII.35).

6.5.4 Immediate support from others

After the earthquake, an open-ended question was asked whether the households got any monetary, kind, or medication assistance from family, friends, neighbors, or development agencies (Annex XVII.36).

Data reveal that more than 50 percent of the earthquake-affected households received cash support. Economic and other support was provided by different individuals and NGOs. Overall 72 percent of the households reported that they received some cash support from individuals. However, this proportion is much lower in the case of marginalized groups which is 43.5 percent. In the case of severely poor category

households it was 58 percent 52 percent of families reported that they received some monetary assistance from NGOs, but a considerably smaller number of disadvantaged and impoverished group informed that the support did not reach them properly.

6.5.5 Organizations reported involved in support

Annex XVII.37 shows the distribution of households which reported about the different support received by different organizations after the earthquake on the basic of some selected characteristics. In Sindhupalchok, 90.1 percent of the households received support from Nepal Government, 73.7 percent from Private Sector, 9.9 percent from Nepal Red Cross, 36.9 percent from the World Food Program and 12.5 percent from others. In Rasuwa, 95.1 percent of the households received support from Nepal Government, 73.3 percent from Private Sector, 52.8 percent from Nepal Red Cross, 46.7 percent from the World Food Program and 0.6 percent from others.

Among the caste/ethnic group, 95.2 percent of the households of Janajati, 80 percent of marginalized Janajati group, 91 percent of Dalit, and 100 percent of Brahman/Chettri reported that they have received support from Nepal Government. There were also a considerable proportion of households receiving support from NGOs, Nepal Red Cross Society and World Food program (Annex XVII.38). It was reported that several NGOs provided relief materials, organized health camps, which were involved in the rescue operation, arranged temporary shelters. NGOs are also found to have involved in providing skills to the members of the affected households. These NGOs include SOS Children's Villages International, World Vision, Save the Children, Samaritan's Purse, Relief International, Plan International, Oxfam International, Mercy Corps, Lutheran World Relief, International Organization for Migration, Counterpart International, Concern Worldwide, CARE International, Ameri Cares, Action Aid, etc. were involved in skill-oriented programs at the research areas (Annex XVII.38).

The Data reveals that 20 percent of households have not started to construct the house even after three years of the earthquake and another 26 percent had done nothing. This finding suggests a massive delay in the building of houses in the study area. Short and long-term support was the response to the earthquake made in the study area. Most of the short-term supports were made immediately after the earthquake and then long-term support based on the planning was seen and collected the information

related to the support. It was found that different supporting agents appeared after the earthquake in the study area with different types of supports (Annex XVII.37).

Following matrix shows name of organizations involved in recovery and their working area in the study area.

Name of organization	Working area
CDC-Nepal with collaboration between Save the children, DFID,	Earth quake response, Livelihood recovery, WASH
CDC-Nepal with collaboration between USAID, SABAL	Livelihood recovery
Cardson Nepal	Wash, education, livelihood
Decon Nepal	Wash
Nari Jagaran Nuwakot collaboration with World Renew	Livelihood
RUDEK Nepal partnership with Room to read, world vision, UNDP	Education, Livelihood
Doctor's For you	Health
Handicraft International	Health, livelihood and relief support
Red cross	Health, reconstruction, WASH
Qatar Red cross	Health
American Red cross	Health
TDH	Psychosocial counseling
UNDP	Livelihood
UNICEF	WASH
Oxfam	Health, livelihood and relief support
Batash Foundation	Relief and reconstruction , shelter support
Purnima support by MOTT Mac Donald	Livelihood, reconstruction
SEEDs Nepal in Rasuwa	Livelihood, reconstruction
Gerkhutar Club	Livelihood, WASH
Lacos Rasuwa	Livelihood, reconstruction
Manekor Society	WASH, Livelihood, reconstruction
Pariwantan Nepal	Livelihood,
Lumanti	Reconstruction
Red cross Rasuwa	Shelter, Livelihood, reconstruction, WASH
Nepal Krishi Ban Pratisthan	Shelter support, School reconstruction
Biswas, Nepal	Livelihood, Wash
Batas, Rasuwa	Shelter support, school building support

Source; Interview with CDC Nepal 2018, Lecturer from Batar campus

6.6 Developing the combined livelihood capital assets index

The combined livelihood index has been calculated by combining the indicators of five capitals assets as presented in annex (Annex IX). The index is constructed by combining different types of capital (human capital, natural capital, physical capital, financial capital and social capital).

For each capital, differences are stated as; natural capital includes land uses and productivity, drinking water, access to forest, agriculture scope. Human capital includes health status of the household members, educational level of the household members and household labor capacity, sources of income. Financial capital includes cash incomes and loan, bank access, bank saving, remittances, etc. Physical capital includes livestock ownership, housing facilities. Social capital includes social networks, membership in social organization, supports from others. Table in (Annex XVII.38) shows a Combined Livelihood Asset and reference indicator for five livelihood capitals with evaluation indices followed by survey questions for each indicator. For each dimension of livelihood, the same weightage is assigned. The value of each dimension ranges from 0 to 1. All these five categories of livelihood capitals were weighed before and after the earthquake to see the paired differences. P-value 2-tailed (Table 6.1).

Table 6. 1 Change in capital assets after the 2015 Nepal Earthquake

Paired Differences	**Natural capital (BEQ – AEQ)**	**Financial capital (BEQ - AEQ)**	**Social capital (BEQ – AEQ)**	**Physical capital (BEQ –AEQ)**	**Human capital (BEQ – AEQ)**
Mean	1.618	0.023	0.343	0.92	-0.322
Std. Deviation	1.09592	1.111	1.166	1.086	0.577
Std. Error Mean	0.04042	0.041	0.043	0.04	0.021
Lower range	1.538	-0.057	0.258	0.841	-0.363
Upper range	1.697	0.104	0.427	0.998	-0.28
t	40.02	0.564	7.973	22.95	-15.09
p-value(2-tailed)	0.000	0.573	0.000	0.000	0.000

The significant change in social capital shown was due to the loss of social networking at the new place of residences, decreased social participation, although there is some kind of supports received as they are earthquake victims the access to other several rights of the support have been lost. Cultural practices have been less prioritized, such as daily worship of the deities, cultural gatherings, feasts and festivals are minimally celebrated.

Significant changes in physical capital assets appeared as loss of the household assets that are used in daily livelihoods such as – furniture, cooking materials, agriculture types of equipment, fuel access (forest), are lost due to earthquake and are not yet recovered. In the case of human capital access, there were significant changes after the earthquake. Human loss due to the earthquake, access to the education difficulties

and educated members in each family, changes in economically active family members in individual households after the earthquake seemed negatively changed.

Following FGD discussion addressed what happened after the earthquake due to capital assets' changes in their livelihoods. It was found that in many places people faced the following difficulties in their settlement:

- The source of drinking water was destroyed
- The people who had their houses in the district headquarters shifted over there.
- When people tried to make houses in their original places where there was less risk of landslides, the high cost for transport of construction goods made them unable to construct houses on their land in time.
- As there was a lack of health facilities in the relocation areas.

Currently, the people were facing various problems in their relocation areas. As they had to live in houses made of tin, they had to go through extreme cold conditions during winter season whereas, in the summer, they had to suffer from extreme hot conditions. Similarly, the fear of dangerous insects such as poisonous scorpions and reptiles like snakes were the other problems they had to face in the summer season. Similarly, the surrounding people accusing them of taking the government's land was another source of grief they had to listen to all the time but could not reply them properly.

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6.7 Summary

This chapter has been structured into five broad sections such as; natural capital, physical capital, human capitals; financial capital; and the social capitals. Section six attempted to combine all five capitals differences before and after the earthquake.

The natural capital included here were: access to land, forests and water, changes in production, access to safe drinking water, access to the kitchen garden, access to sources cooking and light energy. Overall the landless people increased (10 % to 58 %) after the earthquake, it was five times increased among the non-poor, while in the case of vulnerable to poor huge difference in land less (seven times) increased after the earthquake. Total mean value of land ownership dropped half folds after the earthquake. It was proved that decrease in land less and means value of land ownership differs according to level of economic strata. The value change of the land ownership after the earthquake varies according to the economic strata, and caste/ethnicity. Findings indicate that there has been a drastic decline in households with all land cultivation status resulting in the rise of households with no cultivation. This is also confirmed by the f-test.

Findings indicate that there has been a drastic decline in households with all land cultivation status resulting in the rise of households with no cultivation. This is also confirmed by the f-test. Overall response regarding to reasons for not cultivation before and after the earthquake were: land fault and cracked (2.6% to 48.3%), lack of irrigation (69.4 % -15.6 %), lack of human resources (24.1 -2.3 %), and lack of tools (3.9 % – 0.7%). Its impact was on crop production; more than 75 percent of households experienced a decrease in crop production while 19 percent reported no change in crop production and it was 5 percent of households reported their crop production increased than that pre-earthquake situation.

There is no significant variation in access of safe drinking water before and after the earthquake. Nearly two-thirds of the households before and after the earthquake reported having access to safe drinking water. The X^2-test also confirms the fact that there is no association of safe/unsafe drinking water before and after the earthquake. As indicated by the data, almost all households did not have access to forest/river resources after the earthquake and most earthquake-affected families have lost their access to the kitchen garden.

Accesses to toilet facilities have declined substantially after the earthquake. For example, 78 percent of households have access to toilet facility before the earthquake while the comparable figure was just 14 percent households after the earthquake. Data reveal that toilet facility decreased more than half after the earthquake.

While talking about the basic amenities, data reveals that household basic amenities found decreased (21%) after the earthquake, likewise agriculture related amenities (15 %) and electric goods (1.53%) decreased than before the earthquake. But IEC material and transportation goods are somehow increased than before the earthquake.

During the course of the survey, carried out after 3 years after the earthquake, one-fourth of the households' respondents reported that their houses were already constructed, while another one- fourth had done nothing for construction of their houses, 29 percent respondents informesd that they were constructing and the rest 20 percent reported that they were yet to start. It was reported that, delay in the construction of houses was due to the lengthy and complicated process of the loan of government and much time to purchase the land after received the said installment. Many respondents reported that they could not follow the process and procedure put forward by the government of Nepal.

According to studies, approximately 17 percent of men and women reported learning new skills as a result of the earthquake. This proportion, however, is substantially larger for males (28%) than girls (6%), highlighting the gender bias in skill training given by NGOs or the government. The data reveals that agriculture was the primary occupation before the earthquake, and after the earthquake overwhelming of them started non-agricultural occupation. , The direct impact of the earthquake on livelihoods shifted after the earthquake especially in occupation and income. The average income came down to Rs. 3,101 with a standard deviation of Rs. 3,374 after the earthquake showing huge variation in monthly income family.

Health was a major problem in the study area. In the survey of 735 households, at least 15 percent of the households' members reported that they felt fainting due to the fear of earthquake and other health problems reported were craping, crying, mental tension/stress and blood pressure. More than one-third of the deaths for the last 5 years were due to the earthquake. Around 31.1 percent of respondents reported their loved one's death was due to the earthquake in the house, whereas 6.3 percent stated that they died on the way to hospital or in the hospital. Out of the 735, a total of 183 households' members were injured due to the earthquake. The majority of injuries happened due to running, hit by the collapsed houses and jumping during the earthquake. The total disables among the total households was 1.8 percent before the earthquake, then after the earthquake, it was increased to 4.1 percent.

Study shows that overall, 18 percent of the households reported a baby's delivery in the family after the earthquake. Of the total households reporting deliveries, one-third of households reported that their babies were delivered at home, 65% of households reported that it was in the hospital and 2 percent reported that the health workers carried it out. Children less than 5 years of age were affected by the earthquake, nearly 87 percent of the households reported that children in their families were immunized before the earthquake while the comparable figure after the earthquake was decreased to 28 percent.

The majority of children were not attending schools due to economic problems after the earthquake, and due to fear of the frequent earthquakes. The educational infrastructure, the condition of road and distance of schools from present relocation area were for not attainding to schools for education.

Financial access increased in the study area after the earthquake. In the meantime the volume of saving amount was decreased after the earthquake. Study has revealed that there was a positive change in the households' saving patterns after the earthquake. Numbers of families having no bank saving account (Before the earthquake, 35.5% then after 14.8%) decreased after the earthquake. It seems that the proportion of the household saving increased after the earthquake. Remittances had a major role in livelihoods of the affected communities. Out of the total migrants 454 individuals, 281 individuals were sending remittances. Among them, nearly 69 percent was used for education, 63 percent for house building and to go to a foreign country.

People's social security appears to be threatened greatly due to the earthquake. However, after the earthquake, 6.7 percent of the respondent reported that they have received support for social security. The provisions of social security of natural calamity compensation, student scholarships, widow allowance, disabled and old people allowance, infant/delivery and different government scholarships for marginalized people have been greatly obstructed due to the earthquake for a temporary period. The data reveals that there has been a greater impact of the earthquake on the study community's religious rituals. More than 80 percent of the respondents reported that they used to worship the god/goddess before the earthquake, while this proportion declined to 24 percent.

Livelihood shift

The significant changes in social capital result are shown. After the earthquake, land less population increased 5 times, the area of land covered decreased and unequal distribution of land observed like in the past before the earthquake. Loss of social networking at the new place of residences, decreased social participation, although there is some kind of supports received as they are earthquake victims the access to other several rights of the support have been lost.

Cultural practices have been given less prioritized, such as daily worship of the deities, cultural gatherings, feasts, and festivals are minimally celebrated. Significant changes in physical capital assets appeared as loss of the household assets that are used in daily livelihoods such as – furniture, cooking materials, agriculture types of equipment, fuel access (forest), are lost due to earthquake and are not yet recovered. In the case of human capital access, there were significant changes after the earthquake. The earthquake resulted in human casualties. Each household had challenges in gaining access to school and having educated relatives. After the earthquake, changes in economically active family members in individual homes appeared to be unfavorable.

The chapter concludes that there were substantial changes and shifts in the livelihood patterns in the earthquake-affected communities.

Chapter 7

DISCUSSION CONCLUSIONS, RECOMMENDATIONS AND FUTURE RESEARCH SCOPE

This chapter summarizes the discussion of major findings analyzed in the earlier chapters. It draws conclusions, and further research areas on the 2015 Nepal earthquake that has a significant impact on human life. It had been one of the worst natural disasters in history that hit Nepal after the 1934 Nepal–Bihar earthquake. The magnitude of the disaster was not limited to the country itself but also beyond the country, mostly in different parts of India and China. The impacts of the earthquake have been multidimensional and have also induced the people's movements from the place of origin following the other secondary migration. Earthquake induced displacement after the earthquake has become the recent.

7.1 Discussion of the major findings

Existing academic research indicates that disasters are caused by natural factors that are beyond the control of human beings or through secondary human actions. The disaster impacts the human race. Among many impacts, this study is significant for the explanation of risk and displacement caused by the earthquake which is related to livelihoods of the population affected by earthquake.

This study is to develop different discourses on displacement due to the earthquake. It will also create an additional opportunity for scholars interested in this issue, leaving a gap in the study. The study's overall objective was to contribute to understanding the impact of the earthquake on people's livelihoods, especially focusing on displacement. From different angles, this study is relevant to these studies such as – relation among the earthquake, migration, migration vs. displacement.

This is basic research design used covered both exploratory and explanatory. This study was carried out using primary and secondary data that used quantitative data a structured questionnaire was administered which captures the information required. A pretest of the questionnaire was made after the full structured questionnaire was developed and presented the questionnaire among the experts and supervisor; finally, the final questionnaire was printed and programmed into the KOBO TOOL Box.

Research areas were Rasuwa and Sindhupalchok districts. Both are located in the mountain ecological belt of Nepal and it is part of the "Central hill sub-Region". In the sample, 359 households in Sindhupalchok district and 376 households in Rasuwa districts were interviewed.

Findings with respect to the objective one; this objective dealt with the socioeconomic and demographic situation of the earthquake-affected populations.

One-third of the population was the child (less than 14 years), nearly two-thirds (62.5%) is the working-age population and fewer (5.6%) elderly in the study area. The highest population was concentrated in the age group 10-14 that was 12.1 percent. The highest percentage of the male and female population in the same age group was 10-14 years in male and female which were 12.2 percent and 11.9 percent respectively. The median age of the study population was 23 years and the mean 26+. Three-fifths of the population was married and the rest are unmarried. The percentage of widows/widower was below 4. Polygamy was nearly one percent and remarried, divorce, and separated were below one percent. The female mean age at marriage is under the age of 20 years and differs according to caste/ethnicity and education.

In sample 735 households, the highest percentage of households was from Janajati (59%), followed by Dalit (18%), Janajati marginalized (16%) and least was from Brahmin/Chettries (7%). Janajati includes Tamang/Sherpa, Gurung and Newars. Marginalized Janajati includes Magar, Danuwar, Majhi and Bhujel. In terms of religion, the highest proportions of households are from Buddhism (61%), Hindu 32 percent and the rest were 7 percent.

In the total study population the age10 years and above are 2843 population, among them, 41percent were found to be illiterate, and 59 percent are literate. Nearly one-third of the population was child population, 6 percent were elderly population and the overall dependency ratio was more than 60.

The 2015 Nepal earthquake has impacted livelihoods and economies (local and national). Regarding food sufficiency, 86 percent among the total households (735) households have food-deficit around the year, 14 percent reported sufficiency around the year. In the total surveyed 735 households 454 individuals found migrated, the highest percentage of migrants found in the age group15-49 for males and 20-39 for

females. 58 percent of the migrants are from Tamang/Sherpa, 27 percent are from Dalit, and so on. Among the migrants 6 percent shown reason was for new work and 4.4 better income1.4 percent higher studies, 15 percent business. A higher percent of the male are moved for new works than of the females.

Findings suggest that migration is age selective – more-young tends to migrant. Migration has been the livelihood strategy of the people of Nepal for many decades in the study area. The overall socio economic scenario of study districts reveals that migration of the households in the pre-earthquake situation was socially disadvantaged relatively poor, illiterate, mostly dependent in agriculture and not having adequate food sufficiency around the year from own production. Most populations constitute socially disadvantaged populations –the Janajati, marginalized Janajati, and Dalit and it is revealed that the poverty level is also higher among these successive groups.

In the field, it was reported that a household having more than 10 Ropanies land is a land poor households. Thus in our sample, more than two-thirds of households possess less than 10 Ropanies land and are land-poor households, these households do not have food sufficiency around the year from their landholding and they have to depend on other sources. Average land owned by vulnerable to poor was lowest, while poor and severely poor owned was 6 ropanies in an average. Average land owned by Brahmin/Chettri is highest in comparison to other caste/ethnic groups. The average land size owned by female-headed households is higher than that of male-headed.

The study population in this study categorized in to four economic levels, such as majority severely poor (57.6 %), poor (27.9%), vulnerable to poor (11.8 %) and non-poor (4.27%) which means 78.5 percent are in the poor category. There is an association between caste/ethnic group and economic strata. The total non-poor decreased from 58.5 to 14.6 after th`e earthquake. The total poor increased from 11.5 percent to 40.4 percent after the earthquake.

Findings regarding to objective two; to explore the processes of earthquake induced displacement and cooping strategy.

Another objective of this research was to explore the processes of earthquake induced displacement and cooping strategy analyzing cause and consequences of the

displacement. For this, it especially analyses how people were displaced as a result of an earthquake. Displacement was the first coping strategy of the earthquake affected population assumed here in this study. Here, the magnitude of displacement refers to the size and frequency of the displacement concerning its direction and migration. Migration has been treated as the ultimate option after several displacements or involuntary movements. Here discussion has been carried out by explaining how the displaced households immediately took the emergency shelter, and how they change second and third shelters and how they cope with the situation.

Findings of this study report reflect that the displaced families scattered to different emergency places immediately after they found their own house was completely collapsed due to the earthquake. Moved to different places for living as emergency places such as - stayed in own land in (*Tripal*), stayed in neighbours land in (*Tripal*), stayed in public land, displaced to other village and public land, stayed in rented land, stayed in surrounding the own house, emergency safe places such as - schools, municipality building and Nepal government land.

Analysing the case of displacement, the first displacement can be labelled as the physical displacement and the second and the third displacements labelled as the economic and social displacement. The process continues until the victims feel they are economically and socially benefitted at the new place of residence. And finally, displacement stops when they come in a position to rebuild the house collapsed and recover the livelihood damaged facilities and the victims would end their movement and migrate to the current place.

A total of 11(1.5 %) households came directly from the origin, 220 (29.9%) households came crossing first destinations after the emergency place, 257 (35.0%) households came crossing the second destination from the emergency and origin and one more, 237 (32.2%) households came crossing the third destination from the origin and 10 (1.4%) households came crossing fourth place before arriving at the last destination.

Findings show that the types of the mobility of the displaced households like - Inter and Intra-district displacement, inter and Intra-Local Levels, as well as Inter and Intra-Ward Levels.

It was proved from the study that the displacement of the people from one municipality to the next was higher than the displacement within the municipality. There were two reasons behind it: probability of secondary disaster was high at the origin and next it was not possible to bring back the original livelihoods in the same community and the whole agricultural land was not suitable for production which has been cracked sloppy.

Five causes of displacement evolved here – 32 percent reported houses collapsed, 31 percent said that their land swiped away/cracked, 13 percent said there was a risk of landslide in the future and the rest of them gave the reason of security problem and the possibility of secondary disaster in the future. It was seen that there is strong relation between district and root cause of displacement (Chi-square = 330.720, df = 4, p-value= 0.000) and strong relation between poor and non-poor and cause of the displacement (Chi-square =43.401, df= 4, p-value =0. 000). But the relation between caste/ethnicity, head of household with the causes of displacement has no significant relationships.

The displacement of the people from one rural municipality to the next was high and then the mobility within the municipality. There were two reasons mentioned behind it: the high probability of secondary disaster and the next was not possible to bring back the original livelihoods in the same community, it was because of, and not the living house was collapsed but whole agricultural land not suitable for production. As field study reports, the earthquake respondents visiting origin repeatedly and earthquake-affected people are still in touch at the origin, and some have acquired property at the destination.

In our study the reasons related to pull factors were: no home at origin (13.5%), no security at origin (6.8%), no land at origin (28%), soil erosion at origin (18.5%), no access to education (10.2%) and secondary disaster at origin (7.4%) the reasons related to pull factors were -established good political relation is the current place (0.7%), better economic opportunities 94.1%), good living environment (2.7) and properly added in the current place (8.1%).

While talking about the leaving previous place, the respondents say the reasons such as; no relatives (3.7%), political problem (1.2%), secondary disaster (30.2%), social/

religious problem (32.8%), no health access (3.1%), no education access (12.9%), and no better economic/ employment opportunity (16%).

According to the findings of the study, the availability of livelihood facilities impacts the frequency of moves, as well as whether or not to shift from one location to the next. Lower the odds of re-displacement; lower the availability of amenities, the greater the possibilities of re-displacement. The stronger the pull factor, the better the amenities. The stronger the push force, the worse the facilities. They will continue to migrate till they feel safe. This was an example of the FGD conversation mentioned before. As a result, it appears that they are regularly traveling, focusing on work, education, and health-care access, respectively.

Finding of the objective three was to explore the shift in the livelihood patterns before and after the earthquake due to displacement

The study population reveals that the percentage of landless households has dramatically increased from 10.7 percent before the earthquake to 58.0 percent after the earthquake. Similarly, the household with land less than 5 *ropanies* have declined from 32.9 percent before the earthquake to 11.4 percent after the earthquake. The data reveals a shift in the landholding status of the household surveyed before and after the earthquake. The proportions of landless dramatically increased after the earthquake. Overall, the household with no land cultivation has increased drastically from 11.6 percent before the earthquake to 64.4 percent after the earthquake. It can be concluded that there has been a drastic decline in the households with all land cultivation status resulting in the rise of households with no cultivation. The f-test proved that there is a significant change in the overall cultivation pattern before and in cultivation after the earthquake.

Percentage of households having safe drinking water sources has decreased after the earthquake with an increase in the percentage of households having safe drinking water sources. In our study households, access to forest before the earthquake that in 63.55 households did not have access to forest/river resources before the earthquake. As indicated by the data, almost all households did not have access to forest/river resources after the earthquake. Access to kitchen gardening is almost lost after the earthquake.

Data reveal that toilet facilities decreased to more than half after the earthquake. The research data found that most of the households who are living now in one cluster in the group sharing toilet, one toile for each 3 to 4 households as they were temporarily living there. The households who want to live permanently start to build a house have their family toilet.

Data reveal that there has been a tremendous shift in the main source of lighting among earthquake-affected households as they shifted from electricity to coal use. There was not much change in the use of electricity as cooking energy after the earthquake but an increase in liquefied petroleum gas (LP gas) users 25 to 64 percent after the earthquake. It seems wooden stuff users are still like in the past (not seen change).

Data shows that household amenities such as basic amenities found decreased (21%) after the earthquake, likewise agriculture-related amenities (15 %) and electric goods (1.53%) decreased than before the earthquake, and shown the increment in IEC materials and transportation goods. Most of the surveyed families are under the one-floor tin sheet roofed shade, therefore, as their house was collapsed due to the earthquake their household amenities being lost, they are still under the process of necessary amenities management and hardly surviving without needy daily necessary goods/amenities. Livestock ownership has decreased after the earthquake; most changes were seen with Buffalo and cows which decreased to half after the earthquake.

Only one-fourth of the households' respondents said their houses were already built at the time of the survey, while another one-fourth said they had done nothing, meaning they had not yet followed the process of receiving funds from the NRA, 29 percent said they were constructing, and the remaining 20 percent said they had yet to begin. The respondents expressed dissatisfaction with the procedures that must be followed in order to obtain NRA assistance, claiming that the procedures are too lengthy and difficult.

There are different kinds of training received by the respondents after the earthquake - mason (32.5%), plumber (16.5%), carpenter (14.7%), tailoring (3.8%) agriculture (6.1%) machinery (8.4 %), micro industries (7.1%), and driver (9.4%) and hotel-related (1.5 %). Therefore, the highest percentage of newly learned skill was a mason

and the lowest in hotel-related skill. The chi-square test is done to see the significance of the relationship between newly learned skills and selected characteristics (district, economic strata and sex of the household) is found to be statistically significant.

Regarding the livelihood skill, the finding reveals that there has been an increase in the livelihood skill using new technology, tunnel vegetable, etc. Skills like *Doko*/*Namlo*/*Ningaloo* (basket and rope made of bamboo) making, plumbing/massion, teaching, hotel/restaurants and driver are in practice for livelihood after the earthquake. It has decreases in the traditional method of agriculture. The decline of agriculture as the main and secondary occupation has brought changes in increase in non-agriculture. There was a significant level of change in the occupation of the respondents in the study area. Around 42.3 percent in Sindhupalchok and 57.4 percent in Rasuwa mentioned the change in their occupation. The shift in major occupation was the challenge for the earthquake-affected population after they were displaced from the origin. Data also shows that a shift in the source of income was found after the earthquake for example while analyzing among the non-poor and poor income decline from the traditional occupation income source. It was respectively 3.3 and 19.1 percent. Data also ranged that we can also observe the huge decline in traditional occupation after the earthquake, 16 percent on average; in Sindhupalchok it declined by 23 percent, Rasuwa in 3.2 percent.

While analyzing among the social group the three groups that seem much involve in traditional occupation were Janajati marginalized, Dalit, and Brahmin/Chhetri their percentage declined respectively 33.3, 24 percent and 15 percent. The data reveals that there has been a tremendous shift in main sources of cash income of the earthquake-affected households before and after the earthquake i.e. salary/wages, farming and fruit farming, business/industry, *Balighare*pratha, daily wages in agriculture and livestock's have declined after the earthquake. It brought changes in the society in daily wages in non-agricultural sectors that shows increase in trend after the earthquake.

Before and after the earthquake, the main sources of income are such as salary/labor sale, agricultural products, micro-businesses, social security (pension), traditional occupation, agriculture wages, non-agriculture wages, and remittances. One can see the data after the earthquake overall there are a decline in income heads such as

salary/labour (1.4%), sale agriculture product (48%), microbusiness (1 %), traditional occupation (16%), and agriculture wages (25%). Similar variation has appeared while analyzing in both districts with caste/ethnicity, and other characteristics.

But in the case of non-agricultural wages/professional income, huge increase was appeared. This was because after the earthquake, they had lost all the agriculture-related jobs, production and sales, then after they were displaced. At the current place of residence, they were easily involved in non-agriculture works and other professionals Therefore increase and decline in profession and income trend has been observed.

The ration of unemployment increased and agriculture professionals decreased in all caste. It varies in terms of the caste. The maximum change in agriculture profession found in the caste Tamang/Sherpa, and it was observed very little change in Newars and Brahmin/Chettri respectively. Unemployment was decreasing. Students decreased and did not change in household works.

We observed even during the survey, that there was some kind of direct impact on the health of the earthquake-affected families. Further, mental health problems like stress, isolation, anger, fear, emotions were also reported among the elderly women, and children. Thus, only nominal respondents reported that they did not have any health problems, while 80 percent of respondents viewed that their family members' health condition worsened due to the earthquake. In the third place of displacement, nearly 11 percent of respondents said that their family members had no health problems, and the rest 89 percent reported that at least some health problems has affected to their family members. It was found the 60 percent of households would like to stay in the current place and they had no interest to return to their place of origin.

A total of 73 individuals were killed due to the earthquake where 34 percent of the people died because of the direct physical impact of the earthquake. Many respondents reported they were either buried in the collapsed house or hit by the different stuff. The maximum number of respondents reported that they were cured by health workers, and 30 percent of the respondent reported that they were taken to *Dhami* and *Jhakri* (traditional healers) for the traditional way of treatment.

At least one-fourth of households reported that their family members got injured due to an earthquake in our sample. A total of 796 people injured in the disaster due to the earthquake and it is 24 percent of the total sample population. That was 24.9 percent of households having injured members and 75 percent of households had no injury in the households. Overall, there was an increase in households with disabling members after the earthquake. The total disables among the total households was 1.8 percent before the earthquake. After the earthquake, it was increased to 4.1 percent. The last column of the table shows the differences in disabilities after the earthquake. In every selected characteristic, the numbers of disable family members have increased. There were no disables in Brahmin/Chettri families, whereas 5.8 percent of families were disabled members after the earthquake. After the earthquake the numbers of male disabled 1.1 percent before the earthquake then after the earthquake 4.7 percent increased which is higher than female disabled 2.4 percent before the earthquake then after the earthquake it increased to 3. percent after the earthquake.

Among the households that reported the delivery of babies, 18 percent reported that it was difficult to take care of women's delivery because of lack of adequate shelter, shortage of nutritious food, medicine, hot water, etc. The proportion of households reporting babies' delivery after the earthquake is not very much different between survey districts. It differs among caste/ethnic group and sex of the household heads distinctly. Whereas, only 6 percent of Brahmin/Chettri households reported that babies born in their family after the earthquake. Regarding the vaccination, we found that there is timely vaccination before the earthquake and a majority people have dropped vaccination after the earthquake.

Impacts on access to cash state programs access to credit, level, and form of savings (cash, liquid assets,), access to remittances, income-generating activities, are such financial capital that enables better livelihood, therefore, considered as impacts on livelihood indicators.

Access to the financial institutions: In the study area until now, however, indicators on the banking practices of the poor, women, and young people were lacking for most economies. To address this gap, the Government of Nepal introduced guidance to the earthquake-affected population to create an account at a nearby bank or financial institution to save, borrow, make payments, and manage risk both inside and outside the formal financial sectors and to transfer amount supported by the Government to

the financial institutions. After the earthquake, most of the households have a bank account where the highest percentage of the household had its account under male members, followed by both members and the lowest is under the female members. Overall, there was 84 percent of the affected people have access to the bank account after the earthquake.

Access to the credit: More than half of all community members (both women and men) reported having access to finances- saving and credit services. It was found that access to the bank increased after the earthquake than before.

Different agencies available at the surveyed communities for access to the credit such as – person, women group, relatives, moneylender, bank, cooperative, and micro-finance are the probable agencies of taking a loan at the surveyed communities. We found 48 percent of the families have taken a loan from different agencies). Therefore, it was seen that the households have received a loan from the moneylender and the least percentage have received the loan from microfinance. More than fifty percent of Janajati, Dalit, and marginalized Janajati received loan from a money lender than other sources. Therefore, it was proved that there are significant differences in sources of taking the loan among the social group.

Savings: The data reveals that there has been a shift in saving patterns of the households before and after the earthquake. Before the earthquake, 35 percent of households did not have any saving account at all, the comparable figure was about 15 percent after the earthquake. It seems that the proportion of households saving some amount of money increased after the earthquake than before the earthquake. An average saving amount was declined by Rs. 1,603 (or by 21.8 percent) after the earthquake.

Remittances: In our sample of 735 households, 164 households received remittance during the last five years, which is 22 percent of the total households. The average amount of remittance was Rs. 74,055 for per remittance-receiving household. The amount of the remittance amount varies by district, caste/ethnic group or poverty level, and sex. We can see that the highest percentage of households receive remittance less than Rs. 30,000 and the lowest receive remittance more than Rs. 150,000.

On the Shifting Pattern of Livelihoods, Social Capitals: The people's social security in the research area seems to be mixed and has decreased after the earthquake. People stated that before the earthquake, when there was a small calamity, people received support from the Government of Nepal. After the earthquake, it seems to be none and only 6.7 percent of the respondent's reports that they have received the support for livelihood.

Daily worship of the god, ritual gatherings such as ceremonies of birth, marriage, death and changes of these events has been observed after the earthquake. The replicating traditional/case-based occupation by their current generation has been analyzed. We found that they were a drastic change in social ceremonies after the earthquake. More than 80 percent of the respondents reported that they used to worship the god/goddess before the earthquake. This proportion declined to 24 percent. The main reasons for the decline of following family tradition like worshipping Gods were change in residence, and their family deity is far from present location. They have different other burden coming to the new location, some of them are temporarily living and some of them are trying to live permanently at the current place. For, following the tradition, they have not got such environment to pray their deity as they wish.

Culture: Findings from the study reveal that there has been a more significant impact of the earthquake on the study community's religious rituals.

Social security: Social security aims to promote social protection for all as a basic set of rights, enabling all society members to access a minimum of goods and services. Before the earthquake, many of them are with minimal access to social security.

Women's security: There are some challenges related to women's safety and sanitary problems after the earthquake. Such as women's daily life process like sleeping, changing clothes, toileting, etc had problems. In comparison to before the earthquake, now the women are not feeling comfortable after in such practices. After the earthquake, a significant increase in conflict within the family can be seen, people are observing that the rise of conflict within a family. Similarly, the governmental efforts for the rehabilitation of children also increased after the earthquake.

Support: Short and long-term support was the response to the earthquake made in the study area. Most of the short-term supports were made immediately after the

earthquake and then long-term support based on the planning was seen and collected the information related to the support. It was found that different supporting agents appeared after the earthquake in the study area with different types of supports.

During the disaster, the NGO's role was to have a quick response and to try and save as many lives as they can with the given funds. The NGOs' main role was providing relief materials, organizing health camps, involved in the rescue operation, arranging temporary shelters, and so on. There were different organization involved in providing skills immediately after the earthquake such as SOS Children's Villages International, World Vision, Save the Children, Relief International, Plan International, Oxfam International, Mercy Corps, Lutheran World Relief, International Organization for Migration, Counterpart International, Concern Worldwide, CARE International, Action Aid. were involved for offering different skills training like plumber, mansion, carpenter.

The distribution of households reporting support from relatives, friends and neighbors and development agencies to the earthquake-affected people who are the survey respondents of this research were evaluated and analyzed. More than 50 percent of the earthquake-affected people from the study area received cash support ranging 21 to 69 percent received goods support, till 60 percent (maximum) victims received medicine, food and clothes support.

Discussion

On the Process of Displacement and Mobility: Previous studies like Ahamed Bashir (2014) from Bangladesh suggested that natural and human-induced disasters generate migration either permanent or temporary and it is a traditional strategy. Similarly, studies from Bangladesh such as by Shamsuddoha, Khan, & Hossain (2012) showed that disasters usually cause mass displacement forcing people to undergo routine economic migration at first, followed later by permanent migration. Our study has similar findings to these previous studies conducted in Bangladesh, but the context and actor of the disaster are different from the case of Bangladesh. In the case of Bangladesh, the actor of the disaster was a flood while in the case of Nepal, it is earthquake. The context of Bangladesh was that it has plain lands while Nepal has hilly terrain which mostly affected by the earthquake – that, there was much more risk of secondary disaster in Nepal than that in Bangladesh.

The place of the first displacement was emergency shelter if these shelters were equipped with facilities and support in the first place of displacement people continued living there. In case the facilities and other support are limited, they tend to move from the first place leading to multiple displacements. If the service and support are available, the first place of displacement becomes the permanent home for all of them. However, whose land and houses were damaged and not well equipped at the place of displacement were vulnerable further moved from that place of displacement, these populations were the ones who made the multiple displacements.

Krishnamurthy (2012, Op.cit.) has discussed on the Shifting Pattern of Livelihoods, Natural Assets: It showed that people are obliged to leave their habitual homes and move either within their territory or abroad due to sudden or progressive changes in the environment adversely affecting their living conditions. In an extreme climate-related event or by implication, an extreme disaster, a secure livelihood may no longer be feasible and it will also be conditioned upon the social and economic conditions of the affected community.

Fang (2018, Op.cit.) showed the relationships between livelihoods risk and corresponding livelihood capitals are complex. While the importance of financial and physical capitals may be obvious, human and social capitals have also emerged as important variables in livelihood risk management. Social cohesion, community networks, equitable gender relations and participation in social organizations, all considered positive expressions of social capital, play important roles in responding to livelihood risk.

Our findings suggest that disasters like the major earthquake of Nepal can have an all-round impact on all types of capital disruption and it is the observed evident. However, like several studies from China, India and elsewhere about the coping mechanism for the disasters like earthquakes, our study also indicates some positive changes in the affected communities. The caste-discrimination has largely been reduced, and people's awareness level on the preparedness of earthquake has greatly increased; skills levels of the affected communities including women have increased.

We found that social security increased after the earthquake. It is the positive impact of the earthquake. Similar findings were reported from Chinese earthquake of Hubei,

the same case of social security was severely disturbed in case of 2010, Haiti earthquake.

7.2 Conclusion and further research scope

The earthquake disaster 2015 in Nepal, prolonged the multiple disaster displacements. The drivers of displacement are relatively well understood, significant uncertainties remain regarding the factors that trigger prolonged or secondary displacement and impede ending of displacement or achieving durable solutions.

Earthquake induced displacement and livelihood was the investigation of this study. As explained in previous paragraphs reference indicators had been set up followed by the quarries in the surveys. All these five categories of livelihood capitals were weighed before and after the earthquake to see the paired differences. The study reveals that there were significant changes in four livelihood capital assets as Natural capital, Human capital, Physical capital, and Social capital. No significant change in financial capital.

Variables used in these measurements of natural capital were access to - farmland, forest, kitchen gardening, production from Land, safe drinking. Similarly, the variables used are placed as shown in the reference indicator matrix in the respondents were being entirely displaced from the origin and coming to the new residence, therefore, they have no access to the natural capital assets at the new places and changes appeared significantly. The significant change in social capital result shown was due to the loss of social networking at the new place of residences, decreased social participation, although there is some kind of supports received as they are earthquake victims the access to other several rights of the support have been lost. Cultural practices have been given less prioritized. Significant changes in physical capital assets appeared as loss of household assets and these assets were used in daily livelihoods such as – furniture, cooking materials, types of equipment agriculture, fuel access (forest). They were lost or damaged during the earthquake, and have not recovered yet. Similarly, in the case of human capital access, there were significant changes after the earthquake. In the cases of human loss due to earthquake, access to education, and educated members in each family, changes in economically active family members in individual households after the earthquake had negative change to impact the society.

Financial capital assets were measured based on the access to the bank, bank account of individuals, savings, etc. It was observed that all the victims' respondents were displaced and the Nepal government has forced them to open the bank account to deposit the building support amount. The government of had supported them two lack rupees for purchasing land and to build their house. It was seen that most of them have a bank account after the earthquake and saving amount although they have decreased in monthly income in general. It has been proved that overall there was no significant change in financial capital assets.

Though the impacts of earthquake induced displacement and migration the 'drivers of forced migration' is solely responsible with its cause and consequences. In every case, it was observed that the poor and marginalized population has less social networks and people with little economic choices do not want to be migrate, but those who are compelled to migrate who are economically well/strong and had well social networking. The poor have frequent places of residence to reach until the permanent place of residence. They are mostly reliant on local economic base where they are residing. Therefore, following the sudden onset the 2015 earthquake, it is important to keep local economy functioning through creating employment opportunities and restoring the geography territory.

Finally, the examined shifting patterns of livelihood after the earthquake on natural assets, human capital, financial capital, physical capital, and social capital. These are considered interconnected variables that need to be understood for understanding the dynamics of displacement due to disaster. Looking at the change in human capital, the human capital increased after the earthquake, thus implies that disaster may not always negative impact at all livelihoods aspects.

Policy Contributions

This study's findings have several important implications for the academic institutions, development partners, emergency relief and development organizations, and their concerned employees. The main implication and contributions are summarized below:

The impacts of earthquake are understood as the prevalence of frequent sudden onset of the nature. This study concludes that the migrated people are still on the process of setting up and are vulnerable to the upcoming disasters and still may force to move.

Therefore, the study area requires most policy attention by the local municipalities and nation level for long term plan for their sustainability.

This study explores the impact of the earthquake on displacement and migration of the household and people. This study is vital in designing policies and programs, looking at the process of and displacement.

It is essential to formulate the recovering the economic aspect of livelihoods, and resettlement plans and to highlight the experiences and challenges faced communities during and after resettlement and relocation.

Local Government and national and international development partners could provide a more integrated approach to understand these patterns and integrate them into the programs and policies to address the challenges.

The affected confined population become particularly vulnerable as they stay and starve in the unsafe location. In such location they could face other forms of repression like secondary disaster like land slide, flooding, social form of problem, discrimination etc. The state should be kind in planning and supporting to such unsafe population from such kind of disaster. State's mechanism such as rehabilitation policy on health, drinking water, sanitation, shelter, and services should be clear and need to be accessed.

This research also experienced that the holistic approach of the government and NRA policy on resettlement and recovery program is itself not free from criticism. Mostly mountain houses and settlements of Nepal are settled and scattered haphazardly without plans for physical infrastructural facilities require for decent human living. In addition to that himalayan region are very fragile from geological and geographical view point. Therefore, the recent earthquake is not only a disaster but also a good opportunity for respective authorities (specially local municipalities and Ministry of Urban Development and Physical Development & Planning) to carry out detailed geological survey of earthquake prone areas to build sustainable settlement in future. This is very critical for seismic prone areas where frequent earthquake occur and people can be protected from displacements and other negative consequences.

The criteria made by the NRA for land support, construction of the house provision made similar for both urban and rural areas which is not appropriate for actual implementation. Mostly urban affected marginalized and vulnerable groups suffering

from this policy, as most of them are not yet able to construct home due to inaccessibility of natural resources such as sand, stones, etc. The have felt difficulties to meet criteria made by the NRA regarding to citizenship, *Lalpurja* (land ownership certificate).

Further recommendation for research

Further investigation may be the remedy design the policy of disaster. This study can aware the government, people and development agencies on to work for sustainable livelihoods in the disaster prone area. The study area requires most policy attention by the local municipalities and national level for long term plan for their sustainability.

Several stakeholders have expressed their interest in long-term impacts on gender relations and empowerment. There is extensive literature on the impacts of the disaster on women but currently, there is analysis gap of long-term impacts. Therefore, it may be a further long term (longitudinal study) research on psychological, sociocultural impacts can be conducted.

Field experiences and study findings revealed that sustainable resettlement seemed always (specially the marginalized and vulnerable groups) challenges due to gap of understanding on socio-cultural and economic factors at the destination. Therefore, the impact of earthquake can have considerable differences by gender. The further studies can have linked with their changes in livelihoods and impact on the individual, adults, children, and elderly.

In course of field study, there were lot of comments and criticisms of locals-marginalized and vulnerable groups regarding the reconstruction and recovery activities implemented by the government as well as other development agencies. Their specific experiences and needs have been neglected by the disaster response authorities and institutions. The publicly available literature also does not clearly discuss the different ongoing approaches to identifying and targeting vulnerable groups – and their respective advantages and challenges. Therefore, there is a need of conducting longitudinal research regarding the multiple issues in research area.

During the field study, the researcher experienced and the findings have revealed that sustainable resettlement should be there in order to reduce the challenge that have been faced by the affected population (specially the marginalized and vulnerable groups). The reason behind this understood a gap of socio-cultural and economic

factors at the destination. Therefore, more research is required to understand the socio-cultural and economic factors. It is considered that the decision-making process and resettlement plans can highlight the experiences and challenges faced by the local communities during and after resettlement and relocation.

Annexes

Annex I: Major Earthquakes in world

Date	Impacts
19 September 2017	At least 200 people die in and around Mexico City during a magnitude 7.1 earthquake. It follows a more powerful but less deadly earthquake 12 days before; the 7 September quake was a magnitude 8.1, the most powerful to hit the country in a century, but its epicenter was offshore. It killed more than 65 people in southern Mexico and Guatemala.
24 August 2016	At least 298 people are killed when a magnitude 6 earthquake strikes central Italy. Worst hit is Matrices, where many of the town's historic buildings collapse. Italy rushes to help homeless after earthquake.
16 April 2016	A powerful 7.8 magnitude earthquake strikes Ecuador's coast, killing more than 650 people. More than 16,000 people are hurt and some 7,000 buildings destroyed.
26 October 2015	Almost 400 people are killed when a magnitude 7.5 earthquake strikes north-eastern Afghanistan. Most of those killed are in Pakistan, but the quake is also felt in northern India and Tajikistan.
25 April 2015	A 7.8-magnitude earthquake kills more than 8,000 people and leaves hundreds of thousands homeless, in the worst natural disaster to strike Nepal since 1934. In some parts of the country, the quake flattens 98% of all homes in hillside villages.
3 August 2014	Approximately 600 people are killed in a 6.1-magnitude earthquake that strikes Yunnan province in China. Thousands of houses are destroyed and landslides are triggered. More than 2,400 people are injured.
15 October 2013	More than 200 people are reported to have died after a magnitude 7.2 earthquake strikes centrally-located Bohol and Cebu in the Philippines.
25 September 2013	More than 300 people are killed as a 7.7-magnitude quake flattens entire villages in Pakistan's remote south-western province of Balochistan, mainly in the district of Awaran.
20 April 2013	A powerful 6.6-magnitude earthquake kills at least 160 people and injured at least 5,700 in China's rural south-western Sichuan province.
11 August 2012	At least 250 people are killed and more than 2,000 injured in north-

	west Iran by two powerful quakes which strikes within minutes of each other near the towns of Tabriz and Ahar.
23 October 2011	More than 200 people are killed and 1,000 are injured in a powerful 7.2-magnitude earthquake which hits south-eastern Turkey; many of the victims are in the town of Ercis, where dozens of buildings collapse.
11 March 2011	A devastating magnitude-8.9 quake strikes Japan, leaving more than 20,000 people dead or missing. The tremor generates a massive tsunami along the Japanese coast and triggers the world's biggest nuclear disaster since Chernobyl in 1986.
22 February 2011	A magnitude-6.3 earthquake shatters the New Zealand city of Christchurch, killing more than 160 people and damaging some 100,000 homes.
14 April 2010	At least 400 people die after a magnitude 6.9 earthquake strikes western China's Qinghai province.
27 February 2010	A magnitude-8.8 earthquake hits central Chile north-east of the second city, Concepcion, killing more than 700 people.
12 January 2010	About 230,000 people die in and around the Haitian capital Port-au-Prince as a 7.0-magnitude earthquake strikes the city.
30 September 2009	More than 1,000 people die after an earthquake strikes the Indonesian island of Sumatra.
6 April 2009	An earthquake hits the historic Italian city of L'Aquila, killing 309 people. Life after L'Aquila's heart was ripped out
29 October 2008	Up to 300 people are killed in the Pakistani province of Balochistan after an earthquake of 6.4 magnitude strikes 45 miles (70km) north of Quetta.
12 May 2008	Up to 87,000 people are killed or missing and as many as 370,000 injured by an earthquake in just one county in China's south-western Sichuan province. The tremor, measuring 7.8, struck 57 miles (92km) from the provincial capital Chengdu during the early afternoon.
15 August 2007	At least 519 people are killed in Peru's coastal province of Ica, as a 7.9-magnitude undersea earthquake strikes about 90 miles (145km) south-east of the capital, Lima.
17 July 2006	A 7.7-magnitude undersea earthquake triggers a tsunami that strikes a

	125-mile (200km) stretch of the southern coast of Java, killing more than 650 people on the Indonesian island.
27 May 2006	More than 5,700 people die when a magnitude 6.2 quake hits the Indonesian island of Java, devastating the city of Yogyakarta and surrounding areas.
8 October 2005	An earthquake measuring 7.6 strikes northern Pakistan and the disputed Kashmir region, killing more than 73,000 people and leaving millions homeless.
28 March 2005	About 1,300 people are killed in an 8.7-magnitude quake off the coast of the Indonesian island of Nias, west of Sumatra.
22 February 2005	Hundreds die in a 6.4 magnitude quake centered in a remote area near Zarand in Iran's Kerman province.
26 December 2004	Hundreds of thousands are killed across Asia when an earthquake measuring 9.2 triggers sea surges that spread across the region.
24 February 2004	At least 500 people die in an earthquake which strikes towns on Morocco's Mediterranean coast.
26 December 2003	More than 26,000 people are killed when an earthquake destroys the historic city of Bam in southern Iran.
21 May 2003	Algeria suffers its worst earthquake in more than two decades. More than 2,000 people die and more than 8,000 are injured in a quake felt across the sea in Spain.
1 May 2003	More than 160 people are killed, including 83 children in a collapsed dormitory, in south-eastern Turkey.
24 February 2003	More than 260 people die and almost 10,000 homes are destroyed in Xinjiang region, in western China.
31 October 2002	Italy is traumatized by the loss of an entire class of children, killed in the southern village of San Giuliano di Puglia when their school building collapses on them.
26 January 2001	An earthquake measuring magnitude 7.9 devastates much of Gujarat state in north-western India, killing nearly 20,000 people and making more than a million homeless. Bhuj and Ahmedabad are among the town’s worst hit.
12 November 1999	About 400 people die when an earthquake measuring 7.2 on the Richter scale strikes Ducze, in north-west Turkey.
21 September 1999	Taiwan is hit by a quake measuring 7.6 that kills nearly 2,500 people and causes damage to every town on the island.

17 August 1999	A magnitude-7.4 earthquake rocks the Turkish cities of Izmit and Istanbul, leaving more than 17,000 dead and many more injured.
30 May 1998	Northern Afghanistan is hit by a major earthquake, killing 4,000 people.
May 1997	More than 1,600 are killed in Birjand, eastern Iran, in an earthquake of magnitude 7.1.
27 May 1995	The far eastern island of Sakhalin is hit by a massive earthquake measuring 7.5, which claims the lives of 1,989 Russians.
17 January 1995	The Hyogo quake hits the city of Kobe in Japan, killing 6,430 people.
30 September 1993	About 10,000 villagers are killed in western and southern India.
21 June 1990	About 40,000 people die in a tremor in the northern Iranian province of Gilan.
7 December 1988	An earthquake measuring 6.9 on the Richter scale devastates north-west Armenia, killing 25,000 people.
19 September 1985	Mexico City is shaken by a huge earthquake which raises buildings and kills 10,000 people.
4 March 1977	Some 1,500 people are killed in an earthquake that hit close to the Romanian capital, Bucharest.
28 July 1976	The Chinese city of Tangshan is reduced to rubble in a quake that claims at least 250,000 lives.
23 December 1972	Up to 10,000 people are killed in the Nicaraguan capital Managua by an earthquake that measures6.5 on the Richter scale. The devastation caused by the earthquake is blamed on badly built high-rise buildings that easily collapsed.
31 May 1970	An earthquake high in the Peruvian Andes triggers a landslide, burying the town of Yungay and killing 66,000 people.
26 July 1963	An earthquake measuring 6.9 on the Richter scale strikes the Macedonian capital of Skopje, killing 1,000 people and leaving 100,000 homeless.
22 May 1960	The world's strongest recorded earthquake devastates Chile, with a reading of 9.5 on the Richter scale. A tsunami 30ft (10m) high eliminates entire villages. Death toll reports vary widely, but many settle on the 2,000 mark.
1 September 1923	The Great Kanto earthquake, with its epicenter just outside Tokyo, claims the lives of 142,800 people in the Japanese capital.
28 December 1908	Earthquake about 7.1 magnitude and subsequent tsunami in Italy's

	Messina Strait, badly affecting the cities of Messina and Reggio Calabria. Deaths estimated at 70,000-80,000.
18 April 1906	San Francisco is hit by a series of violent shocks which last up to a minute. Between 700 and 3,000 people die either from collapsing buildings or in the subsequent fire

Source: National Geophysical Data Center and, Disaster Preparedness Network Nepal. Retrieved on 12/28/2017

Annex II: Land slide Dams

River	Location	Impact	Damage
Tadi (tributary of the Trishuli)	Near Sikharbesi village in Nuwakot at 27.983°N, 85.400°E	Small landslide blocked the river	None
Trishuli	Opposite Ramche village in Rasuwa from Dandagaon to Shyfru Besi	Many scars developed as gullies a few metres to several hundred metres long along the right bank of the Trishuli River. The gullies deposited debris which partially blocked the river at four places.	Road to Melung hydropower damaged
Daraudi	About 5 km upstream of Ghyachok in Rasuwa at 28.296°N, 84.729°E	Debris from a landslide filled the river valley, temporarily blocking the river, but there was no evidence of the river being dammed.	None
Budhi Gandaki	Along the trekking route to Manaslu near Samagaun (Samdo) in Manang at 84.634°E, 28.633°N	A small avalanche blocked the river	Not Known
Kali Gandaki	Baisari village in Myagdi (28.400° N, 83.583° E)	The landslide destroyed 27 homes and buried the entire	Communities had been

	under about 30 m of debris and blocked the Kali Gandaki River	village under the debris.	evacuated so no loss of life.
Trishuli River	Trishuli River (also known as the Gyriong Zangbo) at Chongsecun 7km north of the China/ Nepal border (~2,600 masl) at 28.359°N, 85.365°E	None	None
Sun Koshi River	Chaku village in Sindhupalchok at 27.879°N, 85.900°E	River was blocked by landslide of Chaku village	-
Tom Khola	Ghapsya and Ghap and near Prok village in Gorkha, at 28.559°N, 84.793°E	Landslide blocked the river. A large volume of water was stored in the lake formed behind the landslide which had cut through the landslide dam and was flowing, although not necessarily at full capacity.	NA
Dono Khola	a tributary of the Marsyangdi River, downstream of Thulagi lake and about 7 km upstream of Nache village at 28.526°N, 84.441°E	Landslide blocked the river.	-
Marsyangdi River	Pisang village at 28.526°N, 83.936°E.	A landslide blocked the river.	-

Annex III: Earthquake induced avalanches

Name	Location	Impact	Damage
Avalanche in Langtang	.	Completely buried Langtang village and deposited materials (ice, rock and soil) across the Langtang River.	
Everest Base Camp		The collapsing icy mass swept away a part of Everest Base Camp and with it 22 lives.	

Annex IV: Socio-economic impacts of Landslides

Socio-economic aspects	Location	Impact	Damage
Settlements	Rasuwa, Sindhupalchowk, Tatopani	Field visits showed major destruction of newly-developed settlements by landslides along the Pasang Lamu Highway in the Trishuli valley (Rasuwa) and Kodari Highway along the Bhotekoshi/Sunkoshi valley (Sindhupalchok).Settlements in Tatopani village (at the Nepal-China border) were also hit by rock fall from the nearby mountain.	A total of 109 buildings fell within landslide areas.
School Buildings	Study districts	Many school buildings in the study districts were severely damaged but a few were damaged by landslides	A total of 22 school buildings damaged by earthquake-induced landslides
Hydro-power Projects	Dhading, Sindhupalchok, Lamjung,	The Independent Power Producers' Association Nepal (IPPAN) identified 21	Hydropower facilities with a combined

	Rasuwa	operational hydropower plants that had been impacted by the earthquake Affecting 109 MW of energy production.	capacity of 115 MW out of the total installed capacity of 787 MW in the country (on-grid as well as off-grid) were severely damaged. Facilities with a combined capacity of 60 MW were partially damaged.
Transportation	Dolakha, Gorkha, Sindhupalchok, Sindhuli, Rasuwa, Nuwakot, Lalitpur	The transportation sector was severely affected by the earthquake, mainly as a result of earthquake-induced landslides. The PDNA report (NPC 2015a,b) estimated a total loss of USD 216 million (USD 169 million damage and USD 48 million losses) in the transport sector.	33 km of road damaged by earthquake-induced landslides.
Bridges	Tamakoshi in Gongar, the Friendship Bridge at the Nepal-China border		a few bridges were damaged or destroyed by rock falls derived from earthquake-induced

	(Tatopani), Phulping bridge near Lharcha and Rasuwa Gadi bridge at the Rasuwa Gadi border		landslides
Irrigation Systems		The PDNA report (NPC 2015) identifies a total of 290 irrigation schemes in 31 districts with earthquake-related damage, mostly as a result of landslides and debris flow, with estimated losses of USD 3.8 million.	Two hundred irrigation schemes were damaged in the districts studied (111 in Gorkha, 26 in Dhading, 13 in Nuwakot, 5 in Rasuwa, 7 in Sindhupalchok, 38 in Dolakha).

Sources: (ICIMO, 2016):

Annex IV(I)

वर्ष (वि.सं.मा)	महिना वा पक्ष	गते वा तिथि
१२८०	पौषशुक्ल	प्रतिपदा
१३१२	आषाढशुक्ल	द्वितीया
१३३५	माघशुक्ल	प्रतिपदाभन्दा अघि
१४०१	आश्विनशुक्ल	सप्तमी
१४६७	अधिक भाद्रशुक्ल	द्वादशी
१५६४	आषाढशुक्ल	तृतीयाभन्दा अघि
१६२७	श्रावणशुक्ल	पञ्चमी
१७३८	ज्येष्ठशुक्ल	सप्तमी
१७७१	अधिक आषाढकृष्ण	द्वितीया
१८२४	आषाढ	१७ गते
१८२४	भाद्र	५ गते
१८४७	माघ	१७ गते
१८५५	वैशाख	३ गते
१८५५	वैशाख	३० गते
१८५५	ज्येष्ठ	८ गते
१८५५	ज्येष्ठ	१० गते

१८५५	माघ	१७ गते
१८६५	ज्येष्ठ	२४ गते
१८६८	फाल्गुन	३ गते
१८६९	माघ	१६ गते
१८७७	अधिक ज्येष्ठशुक्ल	पञ्चमी
१८७८	चैत्र	२३ गते
१८७९	आश्विन	४ गते
१८८०	कार्तिककृष्ण	द्वादशी
१८८२	कार्तिक	२५ गते
१८८३	कार्तिक	१४ गते
१८८३	कार्तिक	१५ गते
१८८३	कार्तिक	१६ गते
१८८३	माघ	८ गते
१८८७	कार्तिक	७ गते
१८९०	अधिक भाद्रशुक्ल	द्वादशी
१८९१	आषाढ	२९ गते
१८९१	भाद्र	३० गते
१८९१	आश्विन	१२ गते
१८९१	आश्विन	१५ गते

Source: Brahmshamsher Jung Bahadur Rana. (1991).

घर परिवार नं: … … … Earthquake victim card No.....

मोबाइल.....

त्रिभुवन विश्वविद्यालय

Central Department of Population

जनसङ्ख्या अध्ययन कार्यक्रम

Survey Information and Household Identification

भुकम्प प्रभावित समुदायको आर्थिक, सामाजिक तथा जीविकोपार्जन सम्वन्धी सर्वेक्षण

२०७५

एक अध्ययन

नमस्कार, मेरो नाम ..... हो । विश्वविद्यालय पद्मकन्या बहुमुखी क्याम्पस सञ्चालित Earth Quake Induced Migration, Internal Displacement and Livelihoods अध्ययन गर्ने सिलसिलामा म तपाईहरूको घर-आागनमा आएको छु । तपाईहरूले दिनुभएको जानकारीलेनै यो देशका समग्र पक्षबारेमा थाहा हुन्छ । त्यसकारण तपाईको आफनो घरपरिवार लगायतका विषयहरूमा सोधिएका प्रश्नहरूको सही जानकारी दिई यस अध्ययनलाई सहयोग गरिदिनुहुन हार्दिक अनुरोध गर्दछु । यहाँ सोधिएका विवरणहरू तथ्याङक ऐन २०१५ बमोजिम गोप्य राखिने छ र यसको प्रयोग तथ्याङ्कीय प्रयोजनका लागि मात्र हुनेछ ।

1. Section I Basic Information

१. घरमुलीको नामः .....२. घरमुलीको लिङग : महिला –१, पुरुष –२.

3. धर्म १. हिन्दु २. बौद्ध ३. क्रिश्चियन ४. मुश्लिम ५. अन्य..... 4. घरमुलीको जातजाति (जातिको कोड)..... 1 Tamang 2) Dalit 3) Brahmin/Chettri 3) Magar, Ghale, Gurung 4) Newra 5) others…….)

5. उत्तरदाताको नामः..... महिला –१, पुरुष –२ .....

6. उत्तरदाताको हाल बसिरहेको गा.पा/न.पा नामः ..... वडा नं : .....जिल्लाको नाम .....

7. भुकम्प भन्दा पहिला साविकको बसेको ठाँउः जिल्ला.....गा.पा./न.पा..... वडा नं.....

8. यस घरमा परिवार संख्या;

8.1 कती जना महिला ……

8.2 कती जना पुरुष……

8.3 जम्मा……..

9. बिगत ५ वर्षा भित्र यस घरमा कुनै सदस्य बाहिर (स्वदेश वा विदेश) मा काम गर्न गएका…. छन् ……..१ छैन…….२ (गोलो चिन्ह लगाउने)

9.1 यस परिवारमा ५ वर्षा भित्र बाहिर (स्वदेश वा विदेश) मा काम गर्न गएकाहरु छन् भने तिन का संख्या (कमसे कम छ महिना बाहिर बसेकाहरु मात्रै समेत्ने)

9.2 कती जना महिला ……

9.3 कती जना पुरुष……

9.4 जम्मा……..

9. यस घरमा परिवार १ देखी ५ वर्षका बच्चाहरु संख्या……

10. प्रश्नकर्ताको नाम…… मोबाइल.....

2. SECTION Household Roster

ID	परिवारमा संगै बस्ने र खाने सदस्यहरूको नाम लेख्नुहोस् । (घर मूलीको नामबाट शुरु) (घर मूलीको नाम सबभन्दा पहिले लेख्नु)[2]	घरमूलीसँगको नाता । 1. आफै 2. श्रीमान्/श्रीमती 3. छोरा/बुहारी 4. छोरी/ज्वाईं 5. बाबु/आमा 6. सासु/ससुरा 7. दाजुभाई/दिदी बहिनी 8. नाति/नातिनी 9. घरेलु कामदार 10. अन्य (खुलाउने)…	को लिङ्ग पुरुष..१ महिला.२	पूरा भएको उमेर वर्षमा लेख्न एक वर्षभन्दा मुनीको (.....) लेख्ने ।	वैवाहिक स्थिति १० वर्ष वा सोभन्दा माथिका लागि मात्र सोध्ने । 1.अविवाहित 2.एक विवाह 3.बहु विवाह 4.पुनर्विवाह 5.विधुर विधवा 6.पारपाचुके 7.छुट्टिएको		१५-४९ वर्षा का विवाहित महिला को लागि मात्रा विवाह को उमेर सोध्ने ।	मुख्य पेशा पेसा सम्बन्धी १० वर्ष वा सोभन्दा माथिका लागि मात्र सोध्ने। **1. कृषि** **2. घरेलु उद्योग** **3. जागीर** **4. व्यापार** **5. दैनिक ज्यालादारी (कृषि)** **6. दैनिक ज्यालादारी (गैरकृषि)** **7. शारीरिक रूपमा अशक्त** **8. विद्यार्थी** **9. हाल केही नगरी बसेका** **10. घरायसी काम** **11. थाहा नभएको** **12. अन्य उल्लेख गने...**		दोश्रो पेशा पेसा सम्बन्धी १० वर्ष वा सोभन्दा माथिका लागि मात्र सोध्न ।		उहाँले पढेर पूरा गरेको तह लेख्ने । कहिलै स्कुल नगऐको लाई लेख्ने, पढेका तर स्कुल छोदेका ५ देखी १८ बर्ष उमेर का लाई ९८ लेख्ने।	पढेका तर हाल स्कुल छोदेका ५ देखी १८ बर्ष उमेर का केटा केटी हरु लाई लाई इस्कुल छोदेको कारण सोध्ने . 1.फेरी भुकम्प आउने दर ले 2.कुल भात्क्यो 3.स्कुल मा पढ्ने बातावरण भएन 4.आर्थिओक समस्या 5.अबिभावक्को मृत्यु 6.परिवारको सदस्ये को मृत्यु 7.अन्न्ये	भुकम्प पछि तपाईको परिवार मा कुनकुन सदस्य हरुले निम्न नयाँ वा सिप हासिल गर्नु भएको छ ? छ भने क कसले कस्तो सिप हासिल गर्नु भएको छ .... १. दर्कार्मि २. प्लम्बर ३. सिकर्मी ४. सुचिकार ५. कृषि सम्बन्धी ६. मेसिनरी ७. साना उध्योग ८. scaffolding ९. ड्राइभर १०. होटेलसम्बन्धी ११. टुरिस्त सम्बन्धी १२. अन्न्ये	उक्त सिप ले अन्दाजी वार्षिक कति जती आम्दानी गर्नुहुन्छ ? लेख्नुस NRs ?	*बिगत ५ वर्ष भित्र कम् से कम छ महिना यस घरमा कुनै सदस्य बाहिर (स्वदेश वा विदेश) मा काम गर्न गएका* लाई गोलो चिन्ह लगाउने ।
					Before EQ	After	+12	Before EQ	After EQ	Before EQ	After EQ	Age 6+	Age 12+	Age 12+	Age 12 +	
	201.	202.	203.	204.	205.	206.	207.	208.	209.	210.	211.	212.	213.	214.	215.	216.

3. SECTION 3 Individual Questionnaire

301. भुकम्प पश्चात तपाईको परिवार कहाँ बस्नु भयो ? ठिक ✓ चिन्ह	✓		✓		✓
घरको छेउमा		पर्ती जग्गा		संघ संस्था ले ब्यबस्थापना गरेको ठाउँमा	
आफ्नै जग्गा त्रिपालमा		आन्ये गाउँमा		जग्गा बहालमा लिएको	
छिमेक को जग्गा त्रिपाल		सरकारले दिएको जग्गामा		अपर्झत कुनै हानी नहुने ठाउँमा	

यदी यस परिवार अहिले सम्मै यसै स्थान व फिलो स्थानमै बस्दै छ भने तल ३०२ मा जाने ।

301.1 भुकम्प पश्चात माथि उल्ल्लेखित स्थान पछी तपाईको परिवार कहाँ कहाँ बस्नु भयो ?	भुकम्प पस्चात दोश्रो बसेको स्थान को ठेगाना जिल्ला''गा.पा./न.पा.....वडा.....	यस् भुकम्प पस्चात तेश्रो / अहिले बसेको स्थान को ठेगानाजिल्ला...गा.पा./न.पा.....
301.2 स्थान मा कती महिना बस्नु भयो ?		
301.3 यस स्थान मा आउने बितिकै जिबन निर्बाह को लागि पहिलो काम के गर्नु भयो?		
301.4 अहिले सम्म कती ठाउँ मा सर्दै यस स्थान मा आइ पुग्नु भयो ?		

301.5 यो भन्दा पहिले को बसोबास छोडनुको निम्न करण के के थियो ? ठिक ✓ चिन्ह

1. रोजगारी को अबसर भएन	1	12	1	12
2. सन्स्क्रती रितिरिवाज मिलेन	2	13	2	13
3. राजनैतीक रुप्मा मिलेन	3		3	
4. अर्थिक रुप्मा राम्रो भएन	4		4	
5. शिक्षा को अबसर छैन	5		5	
6. फेरी प्रकृतिक प्रकोप हुने सम्भाबना	6		6	
7. कोही चिने जानेको छैन	7		7	
8. श्वासथको समस्या	8		8	
9. धर्मिक समस्या	9		9	
10. हेपिने तथा छुवाछुत को समस्या	10		10	
11. स्थानियेले हेप्ने	11		11	
12. अन्य				
13. थाहा छैन				

301.6 भुकम्प पश्चात तपाईको घर परिवार बसेको ठाँउमा निम्न के के सुविधाहरु थिए वा थिएन ?				
1. House rent or land 2. Tent, Tarpaulin, CGI	1	8	1	8
3. Food, rice, pulse, oil 4.	2	9	2	9
	3	10	3	10
	4	11	4	11
	5	12	5	12
	6	13	6	13

Medicine/health facilities 5. Clothes, blanket 6. Clean Drinking water7. Toilet facility 8. Sanitation 9. Electricity facility 10. Medicine and Health 11. Food supply 12. Safe place for women13. School for children14. Other…… 15. None of above	7	7
301.7 समग्रमा तपाईको परिवारमा भुकम पश्चात् बिभिन्न ठाउँमा बस्दा आवासको व्यवस्था कस्तो थियो	1.) राम्रो 2)नराम्रो 3)ठिकै 4)थाहा छैन	1.) राम्रो 2)नराम्रो 3)ठिकै 4)थाहा छैन

1. भुकम्प पस्चात आफ्नो भत्केको घर छोडेर अन्नेन्त्र बिभिन्न स्थान बस्दा समग्रमा तपाईंको परिवार को स्वस्थ को अवस्था कस्तो थियो ? Problem in health 4. Do not know 5. No problem in health 6. Family members are frequently sick

तपाई यहा स्थाई रुपमा बस्नुहुन्छ भने तल को बहु कारण चिन्ह लगाउनुस् ✓

Reason	✓	Reason	Reason	✓
1) उद्गम स्थल मा घर नभएको ले		**5)** यहाँ बच्चा हरु लाई शिक्षा को अबसर छ	**9)** उद्गम स्थल मा फेरी प्रकृतिकप्रकोपको सम्भाबना	
2) उद्गम स्थल मा सुरक्षा छैन		**6)** यहाँ रजनैतीक सम्बन्ध राम्रो छ	**10)** यहाँ सम्पती जोर्जाम गरेकोले	
3) उद्गम स्थल मा जग्गा नभएको ले		**7)** यहाँ आर्थिक अबसर बढी छ	**11)** थाहा छैन	
4) उद्गम स्थल मा भु स्खलन हुन दर		**8)** यहाँ बातावरण तथा नतेदार हरु छन्	**12)** अन्ये ……	

301.1 स्थाई रुपमा नबस्ने हो भने बस्न न खोज्नु को कारण दिनु होस्?

Reason	Reason	✓	Reason	✓
1. रोज्गार को अबसर छैन	**5.** धर्मिक समस्या		**10.** बिनास को सम्भाबना	
2. शिक्षा को अबसर छैन	**6.** स्थानिएले हेप्ने		**11.** यहाँ रज्नतिक सम्बन्ध राम्रो छैन	
3. हेप्ने तथा छुवाछुत् गर्ने	**7.** यहाँ आर्थिक अबसर छैन		**12.** नतेदार हरु छैनन	
4. श्वास्थ सुबिधा समस्या	**8.** सडक छैन		**13.** अन्ये.	
5. रितिरिवाज र सन्स्क्रित नमिलेको	**9.** थाहा छैन			

302. भबिस्येमा कहाँ बस्न रुचाउनुहुन्छ ? ✓ चिन्ह लगाउने 1) उद्गम स्थल मा 2) सरकार ले राखेको ठाउँ मा 3) अर्को गाउ मा 4) अर्को जिल्लामा **5)** थाहा छैन

303. पुरनो आफ्नो ठाउं मा किन जानु हुन्छ ? (तल को कारण हरु रोज्नुस्) ?✓ चिन्ह लगाउने

1) Agriculture farming 2) Cattle framing 3) Support to the neighbors/relatives 4) Festivals 5) Social works 7) Politics 8) Religious works 9) others……**……..**

304. भुकम्प पस्चात् निम्न बस्तु हरु मा तपाईको घरमा आएको

1. साकारआत्मक वा
2. नकारात्मक

परिवर्तन बारे लेख्नुस् ।

305. भुकम्प पछि कहिँ केहि परिवार को सम्पत्ति जोड्नु भएको छ ? ✓	छ	**छैन**	थाहा छैन	१, जग्गा जमिन	

305.1 तपाई यहा स्थाई रुपमा बस्नुहुन्छ भने तल को बहु कारण चिन्ह लगाउनुस् ✓

Reason	✓	Reason	✓	Reason	✓
1) उद्गम स्थल मा घर नभएको ले		**5)** यहाँ बच्चा हरु लाई शिक्षा को अबसर छ		**9)** उद्गम स्थल मा फेरी प्रकृतिकप्रकोपको सम्भाबना	
2) उद्गम स्थल मा सुरक्षा छैन		**6)** यहाँ रजनैतीक सम्बन्ध राम्रो छ		**10)** यहाँ सम्पती जोर्जाम गरेकोले	
3) उद्गम स्थल मा जग्गा नभएको ले		**7)** यहाँ आर्थिक अबसर बढी छ		**11)** थाहा छैन	
4) उद्गम स्थल मा भु स्खलन हुन दर छ		**8)** यहाँ बातावरण तथा नतेदार हरु छन्		**12)** अन्ये ……	

305.2 स्थाई रुपमा नबस्ने हो भने बस्न न खोज्नु को कारण दिनु होस्?

Reason	✓	Reason	✓	Reason	✓
1. रोज्गार को अबसर छैन		**5.** धर्मिक समस्या		**10.** बिनास को सम्भाबना	
2. शिक्षा को अबसर छैन		**6.** स्थानिएले हेप्ने		**11.** यहाँ रज्नतिक सम्बन्ध राम्रो छैन	
3. हेप्ने तथा छुवाछुत् गर्ने		**7.** यहाँ आर्थिक अबसर छैन		**12.** नतेदार हरु छैनन	
4. श्वास्थ सुबिधा समस्या		**8.** सडक छैन		**13.** अन्ये.	
5. रितिरिवाज र सन्स्क्रित नमिलेको		**9.** थाहा छैन			

306. भबिस्येमा कहाँ बस्न रुचाउनुहुन्छ ? ✓ चिन्ह लगाउने 1) उद्गम स्थल मा 2) सरकार ले राखेको ठाउँ मा 3) अर्को गाउ मा 4) अर्को जिल्लामा **5)** थाहा छैन

307. पुरनो आफ्नो ठाउं मा किन जानु हुन्छ ? (तल को कारण हरु रोज्नुस्) ?✓ चिन्ह लगाउने**…1)** Agriculture farming2) Cattle framing 3) Support to the neighbors/relatives 4) Festivals 5) Social works 7) Politics8) Religious works 9) others……**……..**

308. भुकम्प पस्चात् निम्न बस्तु हरु मा तपाईको घरमा आएको
1. साकारआत्मक वा
2. नकारात्मक
परिवर्तन बारे लेख्नुस्।

309. भुकम्प पछि कहिँ केहि परिवार को सम्पत्ति जोड्नु भएको छ ? ✓	छ	**छैन**	थाहा छैन	१, जग्गा जमिन		

310. पुरनो आफ्नो ठाउं मा कतिको जानु हुन्छ, यदी छ भने ?	महिनामा..... …….. पटक			२, शिक्षा	
311. भुकम्प पछि तपाईं आफ्नो पुरनो बस्तिमा जानु भएको छ ?	छ	**छैन**	**XXXXXXXXXXX**	३, स्वास्थ्य	
312. भुकम्प पस्चात तपाईको उद्गम स्थल मा निम्न लिखित अवस्था कस्तो रह्यो ? ✓ चिन्ह लगाउने	बधेको	घटेको	यथास्थिति मा भएको	५, खानेकुरा	
308.1 रोजगार को अवस्था				६, घर	
308.2 आर्थिक गतिबिधी				७, सामाजिक सम्बन्धि	
			8.अन्य सम्पत्ति अन्यउल्लेख गर्ने)		

4. SECTION 4: महिला सम्बन्धी

401. महिलासँग सम्बन्धित निम्न समस्याहरू भूकम्प अघि या पछिको अवस्थामा कस्तो छ, थियो ? तपाईले देखे अनुसारको निम्न नम्बर लेख्नुस् ! उपयुक्त छ…….१उपयुक्त छैन…२ अन्य.....३	402. भूकम्प अघि या पछि यस समुदायमा निम्न बिकृती भए नभएको ? ✓ चिन्ह लगाउने कार्यहरू Yes – 1, No – 2

समस्याहरू .....Yes – 1, No – 2	Before	After		Before	After
1. अविवाहित छोरीचेलीलाई बस्न, सुत्न ब्यबस्था कस्तो छ ?	महिला विरुद्धहुने लैङ्गिक हिसा यौन हिसाको कुनै हुने गरेको थियो वा छ ?				
महिनावारी परसर्ने बेला कस्तो समस्या छ, थियो ?	बालबालिका ओसारपसार हुने गरेको थियो वा छ ?				
लुगा फेर्न कस्तो समस्या छ, थियो ?	कुनै बालिकालाई कसैले कतै बेच्ने मनसायले लगेको हुने गरेको थियो वा छ?				

शौचालय जान कस्तो समस्या छ, थियो ?	त्यस्ता बालिकाको पुनरस्थापनाको लागि सरकारी पहल भएको हुने गरेको थियो वा छ ?
आफ्ना दौतेरी साथी सङगीहरूसँग फोनमा कुरा गर्न कस्तो समस्या छ, थियो ?	बालिकालाई अनुचित स्तरले भगाउने विरुद्द कुनै कार्यवाही हुने गरेको थियो वा छ ?
गर्भवति अवस्थाकी महिलालाई सुत्न, बस्न, आराम गर्न कस्तो समस्या छ, थियो ?	भुकम्प पस्चत तपाईको घर परिवार मा केही झैझगदा खतपत भएको थियो ?
2. अन्य (खुलाउने)	

403. भुकम्पीय क्षति पछि तपाईको घरपरिवारका कुनै सदस्यमा निम्न लक्षणहरू देखिएको छ, थियो ? ठिक ✓ चिन्ह लगाउनुस्

	छ	छैन	कति महिना वा दिन	अहिले को अवस्था ? 1) जस्ता को तेस्तै 2) पहिला भन्दा राम्रो 3) निको भएको
1. वान्ता गर्ने	1	2		
2. बेहोस हुने	1	2		
3. गोडा बटारिने	1	2		
4. पिडाउला चर्केको	1	2		
5. रुने	1	2		
6. रुन्दा रुन्दै बेहोश हुने	1	2		
7. शारिरीक रुपमा तन्दुरुस्त भएपनि तनाबमा देखिने	1	2		
8. रक्तचाब बढने/घटने	1	2		
9. अन्य				
10. केही भएन	1	2		

SECTION 5: Social Condition after EQ and Livelihoods

501. उक्त ठाँउमा मनोसामाजिक सल्लाहको व्यवस्था थियो वा थिएन ? ठिक ✓ चिन्ह लगाउनुस् 1) थियो 2) थिएन 3) थाहा छैन

502. यदि भए कस्को लागि गरिएको थियो ? ठिक ✓ चिन्ह लगाउनुस्

1) Children 2) Injured and those who lost families 3) Old age people 4) Women 5) Youth 6) Nothing

503. भुकम्प पछाडि तपाईको परिवारले आफन्त वा साथीहरु, छमेकी, नतागोताबाट निम्नलिखित कुनैपनि सहयोग प्राप्त गर्नु भयो वा भएन ? (Multiple choice, ठिक ✓ चिन्ह लगाउनुस्)

1) Cash Support 2) Goods support 3) Medicine Support 4) Food support 5) Clothes support 6) Other support 7) None

504. तपाईको परिवारले आफ्नो भुकम्प पछाडि गुजारा गर्नको निम्ति कुनै सरकारी, गै.स.स/ निजि क्षेत्र आदिबाट सहयोग पाउनु भएको थियो ? (Multiple choice, ठिक ✓ चिन्ह लगाउनुस्) सहयोग पाउनु भएको थियो भने निम्न उत्तर दिनुहोस् ।

505.यदि सहयोग पाउनु भए कस्तो सहयोग ? 1. Cash for work……1 2. Cash support……..2	**507.**घर निर्माण गर्न नेपाल सरकारबाट प्राप्त सहयोगको विवरण । सबै किस्ता पायो वा पाएन ? 1 Yes received all

3. Material support 4. Tools support 4 5. Livestock support 5 Others……. 506.यी सहयोग कुन कुन निकायबाट पाउनु भएको थिया ? 1. Nepal Government 2. NGO and private sector 3. Nepal Red Cross Society 4. World Food Program 5. Others…	2 No, yet received all 508.तपाईको परिवारको जीवीकोपार्जनको मुख्य समस्या के थिए (कुनै एउटा मुख्य मात्र खुलाउने) ? 1 Lack of land 2 Lack of irrigation 3 Lack of manpower 4 Arable land prone to landslide 5 Lack of education and skills 6 No funds 7 Loss of tools and livestock in EQ 8 Others…

6. SECTION 6; Housing Recovery

601.	भुकम्पले क्षति पुऱ्याएको घर पुन निर्माण गरि सक्नु भयो ? ठिक ✓ चिन्ह लगाउनुस् Completed---1 Still Constructing---2 Not started---3. Nothing done--4	
602.	हाल निर्माण भएको घर विवरण दिनुहोस । 1. कती तल्ला को घर?……. 2. घरमा कोठा को संख्या 3. Foundation materials… …..4. Roof materials… 5. Walls……5. Structure…	1) RBC 2) RCC 3) Mud mortar 4) Mud mortar brick 5) Mud mortar stone 6) Cement brick 7) Cement stone 8) Tin/GI sheet 9) Other…..

603. भुकम्प अघी र पछी तपाईको घरमा निम्न कुन कुन कस्तो सुबिधाहरु छन् ?

HH facilities	Before EQ	After EQ
1. घरमा कोठाको संख्या		
2. एक कोठामा कती जना सुत्छन् ?		
3. छुत्तै भान्चा कोठा छ ? छ…. 1 छैन…. 2		
4. घरसँगै तरकारी बारी छ ? छ…. 1 छैन…. 2		
5. कती तल्लाको घर ?		
6. यो घरमा कती जोडी बस्दछन् ?		
7. यो घरमा टोइलेट छ?		
8. पानी लिने ठाउँ कती टाढा छ ? …… मिनेट टाढा छ		
9. अन्य		

7. SECTION Individual Assets

701. तपाईको परिवारको स्वामित्वको कति जग्गाजमिन थियो /छ (थियो भने रोपनीमा लेख्ने)?		Before EQ	1) After EQ until now
	1) खेत …… बारी……चरन…… रोपनी	खेती गरी राखेको जमिन ……बाझो जमिन…….	3) खेती गरी राखेको जमिन ……बाझो जमिन
702.	जमीनमा खेती गर्ने गर्नुहुन्थ्यो थिएन	1)सबै जमिनमा 2) केहीमा 3) बाझो	1. 1)सबै जमिनमा 2) केहीमा 3)

	? ठिक ✓ चिन्ह लगाउनुस्	राखेको	बाझो राखेको
703.	यदि वषैभरि खेती नगरिएको भएके कति कारणले ? ठिक ✓ चिन्ह लगाउनुस्	1. जमिन भास्सिएको चर्किएको 2. सिचइे नभएको 3. काम गर्ने मानिस छैन 4. कृषि सामाग्रीनै छैन 5. फेरी भुकम्पको दर 6. अन्य	1. जमिन भास्सिएको चर्किएको 2. सिचइे नभएको 3. काम गर्ने मानिस छैन 4. कृषि सामाग्रीनै छैन 5. फेरी भुकम्पको दर 6. अन्य

704. तपाई संग गाईबस्तु चौपाया आदि छ ? संख्या उल्लेख गर्नुस ?

Number of animals	Before EQ	After EQ	Before EQ	After EQ
Cow/Ox			Chicken/Duck	
Buffalo			Others	
Goat			केही छैन	
Pig				

7. Food Sufficiency

801. भुकम्प भन्दा अगाडि र पछाडि तुलनात्मक रुपमा तपाईको बाली नालीको उत्पादन कस्तो हुन्थ्यो ? (before and after EQ) ? वृद्धि भएको छ.....१, कमि आएको छ...२, जस्ताको त्यस्तै छ.....३ थाहा छैन....४

80	हाल सम्म रहेको कामले तपाईको परिवारलाई वर्ष भरी खान पुग्छ (कृषि तथा गैरकृषि व्यवसायबाट) यदि वर्ष भरी खान नपुग्ने भए कति महिना पुग्छ ? १= बर्षका सबै महिना पुग्छ २ पुग्दैन भने बर्षको.....महिना मात्र पुग्छ।

803. उक्त खान नपुगेको महिनामा खाधान्नको अभाव कसरी पुर्ती गर्नुहुन्छ ? ठिक ✓ चिन्ह लगाउनुस ?

ऋण खोजेर		मागेर आफन्तवाट प्राप्त उपहार		उधारो लिएर	
आधा पेट (कम्ती) खाएर		गाउँमा ज्याला मजदुरी		स्वदेशी विप्रेशण	
जग्गा, गरगहना विक्री		विदेशी विप्रेशण		Others	
पशुपक्षी विक्री					

801. यस परिवारको विगत भुकम्प अघी पछी को आम्दानीको प्रमुखश्रोत हरु के के हो ? ठिक ✓ चिन्ह लगाउनुस् / भुकम्प			802. ब्यक्तिगत रुपमा माथि रोस्तर २ मा उल्लेखित बाहेक तपाई संग वा परिवार मा जीवन निर्वाह गर्न सक्ने निम्न लिखित के के विशेष शीप छ ? ठिक चिन्ह लगाउनुस् Mark ✓ भुकम्प		
आम्दानीको प्रमुख श्रोत ✓	अघी	पछी	विशेष शीप	अघी	पछी
तलब ज्यालाबाट आम्दानी			परम्परागत खेती		
कृषि, पशुपालन, फलफूल खेती			नयाँ प्रबिधी खेती		
पसल, व्यापार, उद्योगधन्दा आदिबाट			घडी, मोवाइल, फोन, टिभी, रेडियो मर्मत		
दैनिक ज्यालारमजदुरी पेन्सन			टनेलको बिकसित तरकारी खेती		
Pension, social security			डोको, डालो, घुम जस्ता बाँस वा निगालो बुनाई		
वालीघरे प्रथा र विष्टघरे र जातिगत			क्यातुकेको डोरी, नाम्लो, दाम्लो बुन्ने शीप		

पेशा					
Daily wages agriculture			सिकर्मी, डकर्मी, बिजुलीको काम		
Daily wages non agriculture			शिक्षण कला		
गाईबस्तु चौपाया आदि विक्रिबाट			होटल, रेष्टुरेन्ट चलाउने		
दुध, दही, घिउ, आदि विक्रिबाट			धामी, झार्की, झारफुक		
विप्रेशण			पर्यटन क्षेत्र		
others			सवारी साधन चलाउने		
			अन्य (उल्लेख गर्नुहोस्).....		

5. SECTION: Social Capital

901. तपाईले बिगत ५ बर्षमा निम्न नगद हस्तान्तरण प्रदान गर्ने कार्यक्रमहरूसंग सम्बन्धित संघ संस्था, सरकार आदी बाट सुबिधा / फाइदा लिनुभयो ?

If not escape it. - (बहु उत्तर Mark ✓)

902. तपाईको परिवारमा कुनै सदस्यको निम्न समितिको र सामाजिक संघ सस्था आदिमा संलग्न हुनुहुन्छ थियो ? (बहु उत्तर Mark ✓)

कार्यक्रमहरू	भुकम्प अघी	भुकम्प पछी	संघ संस्था	भुकम्प अघी	भुकम्प पछी
1. प्राकृतिक प्रकोपको क्षतिपूर्ति			खानेपानी/सिचाई उपभोक्ता समितिका		
2. सामान्य छात्रवृत्ति			शहकारिका सदस्य		
3.विधुवा भत्ता			वन उपभोक्ता समितिको रु		
4.असक्त भत्ता			महिला समुह		
5.बच्चा भत्ता			सरसफाई समितिको		
6.सुत्केरी भत्ता			स्थानिय क्लब		
7.दलित छात्रवृत्ति			NGOs,CBOs NGOs,		
8.महिला छात्रवृत्ति			Others		
9.अपाङ्ग छात्रवृत्ति			None of above		
10.Others					

6. SECTION Access to Facilities

1001. तलकामध्ये कुनकुन धनमाल तपाईको घरपरिवारको स्वामित्वमा छन् (बहु उत्तरMark ✓) छ ...१ छैन...२ (बहु उत्तर Mark ✓)

SN	धानमाल	Before EQ	After EQ	SN	धनमाल	Before EQ	After EQ
1	अनाज स्टोर			15	क्यामेरा		
2	खाट, फलैचा			16	दराज आलमारी		
3	मेच सोफा			17	कपडा,गलैंचा, बुन्ने		
4	टेबुल			18	Tractor		
5	भित्ते घडी घडी			19	थ्रेसर		
6	टेलिभिजन			20	पानी तान्ने पम्प		
7	भीसीआर भीसीडी			21	कुटो, कोदालो,		
8	विजुलि पंखा			22	ढीकी, जातो		
9	रिफ्रिजरेटर (फ्रिज)			23	पानी घट्ट		

10	टेलिफोन, मोबाइल			24	राइस कुकर		
11	लुगा सिउने कल			25	घुम्ती पसल		
12	मोटरसाइकल			26	सोलार		
13	साइकल			27	Others…….		
14	रेडियो टेप						

1002. खाने पानि तथा सरसफाई बारे मा निम्न कुरा हरु चिन्ह लगाउनुस ? ☐ (Mark ✓)

	Before EQ	After EQ	
खानेपानी कहाँबाट ल्याउनुहुन्छ ?			1. घरआँगनभित्रै पाइपबाट 2. सार्वजनिक धाराको पाइपबाट 3. भण्डार गरिएको वर्षाको पानी 4. मुल नदी, पोखरी, खोला 5. खुला पानीको स्रोत 6. अन्यभए उल्लेख गर्ने
बर्षाको मौसममा ?			
हिउद वा सुख्खा मौसममा ?			
पानी सफा र सुरक्षित बनाउन कुनै उपाय गर्नु भएको छ ?			छ ……१ छैन……2
यदि भए धैरैजसो के उपाय गर्ने गरेको छ ?			१, उमाल्ने घाममा राख्ने २, फल्टर ३, क्लोरिन हालेर उपचार ४, अन्यभए उल्लेख गर्ने
तपाईको घरमा चर्पी छ कि छैन ?			छ ……..१ छैन……..2
घरको सदस्यहरुले कहाँ दिशापिसाब गर्छन ?			१, घर आंगन, २, बाटो छेउ, ३, खुला खेत वा जंगल पोखरी, ताल, ५,नदि वा खोला

1003. तपाईको घरमा प्रयोग गरिने बत्तीको प्रमुख स्रोत के हो निम्न कुराहरु चिन्ह लगाउनुस् ? ✓	Before EQ	After EQ	1004. तपाईको परिवारले पकाउन ततौउन सामान्यतः कस्तो प्रकारको ईन्धन प्रयोग गर्दछ? - मूख्य तीन वटा)	Before EQ	After EQ
1.Electricity					
2.Kerosene					
3.Gobbar gas					
4.Tukimara			[redacted]		
5.Oil					
6.Laltine			[redacted]		
7.Solar					
8.Others					

7. SECTION: Access to Credit

1101. तपाईको परिवारमा कुनै सदस्यको नाममा कुनै बैक वा बित्तीये संस्थामा खाता थियो ?) थिएन भने 1103 जाने		1102. यदि तपाईको परिवारमा कुनै सदस्यको नाममा कुनै बैक वा सहकारीमा खाता छ थियो < mark ✓ महिला ? पुरुष ? वा दुबै ? छ भने कस्को नाम मा ?			
			महिला	पुरुष	दुबै
थियो (… before EQ)	थियो (…..After EQ)	भुकम्प अघी			
थिएन (…Before EQ) (… After EQ)	थिएन) (… After EQ	भुकम्प पछी छ			

1103. भुकम्प पश्चात तपाईको परिवारले कसैबाट ऋण लिनुभयो ? लिए (…..) लिएन (…..) Mark ✓

यदि ऋण भएको भए उक्त ऋण के को, लागि लिनु भएको हो थियो ? mark ✓		1104. यदि ऋण भएको भए उक्त ऋण को को बाट लिनु भएको छ थियो ? (✓)	
1) घर बनाउन	2) सानो ब्यापार	1) आफ्नै लगानी	2) महिला समुह
3) श्वासथ उपचार	4) बाचात	3) नातेदार , साथीभाई	4) साहु
5) शिक्षा	6) जग्गा किन्न	5) बैंक	6) अन्य
7) रिन तिर्न	8) कृषि मा	7) लघुबित्त	
9) बिदेश जान	10) कुनै पनि होइन		

8. SECTION; धर्म रितिरिवाज र सास्कृति

1201. भुकम्प अघी र पछी बर्ष भरीमा तपाईं हरु के कस्ता चाड पर्ब हरु मनाउनु हुन्छ ? महिना अनुसार तलको तेबुल भर्नुस् । If not ant escape it.

महिना	Before EQ	After EQ	महिना	Before EQ	After EQ

9. SECTION

Individual Questionnaire for Injuries, Death, Birth, pregnancy, occupation variation

1401. भुकम्पको कारणले तपाईको परिवारमा कसैलाई चोटपतक लागेको थियो ? १) थियो 2) थिएन

1402. २०७२ साल वैशाख १२ र त्यसपछि भुकम्प वा भुकम्प पराकम्पनबाट तपाईँको परिवारमा कोहि कतै घाइते हुनुभएको भए घाईते हुने विवरण दिनुहोस ।

भुकम्प पश्चात तपाईको घर परिवारको मृत्युको कारण भुकम्प भएको थियो ? Yes (….) No बिगत ५ बर्ष भित्रमा भएको मुत्यु भएको भए मात्र तल को उत्तर दिन होस् ।SN	मुत्यु हुनेको लिङ्ग ? १. पुरुष २. महिला	मुत्यु भएका बेला उहाँको उमेर ?	घरमूलीसँगको नाता (सम्बन्धी कोड) घरमूली Relation with the Household Head 1. आफै 2. श्रीमान्/श्रीमती 3. छोरा/बुहारी 4. छोरी/ज्वाई 5. बाबु/आमा 6. सासु/ससुरा 7. दाजुभाई/दिदी बहिनी 8. नाति/नातिनी 9. घरेलु कामदार 10. अन्य (खुलाउने)…	मुत्यु भएको मिति Year…….. Month…..	मुत्यु कारण ? 1. भुकम्प 2. क्यान्सर 3. श्वासप्रश्वास (ARI) 4. कर्थग्रिन 5. kidney 6. wáter borne 7. Heart 8. Mental disorder 9. निमोनिया 10. Diarohea 11. महिनावारि को समस्या 12. पाठेघर खस्ने 13. Brest cancer 14. Others	मुत्यु भएको बेला कसले उपचार गरेको थिया ? 1. धमी झाक्री 2. बैध्ये 3. 2.Baidya/traditional healer 4. महिला 5. सोयमसेबिका 6. AHW/HA 7. Doctor 8. Other... 9. No body 10. Do not know	मृत्यु कहाँ भएकोथियो ?
	1403.	1404.	1405.	1406.	1407.	1408.	1409. 1410. 14

10.SECTION; बसाइसराइँ को लगत

यो लगत बिगत ५ बर्षमा बसाइसराइ गरि अन्यत्र बसोवास गरेकालाई मात्र सोध्नुहोस्)

हाल कहाँ बसोबास गर्नुहुन्छ? (जिल्ला वा देशको नाम)	सो ठाऊँमा गएको मिति Year month	निज सो ठाऊँमा कती महिना बस्नु भयो ?	बसाइसराइँका कारणहरू १ विवाह २ कामको लागि ३. उच्च शिक्षा ४. प्राकृतिक प्रकोप ५. कार्य परिवर्तन ६. द्वन्द ७.परम्परागत जीवन ८.अपर्याप्त आम्दानी ९.देखासिकि प्रभाब १०.पारिवारिक दवाब ११.सामाजिक प्रतिष्ठा १२. अन्य.	निज घर छाडेर वाहिर जानुभको कति पटक भयो? बिगत ५ बर्षमा	फर्केको भये किन हो कारण लेख्नुस्	उहाँ कुन माध्यमबाट जानुभएको हो ? 1. सरकार 2. म्यानपावर 3. नातेदार 4. दाजुभाइ 5. दलाल 6. अन्त्ये	बसाइसराइँको क्रममा भएको लगानी (रुपियाँमा)	लगानीको श्रवोत 1. आफ्नै लगानी 2. नातेदार 3. साथीभाई 4. बैंक 5. लघुबित्त 6. महिला समुह 7. साहु 8. अन्त्ये	वार्षिक बिप्रेसन रुपियाँमा	बिप्रेसनको प्रयोग 1. घर बनाउन 2. श्वासथ उपचार 3. शिक्षा 4. रिन तिर्न 5. बिदेश जान 6. कृषि मा 7. सानो ब्यापार 8. बाचात 9. जग्गा किन्न 10. अन्त्ये 11. कुनै पनि होइन	उहाँको विदेशको मोवाइल नं.	उहाँसँग के सिप छ ? १. दकर्मि २. प्लम्बर ३. सिकमी ४. सुचिकार ५. कृषि सम्बन्धी ६. मेसिनरी ७. साना उध्योग ८। scaffolding ९. ड्राइभर १०. होटेलसम्बन्धी ११.टुरिस्तसम्बन्धी १२. अन्त्ये
1301.	1302.	1303.	1304.	1305.	1306.	1307.	1308.	1309.	1310.	1311.	1312.	1313.

1314. घरबाहिर रहेका सदस्यले आफु नआए पनि भूकम्पपछिको आपतकालिन व्यवस्थापन गर्न केही रकम पठाएका थिए ? थियो.....1 थिएन....2

1315. यदि थियो भने कति रकम पठाएका थिए ? जम्मा रकम रु……if yes how much ? NRs…….

1316. आफ्नो गतब्यमा सिकेको कुनकुन शिप कृषि व्यवसाय वा उद्योग यस गाउँमा प्रयोगमा ल्याउनु भएको छ ? के के नँया काम यहाँ गर्दै हुनुहुन्छ ?

1317. आफ्नो गतब्यमा सिकेको शिपले के के नँया काम यहाँ गर्दै हुनुहुन्छ यस परिवारका सदस्यहरुले विगत १२ महिनाको समयमा कुनै नगद जिन्सी पठाउनु भएको छ ? पठाउनु भएको भए मुल्याङ्कन गरी नगदमा विवरण लेख्नुस । ..... (रुपैयामा) .....

1318. त्यसरी प्राप्त भएको रकम के मा प्रयोग गर्नुहुन्छ ?
१) दैनिक घरायसी प्रयोजनका लागि २) बच्चको शिक्षामा ३) ऋण तिर्न, ४) जग्गाजमिन जोड्न, ५) विवाहमा दाईजो दिन, ६) घर किन्न७), मर्मत गर्न, ८) नयाँ व्यवसाय शुरु गर्न/व्यवसाय विस्तार गर्न, ९) कृषि कार्य विस्तार गर्न, १०) बैङ्कमा सञ्चय गर्न ११) अन्य.....

1319. बसाइसर्ने ब्यक्तीले आफ्ना कमएको रकम बाट केही उपल्बधिमुलक आम्दानी हुने काम गरेको भये तेस्को विवरण दिनुस् । काम गरेको विवरण..... आम्दानी गरेको विवरण दिनुस् रुपया¤.....

1320. देश बाहिर गएर कमाएको रकमले केही लगानी गरेर केही ब्यबसये गर्नु भ्एको छ ? छ भने कती जती आम्दानी गर्नु हुन्छ बर्ष मा NRs……

1412. तपाईको घरमा भुकम्पको कारणले गर्दा कुनै सदस्यको हुन लागेको विवाह, स्थगित भएको छ ? छ…..1 छैन…2

1413. तपाईको घरमा भुकम्प पश्चात कसैको विवाह भएकोथियो ?, भयो..... 1, भएको छैन...2

1414. भुकम्प पछाडि यस परिवारमा कुनै बालबालिकाको जन्म भयो वा भएन ? , भयो –1 भएन --2

1415. भएमा कहाँ भएको हो ? If there was delivery of baby, where?, अस्पताल..1 घर…..2 अन्य.....

1416. भुकम्पको कारणले सुत्केरी स्याहारमा केहि कठिनाई व्यहोर्नु पर्यो या परेन? पर्यो...1 परेन...2

1417. स्वास्थ्य जाँचको लागि कहाँ जानुहुन्छ ? क) नजिकको स्वास्थ्य चौकी ख`) औषधी पसल ग) डाक्टर घ) वैद्य, झारफुक, धामी, झाक्री

1418. भुकम्प पश्चात बालबालिकालाई खोप नियमित लगाउनु भयो वा भएन? (परिवारका सवै ५ वर्ष मुनिका बालबालिकाका बारेमा सोध्ने)! लगाएको...1 नलगाएको.2 खोप लगाउने बच्चा परिवारमा नभएका—3, यदि नलगाएको भए कारण (खुलाउने…….

1419. बिगत ५ बर्ष भित्र कोही यस परिवारका सदस्य गर्भवती हुनुहुन्थ्यो बा भएको छ ? Yes…1 No…2.

1420. गर्भवती भएको हुनुहुन्थ्यो र गर्भवती भएर स्वस्थ परीक्षण नगराएको भए मात्र तलको उत्तर दिनुहोस ! If not escape it

भुकम्प	ID from HH Roster	गर्भवती भएको वेला नियमित स्वास्थ्य परीक्षण नगराउनुको मुख्य कारण के हो तलको उल्लेखित नम्बर लेख्नुस ! 1) स्वास्थ्य संस्था नभएर, 2) थाहा नभएर, 3) डर लागेर,5) घरबाट नपठाएर, 6) अन्य (खुलाउने..)

1421. समग्रमा बालबालिका तथा युवाहरूमा भुकम्पका कारण मुख्य शैक्षिक संस्थामा कस्तो असर पुगेको छ ? विद्यालय भत्केका.....1, घर भत्केको.....2, विद्यालय र घर दुवै भत्केको....3, कुनैपनि समस्या नभएको.....4, अन्य (खुलाउने.थाहा छैन ……5

1422. तपाईको पेशा बाट भुकम्प भन्दा पहिला सन्तुष्ट हुनुहुन्छ वा अहिले सन्तुष्ट हुनुहुन्छ ?

१ - पहेलै सन्तुष्ट थिए 2 - अहिले सन्तुष्ट छु! 3 -- त्यस्तै हो! 4 --- थाहा छैन ।

Annex V: Persons involved in the survey

Rasuwa

1. Sukuman Dangol Lecturer (Batar Multiple Collage)

Rasuwa

1. Chameli Gurung 98511 43197
2. Biswas Nepali 9851241866 Bhumisudhar Manch
3. Bijaya Tiwari 9851234839
4. Purna Ghale 9840503629 Ward member
5. Nanimaya tamang 9808890812 Vice chair of betrawoti
6. Sang Tempa 9860188184

Sindhupalchok

1. Sita Bhujel 9861925160 Bhumisudhar Manch
2. Madhusudhan Sapkota 9851176932 CDCF
3. Rajendra Sharma Janahit Manch CEO 9851179737
4. Balkrishna Deuja

Listikot

1. Pema dawa Shrepa 9813799202, 9844377912, sherpadawa@gmail.com
2. Laxu Sherpa 9823688198, 9614461358

Jhadibesi (between Chautara and Sipaghat)

1. Subba bahadur karki 9869240777 Jhadibesi
2. Ramila Adhikari 98089231356
3. Raju Acharya 9851290190

Annex VI: Human resource of the survey

Name list of the persons who helped to conduct survey, Municipality Chair persons, Ward Members are as followings,

SN	Name of the person	RM	Post
1	Upendra Lamsal	Uttargaya	Chair Person
2	Chameli Gurung	Uttargaya	Vice-Chair Person
3	Ishwor Thapa		5 no Chair person
4	Khuwa Bahadur Gurung		2 no Chair person
5	Keshar Bahadur Tamang		4 no chair person
6	Govinda Prasad Rimal	Nilkantha Secondary School, Uttargaya	Head Teacher
8.	Nurbu sanbo Tamang	Naukunda	Chair person
9	Srijana Tamang	Naukunda	Vice-Chair person
10	Sukraman Pakhern	Naukunda	4 no chairperson
11	Chatra Tamang	Kispang	Chair Person
12	Aasha Bahadur Tamang	Meghang	Chair Person
13	Shanti Tamang	Meghang	Vice -Chair Person

Annex VII: Detail list of the respondents

Detail list of the participants who participate in providing qualitative information with the role in FGD, KII and Case studies.

SN	Name	Location	Participants		
	Focus Group Discussion (FGD)		**Female**	**Male**	**Total**
1.	Rasuwa,	Betrawoti	6		6
2.	Betrawoti, Rasuwa	Uttargaya		4	4
3.	Simbutar, Bidur Municipality	Simbutar		15	15
4.	Simbutar,	Simbutar	8		8
5.	Bhotekoshi Municipality-2	Kaanglaang		4	4
6.	Bhotekoshi Municipality-2	Kaanglaang	6		6
7.	Municipality-2, Sindhupalchok	Fulpingkatti		5	5
	Case studies				
1.	Man B. BK	Simbutar			
2.	Shyam Tamang	Betrawoti			
3.	Kale Kami (I)	Melamchi, Helambu			
4.	Bir Bahadur Tamang	Balche			
5.	Dawa Omu Sherpa	Listikot Village, Sindhupalchok			
6.	Kale Kami (II)	Listikot 1			
7.	Binod Sherpa, Sindhupalchok	Listikot Village 2			
8.	Gyalmu Sherpa (Lama)	Bhotekoshi			
9.	Tara Giri, Duwachaur-8 Female	Haku			
10.	Sita Maya Tamang, Palchowk 1 Sindhupalchok	Palchowk			
11.	Indra Lamichhane, Gagantaar Mahankal VDC	Gagantaar, ward no 9 of Mahankal VDC			
12.	Phull Maya Tamang, Duwachaur -3	Duwachaur -3			
13.	Radhika Tamang, from Betrawoti	Betrawoti			
14.	Ful Bahadur Tamang	Uttargaya			
15.	Laxmi Dhungana	Female activist, Betrawoti			
16.	Rama Dhungana	Talamalang-1			
17.	Kumar Ghimire	Bhotsipa -5, Gaitar			
18.	Ramee Tamang				
	Key Informants Interview (KII)				
1.	Laxu Sherpa Social worker Listi, Barhabise	Social worker Listi, Barhabise			
2.	Mahili Tamang, Betrawoti	Betrawoti			
3.	Vice-chairperson of Rural Municipality - Betrawoti				
4.	KII with Krishna Gyanwali, VDC Secretary of Melamchi	VDC Secretary of Melamchi			
5.	KII with Radha Krishna	Indreswori High School and			

	Shrestha, Campus Chief	Indrawati campus, Melamchi			
6.	KII with Arjun Niraula, VDC Secretary of Mahankal VDC	VDC Secretary of Mahankal VDC			
7.	KII with Ram Chandra Gautam, VDC Secretary, Duwachaur	VDC Secretary, Duwachaur			
8.	KII Mangal Jai Tamang – 9843672283 - KII	JICA, Melamchi, Mobilizer ward no. 11			
9.	KII Mahendra Bhattarai – 9841594681	Staff from the Reconstruction Committee of Melamchi			
10.	KII Gyalmu Sherpa Lama – 9621174529, 9813263586				
11.	KII Sanish Tamang, Listi	Rasuwa			
12.	KII Jit B Basnet	Primary teacher, Indreshwori H Secondary School			
13.	KII Nanimaya Tamang, Sindhupalchok Listi	Sindhupalchok Listi			
14.	KII, Santosh Tamang, Sindhupalchok, Chautara, Gumba	Sindhupalchok, Chautara, Gumba			
15.	KII, Nilima Tamang, Rasuwa, Dhunche	Rasuwa			
16.	KII, Bir Bahadur Tamang, Rasuwa, Kalikasthan	Betrawati			

Annex VIII: Calculation process of combined livelihood asset index

CAPITAL		Variables	Measurement	Code
Natural	N1. Access to Natural Resources and farmland	□ Access to farm Land BEQ □ Access to farm Land AEQ	Less than 5 ropanies= 0 5 and above = 1	NI_1_BEQ NI_1_AEQ
	N2. State of Natural Resources Available to communities	□ Access to forest BEQ and AEQ	Yes = 1 No =0	NI_2_BEQ NI_2_AEQ
	N3. Access to kitchen gardening	□ Access to kitchen gardening BEQ and AEQ	Yes = 1 No =0	NI_3_BEQ NI_3_AEQ
	N4. Land Productivity	□ Families having production from Land cultivation BEQ	Yes = 1 No = 0	NI_4_BEQ NI_4_AEQ
	N5. Access to drinking water	□ Access to safe drinking water	Yes = 1 No = 0	NI_5_BEQ NI_5_BEQ
Natural capital index = SUM(REFERENCE INDICATORS N1: N5), Index value ranges for 0 to 5				
Human	HI1. Access to skill	□ Household's member having IG skilled or not how many skills and with whom?	Households having at least one member IG skilled = 1 Households having none members have any IG skill = 0	HI_Skill_BEQ and skill AEQ
	HI2. Source of income	□ Having one source of income and □ More than one source of income	Having => one source of income = 0 Having more than one source of income = 1	HI_7_Income_Source_index_BEQ HI_7_Income_Source_index_AEQ
	HI3. A household with economically active aged family member	□ Numbers of family members are aged 0-14, 15 59 and 15 +	Household having at least one family member economically active age = 1 Household having none family member economically active age = 0	HI_ecoactive_BEQ_4 HI_ecoactive_AEQ_4
	HI4. Household having Disable person	□ If there are disable in any households	Yes = 1 No = 0	HI_5_BEQ_3 HI_5_AEQ_3
	HI5. Level of Education of each Household member	□ Households having at least one member is educated and level of education versus age	If anyone of the family member passed 10 or SEE is educated family = 1, If none of the family members passed 10 or higher = 0 score	HIEdu_Index_AEQ_5 HI_Edu_Index_AEQ_5

Human capital index = SUM (REFERENCE INDICATORS H1: H5), Index value ranges for 0 to 5				
Financial	F1. Access to credit	□ A household member having bank account vs. sex	Yes = 1 No = 0	FI_1_BEQ FI_1_AEQ
	F2. Level and form of savings	□ Households' members having cash saving amount	Saving AEQ 3. Yes = 1 4. No = 0	FI_2_BEQ FI_2_AEQ
	F3. Access to remittances	□ Migrant's households and receiving remittances access	Yes = 1 No = 0	FI_3_BEQ FI_3_AEQ
	F4. Monthly income	□ Monthly income amount BEQ and AEQ	Till Rs. 3000 = 0 More than 3000 = 1	FI_4_BEQ FI_4_AEQ
Financial capital index = SUM (REFERENCE INDICATORS F1: F4). Index value ranges for 0 to 4				
Physical	P1. Livestock ownership			
	P2. Source of light BEQ/AEQ	□ What source of light	Solar or electricity = 1, Others = 0	PI_2_BEQ
	P3. Source of cooking fuel BEQ/AEQ	□ What source of cooking energy	Electricity, Gas or solar = 1, Others = 0	PI_3_BEQ PI_3_AEQ
	P4. Access to toilet BEQ/AEQ	□ Open defecation or toilet	Yes = 1, No = 0	PI_4_AEQ PI_4_BEQ
	P5. Access to TV BEQ/**AEQ**	□ Households having Television	Yes = 1, No = 0	PI_television_5_BEQ PI_television_5_AEQ
	P6. Grinding tool	□ Households having daily using machined such as Grinding tools	Yes = 1, No = 0	PI_6_BEQ PI_6_AEQ
	P7. Almeria	□ Households having Almeria	Yes = 1, No = 0	PI_Almira_6_BEQ PI_Almira_6_AEQ
Physical capital index = SUM (REFERENCE INDICATORS P1: P7). Index value ranges for 0 to 7				
Social	Si_1. Religious and cultural insistence	□ Worship of god and goddess □ Yearly Cultural participation □ Traditional occupation □ Continuation of Traditional occupation	Question (1202+1203+1204+1207+1208) Yes = 1 No = 0	Si1_1 Si1_2 Si1_3 Si1_4 Si1_5
	Si_2. Support received	□ From social organization/GO/NGs et	Yes = 1 No = 0	Si1_6

	Si_3. Social participation	□ Membership in organizations (the type of organization, services, activities, organization sustainability)	Participation in social organization/GO/NGOs etc. = 1 No Participation in social organization/GO/NGOs etc. = 0	Si1_7
Social capital index = SUM (REFERENCE INDICATORS S1: S3). Index value ranges for 0 to 3				

Annex IX: Percentage of household population by 5-year age group, according to sex ratio

Age group	Female		Male		Total	
	(N)	(%)	(N)	(%)	(N)	(%)
0-4 years	145	9	152	9.1	297	9.1
5-9 years	169	10.5	189	11.3	358	10.9
10-14 years	192	11.9	204	12.2	396	12.1
15-19 years	164	10.2	169	10.1	333	10.2
20-24 years	180	11.2	142	8.5	322	9.8
25-29 years	152	9.4	141	8.5	293	8.9
30-34 years	130	8.1	143	8.6	273	8.3
35-39 years	108	6.7	129	7.7	237	7.2
40-44 years	80	5	79	4.7	159	4.9
45-49 years	56	3.5	66	4	122	3.7
50-54 years	65	4	58	3.5	123	3.8
55-59 years	41	2.5	51	3.1	92	2.8
60-64 years	41	2.5	47	2.8	88	2.7
65-69 years	30	1.9	28	1.7	58	1.8
70-74 years	35	2.2	31	1.9	66	2
75-79 years	11	0.7	21	1.3	32	1
80-84years	7	0.4	7	0.4	14	0.4
85 years and above	3	0.2	9	0.5	12	0.4
Total	1609	100	1666	100	3275	100
Population in the broad age group						
0-14	504	31.3	542	32.5	1046	31.9
15-64	1019	63.3	1028	61.7	2047	62.5
65 and above	86	5.3	96	5.8	182	5.6
Total	1609	100	1666	100	3275	100
Child/Adult population						
>18 years Child Population	642	39.9	683	41	1325	40.5
<=18 years Adult Population	967	60.1	983	59	1950	59.5
Total	1609	100	1666	100	3275	100

Source: Field Survey, 2018

Annex X: Proportion of never-married women

Marital status	Female		Male		Total	
	(N)	(%)	(N)	(%)	(N)	(%)
Unmarried	418	32.2	487	36.5	905	34.4
Married	795	61.2	774	58.1	1569	59.6
Polygamy	10	.8	19	1.4	29	1.1
Remarried	4	.3	2	.2	6	.2
Widow/Widower	66	5.1	41	3.1	107	4.1
Divorce	4	.3	2	.2	6	.2
Separated	1	.1	8	.6	9	.3
Total	1298	100.0	1333	100.0	2631	100.0
Person age 10>	1295	80.5	1326	80	2621	89.1

Source: Field Survey, 2018

Annex XI: Proportion of never-married women by caste and ethnicity, mean and median age at marriage vs. ethnicity

Age group	Never married		Mean age at marriage	Median age at marriage
	%	N	Years	Years
15-19 years	60.4	134	17.5	17.0
20-24 years	28.4	63	19.1	20.0
25-29 years	8.1	18	19.0	20.0
30-34 years	0.9	2	19.0	19.5
35-39 years	0.5	1	18.6	18.0
40-44 years	0.9	2	18.9	19.5
45-49 years	0.9	2	19.1	19.5
Total	100.0	222	18.9	19.0
Caste/Ethnicity				
Janajati	65.2	273	19.6	20.0
Janajati marginal group	8.8	37	17.3	17.0
Dalit	18.1	76	17.9	18.0
Brahmin/Chhetri	7.9	33	17.3	17.0
Total	100.0	419	18.9	19.0

Source: Field Survey, 2018

Annex XII: Distribution of family members by relation with the household head

	Female		Male		Total	
Household Head	**N**	**%**	**N**	**%**	**N**	**%**
Head of Household self	147	9.1	588	35.3	735	22.4
Spouse	540	33.6	81	4.9	621	19.0
Son/Daughter in law	234	14.5	650	39.0	884	27.0
Daughter/Son in law	380	23.6	34	2.0	414	12.6
Mother in law/ Father in law	17	1.1	19	1.1	36	1.1
Brother/sister	99	6.2	90	5.4	189	5.8
Granddaughter/Grand son	190	11.8	198	11.9	388	11.8
Household worker	1	0.1	1	0.1	2	0.1
Others	1	0.1	5	0.3	6	0.2
Total	1609	100.0	1666	100.0	3275	100.0

Source: Field Survey, 2018

Annex XIII: Living arrangement and family formation in the study area

Living arrangement	Household head (%)	Spouse (%)	Son/Daughter in law (%)	Daughter/Son in law (%)	Mother in law/ Father in law (%)	Brother/sister (%)	Granddaughter/Grandson (%)	Total	
Districts									
Sindhupalchok	21.5	17.2	29.2	13.2	1.5	4.3	13	100	**359**
Rasuwa	23.5	20.9	24.8	12.1	0.7	7.3	10.7	100	376
Caste/Ethnicity									
Janajati	22.5	19.3	28	12.5	0.5	6	11.3	100	433
Janajati marginalize group	22.8	18.1	24.9	11.4	2.2	6	14.6	100	118
Dalit	22.1	17.4	24.7	12.3	2.4	6.6	14.5	100	132
Brahmin/Chhetri	23	22.6	30.9	18.4	0.5	1.4	3.2	100	52
Economic strata									
Non poor	20.2	19.5	29.2	13.6	1.6	4.5	11.4	100	130
Vulnerable to Poor	21.7	19.3	25.8	12.7	0.9	6.7	13	100	300
Poor	23.8	18.7	27.4	12	1.2	4.8	12.1	100	212
Severely poor	26.2	18	27.2	12.8	0.8	6.8	8.2	100	93
Sex of household head									
Female population	24.8	14.8	27.4	10.6	1.9	6.3	14.3	100	364
Male population	22	19.8	27	13.1	1	5.7	11.4	100	371
Total	22.5	19	27.1	12.7	1.1	5.8	11.9	100	**735**

Source: Field Survey, 2018

Here Non poor = (Non poor+ Vulnerable to Poor) and *Poor = (Poor+Severely poor)*

Annex XIV: Distribution of household head by sex according to the selected characteristics

Age group	Female	Male	Total	
	(%)	(%)	(%)	(N)
20< years age	100.0	0.0	100.0	1
20-39	18.6	81.4	100.0	323
40-59	16.6	83.4	100.0	253
60=>	27.8	72.2	100.0	158
Total	20.0	80.0	100.0	735
District				
Sindhupalchok	26.0	74.0	100.0	358
Rasuwa	14.3	85.7	100.0	377
Total	20.0	80.0	100.0	735
Caste/Ethnicity				
Janajati	15.5	84.5	100.0	433
Janajati marginalized group	27.9	72.1	100.0	122
Dalit	21.5	78.5	100.0	130
Brahmin/Chhetri	36.0	64.0	100.0	50
Total	20.0	80.0	100.0	735
Economic strata				
Total non-poor	19.2	80.8	100.0	426
Total poor	21.0	79.0	100.0	309
Total	20.0	80.0	100.0	735
Sex of households head				
Female population	100.0	0.0	100.0	147
Male population	0.0	100.0	100.0	588
Total population	20.0	80.0	100.0	735

Source: Field Survey, 2018 Here Non poor = (Non poor+ Vulnerable to Poor) and *Poor = (Poor+Severely poor)*

Annex XV: Dependency ratio

Districts	Old dependency	Child dependency	Total
Sindhupalchok	8.2	39.3	47.5
Rasuwa	9.7	65.2	75.0
Caste/Ethnicity			
Janajati	9.5	54.8	64.3
Janajati marginalized group	11.1	54.8	65.9
Dalit	5.0	42.5	47.5
Brahmin/Chhetri	9.3	34.4	43.7
Economic Strata			
Non poor	4.3	39.5	43.7
Vulnerable to poor	6.8	54.2	61.0
Poor	15.0	57.2	72.2
Severely poor	11.6	46.6	58.2
Sex of households head			
Female population			57.9
Male population			61.6
Total population	8.9	50.9	59.8

Source: Field Survey, 2018

Annex XVII.1: Earthquake affected households by volume of land holding before and after

Landholding size before and after the earthquake in ropanies						
	No of HHs	HHs (%)	HHs Cuim (%)	Land area in ropanies	land area (%)	Lland area (%)
Before the Earthquake						
Landless	79	10.7	10.7	0	0.0	0
<5	242	32.9	43.7	925	12.1	12.1
5-9	141	19.2	62.9	1033	13.5	25.5
10-19	155	21.1	83.9	2053	26.8	52.3
20 <=	118	16.1	100.0	3655	47.7	100.0
After the Earthquake						
Landless	426	58.0	58.0	0	0.0	0.0
<5	84	11.4	11.4	296	8.1	8.1
5-9	60	8.2	8.2	445	12.1	20.2
10-19	102	13.9	13.9	1127	30.7	50.9
20 >	63	8.6	8.6	1805	49.1	100.0
Total	735	100.0		3673	100.0	

Note ; 1 ropani land = 0.051 ha
Source: Field Survey, 2018

Annex XVII.2: Average volume of Land holding and landless before and after the earthquake.

	Total land BEQ				Total land AEQ			
District	Mean land size	Standard Deviation	N	% of Landless	Mean	Standard Deviation	N	% of Landless
Sindhupalchok	13.7	14.1	359	12.3	10.1	11	359	24.5
Rasuwa	7.4	7.4	376	8.5	0.4	1.7	376	89.6
F test = 7, P-value= .000,				F= 15.870, p-value = 0.000				
Economic strata								
Non-poor	13.7	13	130	10	7.7	13.1	130	53.8
Vulnerable to Poor	9.1	9.4	300	9.7	3.4	7.8	300	69.0
Poor	11.6	13.7	212	9.0	6	10.1	212	51.9
Severely poor	8.7	9.7	93	16.1	5.9	7.9	93	40.9
F-test= 8.021, P-value =0.005				F test= 7.861, p-value=.005				
Caste/Ethnicity								
Janajati	9.9	11	433	10.2	3.4	9.5	433	75.8
Janajati marginalized group	10.7	10.8	118	10.2	7.1	10.4	118	44.9
Dalit	8.4	9	132	11.4	6.4	7.5	132	28.8
Brahmin/Chettri	20.1	17.9	52	9.6	12.7	10	52	11.5
F-test= 14.635, P-value = .000				F-test= 22.194, P-value = .000				
Sex of HH head								
Female population	11.8	16.8	134	9.0	7.7	14.5	134	51.5
Male population	10.2	10.1	601	10.6	4.7	8.2	601	59.2
F-test= 1.091, P-value = .277				T test=2.310, p-value = .022				
Total population	10.5	11.6	735	10.3	5.2	9	735	57.8

Note: Land size is presented in Ropanies, 1 ropani = 0.051 hectares
Source: Field Survey, 2018

Annex XVII.3: Earthquake affected households by land cultivation status

	Before the earthquake (BEQ)			After the earthquake (AEQ)			
	Yes in all land	**Partial land**	**No farming**	**Yes in all land**	**Partial land**	**No farming**	**Difference % of no farming (AEQ-BEQ)**
District	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**
Sindhupalchok	54.3	29.8	15.9	25.1	42.9	32.0	16.16
Rasuwa	62.0	30.6	7.4	0.8	4.0	95.2	87.77
Chi-square = 13.170, df =2, P=.001				Chi-square = 320.330, df = 2, P=.000			
Caste/Ethnicity							
Janajati	53.8	35.3	10.9	1.8	16.2	82.0	71.13
Janajati marginal group	78.8	13.6	7.6	31.4	17.8	50.8	43.22
Dalit	50.0	31.8	18.2	31.8	28.0	40.2	21.97
Brahmin/Chettri	69.2	21.2	9.6	11.5	78.8	9.6	0.00
Chi-square=35.715				Chi-square=253.605, df = 6, P = .000			
Economic strata							
Non-poor	63.8	19.2	16.9	11.5	30.0	58.5	41.54
Vulnerable to poor	61.3	30.3	8.3	10.3	15.7	74.0	65.67
Poor	57.1	32.1	10.8	13.2	25.5	61.3	50.47
Severely poor	43.0	40.9	16.1	20.4	31.2	48.4	32.26
Chi-square = 21.580, df = 6, P= .001				Chi-square = 27.985, df = n6, P = .000			

Source: Field Survey, 2018

Annex XVII.4 Reason for not cultivation of crops before and after the earthquake (%)

	Before earthquake				After earthquake				
	Land fault and cracked	Lack of irrigation	Lack of human resource	Lack of tools	Land fault and cracked	Lack of irrigation	Lack of human resource	Lack of tools	Fear of eq
Districts	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Sindhupalchok	3.0	61.0	29.3	6.7	48.7	20.9	4.2	1.4	24.8
Rasuwa	2.1	79.0	18.2	0.7	47.9	10.6	0.5	0.0	41.0
Economic strata									
Non-poor	0.0	57.4	40.4	2.1	37.7	18.5	3.1	0.8	40.0
Vulnerable to poor	4.3	69.8	21.6	4.3	47.0	15.7	2.0	0.7	34.7
Poor	1.1	71.4	20.9	6.6	54.7	11.8	2.8	0.9	29.7
Severely poor	3.8	75.5	20.8	0.0	52.7	20.4	1.1	0.0	25.8
Caste/Ethnicity									
Janajati	3.0	74.0	19.5	3.5	50.8	12.5	0.7	0.5	35.6
Janajati marginalized group	0.0	68.0	32.0	0.0	44.1	12.7	5.1	0.0	38.1
Dalit	3.0	59.1	33.3	4.5	48.5	20.5	3.0	0.8	27.3
Brahmin/Chettri	0.0	56.3	31.3	12.5	36.5	36.5	7.7	3.8	15.4
Total	2.6	69.4	24.1	3.9	48.3	15.6	2.3	0.7	33.1

Source: Field Survey, 2018

Annex XVII. 5: Households by changes in crop production after the earthquake

District	Increased (%)	Decreased (%)	No change (%)	Total (%)	N
Sindhupalchok	9.5	57.9	32.6	100	**359**
Rasuwa	0.8	93.4	5.9	100.0	376
		Chi square - test =127.157, Df= 2,P = 0.000*			
Caste/Ethnicity					
Janajati	0.9	88.5	10.6	100.0	433
Janajati marginalized group	9.3	65.3	25.4	100.0	118
Dalit	10.6	48.5	40.9	100.0	132
Brahmin/Chettri	15.4	67.3	17.3	100.0	52
		Chi square - *test* =114.545, *Df*= 6, *P-value* = 0.000*			
Economic strata					
Non poor	8.5	70.8	20.8	100.0	130
Vulnerable to poor	4.3	83.3	12.3	100.0	300
Poor	3.8	73.6	22.6	100.0	212
Severely poor	5.4	65.6	29.0	100.0	93
Total	5.0	76.1	18.9	100.0	735
		Chi square - *test* = 21.792, *Df* = 6, *P-value* = 0.001*			

Source: Field Survey, 2018

Annex XVII. 6: Households by sources of drinking water in the before and after the earthquake

	BEQ			AEQ			Change (AEQ-BEQ)		
	Pipe water	Open-source	Pond /river	Pipe water	Open-source	Pond/ river	Pipe water	Open-source	Pond/ river
District	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**	**(%)**
Sindhupalchok	85.8	3.9	10.3	79.9	1.4	18.7	-5.8	-2.5	8.3
Rasuwa	96.5	1.3	2.1	94.9	0.8	4.3	-1.6	-0.5	2.1
p-value=.000	p-value=.000				p-value=.000				
Caste/Ethnicity									
Janajati	95.4	1.6	3.0	94.9	0.7	4.4	-0.5	-0.9	1.4
Janajati marginal group	70.9	6.8	22.2	65.3	1.7	33.1	-5.7	-5.1	10.8
Dalit	94.7	3.0	2.3	80.3	2.3	17.4	-14.4	-0.8	15.2
Brahmin/Chettri	94.2	0.0	5.8	96.2	0.0	3.8	1.9	0.0	-1.9
P-value=.000	p-value=.000				p-value=.000				
Economic strata									
Non-poor	93.8	2.3	3.8	94.6	0.8	4.6	0.8	-1.5	0.8
Vulnerable to poor	92.0	1.7	6.4	89.3	1.7	9.0	-2.6	0.0	2.6
Poor	87.7	4.2	8.0	83.0	0.5	16.5	-4.7	-3.8	8.5
Severely poor	93.5	2.2	4.3	82.8	1.1	16.1	-10.8	-1.1	11.8
P-value=.108					P-value=.005				
Total	91.3	2.6	6.1	87.6	1.1	11.3	-3.7	-1.5	5.2

Source: Field Survey, 2018

Annex XVII. 7 Earthquake affected HHs by quality of drinking water before and after the earthquake

Districts	Before earthquake		After earthquake		Total	
	Unsafe	Safe	Unsafe	Safe		
	%	%	%	%	%	
Sindhupalchok	34.6	65.4	40.7	59.3	100	359
Rasuwa	26.6	73.4	27.9	72.1	100	376
$\chi 2$=5.592, df=1, p =.018			$\chi 2$=513.262 df=1, p =.000			
Caste/Ethnicity						
Janajati	27.3	72.7	27.9	72.1	100	433
Janajati marginal group	57.3	42.7	62.7	37.3	100	118
Dalit	16.7	83.3	31.1	68.9	100	132
Brahmin/Chettri	32.7	67.3	28.8	71.2	100	52
$\chi 2$=53.712, df=3, P- value=.000			$\chi 2$=51.432, df=3, p =.000			
Economic strata						
Non poor	32.3	67.7	33.1	66.9	100	130
Vulnerable to poor	33.8	66.2	36	64	100	300
Poor	27.4	72.6	31.1	68.9	100	212
Severely poor	24.7	75.3	36.6	63.4	100	93
Total	30.5	69.5	34.1	65.9	100	735
$\chi 2$=4.163, df=3, P-value=.244				$\chi 2$=41.622, df=3, p =.654		

Source: Field Survey, 2018

Annex XVII. 8: Earthquake affected by access to forest before/after the earthquake

	Access to the forest							
	Before earthquake				After earthquake			
	Yes		No		Yes		No…..	
District	(N)	(%)	(N)	(%)	(N)	(%)	(N)	(%)
Sindhupalchok	116	32.3	243	67.7	7	1.9	352	98.1
Rasuwa	152	40.4	224	59.6	13	3.5	363	96.5
Chi-square=5.218,Df.=1,P-value=.022*					Chi-square=1.577,Df.=1,P-value=.209*			
Caste/Ethnicity								
Janajati	177	40.9	256	59.1	15	3.5	418	96.5
Janajati marginalized group	33	28	85	72	3	2.5	115	97.5
Dalit	50	37.9	82	62.1	0	0	132	100
Brahmin/Chettri	8	15.4	44	84.6	2	3.8	50	96.2
Chi-square=17.406,df=3, P-value=.001					Chi-square=4.859,df=3, P-value=.182			
Economic strata								
Non poor	50	38.5	80	61.5	2	1.5	128	98.5
Vulnerable poor	110	36.7	190	63.3	15	5	285	95
Poor	76	35.8	136	64.2	3	1.4	209	98.6
Severely poor	32	34.4	61	65.6	0	0	93	100
Chi-square=0.433,df=3, P-value=.933					Chi-square=10.540, df=3, P-value=.014			
Total	268	36.5	467	63.5	20	2.7	715	97.3
$\chi 2$ = 0.587,df=1, P-value=4443					Chi-square=0.144,df=1, P-value=.704			

Source: Field Survey, 2018

Annex XVII. 9: Percentage of Households affected by earthquake by access of kitchengardening

	BEQ		AEQ		Change AEQ		Total	
Districts	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**N**	**%**
Sindhupalchok	77.2	22.8	18.1	81.9	-59.1	63.8	100.0	359
Rasuwa	73.7	26.3	1.1	98.9	-72.6	97.9	100.0	376
Caste/Ethnicity								
Janajati	77.8	22.2	5.3	94.7	-72.5	89.4	100.0	433
Janajati marginalized group	75.4	24.6	10.2	89.8	-65.3	79.7	100.0	118
Dalit	59.8	40.2	16.7	83.3	-43.2	66.7	100.0	132
Brahmin/Chettri	94.2	5.8	23.1	76.9	-71.2	53.8	100.0	52
Economic strata								
Non-poor	80.0	20.0	7.7	92.3	-72.3	84.6	100.0	130
Vulnerable to poor	74.7	25.3	6.0	94.0	-68.7	88.0	100.0	300
Poor	73.6	26.4	14.2	85.8	-59.4	71.7	100.0	212
Severely poor	75.3	24.7	11.8	88.2	-63.4	76.3	100.0	93
Sex of household head								
Female	79.9	20.1	14.2	85.8	-65.7	71.6	100.0	134
Male	74.4	25.6	8.3	91.7	-66.1	83.4	100.0	601
Total	75.4	24.6	9.4	90.6	-66.0	81.2	100.0	735

Source: Field Survey, 2018

Annex XVII. 10: Toilet facilities before and after the earthquake (%)

Characteristics	% of households using toilet facilities						
	Before earthquake		After earthquake		Change	Total	
	Yes	No	Yes	No	AEQ-BEQ		
Districts							
Sindhupalchok	84.4	15.6	2.8	97.2	-81.6	359	100.0
Rasuwa	71.8	28.2	23.1	76.9	-48.7	376	100.0
Chi-square	0.0						
Caste/Ethnicity							
Janajati	76.4	23.6	18.2	81.8	-58.2	433	100.0
Janajati marginalized group	83.9	16.1	10.2	89.8	-73.7	118	100.0
Dalit	70.5	29.5	3.0	97.0	-67.4	132	100.0
Brahmin/Chettri	96.2	3.8	3.8	96.2	-92.3	52	100.0
Chi-square p-value	0.001						
Economic strata							
Total non-poor	82.3	17.7	16.3	83.7	-66.0	430	100.0
Total poor	71.8	28.2	8.9	91.1	-63.0	305	100.0
Chi-square	0.001						
Head of household							
Female population	85.8	14.2	9.7	90.3	-76.1	134	100.0
Male population	76.2	23.8	14.0	86.0	-62.2	601	100.0
Total population	78.0	22.0	13.2	86.8	-64.8	735	100.0
$\chi 2$, p-value	0.015						

Source: Field survey 2018

Annex XVII. 11: Households by main sources of light energy before and after Earthquake (%)

	Electricity		Kerosene		Bio- gas		*Tukimara*		Solar		Others		Total
Districts	**BEQ**	**AEQ**	**BEQ**	**AEQ**	**BEQ**	**AEQ**	**BEQ**	**AEQ**	**BEQ**	**AEQ**	**BEQ**	**AEQ**	**%**
Sindhupalchok	93.3	56.8	1.7	4.7	0.0	0.0	0.0	0.3	4.5	38.2	0.6	0.0	100.0
Rasuwa	81.4	51.3	0.8	2.4	1.9	0.3	0.0	0.0	16.0	46.0	0.0	0.0	100.0
	BEQ, Chi-square= 36.412, df = 4 , P-value=.000[*,b,c]								AEQ, Chi-square= 8.558, df = 4 , P-value=.073[b,c]				
Caste/Ethnicity													
Janajati	82.9	46.4	0.7	2.1	1.2	0.2	0.0	0.0	15.2	51.3	0.0	0.0	100.0
Janajati marginalized group	83.9	70.3	4.2	5.1	1.7	0.0	0.0	0.8	8.5	23.7	1.7	0.0	100.0
Dalit	100.0	53.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	43.9	0.0	0.0	100.0
Brahmin/Chettri	98.1	82.7	1.9	13.5	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	100.0
	BEQ, Chi-square= 58.383, df = 12 , P-value=.000[*,b]								AEQ, Chi-square= 78.512, df = 12, P-value=.000				
Economic strata													
Non poor	90.0	62.3	0.8	4.6	0.0	0.0	0.0	0.0	9.2	33.1	0.0	0.0	100.0
Vulnerable to poor	88.3	55.3	1.0	3.7	0.3	0.0	0.0	0.0	10.0	41.0	0.3	0.0	100.0
Poor	85.4	53.8	0.9	2.8	1.9	0.0	0.0	0.0	11.3	43.4	0.5	0.0	100.0
Severely poor	83.9	38.7	3.2	3.2	2.2	1.1	0.0	1.1	10.8	55.9	0.0	0.0	100.0
	BEQ, Chi-square= 11.032, df = 12 , P-value=.526								AEQ, Chi-square= 12, df = .007 , P-value=.54				
Sex of household head													
Female	89.6	55.2	0.7	3.0	0.0	0.7	0.0	0.0	9.7	41.0	0.0	0.0	100.0
Male	86.7	53.7	1.3	3.7	1.2	0.0	0.0	0.2	10.5	42.4	0.3	0.0	100.0
Total	87.2	54.0	1.2	3.5	1.0	0.1	0.0	0.1	10.3	42.2	0.3	0.0	100.0
$\chi 2$ = 2.480, df=4, P-value=.648[b]									Chi-square=4.944, df=4, P-value =.293				

Source: Field survey 2018 Note: Tukimara refers traditional oil lamp,

Annex XVII. 12: Households by source of fuel for cooking before and after the earthquake

Characteristics	Electricity		Kerosene		Gobbar gas		Wooden stuff		--Straw-----		--Charcoal---		----LP gas---		-----Others---		Total
	BEQ	AEQ	BEQ	AEQ	BEQ	AEQ	BEQ	AEQ	BEQ	AEQ	BEQ	AEQ	BEQ	AEQ	BEQ	AEQ	
District																	
Sindhupalchok	39.6	36.2	16.7	15.6	3.3	3.9	76.3	76.9	12.3	13.1	15.6	15.9	37.0	45.1	1.4	2.5	359
Rasuwa	39.4	39.9	2.9	1.3	4.3	0.5	96.5	94.1	41.5	31.4	12.5	4.8	15.2	62.2	0.3	0.5	376
Caste/Ethnicity																	
Janajati	44.1	42.5	10.4	7.2	3.7	0.9	90.5	89.6	35.6	27.7	14.8	9.7	21.9	59.6	0.2	1.2	433
Janajati marginalized group	31.4	32.2	7.6	7.6	1.7	0.8	83.1	83.9	13.6	11.0	9.3	4.2	16.1	40.7	0.8	0.8	118
Dalit	34.1	31.8	10.6	13.6	7.6	7.6	86.4	84.1	20.5	22.0	21.2	21.2	40.9	49.2	3.0	3.8	132
Brahmin/Chettri	32.7	30.8	5.8	5.8	0.0	1.9	63.5	61.5	5.8	5.8	0.0	0.0	42.3	48.1	0.0	0.0	52
Economic strata																	
Total non-poor	41.2	39.1	8.6	7.0	2.8	2.1	87.2	85.3	26.7	21.6	11.4	7.0	24.0	57.4	1.4	1.9	430
Total poor	37.0	36.7	11.1	10.2	5.2	2.3	85.9	86.2	27.9	23.6	17.7	14.8	28.5	48.9	0.0	1.0	305
Sex of household head																	
Female	33.6	32.8	14.9	14.2	3.7	3.0	84.3	85.8	22.4	17.9	17.9	9.7	20.9	45.5	1.5	2.2	134
Male	40.8	39.3	8.5	7.0	3.8	2.0	87.2	85.7	28.3	23.5	13.1	10.3	27.0	55.7	0.7	1.3	601
Total	**39.5**	**38.1**	**9.7**	**8.3**	**3.8**	**2.2**	**86.7**	**85.7**	**27.2**	**22.4**	**14.0**	**10.2**	**25.9**	**53.9**	**0.8**	**1.5**	**735**

Source : Filed survey 2019

Annex XVII. 13: Households using amenities and changes after the earthquake

House using amenities	Before	After	Change (AEQ-BEQ)
Basic amenities	52.13	30.92	-21.21
IEC Material[3]	43.7	44.8	1.15
Electric goods	15.7	14.2	-1.53
Agriculture related	58.3	42.8	-15.47
Transportation goods	3.4	3.4	0.04
Total	173.2	136.2	-37.0

Source: Field survey 2018

Annex XVII. 14: Percentage of households by livestock ownership

Districts	Cow/Ox-		Buffalo/Cow		Goat		Pig		Total
	BEQ	AEQ	BEQ	AEQ	BEQ	AEQ	BEQ	AEQ	
Sindhupalchok	37.1	0.0	66.7	37.1	9.5	7.6	3.8	0.0	105
Rasuwa	34.1	0.0	56.8	2.3	15.9	2.3	0.0	0.0	44
Economic strata									
Non poor	40.0	0.0	77.5	32.5	17.5	10.0	0.0	0.0	40
Vulnerable to poor	36.5	0.0	53.8	19.2	9.6	3.8	1.9	0.0	52
Poor	35.0	0.0	62.5	32.5	10.0	7.5	7.5	0.0	40
Severely poor	29.4	0.0	64.7	23.5	5.9	0.0	0.0	0.0	17
Caste/Ethnicity									
Janajati	33.3	0.0	50.0	10.4	16.7	0.0	0.0	0.0	48
Janajati marginalized group	33.3	0.0	59.0	15.4	7.7	7.7	10.3	0.0	39
Dalit	31.6	0.0	73.7	39.5	5.3	5.3	0.0	0.0	38
Brahmin/Chettri	54.2	0.0	83.3	58.3	16.7	16.7	0.0	0.0	24
Sex of household head									
Female	38.5	0.0	69.2	15.4	3.8	3.8	0.0	0.0	26
Male	35.8	0.0	62.6	29.3	13.0	6.5	3.3	0.0	123
Total	**36.2**	**0.0**	**63.8**	**26.8**	**11.4**	**6.0**	**2.7**	**0.0**	**149**

Source: Field survey 2018

[3] IEC refers for Information, Education and Communication

Annex XVII. 15: Status of construction of new houses

	Yes Completed		Still Constructing		Not started		Nothing done		Total	
Districts	N	%	N	%	N	%	N	%	N	%
Sindhupalchok	111	30.9	167	46.5	50	13.9	31	8.6	359	100.0
Rasuwa	73	19.4	44	11.7	99	26.3	160	42.6	376	100.0
Chi-square=182.493, df=3, p-value=.000										
Caste/Ethnicity										
Janajati	89	20.6	108	24.9	96	22.2	140	32.3	433	100.0
Janajati marginal group	37	31.4	12	10.2	34	28.8	35	29.7	118	100.0
Dalit	22	16.7	76	57.6	18	13.6	16	12.1	132	100.0
Brahmin/Chettri	36	69.2	15	28.8	1	1.9	0.00	0.00	52	100.0
Chi-square=151.327, df=9, p-value=.000										
Economic strata										
Non poor	47	36.2	34	26.2	23	17.7	26	20.0	130	100.0
Vulnerable to poor	73	24.3	69	23.0	55	18.3	103	34.3	300	100.0
Poor	55	25.9	63	29.7	51	24.1	43	20.3	212	100.0
Severely poor	9	9.7	45	48.4	20	21.5	19	20.4	93	100.0
Chi-square=47.777, df=9, p-value=.000										
Sex of the household head										
Female	36	26.9	43	32.1	32	23.9	23	17.2	134	100.0
Male	148	24.6	168	28.0	117	19.5	168	28.0	601	100.0
Chi-square=6.833, df=3, p-value=.077										
Total	184	25.0	211	28.7	149	20.3	191	26.0	735	100.0

Source: Field survey 2018

Annex XVII. 16: Earthquake affected households members by new skills learned after the earthquake

	Population aged 12 years and above					
	Female		**Male**		**Total**	
Received training	**N**	**%**	**N**	**%**	**N**	**%**
Got training	68	5.7	326	27.7	394	16.6
No training	1123	94.3	852	72.3	1975	83.4
Total	1191	100.0	1178	100.0	2369	100.0
Types of training received						
Mason	4	5.9	124	38.0	128	32.5
Plumber	7	10.3	58	17.8	65	16.5
Carpenter	2	2.9	56	17.2	58	14.7
Tailoring	13	19.1	2	0.6	15	3.8
Agriculture-related	13	19.1	11	3.4	24	6.1
Machinery	0	0.0	33	10.1	33	8.4
Micro industries	25	36.8	3	0.9	28	7.1
Scaffolding	0	0.0	0	0.0	0	0.0
Driver	1	1.5	36	11.0	37	9.4
Hotel related	3	4.4	3	0.9	6	1.5
Tourism	0	0.0	0	0.0	0	0.0
Others	0	0.0	0	0.0	0	0.0
Total	68	100.0	326	100.0	394	100.0

Source: Field Survey, 2018

Annex XVII. 17: Distribution of the households 'members by types of skill learnt

	Mason	Plumber	Carpenter	Tailoring	Agriculture -related	Machinery	Micro enterprises	Driving	Hotel related	Total	
District	%	%	%	%	%	%	%	%	%	%	N
Sindhupalchok	33.7	21.6	11.5	7.2	5.8	0.5	1.4	15.9	2.4	100.0	208
Rasuwa	31.2	10.8	18.3	0.0	6.5	17.2	13.4	2.2	0.5	100.0	186
Chi-square = 98.34, df = 8, p-value = .000											
Economic strata											
Non-poor	28.1	14.0	12.3	5.3	19.3	3.5	8.8	3.5	5.3	100.0	57
Vulnerable to poor	29.6	10.7	13.2	4.4	3.1	11.9	11.9	13.2	1.9	100.0	159
Poor	35.7	19.6	17.9	0.9	4.5	8.0	2.7	10.7	0.0	100.0	112
Severely poor	37.9	27.3	15.2	6.1	4.5	4.5	1.5	3.0	0.0	100.0	66
Chi-square = 67.275, df = 24, p-value = .000											
Caste/Ethnicity											
Janajati	26.6	13.1	16.8	2.9	5.3	12.3	9.0	12.3	1.6	100.0	244
Janajati marginal group	55.3	10.6	12.8	0.0	0.0	2.1	8.5	10.6	0.0	100.0	47
Dalit	38.6	31.8	12.5	9.1	0.0	2.3	1.1	2.3	2.3	100.0	88
Brahmin/Chettri	20.0	0.0	0.0	0.0	73.3	0.0	6.7	0.0	0.0	100.0	15
Chi-square =189.393, df = 24, p-value = .000											
Sex of household head											
Female population	5.9	10.3	2.9	19.1	19.1	0.0	36.8	1.5	4.4	100.0	68
Male population	38.0	17.8	17.2	0.6	3.4	10.1	0.9	11.0	0.9	100.0	326
Chi-square = 219.665, df = 8, p-value = .000											
Total population	32.5	16.5	14.7	3.8	6.1	8.4	7.1	9.4	1.5	100.0	394

Source: Field Survey, 2018

Annex XVII. 18: Households population aged above 10 years by the main occupation before and after the earthquake

Districts	Before the earthquake				After the earthquake			
	Agriculture	**Non-agriculture**	**Ideal students/disable**	**Household work**	**Agriculture**	**Non-agriculture**	**Ideal students/disable**	**HH work**
Sindhupalchok	47.4	29.2	3.3	20.2	39.1	32.7	7.1	21.0
Rasuwa	73.1	10.8	2.3	13.8	21.6	58.0	4.4	16.0
Chi-square=139.290, Df= 3, P-value=.000*				Chi-square= 123.446, Df= 3, P-value= .000*				
Caste/Ethnicity								
Janajati	61.0	17.5	2.7	18.8	23.6	51.3	5.2	19.8
Janajati marginalized group	71.5	15.8	2.8	9.8	45.2	37.0	6.2	11.5
Dalit	4 1.7	31.8	3.7	22.8	34.3	33.1	7.2	25.4
Brahmin/Chettri	58.1	31.8	1.6	8.5	51.9	31.6	6.8	9.8
Chi-square=89.647, Df= 9, P-value=.000*				Chi-square=113.555, Df= 9, P-value=.000*				
Sex of the HH head								
Female population	55.5	10.1	2.8	31.5	28.6	31.2	6.2	33.9
Male population	62.2	31.3	2.8	3.8	33.8	57.2	5.5	3.6
Chi-square=312.181, Df= 3, P-value=.000*				Chi-square=303.143, Df= 3, P-value=.000				
Economic strata								
Non poor	59.3	27.0	2.9	10.8	35.1	47.8	6.0	11.2
Vulnerable to poor	67.6	16.5	1.6	14.2	30.2	50.1	4.1	15.6
Poor	52.6	22.5	3.4	21.5	27.3	40.9	7.0	24.8
Severely poor	43.9	22.0	5.4	28.7	36.7	24.8	9.2	29.4
Chi-square=81.249, Df= 3, 9-value=.000*				Chi-square=80.963, Df= 3, 9-value=.000*				
Economically active								
<18 years	68.1	14.5	7.2	10.1	26.5	35.3	20.6	17.6
18-24 years	52.7	24.2	4.3	18.8	23.5	44.3	10.4	21.8
25-39 years	56.7	27.0	1.1	15.1	29.8	50.7	3.4	16.1
40-64 years	62.5	16.6	2.2	18.7	37.6	40.6	2.8	19.1
<64	62.1	6.6	8.2	23.1	30.8	28.9	14.5	25.8
Chi-square=87.186, Df= 12, 9-value=.000*								
Total	58.9	20.9	2.8	17.3	31.2	44.2	5.9	18.8

Source: Field Survey, 2018

Annex XVII. 19: Average monthly earnings of the family before and after the earthquake

Districts	Income BEQ per month Rs			Income AEQ per month Rs			Differences	
	(N)	Average Rs.	Std	N	Average Rs.	Std. Dev.	Average income Rs.	Std. Dev.
Sindhupalchok	359	7,356	11,558	359	3,474	3,776	-3,882	-7,782
Rasuwa	376	4,680	4,026	376	2,744	2,901	-1,936	-1,125
Caste/Ethnicity								
Janajati	433	4,529	3,941	433	2,679	2,797	-1,850	-1,144
Janajati marginalized group	118	4,988	3,110	118	2,345	2,357	-2,643	-753
Dalit	132	4,502	3,201	132	2,689	2,862	-1,813	-339
Brahmin/Chettri	52	24,165	23,231	52	9,375	4,519	-14,790	-18,712
Economic strata								
Non-poor	130	9,442	14,243	130	4,395	4,585	-5,047	-9,658
Vulnerable to poor	300	5,593	8,364	300	2,979	3,173	-2,614	-5,191
Poor	212	5,131	4,831	212	2,843	2,923	-2,288	-1,908
Severely poor	93	4,380	3,639	93	2,274	2,406	-2,106	-1,233
Sex of household head								
Female	371	6,537	9,284	371	3,342	3,583	-3,195	-5,701
Male	364	5,427	7,978	364	2,855	3,133	-2,572	-4,845
Total	735	5,987	8,674	735	3,101	3,374	-2,886	-5,300

Source: Field Survey, 2018

Annex XVII. 20: Households by their main sources of family's income before and after the earthquake

Main sources of family's income	Before the earthquake (BEQ)		After the earthquake (AEQ)		Total	
	No	Yes	No	Yes		
	%	%	%	%	N	%
Salary, Wages	78.4	21.6	79.6	20.3	735	100.0
Farming and fruit farming	40.1	59.9	88.2	11.8	735	100.0
Business, industry	89.4	10.6	90.5	9.5	735	100.0
Daily wages	58.6	41.2	50.7	49.3	735	100.0
Pension, social security	99.0	1.0	99.0	1.0	735	100.0
*Balighare*pratha	80.7	19.3	96.3	3.7	735	100.0
Daily wages agriculture	27.1	72.9	98.0	2.0	735	100.0
Daily wage non-agriculture	84.1	15.9	65.4	34.6	735	100.0
Livestock	78.2	21.8	93.3	6.7	735	100.0
Milk products	82.6	17.4	96.5	3.5	735	100.0
Remittance	99.3	0.7	99.7	0.3	735	100.0
Others	76.2	23.8	70.5	29.5	735	100.0

Source: Field Survey, 2018

Annex XVII. 21: Households reported the different health problems in family members

	Problem reported				Present condition				
	Yes problem	No problem	Total	Problem remained average month	No, improve	Better now	Cured	Total problem reported	
	(%)	(%)	N (%)		(%)	(%)	(%)	(n)	(%)
Vomiting	15.2	84.8	735 (100.0)	3	10.7	13.4	75.9	112	100
Fainting	15.1	84.9	735 (100.0)	4	13.5	13.5	73.0	111	100
Leg craping	8.3	91.7	735 (100.0)	3	8.2	14.8	77.0	61	100
Arm pain	7.2	92.8	735 (100.0)	3	9.4	11.3	79.2	53	100
Crying	7.8	92.2	735 (100.0)	4	17.5	15.8	66.7	57	100
Cries followed by fainting	8.8	91.2	735 (100.0)	3	7.7	13.8	78.5	65	100
Mental tension	4.4	95.6	735 (100.0)	4	15.6	9.4	75.0	32	100
Fluctuation blood pressure	4.4	95.6	735 (100.0)	4	15.6	18.8	65.6	32	100

Source: Field Survey, 2018

Annex XVII. 22: Households by cause of deaths according to selected characteristics

	Cause of death			
	Earthquake	Other cause	Total dead persons	
Sex	%	%	N	%
Male population	40.0	60.0	40	100
Female population	27.3	72.7	33	100
Social group				
Janajati marginal group	40.5	59.5	42	100
Dalit	25.0	75.0	12	100
Brahmin/Chettri	0.0	100.0	2	100
Age group				
0-4	33.3	66.7	9	100
5-14	33.3	66.7	9	100
15-24	28.6	71.4	14	100
25-59	39.3	60.7	28	100
60>	0.0	0.0	0	0
District				
Sindhupalchok	18.8	81.3	32	100
Rasuwa	46.3	53.7	41	100
Who cure?				
Dhami/Jhakri	30.0	70.0	10	100
Baidye	27.3	72.7	22	100
Health volunteer	63.2	36.8	19	100
Ass. Health worker / Health Assistant	30.0	70.0	10	100
Doctor	8.3	91.7	12	100
Do not know	0.0	0.0	0	0
Where died?				
Hospital	6.3	93.8	16	100
House	31.1	68.9	45	100
Outsides the house	83.3	16.7	12	100
Total	34.2	65.8	73	100

Source: Field Survey, 2018

Annex XVII. 23: Categories of injury according to its quantity

Category of injury	Number of injuries	%
Serious	20	10.9
Medium	40	21.9
General/simple	123	67.2
Injured part	0	0.0
Hands	71	38.8
Face/head	10	5.5
Legs	50	27.3
Spinal cord	10	5.5
Head/Chest	42	23.0
How injured?		
Running	122	66.7
Jumping	10	5.5
Hit from house collapsed/debride	51	27.9
Total	183	100.0

Source: Field Survey, 2018

Annex XVII. 24: Households having disabled family member before and after the earthquake

Districts	**BEQ (%_)**		**AEQ (%)**		**-----Total-----**		**Difference (AEQ-BEQ)**
	Yes	**No**	**Yes**	**No**			
Sindhupalchok	2.2	97.8	5	95	100	359	2.8
Rasuwa	1.3	98.7	3.2	96.8	100	376	1.9
Economic strata							
Non poor	1.5	98.5	6.2	93.8	100	130	4.7
Vulnerable to poor	1	99	3.3	96.7	100	300	2.3
Poor	1.9	98.1	3.3	96.7	100	212	1.4
Severely poor	4.3	95.7	5.4	94.6	100	93	1.1
Caste/Ethnicity							
Janajati	1.4	98.6	3.5	96.5	100	433	2.1
Janajati marginalized group	3.4	96.6	6.8	93.2	100	118	3.4
Dalit	2.3	97.7	3	97	100	132	0.7
Brahmin/Chettri	0	100	5.8	94.2	100	52	5.8
Male disable	1.1	98.9	4.7	95.3	100	364	3.6
Female disable	2.4	97.6	3.5	96.5	100	371	1.1
Male-headed	1.0	99.0	3.7	96.3	100	364	2.7
Female headed	5.2	94.8	6.0	94.0	100	371	0.7
Total	1.8	98.2	4.1	95.9	100	735	2.3

Source: Field Survey, 2018

Annex XVII. 25: Households' by place of delivery, postpartum cure problem

District	Was any delivery of baby in your family after EQ?				Place where the delivery was carried out						
	Yes	No	-----Total------		House	Hospital	Health worker	Problem	No problem	-----Total----	
	(%)	(%)	(n)	(%)	(%)	(%)	(%)	(%)	(%)	(n)	(%)
Sindhupalchok	17.3	82.7	62	100.0	24.2	71.0	4.8	10.6	89.4	339	100.0
Rasuwa	19.4	80.6	73	100.0	39.7	60.3	0.0	24.3	75.7	346	100.0
Caste/Ethnicity											
Janajati	19.2	80.8	83	100.0	37.3	61.4	1.2	21.5	78.5	400	100.0
Janajati marginalized group	18.6	81.4	22	100.0	31.8	63.6	4.5	13.4	86.6	112	100.0
Dalit	19.7	80.3	26	100.0	19.2	76.9	3.8	14.5	85.5	124	100.0
Brahmin/Chettri	7.7	92.3	4	100.0	25.0	75.0	0.0	2.0	98.0	49	100.0
Economic strata											
Non poor	18.5	81.5	24	100.0	25.0	70.8	4.2	16.3	83.7	123	100.0
Vulnerable to poor	19.3	80.7	58	100.0	27.6	70.7	1.7	16.2	83.8	284	100.0
Poor	16.5	83.5	35	100.0	42.9	54.3	2.9	20.1	79.9	194	100.0
Severely poor	19.4	80.6	18	100.0	38.9	61.1	0.0	17.9	82.1	84	100.0
Sex of household head											
Female population	11.9	88.1	16	100.0	18.8	62.5	18.8	12.8	87.2	125	100.0
Male population	19.8	80.2	119	100.0	34.5	65.5	0.0	18.6	81.4	560	100.0
Total	**18.4**	**81.6**	**135**	**100.0**	**32.6**	**65.2**	**2.2**	**17.5**	**82.5**	**685**	**100.0**

Source: Field Survey, 2018

Annex XVII. 26: Households by vaccination status of children before and after the earthquake

	Before the Earthquake Did you timely vaccinate your children?				After the Earthquake Did you timely vaccinate your children?				Total
District									
Sindhupalchok	84.9	15.1	100.0	172	27.9	24	48.2	100.0	359
Rasuwa	88	12	100.0	184	28.7	41.8	29.5	100.0	376
Chi-square= 0.761, df= 1, P-value= 0..383					Chi-square= 34.213, df= 2, P-value= 0.000				
Caste/Ethnicity									
Janajati	87.1	12.9	100.0	209	28.4	36	35.6	100.0	433
Janajati marginal group	88.7	11.3	100.0	53	26.3	32.2	41.5	100.0	118
Dalit	80.6	19.4	100.0	72	28.8	29.5	41.7	100.0	132
Brahmin/Chettri	95.5	4.5	100.0	22	30.8	19.2	50	100.0	52
Chi-square= 3.970, df= 3, P-value= 0.365					Chi-square= 8.340, df= 6, P-value= 0.214				
Economic strata									
Non poor	96.8	3.2	100.0	62	27.7	34.6	37.7	100.0	130
Vulnerable to poor	94.2	5.8	100.0	138	28.7	33	38.3	100.0	300
Poor	79.8	20.2	100.0	99	27.4	30.7	42	100.0	212
Severely poor	68.4	31.6	100.0	57	30.1	36.6	33.3	100.0	93
Chi-square= 32.413, df= 3, P-value= 0.000					Chi-square= 2.342, df= 6, P-value= 0.886				
Sex of household head	Yes	No		Total	Yes	No	No children	(%)	(N)
Female	84.7	15.3	100.0	59	26.9	22.4	50.7	100.0	134
Male	86.9	13.1	100.0	297	28.6	35.4	35.9	100.0	601
Chi-square= 0.190, df= 1, P-value= 0.663					Chi-square= 11.982, df= 2, P-value= 0.003				
Total	86.5	13.5	100.0	356	28.3	33.1	38.6	100.0	735

Source: Field Survey, 2018

Annex XVII. 27: School not going children age 5 to 18

Population characteristics	School not going	School going	Total	Not going rate
	n	n	n	
Sex				
Female	123	376	499	11.91
Male	105	429	534	10.16
Caste/Ethnicity				
Janajati	132	495	627	12.78
Janajati marginalized group	41	128	169	3.97
Dalit	36	148	184	3.48
Brahmin/Chettri	19	34	53	1.84
Economic strata				
Non poor	52	125	177	5.03
Vulnerable to poor	100	372	472	9.68
Poor	59	217	276	5.71
Severely poor	17	91	108	1.65
Age group				
5-9 years	151	211	357	14.62
10-14 years	29	365	394	2.81
15-19 years	48	229	277	4.65
Total	228	805	1033	22.07

Source: Field Survey, 2018

Annex XVII. 28: Reason for not going school household's population aged 5-18 years

	Reason for not going school							
Age group	Repetition of earthquake	School collapsed	No environment	Economic problem	Parent's death	Family member dead	**Total** %	N
5-9 years	0.0	0.0	0.0	25	0.0	75	100.0	4
10-14 years	4.5	4.5	9.1	31.8	4.5	45.5	100.0	22
15-19 years	10.8	10.8	21.6	43.2	8.1	5.4	100.0	37
Caste/Ethnicity								
Janajati	10.3	7.7	20.5	17.9	7.7	35.9	100.0	39
Janajati marginalized group	0	0	0	50	0.0	50	100.0	2
Dalit	7.1	14.3	14.3	64.3	0.0	0.0	100.0	14
Brahmin/Chettri	0.0	0	0	87.5	12.5	0.0	100.0	8
Economic strata								
Non poor	9.4	7.4	13.25	36.8	5.7	27.4	100.0	42
Poor	0.0	12.5	26.8	46.45	7.15	7.15	100.0	11
Sex of household head								
Female	5.3	7.9	15.8	42.1	2.6	26.3	100.0	38
Male	12	8	16	32	12	20	100.0	25
Total	7.9	7.9	15.9	38.1	6.3	23.8	100.0	63

Source: Field Survey, 2018

Annex XVII. 29: Access to the financial institutes before and after the earthquake

	Do you have account before the earthquake		If yes who has the account?- before the earthquake			Do you have account after the earthquake		IF yes who has the account? after the earthquake			Total	
	Yes	No account	Male	Female	Both	Yes	NO	Male	Female	Both		
Caste/ethnicity	%	%	%	%	%	%	%	%	%	%	N	%
Janajati	68.6	31.4	23.1	6.5	39.0	91	9	40.4	10.4	40.2	433	100.0
Janajati marginalized	44.1	55.9	9.3	16.9	17.8	69.5	30.5	21.2	26.3	22.0	118	100.0
Dalit	56.1	43.9	32.6	8.3	15.2	74.2	25.8	45.5	10.6	18.2	132	100.0
Brahmin/Chettri	65.4	34.6	48.1	13.5	3.8	78.8	21.2	53.8	19.2	5.8	52	100.0
Economic strata												
Non poor	39.8	60.2	26.9	6.5	6.5	86.6	13.4	35.9	14.0	36.7	215	100.0
Poor	48.7	51.3	26.4	7.2	15.0	79.7	20.3	50.0	12.4	17.3	153	100.0
Total	62.2	37.8	24.4	9.0	28.8	83.7	16.3	39.2	13.6	30.9	735	100.0

Source: Field Survey, 2018

Annex XVII. 30: Households by the status of loan taken after the earthquake

	Percentage of households taking the loan	Purpose of taking loan							Total N - %	
		Construct house	Micro enterprise	Health care	Education	Purchase land	Payback loan	Agriculture		
District										
Sindhupalchok	27.9	58.0	4.0	5.0	8.0	12.0	11.0	2.0	100	100.0
Rasuwa	8.0	26.7	30.0	20.0	3.3	13.3	3.3	3.3	30	100.0
Caste/Ethnicity										
Janajati	12.0	51.9	17.3	13.5	5.8	9.6	0.0	1.9	52	100.0
Janajati marginalized group	22.9	11.1	3.7	3.7	7.4	33.3	37.0	3.7	27	100.0
Dalit	29.5	64.1	7.7	7.7	10.3	5.1	5.1	0.0	39	100.0
Brahmin/Chettri	23.1	91.7	0.0	0.0	0.0	0.0	0.0	8.3	12	100.0
Economic strata										
Non poor	19.2	60.0	12.0	8.0	4.0	8.0	4.0	4.0	25	100.0
Vulnerable to poor	13.3	47.5	12.5	7.5	10.0	15.0	5.0	2.5	40	100.0
Poor	16.5	48.6	2.9	5.7	5.7	14.3	20.0	2.9	35	100.0
Severely poor	32.3	50.0	13.3	13.3	6.7	10.0	6.7	0.0	30	100.0
Sex of household head										
Female	23.9	43.8	12.5	3.1	9.4	21.9	9.4	0.0	32	100.0
Male	16.3	53.1	9.2	10.2	6.1	9.2	9.2	3.1	98	100.0
Total	17.7	50.8	10.0	8.5	6.9	12.3	9.2	2.3	130	100.0

Source: Field Survey, 2018

Annex XVII. 31: Saving amount change according to selected characteristics

District	Average saving in Rs. BEQ	Average saving in Rs. AEQ	Change (BEQ-AEQ) in Rs.
Sindhupalchok	10002	6439	3564
Rasuwa	4856	5125	-269
F-test=3.810, p-value=.000		f=1.573	*t-test*=1.673, p-alue=.000
Caste/Ethnicity			
Janajati	6756	5692	1064
Janajati marginalized group	4627	3873	754
Dalit	5019	6777	-1758
Brahmin/Chettri	24673	8121	16552
F-test,=18.750, p-value=.000		f=.079p-value=.000,	
Economic strata			
Non poor	10022	5768	4255
Vulnerable to poor	7957	6226	1731
Poor	6367	4446	1921
Severely poor	4054	7292	-3239
F-test=2.3, p=.1		f=1.731, p- .159	
Sex of household head			
Female	8190	5020	3170
Male	7187	5933	1254
t-test=0.532, p=.595		t=-1.302, p= .195	
Total	7370	5767	1603

Source: Field Survey, 2018

Annex XVII. 32: Distribution of remittance receiving households for the last five years

	Remittances Rs						Household receiving remittances		
	<30,000	30,000-100,000	100,000-150,000	>150,000	Mean	Std. dev.	n	%	Total
Caste/Ethnicity									
Janajati	39.8	29.6	22.4	8.2	73,367	65,758	98	22.6	433
Janajati marginalized	44.4	16.7	27.8	11.1	82,222	81,642	18	15.3	118
Dalit	48.6	25.7	22.9	2.9	59,429	54,311	35	26.5	132
Brahmin/Chettri	15.4	23.1	53.8	7.7	107,308	65,879	13	25.0	52
Economic strata									
Non poor	33.2	26.0	33.1	7.6	85,187	67,775	96	21.7	215.0
Poor	52.2	22.3	21.0	4.5	58,305	58,739	68	22.4	152.5
Sex of household head									
Female	35.4	35.4	25.0	4.2	69,688	58,695	48	35.8	134
Male	42.2	23.3	25.9	8.6	75,862	68,842	116	19.3	601
Total	40.2	26.8	25.6	7.3	74,055	65,916	164	22.3	735

Source: Field Survey, 2018

Annex XVII. 33: Government supported social security

	Natural calamity compensation		Student Scholarships		Widow allowance		Disabled and old people allowance		Infant/delivery		Different Govt. Scholarships for marginalized people		None		Differences
	AEQ	**BEQ**	**AEQ**	**BEQ**	**AEQ**	**BEQ**	**AEQ**	**BEQ**	**AEQ**	**BEQ**	**AEQ**	**BEQ**	**AEQ**	**BEQ**	
Economic strata															
Non-poor	17.0	4.0	4.9	3.5	5.3	2.8	1.9	0.5	6.3	0.5	5.8	2.6	59.1	86.0	-27.0
poor	15.1	2.3	7.2	4.3	5.2	2.6	6.2	1.6	2.3	0.0	16.7	9.2	52.5	82.0	-29.5
Caste/Ethnicity															
Janajati	16.6	1.6	3.0	1.2	4.2	1.2	4.4	0.2	4.8	0.0	2.1	2.1	66.7	93.1	-26.3
Janajati marginalized	15.3	3.4	7.6	2.5	5.1	2.5	2.5	1.7	4.2	0.0	6.8	1.7	53.4	89.8	-36.4
Dalit	9.1	4.5	6.8	6.8	7.6	5.3	3.0	2.3	4.5	0.8	44.7	21.2	31.8	62.1	-30.3
Brahmin/Chettri	32.7	13.5	23.1	21.2	9.6	9.6	1.9	1.9	3.8	1.9	0.0	0.0	38.5	55.8	-17.3
Sex of household head															
Female	17.9	5.2	5.2	3.7	20.9	11.2	6.0	3.7	3.0	0.7	12.7	4.5	39.6	73.1	-33.6
Male	15.8	2.8	6.0	3.8	1.8	0.8	3.2	0.3	5.0	0.2	9.8	5.5	60.1	86.9	-26.8
Total	16.2	3.3	5.9	3.8	5.3	2.7	3.7	1.0	4.6	0.3	10.3	5.3	56.3	84.4	-28.0

Source: Field survey 2018

Annex XVII. 34: Affiliation in religious and cultural practices after the EQ

Population Characteristics	*% in the change in religious and cultural practice*									Total
	Worship daily		% Change	Cultural ceremony		% Change	Involve in the traditional occupation		% Change	
	AEQ	BEQ	AEQ-BEQ	AEQ	BEQ	AEQ-BEQ	AEQ	BEQ	AEQ-BEQ	
Districts										
Sindhupalchok	9.8	77.4	-67.6	60.1	58.1	2.0	15.4	45.5	-30.2	215
Rasuwa	37.5	89.4	-51.9	97.9	98.4	-0.5	3.7	36.7	-33.0	368
Chi-square 0.000										
Caste/Ethnicity										
Janajati	31.2	90.1	-58.9	86.1	86.6	-0.5	4.8	39.0	-34.2	373
Janajati marginalized	20.5	76.9	-56.4	85.5	82.1	3.4	7.7	37.6	-29.9	100
Dalit	9.1	61.4	-52.3	67.4	64.4	3.0	12.1	38.6	-26.5	89
Brahmin/Chettri	9.6	100.0	-90.4	40.4	42.3	-1.9	44.2	71.2	-26.9	21
				Chi-square 0.000						
Economic strata										
Non-poor	24.9	86.7	-61.9	81.6	81.4	0.2	9.1	40.2	-31.2	351
Poor	22.7	78.9	-56.3	76.3	75.0	1.3	9.9	42.1	-32.2	232
				Chi-square 0.009						
Sex of household head										
Female	14.9	76.1	-61.2	82.8	83.6	-0.7	3.0	37.3	-34.3	111
Male	26.0	85.2	-59.2	78.7	77.7	1.0	10.8	41.8	-31.0	472
Chi-square 0.000										
Total	24.0	83.5	-59.5	79.4	78.7	0.7	9.4	41.0	-31.6	583

Source: Field Survey, 2018

Annex XVII. 35: Affiliation at least one household member in social organization (in %)

	BEQ	AEQ	Total	Difference (AEQ-BEQ)
Sindhupalchok	79.7	42.3	359	-37.3
Rasuwa	68.1	36.4	376	-31.6
	Chi-square=12.720, df=1, p-value=.000	Chi-square=12.720, df=1, p-value=.010		
Caste/Ethnicity				
Janajati	70.2	37.2	433	-33.0
Janajati marginalized	76.3	40.7	118	-35.6
Dalit	74.2	28.8	132	-45.5
Brahmin/Chettri	96.2	80.8	52	-15.4
	Chi-square=16.689, df=3, p-value=.001	Chi-square=44.501, df=3, p-value=.000		
Economic strata				
Non poor	84.6	54.6	130	-30.0
Vulnerable to poor	74.7	46.0	300	-28.7
Poor	70.3	28.3	212	-42.0
Severely poor	63.4	21.5	93	-41.9
	Chi-square=14.477, df=3, p-value=.002	Chi-square=41.515, df=3, p-value=.000		
Sex of the household head				**0.0**
Female	77.6	41.0	134	-36.6
Male	72.9	38.9	601	-33.9
Chi-square=1.268, df=1, p-value=.260		Chi-square=.204, df=1, p-value=.651		

Source: Field Survey, 2018

Annex XVII. 36: Distribution households reporting support from outsider individuals

District	Relatives, friends, neighbors						GOs/NGOs/Private Sector							
	Cash	Goods	Medicine	Food	Clothes	Other	Cash	Goods	Medicine	Food	Clothes	Other	Total	
Sindhupalchok	66.2	39.1	8.3	39.1	14.7	13.5	56.1	65.1	49.0	13.5	1.0	5.4	100	266
Rasuwa	93.1	69.4	56.9	30.6	26.4	6.9	49.9	81.4	55.1	27.5	7.2	1.2	100	72
Ethnicity														
Janajati	85.3	59.7	33.3	37.2	17.8	3.9	58.3	76.6	53.5	23.6	6.0	1.8	100	129
Janajati marginalized	43.5	46.8	16.1	40.3	27.4	33.9	33.0	62.9	60.8	25.8	4.1	12.4	100	62
Dalit	63.8	37.1	8.6	46.7	17.1	12.4	57.6	69.5	54.2	14.4	0.0	1.7	100	105
Brahmin/Chettri	92.9	21.4	2.4	9.5	0.0	4.8	34.1	81.8	15.9	2.3	0.0	0.0	100	42
Poor group														
Non- poor	73.8	31.1	11.5	24.6	14.8	9.8	54.2	66.1	43.2	15.3	5.1	5.1	100	61
Vulnerable to poor	76.4	56.6	24.5	36.8	15.1	9.4	49.5	78.7	51.3	25.6	6.1	2.5	100	106
Poor	73.5	49.6	19.5	39.8	17.7	16.8	57.0	74.7	52.7	20.4	2.2	3.2	100	113
Severely poor	58.6	32.8	13.8	46.6	22.4	10.3	52.6	64.5	68.4	13.2	1.3	2.6	100	58
Sex														
Female	72.2	53.8	25.4	32.5	18.9	13.6	51.7	76.9	47.4	24.0	5.8	2.8	100	169
Male	71.6	37.3	11.8	42.0	15.4	10.7	53.9	70.5	56.9	17.8	2.7	3.6	100	169
Total	71.9	45.6	18.6	37.3	17.2	12.1	52.8	73.7	52.2	20.9	4.3	3.2	100	338

Source: Field Survey, 2018

Annex XVII. 37: Households received support from different agencies (%)

	Nepal Government	NGOs	Nepal Red Cross	World Food Program	Others	Total
Districts	(%)	(%)	(%)	(%)	(%)	n
Sindhupalchok	90.1	73.7	9.9	36.9	12.5	312
Rasuwa	95.1	73.3	52.8	46.7	0.6	345
Caste/ethnicity						
Janajati	95.2	79.1	43.5	50.5	2.0	398
Janajati marginalized group	80.4	66.0	29.9	21.6	14.4	97
Dalit	91.5	80.5	7.6	44.9	16.1	118
Brahmin/Chettri	100.0	20.5	4.5	2.3	0.0	44
Economic strata						
Non poor	93.2	68.6	33.9	32.2	8.5	118
Vulnerable to poor	93.5	73.3	42.2	44.4	2.9	277
Poor	93.0	75.8	23.7	40.9	7.5	186
Severely poor	88.2	76.3	15.8	51.3	11.8	76
Sex of the household head						
Female	93.5	70.5	34.8	35.7	7.4	325
Male	91.9	76.5	30.1	48.2	5.1	332
Total	**92.7**	**73.5**	**32.4**	**42.0**	**6.2**	**657**

Source: Field Survey, 2018

Annex XVII. 38: Change in capital assets before and after the earthquake

Paired Differences	Natural capital (BEQ –AEQ)	Financial capital (BEQ - AEQ)	Social capital (BEQ –AEQ)	Physical capital (BEQ –AEQ)	Human capital (BEQ – AEQ)
Mean	1.618	0.023	0.343	0.92	-0.322
Std. Deviation	1.09592	1.111	1.166	1.086	0.577
Std. Error Mean	0.04042	0.041	0.043	0.04	0.021
Lower range	1.538	-0.057	0.258	0.841	-0.363
Upper range	1.697	0.104	0.427	0.998	-0.28
t- test	40.02	0.564	7.973	22.95	-15.09
p-value(2-tailed)	0.000	0.573	0.000	0.000	0.000

Source: Field survey 2018

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