

**CHALLENGES AND OPPORTUNITIES OF HOME OWNER
DRIVEN RECONSTRUCTION APPROACH**

(A Study from Melung Rural Municipality, Dolakha, Nepal)

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The Central Department of Rural Development
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DECLARATION

I hereby declare that the thesis entitled “**Challenges and Opportunities of Home Owner Driven Reconstruction Approach: A Study from Melung Rural Municipality, Dolakha, Nepal**” submitted to the Central Department of Rural Development, Tribhuvan University is entirely my original work prepared under the guidance and supervision of my supervisor. I have made due acknowledgements to all ideas and information borrowed from different sources in the course of preparing this thesis. The result of this thesis have not been presented or submitted anywhere else for the award of any degree or for any other purposes. I assure that no part of the content of this thesis has been published in any form before.

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LETTER OF RECOMMENDATION

The thesis entitled **Challenges and Opportunities of Home Owner Driven Reconstruction Approach: A Study from Melung Rural Municipality, Dolakha, Nepal** has been prepared by **Arun Kumar Sharma** under my guidance and supervision. I hereby forward this thesis to the evaluation committee for final evaluation and approval.

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APPROVAL LETTER

The thesis entitled **Challenges and Opportunities of Home Owner Driven Reconstruction Approach: A Study from Melung Rural Municipality, Dolakha, Nepal** submitted by **Arun Kumar Sharma** in partial fulfillment of the requirements for the Master's Degree (M. A.) in Rural Development has been approved by the evaluation committee.

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ABSTRACT

On Saturday, 25 April 2015 at 11:56 local time, a 7.6 magnitude earthquake struck Nepal. This earthquake results in over 8,790 casualties and 22,300 injuries. It is estimated that the lives of eight million people, almost one-third of the population of Nepal, have been impacted by these earthquakes. Nearly 500,000 houses were destroyed and more than 250,000 houses were partially damaged in this earthquake. Government of Nepal adopted Owner Driven Reconstruction (ODR) Approach to implement safe building design and construction in 31 affected districts. ODR approach was tested in countries like India, Pakistan, Sri-Lanka and Thailand and proved to be best approach for post-disaster reconstruction scenario. Government of Nepal established National Reconstruction Authority (NRA) under reconstruction and rehabilitation act 2072 to lead the reconstruction in Nepal. After three years of earthquake, only 40% people completed their house up to DPC level and 10% completed their houses. Because of this slow pace of construction few experts are arguing that owners driven reconstruction may not work in Nepalese context. Hence this study tries to analyze the current challenges and opportunities of owner driven reconstruction approach in Nepal.

Survey was carried out in 342 households in Melung Rural Municipality of the Dolakha district. Key Informant Survey with the local authorities was carried out to understand the overall scenario of the areas. Site observation was done based on the prepared checklist. Collected data was formatted and organized in excel. The data were analyzed and conclusions were made based on the each questionnaire. All the plan, policies and guidelines formulated by the government were also reviewed and analyzed the gaps between plan and implementation.

From the study it was concluded that Home Owner Driven Reconstruction Approach need to modify in Nepalese context. It was found that the reconstruction is not started or slower because of several socio-economic factors. Policies and plans are not coinciding with the real field scenario. The immediate recommendation made was clear messaging through awareness activities, effective mobilization of technical manpower and masons, establishment of technical support center, bringing women in the mainstream of reconstruction, made clear provision of loan and subsidy, clear provision of retrofitting will expected to increase the speed and effectiveness of the home-owner driven reconstruction approach.

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ACRONYMS AND ABBREVIATIONS

AD	Anno Domini
ADB	Asian Development Bank
ADRS	Agency Driven Reconstruction in Situ
ADRRS	Agency Driven Reconstruction in Relocated Sites
APF	Armed Police Force
BMM	Brick Masonry in Mud
CA	Cash Approach
CBS	Central Bureau of Statistics
CDR	Community Driven Reconstruction
CDRC	Central Disaster Relief Committee
CEO	Chief Executive Officer
CGI	Corrugated galvanized Iron
CLPIU	Central Level Project Implementation Unit
DLPIU	District Level Project Implementation Unit
DUDBC	Department of Urban Development and Building Construction
EMS	European Macro-seismic Scale
ERRA	Earthquake Reconstruction and Rehabilitation Authority
GoN	Government of Nepal
HODR	Home Owner Driven Reconstruction
HRRP	Housing Reconstruction and Recovery Platform
ICRC	International Committee of Red Cross
IFRCRCS	International Federation of Red Cross and Red Crescent
IHRC	International Human Rights Council
INGO	International Non-Governmental Organizations
IsDB	Islamic Development Bank

KfW	Kreditanstalt für Wiederaufbau
MOE	Ministry of Education
MOFALD	Ministry of Federal Affairs and Local Development
MOFSC	Ministry of Forest and Soil Conservation
MoHA	Ministry of Home Affairs
MOUD	Ministry of Urban Development
NA	Nepalese Army
NDRF	National Disaster Relief Committee
NEOC	National Emergency Operation Center
NGO	Non-Governmental Organizations
NP	Nepal Police
NPC	National Planning Commission
NRA	National Reconstruction Authority
NRS	Nepalese Rupees
NSC	National Seismological Center
ODHR	Owner Driven Housing Reconstruction
ODR	Owner Driven Reconstruction
ODRC	Ohio Department of Rehabilitation and Correction
PDNA	Post Disaster Needs Assessment
PNGO	Partner NGO
RC	Reinforced Concrete
RCC	Reinforced Cement Concrete
RM	Rural Municipality
SAR	Search and Rescue
SMC	Stone Masonry in Cement
SMM	Stone Masonry in Mud

TIA	Tribhuvan International Airport
TU	Tribhuvan University
UN	United Nation
UNDRO	United Nations Disaster Relief Organizations
UN-HABITAT	United Nations Human Settlement Programmes
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNOPS	United Nations Office for Project Support
UPLINK	Urban Poor Linkage
US	United States
USAID	United States Aid for International Development
USD	US Dollar
VDC	Village Development Committee
WB	World Bank
Dr.	Doctor
eg.	example
et al.	et alia
etc.	et cetera
Km	Kilo Meter
mi	miles
No.	Number
Regd.	Registration
sq	square
\$	Dollor
%	Percentage
>	Greater Than

CHAPTER 1: INTRODUCTION

1.1 Background of the Study

The geology of Nepal is dominated by the Himalaya, the highest, youngest and a very highly active mountain range. Himalaya is very important for the study of ongoing continent-continent collision of tectonics. The Himalayan arc extends about 2400 km from Nanga Parbat (8,138 m) by the Indus River in northern Pakistan eastward to Namche Barwa (7,756 m) by the gorge of the Tsangpo-Brahmaputra in eastern Tibet (Le Fort 1996). About 800 km of this range lies only in Nepal; the remaining lies in Bhutan, Pakistan, India, and China.

The Himalayan orogeny beginning with the collision of Indian subcontinent and Eurasia at the Paleocene/Eocene epoch (Rowley 1996), has thickened the Indian crust to its present thickness of 70 km (Le Fort 1975). The northwest tip of India after colliding with Asia seems to have met along the full length of the suture (Dewey et al. 1988).

Immediately prior to the onset of the Indo-Asian collision, the northern boundary of the Indian shield was likely a thinned continental margin on which Proterozoic clastic sediments and the Cambrian Eocene Tethyan shelf sequence were deposited (Le Fort 1996).

Heim & Gansser 1939, and Gansser 1964 divided the rocks of the Himalaya into four tectonostratigraphic zones that are characterised by distinctive stratigraphy and physiography. From south to north, it can be divided into five latitudinal morpho-tectonic zones and these are:

- The Gangatic Plain (Terai)
- The Sub Himalayan (Chure or Siwalik)
- Lesser Himalayan (Mahabharat Mountain Range),
- Greater Himalayan, and
- Tibetan Himalayan zones (Tethys Himalaya).

Because of above mentioned geological reason, Nepal is among the most disaster prone countries in the world. The country is ranked 11th in earthquake vulnerability, and Kathmandu is said to be exposed to the greatest earthquake risk among 21 megacities around the world (CRD, 2017).

Lying in one of the most seismically active regions of the world, Nepal has a long history of earthquakes. The first documented earthquake event in the country dates back to 7 June 1255, during the reign of King Abhaya Malla. The quake, measuring 7.8 on the Richter scale, took the life of the king and wiped out a third of Kathmandu's then population. Nepal has witnessed at least one major earthquake per century ever since (Choi, 2012).

The earthquake of 1408 A. D. has been reported to destroy the Machhendranath temple of Patan. Similarly the earthquake of 1681 A. D. and 1810 A. D. have been reported to occur but the exact location of these earthquakes are not known (NSC, 2017).

Recent research on historical data has well constrained on the source size, magnitude and possible location of 1833 A. D. event (R.Bilham, 1995) which devastated Kathmandu valley. Its magnitude is reported to be of 7.8 with possible rupture length of more than 70 km and the event is located at 50 km North East of Kathmandu (NSC, 2017)

The earthquake of 1934 A. D. is the most devastating earthquake ever occurred in the territory of Nepal with casualties of more than 16000 people including from Nepal and India put together. The rupture length is estimated to be 200 Km 100 Km (Molnar and Pandey, 1994). Subsequent earthquakes causing severe human and physical loss in 1980, 1988 and 2011.

Assam great earthquake of 1897, Kangra earthquake 1905, and Assam earthquake 1950 were also felt in Nepal. The record of historical earthquake is not complete which poses a problem in assessing the recurrence period of great earthquakes. From the available data there has been no great earthquakes of magnitude >8.0 in the gap between the earthquakes of 1905 A. D and 1934 A. D (NSC, 2017).

On Saturday, 25 April 2015 at 11:56 local time, a 7.6 magnitude earthquake as recorded by Nepal's National Seismological Centre (NSC), struck Barpak, in the historic district of Gorkha, about 76 km northwest of Kathmandu. Nepal had not faced a natural shock of comparable magnitude for over 80 years (PDNA, 2015).

The catastrophic earthquake was followed by more than 300 aftershocks greater than magnitude 4.0 (as of 7 June 2015). Four aftershocks were greater than magnitude 6.0, including one measuring 6.8 which struck 17 days after the first big one with the epicentre near Mount Everest. To date, there are over 8,790 casualties and 22,300 injuries. It is estimated that the lives of eight million people, almost one-third of the population of Nepal, have been impacted by these earthquakes. Thirty-one of the

country's 75 districts have been affected, out of which 14 were declared 'crisis-hit' for the purpose of prioritizing rescue and relief operations; another 17 neighbouring districts are partially affected (PDNA, 2015).

The destruction was widespread covering residential and government buildings, heritage sites, schools, health posts, rural roads, bridges, water supply systems, agricultural land, trekking routes, hydropower plants and sports facilities. Rural areas in the central and western regions were particularly devastated and further isolated due to road damage and obstructions. In the worst hit areas, entire settlements, including popular tourist destinations like Langtang, were swept away by landslides and avalanches triggered by the earthquakes. Due to the weakened, ruptured, and destabilized slopes and surfaces, the vulnerable areas have now become even more susceptible to flooding and landslides that can occur during the monsoon. Hundreds of historical and cultural monuments at least a century old were either destroyed or extensively damaged. Over half a million houses were destroyed. The damage exposed the weaknesses of houses that did not have any seismic-resistant features or were not in accordance with the building codes. The disaster also highlighted aspects of inequities in Nepali society spanning geography, income and gender. Poorer rural areas have been 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. The time and day of the first earthquake saved thousands of lives. Being a Saturday, the weekly holiday, schools across Nepal were closed on 25 April. The death toll of young people could have been much higher considering that nearly 7,000 schools were completely or significantly damaged. Similarly, if the earthquake had struck at night, and not in the middle of the day, there would certainly have been greater casualties. Nearly 500,000 houses were destroyed and more than 250,000 houses were partially damaged in this earthquake (PDNA, 2015).

1.2 Statement of the Problem

After the devastating earthquake of 2015, government of Nepal with the help of other countries and foreign agencies complete the emergency responses. To plan in longer term sustainability and to rebuild the devastated structures, Nepal government calls meeting of donors seeking their help, support and suggestion. The donor's meeting was held in Kathmandu on 25th June 2015. In the donor meeting the finding of PDNA (Post Disaster

Needs Assessment) was presented in between. 239 delegates from 53 countries and agencies took part in that donor meeting. Donor countries had pledged 4.4 billion US dollar for the reconstruction of Nepal, out of which 2.2 billion USD would be subsidy and remaining 2.2 USD would be in loan (The Himalayan, 2015).

After the commitment from the donor, Nepal government prepare effective and validated baseline survey of affected private houses across the affected district of Nepal mobilizing around 2000 engineers and social mobilizers. GoN also established National Reconstruction Authority as a policy making body for reconstruction. NRA also decides to provide NRS 300,000 subsidy per household as an incentives to build house. The amount was decided to distribute in three different tranches. First tranche of NRS 50,000 decided to distribute immediately after agreement with local government, second installment of NRS 150,000 decided to distribute after completion of construction up to plinth beam level and last tranche of NRS 100,000 was decided to distribute after completion of construction up to roof beam level. Also it was decided to provide completion certification after completing construction. Beneficiaries across 14 most affected districts started to build their house after doing agreement with local government.

The three years of great disaster has already passed. As per the target of the government there is no satisfactory progress in reconstruction of the private houses. In affected districts there are altogether 767,705 beneficiaries. Till April, 2018, 93% beneficiary did agreement with local government, 91% people received first tranche, 40% beneficiary received second tranche and only 10% received third tranche (HRRP, 2018).

With this slow progress it is difficult to complete reconstruction programs successfully. Now government is compelled to announce that all the tranches need to be taken within this fiscal year.

We need to re-access the approach and policy of the government. We need to identify the gaps between government and community which is not supporting or delaying the homeowner driven reconstruction approach.

This research will try to identify the challenges and gap for successful completion of the homeowner driven reconstruction approach in Nepal. The issues will identified both at local level and also at policy level.

1.3 Objective of the Study

The general objective of the study is to explore challenges and opportunities of homeowner driven reconstruction approach in Nepal. The specific objectives of this study are:

- To explore the challenges facing by local people to rebuild their houses.
- To assess the opportunity of disaster to build back better.
- To identify the gap between plans, policies and processes of the government and local scenario.

1.4 Importance of the Study

Of course disaster gives both losses of lives and property but also immense pain even after several years. Earthquake never kills people but the structures we made in the past. To save the lives in future disaster it is necessary to build all the structure earthquake resistant. To make structure earthquake resistant it is necessary to strictly follow the building code, people need to become aware about effect of earthquake and potential losses from collapse of the structure.

In Nepal, the knowledge of the people about safer houses and all the earthquake resistant components of masonry and RCC structures increased satisfactorily after recent earthquake. Earthquake not only damages the structures but also gives an opportunity to build safer and model village and city, if government, policy maker, I/NGO, donor agencies and people work effectively.

Melung, Ghyansukathokar and Bhedpu villages of Dolakha district were one of the severely damaged villages in 2015 earthquake. Most of the houses in these village were Mud Stone Masonry before earthquake; almost all of them met ground because of the earthquake.

This study attempts to identify the challenges and opportunities of reconstruction of this area. This study will help to determine the impact of earthquake and reconstruction to uplift the socio-economic status of study area. Similarly, the study will recommend possible correction in plan, policies and processes of National Housing Reconstruction Project.

CHAPTER 2: REVIEW OF LITERATURE

2.1 Background

Reconstruction projects are defined as the modification, conversion or complete replacement of an existing facility that involves expansion, additions, interior renovation or upgrading the functional performance of a facility. The reconstruction can be referring to restoring basic services and life support infrastructure to normal (Ismail, et al., 2014).

Post-disaster reconstruction can be undertaken through different approaches, which may vary principally in terms of a household's degree of control over the reconstruction process (Barenstein, 2012). The choice of the best reconstruction approach—or approaches—to be employed is context-specific and should take into consideration (1) reconstruction costs; (2) improvement in housing and community safety; (3) restoration of livelihoods; (4) political milieu; (5) cultural context; and (6) people's own goals for well-being, empowerment, and capacity. Consultation with the community and evaluation of requirements and capacities is critical before deciding on any reconstruction approach (Jha et al., 2010). With reference to the labels currently used by reconstruction agencies and housing reconstruction literature (Barenstein, 2006; Jha et al. 2010), a distinction can be made between five reconstruction approaches that may be pursued after a disaster.

2.1.1 Agency-Driven Reconstruction in Relocated Sites (ADRRS)

Agency-Driven Reconstruction in Relocated Sites (ADRRS) refers to an approach in which a governmental or nongovernmental agency hires a construction company to build new houses in a new site.

When using ADRRS, a governmental or nongovernmental agency contracts the construction of houses on a new site, generally with little or no involvement by the community or homeowners. The community, government, or agency supporting the reconstruction may purchase the land for the new settlement. Upon completion, the houses may be allotted through a lottery or using criteria defined by the community or the agency, or both. ADRRS, often justified as a risk-mitigation measure, may be advisable when communities are being relocated. And agencies may favor ADRRS for the ease of constructing on a clear site without tenancy issues or other complications. ADRRS is used by public agencies to reconstruct government-owned housing in a relocated site, generally public land. However, for single-family homes, ADRRS can be problematic. It can lead

to the construction of costly, inappropriate housing of poor quality and settlement arrangements that do not meet the socio-cultural and livelihood requirements of the people, causing severe economic consequences and low occupancy rates. The argument that ADRRS results in higher construction quality is rarely valid, because of poor supervision or the lack of qualified contractors. Moreover, finding an appropriate site can be a major challenge; failing to do so is, in fact, one of the principal reasons for dissatisfaction with this approach.

2.1.1.1 Experiences with ADRRS

International NGOs and national private companies opted for ADRRS after the 2001 Gujarat, India, earthquake because of perceived organizational advantages and higher visibility, including naming rights to new settlements. Local elites were sometimes given incentives to sell this approach to local officials. By accepting these offers, people lost their access to government financial assistance. When they later found the designs, layouts, and construction quality to be subpar and refused to occupy these villages, they ended up having to liquidate their assets, such as land and livestock, so they could rebuild elsewhere. An independent study found that in villages that opted for ODR, housing conditions were considered better than before the earthquake and economic conditions unchanged, while in villages reconstructed with the ADRRS approach, a significant percentage of households reported high levels of indebtedness and worse economic conditions.

ADRRS has had positive results in urban contexts. Two examples are the city of Nagapattinam in Tamil Nadu, India, and Banda Aceh, Indonesia, after the 2004 Indian Ocean tsunami. In Banda Aceh, a Korean voluntary organization acquired land in a middle-class neighborhood for an urban housing project. Although the houses were small, high occupant satisfaction was attributed to housing design, good location, access to public services, and the fact that livelihoods were not site-dependent.

2.1.2 Agency-Driven Reconstruction in Situ (ADRIS)

Agency-Driven Reconstruction in Situ (ADRIS) refers to an approach in which a governmental or nongovernmental agency hires a construction company to replace damaged houses in their pre-disaster location.

In ADRIS, a governmental or nongovernmental agency hires one or more contractors to design and build the houses. Design, materials, and expertise are likely to be imported

from outside the community. The community may or may not be consulted on certain aspects of the project, such as house designs. House owners may be asked to take over some building tasks, such as curing concrete. Whereas house owners may also hire contractors within the framework of ODR, the principal contractor is accountable to the agency and may be contracted through formal tendering procedures. A special case of ADRIS is when a public agency reconstructs government-owned housing, on public property. Because ADRIS takes place on the owners' own land, it gives the homeowner some degree of control over quality, and sometimes the opportunity to participate in specific tasks. During construction, owners may be able to make suggestions to or modify the design. ADRIS eliminates the hurdle of land acquisition and generally allows the household to know where its house will be located. However, if housing designs are standardized or different from local designs, it may be difficult to fit the houses into pre-disaster settlement layouts or to modify them later. ADRIS, therefore, often results in similar or even worse outcomes than those of ADRRS, especially in the case of large-scale single-family reconstruction.

2.1.2.1 Experiences with ADRIS

Many international NGOs and private companies adopted ADRIS to build houses after the 2001 Gujarat, India, earthquake, even though government adopted an ODR policy. These projects often became a mix of ADRIS and ADRRS in adjacent sites where the housing designs did not fit existing sites and individual households, humanitarian agencies, or local governments bought additional land for new construction. In some cases, contractors did not respect the heritage sites and spatial organization, and caused irreversible damage to historical villages.

Many private voluntary organizations adopted ADRIS in Tamil Nadu, India, following the 2004 Indian Ocean tsunami. However, they required that the land be cleared of houses and vegetation before starting construction. As a result, hundreds of pre-tsunami houses that were culturally and climatically appropriate and easily repairable were demolished, and thousands of trees were felled, which negatively affected people's livelihoods and well-being.

2.1.3 Community-Driven Reconstruction (CDR)

In Community-Driven Reconstruction Approach financial and/or material assistance is channeled through community organizations that are actively involved in decision making

and in managing reconstruction. CDR entails varying degrees of organized community involvement in the project cycle, generally complemented by the assistance of an agency. The degree of control over reconstruction by the community in CDR projects varies between agencies and from project to project. The agency may take the lead, suggesting housing designs, technologies, and/or materials, and delivering construction inputs and training. The agency may also employ skilled and unskilled laborers from the community or facilitate the formation of construction committees. At the other extreme, the community may manage most of the reconstruction process and receive only the support of facilitators. In summary, CDR may involve one or more of the following roles for the community:

1. Organization and planning of the entire reconstruction process, including housing and infrastructure
2. Decisions regarding housing design and building materials
3. Production of building materials such as bricks
4. Distribution of building materials or other forms of housing assistance (e.g., cash and vouchers)
5. Oversight of builders

2.1.3.1 Experiences with CDR

1. Adopted by several national NGOs following the 2001 Gujarat, India, earthquake. The level of satisfaction was relatively high, but lower than for ODR houses.
2. Used successfully following the 2006 Java earthquake in Indonesia.
3. Adopted by the United Nations Centre for Human Settlements (UN-HABITAT), KfW, and Urban Poor Linkage Indonesia (UPLINK) in Aceh, Indonesia, following the 2004 Indian Ocean tsunami. Each of these agencies used a somewhat different interpretation of the approach. UPLINK gave people more choice in house designs, but community-based construction committees were given control over the purchase and distribution of building materials and over the mobilization of reconstruction labor. (In some cases, local contractors gained control of these committees.) KfW gave building materials and financial assistance directly to owners, but provided little choice over materials and designs.

4. Used by the city of Ocotal, Nicaragua, to relocate and rehouse residents of displaced neighborhoods and highly vulnerable sites following Hurricane Mitch in 1998. Housing designs and building materials were proposed by a local architect, but receipt of a house was contingent on participation in construction of at least one family member.

2.1.4 Cash Approach (CA)

In Cash Approach unconditional financial assistance is given without technical support. CA is appropriate for disasters that have a relatively limited impact and where housing damage was not caused by shortcomings in local construction practices. Emphasis with CA is on the distribution of financial assistance with minimal attention given to enabling measures. This approach may give affected people the choice to use the assistance based on their own priorities, which may not necessarily be housing. Some people may use the cash to migrate out of the disaster zone, for instance, if that is what they judge to be their best alternative. After the 2004 floods in Santa Fe, Argentina, the World Bank supported a government CA program for housing repair and reconstruction (Jha, et al., 2010).

2.1.5 Owner-Driven Reconstruction (ODR)

In Owner-Driven Reconstruction Approach conditional financial assistance is given, accompanied by regulations and technical support aimed at ensuring that houses is built back better. Owner-Driven Reconstruction will be explained in more details below.

2.2 Owner Driven Reconstruction

The importance of community participation in reconstruction after disaster has been recognized by scholars and relevant agencies for several decades. Ever since UNDRO declared that “the key to success ultimately lies in the participation of the local community-the survivors-in reconstruction” (UNDRO, 1982), most governmental and non-governmental agencies define their approaches as participatory. However, if only people have control over the building process and over the required resources, the process may be considered as truly participatory and empowering. This is potentially the case of a reconstruction approach that a decade ago was successfully tested on a large scale in Gujrat, India and that became known as ‘owner-driven reconstruction’ (Jha et al., 2010).

Owner-driven reconstruction refers to an approach that provides conditional financial and/or material assistance, accompanied by regulations and technical support aimed at

ensuring that houses are built back better. This approach enables people to have leading role in the reconstruction of their houses. The World Bank Handbook for Reconstruction after Disaster recognizes that ODR is the most empowering and dignified approach for households, and that it should be used whenever the conditions are suitable. It is sometime assumed that ODR entails that house owners are directly involved in construction. House owner undertake the construction or repair themselves by employing family labour, a local contractor, and/or local labourers. The main features of ODR does not relate to who is building the house, but to who controls the money to pay the builders. In an ODR approach, the house owner pays the contracted masons only if and when they are satisfied with the construction. This allows avoiding the main pitfalls of agency-driven reconstruction characterized by contractors not being accountable to communities, which is one of the main issues related to poor quality of construction (Barenstein, 2012).

ODR was the approach pursued by the government of Gujarat after the earthquake of 2001, where people could choose between the governmental ODR programme and various types of housing assistance offered by NGOs (Barenstein, 2012). Given the choice, over 73 percent of the people opted for this solution. According to the survey carried out by Barenstein (2012), ODR led to the highest level of overall satisfaction; whereas only 22.8 percent of the people were satisfied with their ADRRS houses, the level of satisfaction with the ODR houses was 93.3 percent. In Gujarat, people who opted for ODR were able to move back to their houses earlier than those who opted for agency build houses. The detailed assessment of Barenstein (2012), of a sample of 136 ODR houses indicated that the quality of construction in most cases was good, complying with the building codes and seismically safe. The ODR villages in Gujarat also managed to preserve their cultural identity and traditional character (Barenstein, 2006).

Under an owner-driven housing reconstruction (ODHR) programme, an institution – government, non-government organization (NGO), bank, National Society etc. – provides assistance directly to households for the rebuilding of their damaged homes. In ODHR programmes, the prioritization of needs and the decision-making are in the hands of the affected families, giving them ownership of their rehabilitation and building their skills and self-confidence (IFRCRCS, 2010).

ODHR programmes assist identified families and communities to rebuild homes that are safe and meet or exceed established technical requirements, in an integrated approach centered on the affected families as informed decision-makers (IFRCRCS, 2010).

For the programme to be truly owner driven, the first decision the families must make is whether or not this approach is the best option for them. To make this choice, families must clearly understand the requirements and roles and responsibilities of each party within the programme and their options to choose a different approach if available (IFRCRCS, 2010).

It is equally important to underline that ODR is no panacea for successful reconstruction. A pre-requisite for successful ODR is an effective and participatory land use and physical planning; for people to be able to participate in planning their settlements and to take a lead in the reconstruction of their houses they must be able to live in or near their village or neighborhood. To this aim, they may require support for the removal of rubble and for building temporary shelters (Thiruppugazh, 2010). This means that a well-managed owner-driven reconstruction approach is only one of several factors that determine the positive outcome of reconstructions.

ODHR requires a strong commitment from the participating families, and families may require varying levels of support, based on their capacities and vulnerabilities. Families may be asked to commit to:

- Participate in pre-construction and construction meetings and workshops (ensure both women and men are participating)
- Manage the house construction, which may include both planning tasks and construction supervision. This may be necessary until completion of the house, especially in cases where families do not include a skilled construction labourer, or are single-parent-headed households
- Strive to complete their house within an agreed schedule
- Follow technical advice as provided
- Use house-construction funds only for the construction of the house (it may be required that extra funds be made available to highly vulnerable families who cannot secure their daily food requirements and other basic needs)
- Process final approval from local authorities

- Participate in activities to identify, prioritize and implement communal infrastructure (ensure women are consulted and their voices have been heard)
- Provide basic labor for communal infrastructure or assist other families.

ODR is the most empowering and dignified approach for households. In fact, the term “owner” in ODR refers as much to the ownership of the building process as to the ownership of the house. A common misunderstanding about ODR is that the owners will build their houses by themselves. Recent examples show that this is rarely the case because people tend to hire local contractors or laborers for at least part of the work. Thus, the key difference between this approach and agency driven approaches is that contractors and paid laborers are accountable to the homeowner rather than to an external agency that may not be able to provide the intensive supervision and control that homeowners often can.

However, the risks of ODR need to be understood and addressed. ODR requires good oversight and governance, that is, a government capable of establishing and enforcing standards, and some agency (governmental or nongovernmental) to ensure the quality of construction. Where engineered building technologies are being used, or multifamily housing is being rebuilt, using ODR is more challenging, but not impossible. The oversight from supporting agencies or government will need to be more technical. Success of ODR lies in establishing a support system for homeowners appropriate to the local context, which may include:

1. Training of tradespeople and homeowners
2. Technical assistance and construction supervision and inspection
3. Updating and enforcement of building codes and construction guidelines
4. Mechanisms to regulate prices and facilitate access to building materials
5. A system for providing financial assistance in installments as construction progresses

2.2.1 Experiences with ODR

Formally adopted by the state government of Gujarat as its official reconstruction policy following the 2001 earthquake in Gujarat, India. Independent evaluations proved it produced high levels of satisfaction.

Used by the World Bank after the 2004 Indian Ocean tsunami in Thailand and Sri Lanka and after the 2005 North Pakistan earthquake. The Bank funded reconstruction and

therefore was in a position to influence government reconstruction policy. In these cases, both official Bank documents and evaluations carried out by other agencies that pursued this approach confirm that this was the most successful housing assistance strategy

2.2.2 Advantages of Homeowner-Driven Reconstruction

Working directly with homeowners to choose the design and hire and oversee builders is a rewarding process that can result in safer houses and satisfied families. Empowering homeowners, builders, construction professionals, and local governments to drive change is a more cost-effective and lasting solution than building houses for people. By addressing three critical barriers – technology, money, and people – the homeowner-driven development model encourages the growth of an environment in which disaster-resistant construction becomes the common practice.

Families and communities that participate actively in the programme acquire skills that enable them to respond to housing, community infrastructure and other needs in more efficient and effective ways. The most critical benefit of ODHR is that it allows individuals affected by a disaster to decide how to rebuild a critical piece of their lives (IFRCRCS, 2010).

The advantages of Homeowner-driven reconstruction can be listed as below:

1. Increase Safety
 - a. Provide a more complete, structurally integrated solution than a core home or partially built home.
 - b. Result in a disaster-resistant building, if sufficient financing and incentives for following standards are provided.
 - c. Increase the technical capacity of the workforce, including engineers, site supervisors, builders, materials producers, and other construction professionals, if coupled with technical assistance.
2. Increase Homeowner Satisfaction by producing a more satisfied, empowered homeowner.
3. Increase Sustainability.
 - a. Leverage the financial resources of the homeowner. In homeowner-driven reconstruction, homeowners can add in their own financial resources, resulting in a larger and more long-term solution.
 - b. Reuse or recycle materials, reducing the overall cost per house.

- c. Put resources back into the local economy. Homeowners typically buy local materials and hire local labor.
 - d. Stimulate investment in local businesses, which creates jobs.
 - e. Stretch the donor's dollar further by reducing the donor contribution per house.
 - f. Help to preserve community's cultural identity by ensuring continuity in local building tradition and architectural style.
4. Mobilize households to take an active role in rebuilding, which speeds recovery from psychological trauma.
 5. Adjust the assistance to the needs of the households related to income, family size, livelihoods and socio-cultural requirements.
 6. It is viable for dispersed and remote locations.
 7. It is less subject to disruptions caused by unstable political Situations.

2.2.3 Drawbacks to Homeowner-Driven Reconstruction

ODHR programmes are challenged constantly by the risks associated with transferring total or partial responsibility of reconstruction to a family or community. One of the most challenging aspects of conditional cash transfers is ensuring that the money is spent as intended. Families will have other priorities such as food, education, transport, paying debts, business expenses etc. Construction is a highly risky activity and it requires supervision by qualified individuals to ensure quality standards are maintained and regulations followed. It is only through the understanding of the risks and from a process of planning that minimizes those risks that the programme can realize its potential.

Homeowner-driven reconstruction may:

1. Take longer. When the homeowner is driving the process, it is difficult to control the pace of the reconstruction. Thus, homeowner-driven reconstruction requires a patient donor.
2. Result in some unfinished houses. If the financial subsidy and homeowner's funds are not sufficient to complete the house, the homeowner may not finish it during the grant period.
3. Result in some houses that are not disaster-resistant. If the financial subsidy and the homeowner's funds are not sufficient to complete the house in a manner which is disaster-resistant, the homeowner and builder may not produce a disaster-

resistant house. In addition, corruption or lack of will may reduce construction quality.

4. Produce houses that are less attractive for photographs. Homeowners may not choose to finish the house during the course of the grant – they may not plaster or paint the house until further funding is available. Thus, it may be difficult to obtain picture-perfect images of houses for reports and PR materials. (USAID, 2014)

2.3 Researches and Experiences on Owner Driven Reconstruction

Looking at the experiences of post-earthquake reconstruction in Bhuj in India and Bam in Iran, Tafti (2010) in his paper sheds light on the inadequacies of the owner-driven model in housing recovery and their unintended consequences for households. The paper suggests three main arguments based on the ways the owner-driven model has been conceived, formulated, and practiced in post-earthquake housing recovery projects. The first argument is that the owner-driven model should be conceived as one component of a holistic housing recovery programme. The second argument revolves around the shortcomings of the standardized arrangements of the owner-driven model. The last argument identifies practical problems that prevailed in the projects. While acknowledging the advantages of the owner-driven model, the paper concludes by advocating a more holistic, nuanced, and inclusive housing recovery programme in disaster-stricken urban settlements for responding the complexities of housing recovery in urban setting.

Bilau et. al. (2017) in their paper concludes that beneficiary participation is very important for housing reconstruction processes during establishment of standards, skill identification and assessment, workers recruitment, capacity development, supervision, technical monitoring and enforcement and all the other processes. He also mentions the importance of need assessment before implementing reconstruction project.

According to Maly and Shiozaki (2012) people-centered housing recovery requires that residents are empowered to make decisions about their housing reconstruction, and that policies create housing options that support the ability of all residents to reconstruct their homes and lives.

Karunasena (2010) in his paper reveals that beneficiary satisfaction is higher on owner-driven approach compared to the donor-driven approach. Further, imposition of the buffer

zone, non-availability of suitable land and capacity constraints of the construction industry are identified as critical factors affecting the success of donor-driven housing programme.

The model of ODR sponsored by the World Bank and the ICRC, for example, uses cash incentives to encourage homeowners to complete home construction according to government-approved building codes, such that homeowners are rewarded for successfully applying earthquake-resistant technologies to their home construction. Representatives approved by the national government monitor the construction process to ensure that homes are built to code, while homeowners remain in control of the pace of construction, the organization of labor for construction, and, within limits, the home design. In the example of Kashmir and Uttarakhand, vernacular architecture was approved for inclusion in the ODR program, and thus local knowledge was validated rather than replaced during the reconstruction process (Johnson, 2017). Here are few country specific examples on research, study and implementation of ODR.

2.3.1 Example from Sri Lanka

Ratnayake and Raufdeen (2010), in their paper discussed through a questionnaire survey conducted among beneficiaries of Tsunami housing programmes in the Matara District of Sri Lanka. The study found that Owner Driven approach has a number of advantages over Donor Driven approach. Nevertheless, Donor Driven approach cannot be totally dismissed as unsuitable because it has scored very high on some important parameters that are relevant for disaster situations.

Main outcome from their survey is that dwellers in owner driven housing programme is more satisfied than the dwellers in donor driven housing programme. In other word, it can be concluded as that owner driven housing programme is more successful than the donor driven programme concerning the dwellers' view. According to the research, it had been argued that the owner driven housing programme has been in prominent level in term of: Quality / Durability, Space availability, Flexibility to make any changes in the future, Agreeing to change the design as required, Land size, Location, Overall facilities provided (Electricity, Water connection and Sanitary). When looking at these parameters, which are superior in terms of owner driven, have proved that the dweller involvement throughout inception design to construction stage resulted better success in owner driven housing programme than those who were under the donor driven housing programme.

But contrast with the owner driven housing programme that the donor driven housing programme has been more superior in term of; Aesthetics and Functionality. Furthermore, it has identified those two main reasons behind that are, the donor houses have been designed by professional architects and most of the houses in the owner driven programme were half built and occupied with the intention of completing in the future.

Parker, et al. (2004) in their paper evaluates the impact of Practical Action's owner-driven reconstruction project after the 2004 tsunami. They interviewed stakeholders and beneficiaries of the project area across southern and eastern district of Sri-Lanka as part of the end of project report. The survey showed that the majority of the sample population were happy with their reconstructed homes. Walk through survey showed that all the houses were structurally sound.

By evaluating the overall information on the post tsunami housing reconstruction programme in Sri-Lanka, the successfulness of the process as well as the victims' view of two different reconstruction strategies will be helpful to decision makers to get comprehensible idea regarding their applicability and drawbacks on both the programmes.

2.3.2 Example from India

When the State Government of Gujarat, India, following the severe earthquake of January 2001, embarked in its ground-breaking owner-driven reconstruction programme, many professionals, scholars, and NGOs reacted sceptically, arguing that people would not have the capacity to build back disaster resilient houses or that they would spend the money for other purposes.

Another large-scale ODR programme was commenced by the Government of Bihar to support the people affected by the severe floods of 2008 in rebuilding better houses, after a pilot project carried out by the ODR Collaborative in two villages demonstrated that with adequate enabling mechanisms even very poor communities are able to build back good quality houses (ODRC, 2010).

2.3.3 Example from Haiti

In Haiti following the earthquake of January 2010, the reconstruction policy developed by the Interim Haiti Recovery Commission (IHRC, 2010) strongly recommends agencies to

persue an ODR approach and a number of these have already adopted this approach in Supporting urban communities to rebuild their houses.

Build Change had been working in Haiti since the earthquake in 2010 and had since become the leading implementer of homeowner-driven reconstruction, having built more homeowner-driven houses than any other agency.

Build Change had been building permanent new housing and seismically retrofitting existing housing stock in Haiti. Those projects were among the first completed, permanent housing solutions in Haiti after the January 12, 2010 earthquake. More than 1,330 buildings had been retrofitted or built new, enabling 1,580 families, or 8,150 people to live in safer homes.

This approach is described in various resources by Build Change and others; in short, with technical assistance, the homeowner makes decisions about materials and architecture, hires the builder, and procures building materials with funding provided in installments.

Some of the key lessons learned by Build Change in Haiti are as follows:

1. Owner-Driven Approaches Put Money Back in to the Local Economy.
2. The Owner-Driven Approach Can be used for Neighborhood Improvement Projects.
3. Land Ownership Issues Can be Satisfactorily Overcome.

These are powerful lessons, and are applicable to any post-disaster reconstruction program anywhere in the world.

2.3.4 Example from Pakistan

The 7.6-magnitude quake on 8 October 2005 shook three countries – Afghanistan, India and Pakistan – but the great majority of casualties and damage were in Pakistan. The government in Islamabad said more than 73,000 people died and 3.5 million more were made homeless; the country itself was left with a multibillion-dollar reconstruction task (IsDB, 2014). Within days of the quake and with a global relief effort gathering pace, the Pakistani Government set up the Earthquake Reconstruction and Rehabilitation Authority (ERRA) – a federal body under the prime minister’s office charged with planning and coordinating reconstruction (IsDB, 2014).

The owner driven reconstruction of the Pakistan government was one of the successful reconstruction programme. The key to success for the programme was accurate assessment of the damaged house, ownership taken by the government and homeowners, independent monitoring and evaluation by IsDB contractors, involvement of women in reconstruction, capacity building training to local masons, transparency, sustainability (eg. Use of salvaged material), effective communication mechanism and recognition (IsDB, 2014).

Three years after Pakistan's earthquake in 2005, 300,000 homes out of a target of 400,000 homes had been constructed across a disbursed area of earthquake- affected households through a government led Earthquake Reconstruction and Rehabilitation Authority (ERRA) designed using an ODR framework (Jha et al., 2010).

2.4 National Context of Owner Driven Reconstruction

Reconstruction process should be considered as development opportunities and should open the access of different types of innovative solutions. These innovations should lead to vulnerability reduction, and should enhance human and other activities security in long term.

After the successful implementation of homeowner driven reconstruction approach in several countries, Nepal government after huge discussion with donor agencies and countries is now implementing HODR approach to build back safer houses in Nepal. The scenario developed so far from the earthquake till date will be explained under following headings.

2.4.1 Earthquake 2015

On Saturday, 25 April 2015 at 11:56 local time, a 7.6 magnitude earthquake as recorded by Nepal's National Seismological Centre (NSC), struck Barpak, in the historic district of Gorkha, about 76 km northwest of Kathmandu. Nepal had not faced a natural shock of comparable magnitude for over 80 years (NPC, 2015)

The catastrophic earthquake was followed by more than 300 aftershocks greater than magnitude 4.0 (as of 7 June 2015). Four aftershocks were greater than magnitude 6.0, including one measuring 6.8 which struck 17 days after the first big one with the epicenter near Mount Everest. There are over 8,790 casualties and 22,300 injuries. It is estimated that the lives of eight million people, almost one-third of the population of

Nepal, have been impacted by these earthquakes. Thirty-one of the country's 75 districts have been affected, out of which 14 were declared 'crisis-hit' for the purpose of prioritizing rescue and relief operations; another 17 neighboring districts are partially affected (NPC, 2015).

The destruction was widespread covering residential and government buildings, heritage sites, schools, health posts, rural roads, bridges, water supply systems, agricultural land, trekking routes, hydropower plants and sports facilities. Rural areas in the central and western regions were particularly devastated and further isolated due to road damage and obstructions. In the worst hit areas, entire settlements, including popular tourist destinations like Langtang, were swept away by landslides and avalanches triggered by the earthquakes. Due to the weakened, ruptured, and destabilized slopes and surfaces, the vulnerable areas have become more susceptible to flooding and landslides that can occur during the monsoon. Hundreds of historical and cultural monuments at least a century old were either destroyed or extensively damaged. Over half a million houses were destroyed. The damage exposed the weaknesses of houses that did not have any seismic-resistant features or were not in accordance with the building codes. The disaster also highlighted aspects of inequities in Nepali society spanning geography, income and gender. Poorer rural areas have been 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. The time and day of the first earthquake saved thousands of lives. Being a Saturday, the weekly holiday, schools across Nepal were closed on 25 April. The death toll of young people could have been much higher considering that nearly 7,000 schools were completely or significantly damaged. Similarly, if the earthquake had struck at night, and not in the middle of the day, there would certainly have been greater casualties (NPC, 2015). Nearly 500,000 houses were destroyed and more than 250,000 houses were partially damaged in this earthquake.

2.4.2 Emergency Responses

The Government of Nepal (GoN) made an official request for international assistance within hours of the 25 April earthquake. Nepal's National Disaster Response Framework (NDRF) served as a key tool for coordination of earthquake response, facilitating decisions and instructions from the central government. The first meeting of the Central

Disaster Relief Committee (CDRC) was held two hours after the first earthquake, with the National Emergency Operation Centre (NEOC) providing an initial report to the CDRC recommending a focus on Search and Rescue (SAR), and lifesaving actions. Financial resources from the Prime Minister's Disaster Relief Fund were immediately allocated, and the government's Cluster mechanisms, comprising 11 sectors, were instantly activated (NPC, 2015).

Though Nepal did not have an integrated national search and rescue capacity formed prior to the event, the trained human resource of the Nepal Army (NA), Nepal Police (NP) and Armed Police Force (APF) carried out effective SAR, despite several limitations. The Indian National Disaster Response Force (NDRF), Indian Air Force and Indian Army Medical Corps were the first foreign contingents to land in Kathmandu within hours of the disaster to help launch relief operations. Over time, 134 international SAR teams from 34 countries responded to Nepal's request for help. The Ministry of Home Affairs (MoHA) reported that "for SAR, 4,236 helicopter flights were used (GoN/private), with 7,558 persons rescued by air and 4,689 persons rescued by land." More than 90 percent of the security forces were mobilized to focus on SAR. Overall, 22,500 civil servants, 65,059 staff of the Nepal Army, 41,776 staff of Nepal Police and 24,775 staff of the Armed Police Force, as well as 4,000 government and private health workers were mobilized to aid rescue and relief efforts. Emergency relief and humanitarian assistance to the affected population was provided with the active support of and contribution by over 60 countries as well as the United Nations and other international agencies. Fixed wing and rotary aircrafts from friendly countries were engaged in carrying out numerous sorties to bring relief supplies into the country and to distribute them in remote areas. A newly constructed humanitarian staging area at the Tribhuvan International Airport (TIA) facilitated the receipt of cargo by air and by truck immediately after the earthquake so that distribution around the country could commence. A UN flash appeal for support was launched on 29 April 2015 for a sum of US\$ 422 million to meet critical humanitarian needs for the following three months. Till date, US\$ 129.1 million or 31 percent of the appeal has been met. Transit shelters were established immediately in Kathmandu with official support in designated public spaces. However, the supply of non-food items, particularly tarpaulins, proved inadequate as the fear of being trapped drove many families, including those whose houses had not been damaged, to seek temporary shelter in the open. As is typical in disasters, community members particularly youths were

galvanized into action, digging out neighbours from the rubble, and providing whatever assistance they could before the arrival of rescue and relief teams. Local governments were also hamstrung, having been under-staffed for years and working without any elected officials. Many local authorities lost family members and their houses were destroyed as well. Furthermore, the remoteness of several villages in the affected areas, coupled with poor weather, hampered relief operations during the initial days. Many district level offices providing public services were severely damaged or reduced to rubble, as a result of which many officials started functioning out of tents and temporary shelters (NPC, 2015).

The network of NGOs and local affiliates of INGOs based in Nepal swiftly rallied to support community rescue and relief efforts. Several volunteer groups, especially of youth and professionals like doctors and engineers, were active in treating the wounded, setting up temporary shelters, supplying food and attending to vital needs (NPC, 2015).

2.4.3 Donors Meeting

After completion of the rescue and relief operations, another challenge was to build back all the damaged structures stronger than before. After the recommendation from National Planning Commission (NPC), government formed Reconstruction and Rehabilitation Committee led by the Prime Minister to rebuild Nepal over next five years. The NPC was also readying its Post-Disaster Needs Assessment (PDNA) report by 15 June, 2015, which would formed the basis of the government's request for international assistance at the conference.

Government of Nepal Called donors meeting at Kathmandu on 25, June 2015, after completion of the PDNA survey. Donor countries had pledged \$4.4 billion in aid for the recovery bid of Nepal during the conference among which \$ 2.2 billion would be in grant while the remaining \$ 2.2 would be in loan. For this grant and loan India, China and ADB was the largest donor (The Himalayan Times, 2015).

2.4.4 Baseline Survey

After donors' meeting in Kathmandu, several donors committed their support for the reconstruction of Nepal. Before releasing fund for reconstruction donors demanded clear data of the house damaged, guideline to distribute support from the government, minimum criteria for safer design to follow by homeowners. As an initial step of this process Central Bureau of Statistics (CBS) started survey of all the 14 most affected

districts in first phase and 17 moderately affected districts in second phase. During the survey engineers categorize the damaged house in five different categories according to EMS 98 that is grade 1 as minimal effect and grade 5 as completely destroyed.

2.4.5 Agreement with Homeowners

After completion of baseline survey, beneficiaries whose house falls in damage grade category 3, 4 and 5 did project agreement with government and enrolled as government beneficiary. Government also published subsidy distribution guideline. According to this guideline homeowner would receive NRS, 50,000 after doing project agreement with government to begin construction.

2.4.6 Tranche Distribution

After completion of enrollment, government decided to distribute Nrs. 200,000 in three installments which was later increased to Nrs. 300,000 to those houses which fall in grade 3, 4 and 5. According to tranche distribution guideline homeowner receives Nrs, 50,000 after doing project agreement with government. Second installment of Nrs, 150,000 would receive after completion of plinth beam level; third installment of Nrs. 100,000 would receive after completion of roof beam level according to government standards. The homeowner would receive completion certificate from government after full completion of house.

The support provided by the government is subsidy to motivate homeowners to build safer house. But all the management of the reconstruction and management of additional money, material and labor need to be done by homeowner himself. That's why donor and government gave name to this approach as homeowner driven reconstruction approach.

2.4.7 Plan, Policies, Rules, Regulations and Guidelines for Post-Earthquake Reconstruction in Nepal

Government of Nepal, Ministry of Law, Justice and Parliamentary Affairs made an act to provide for reconstruction of the earthquake affected structures in 2015. This act was made by the legislature-parliament set forth in clause (1) of article 296 of the constitution of Nepal. In the preamble of this act, it is mentioned as “ Whereas, it is expedient to make legal provisions on the establishment of an empowered National Reconstruction Authority in order to promptly complete the construction works of the structures damaged due to the devastating earthquake of 25 April 2015 and subsequent aftershocks, in a

sustainable, resilient and planned manner, and to promote national interests and provide social justice by making resettlement and translocation of the persons and families displaced by the earthquake” (GoN, 2015).

In the clause 3 of the act, the terms of the authority is mentioned as five years. If for any reason reconstruction work is not completed within that period, the government of Nepal may either extend the terms of the authority for one year or make necessary arrangements so that another body performs the functions being performed by the authority in accordance with this act. The act gave right to approve policies, plans, budget and programs with schedule of operations as may be required for the reconstruction.

As per clause 5, there shall be a National Reconstruction Advisory Council for the purpose of advising the steering committee on the formulation of reconstruction policies and plans chaired by Prime Minister. As per clause 6, there will be another steering committee to act as the central body of the authority chaired by Prime Minister. There shall be an executive committee to exercise and perform, or clause to be exercised and performed, such functions powers as entrusted to the authority under this act. The chairperson of the executive committee would be chief executive officer, appointed by government.

As per this Act, Government formed separate body called National Reconstruction Authority (NRA) as a leading government body for plan and policy making and implementing reconstruction campaign in Nepal under the Reconstruction and Rehabilitation Committee mentioned above.

National Reconstruction Authority has published and coordinate with other ministries to publish several plans, policies, rules, regulations and guidelines to make reconstruction work faster, effective and smoother, which will be discussed below.

NRA published tranche distribute guideline. According to the guideline beneficiary would receive total of 300,000 rupees in grant in three different tranches. NRA also published another guideline for interest free loan. According to this guideline beneficiary can take additional interest free loan of NRA 300,000 keeping the house under construction as mortgage.

NRA did agreement with Banking Associations of Nepal to ease the process of tranche distribution system through different banks and branches in different districts. Later Nepal Rastra Bank circulates notice to all the banks to help and support in tranche

distribution and loan distribution. NRA also formulated guideline for operation and management of reconstruction funds.

NRA published Private House Reconstruction Technical Inspection Guidelines 2073 focusing engineers who has involved in the inspection and monitoring of the private houses and recommending for second and third tranche. This Guideline includes all the minimum criteria checklist for different typology of houses including forms need to be signed by homeowner government inspectors, VDC and DLPIU.

It was not possible to complete this huge campaign of reconstruction only by government itself. It was necessary to involve all the stakeholders and non-governmental organization in this mission. Feeling this necessity NRA published Procedure Relating to Mobilization of Non-Governmental Organizations for Reconstruction and Rehabilitation, 2016. This procedure opens all the I/NGO to participate in the reconstruction campaign following rules and regulations of the NRA.

To construct this amount of earthquake resistant houses it is really necessary to develop skilled manpower in the community. For this, government decided to provide 7 days refresher training to the existing masons in the community. DUDBC published 7 days curriculum to conduct rural and urban mason training. Also DUDBC published training handling, management and facilitation guideline 2073 to bring all the stakeholders and partners in same pace of training facilitation and management. The guideline assumes that all the PNGOs' conduct training and government will monitor the training (NRA, 2016).

During the enrollment, people whose name wasn't appear as beneficiary could register their grievance. Later NRA published grievance management guideline, according to which there will be grievance management committee at VDC/ward level, district level and at central level. These committee has to resolve those grievance based on their complexity and nature.

NRA also published Land purchase Criteria for earthquake victim 2017. Several settlements in different part of the country possess other hazards like landslide and ground fissures. These kind of settlements need to relocate to new safer area. Considering this fact NRA published a guideline for relocation and rehabilitation of hazard prone settlements 2073. Also government decided to provide additional subsidy of NRS 200,000 for those who don't have any piece of private land and those who have land but place is categorized for resettlement.

Ministry of forest and soil conservation published guideline on production, import and management of timber for earthquake affected people. According to this guideline, each household can receive 25 cubic feet of timber from district forest office in 90% subsidy (MOFSC, 2015).

DUDBC also published two different design catalogue to introduce earthquake resistant building to the community. Both the catalogue includes 17 different design by each.

NRA published correction and exception manual targeting the houses which couldn't meet the minimum criteria mentioned in the inspection guidelines. The main objective of this manual is to provide solution to those houses which are not receiving tranches because of small deficiency in the building. It also proves that NRA wants to distribute tranche to as much populations as possible becoming flexible (NRA 2017).

The inspection guideline clearly stated that for the buildings with stone masonry in mud mortar, the number of story is restricted to only one story if wooden band is used, whereas if RC band is used, allowable number of story is one story plus attic, based on structural analysis.

Nevertheless, the people tend to construct two story building to meet their living functional requirement. Hence, they have started to build a light weight structure such as timber or steel with CGI sheet wall and roof, above masonry building. And one other reason is they have experience of risk of masonry in higher position in the wall. Hybrid structure is huge demand in the reconstruction field.

People have built the upper story mostly timber frame structure with the available knowledge and local materials. Hence in order to ensure the safety of these building against wind load and earthquake load, NRA published construction guideline of hybrid structure with proper connection details and standards of hybrid structures (NRA 2017).

Most of the houses which fall in the damage grade category 3 are still standing and are not necessary to demolish and reconstruct if we could strengthen them as it is, which is called retrofitting. Retrofitting is cheaper than new construction and people could get larger spaces than new construction at same price including sentimental value with their old houses. NRA published repair and retrofitting manual for adobe, masonry and RCC structures and also published guideline to provide NRA 100,000 grants in two different tranches to those beneficiaries who wants to retrofit their houses. In the first phase

government has identified 25,000 beneficiaries eligible for retrofit in 31 districts (NRA, 2017).

Based on the right provided by the Act mentioned above government of Nepal, National Reconstruction Authority published and applied few other rules, framework and guidelines. Some of these are 'Earthquake Affected Structure Reconstruction Rules 2072', 'Post disaster recovery framework 2015', 'Guideline to land acquisition for earthquake affected structures reconstruction 2072', 'Guideline to land registration 2072', 'Guideline to make available forest land for relocation 2071' etc.

2.4.8 Owner-Driven Reconstruction

In the aftermath of natural disasters, homeowners face immense challenges to rebuild damaged homes and livelihoods. Over the last two decades, centralized donor- driven reconstruction programs that standardize home design and construction for large- scale implementation through contractors have been demonstrated to result in delayed home occupation and low homeowner satisfaction (Johnson, 2017). Increasingly, Owner Driven Reconstruction (ODR) is identified as a dignified approach encouraging individual homeowners to implement safe building design and construction in natural disaster affected areas. ODR programs have implemented in post- earth quake Pakistan and Gujarat, as well as in post-tsunami Sri Lanka and Thailand. Given the high number homes to be rebuilt and the scattered nature of earthquake- affected settlements, an ODR approach has been used for reconstruction in Nepal.

Since 1994, the Nepal Building Code 203 has provided guidelines for building safe low masonry construction homes sourced from local materials such as stone, earth, bamboo, and timber. While the Building Code was mandatory for government buildings constructed after 1994, and for all low masonry residential homes built in urban areas and municipalities, it was only a recommendation for building construction in rural Nepal. ODR program can help ensure that the building code is implemented in all permanent homes constructed through the program, expanding the reach of seismically safe construction practices throughout Nepal's rural areas and preparing Nepali households for the inevitable next disaster (Johnson, 2017).

2.4.9 Current Situations and Issues

NRA established Central Level Project Implementation Unit (CLPIU), a right hand mechanism in four ministry; Ministry of Urban Development (MOUD), Ministry of

Federal Affairs and Local Development (MOFALD), Ministry of Education (MOE) and Ministry of Culture, Tourism and Civil Aviation. These ministries will lead the reconstruction of the Nepal in coordination with NRA (NRA, 2016).

It is already three years of earthquake in April 2015. The total beneficiaries of 31 districts including the added beneficiary after resolving grievance are 767,705. Among these number, 93% beneficiary enrolled as government beneficiary, 91% beneficiary received first tranche, 40% people received second tranche and 10% people received third tranche (HRRP, 2018).

Because of slow pace of the construction, NRA fixed deadline to receive all the tranches this fiscal year. According to this decision all the beneficiaries need to complete and receive all the tranches before Ashad 2075. From the progress report of NRA which seems impossible to meet (NRA, 2017).

2.5 Summary of the Review

Few experts including Dr. Gobinda Pokhrel, former vice Chairman of National Planning Commission and Executive Director of NRA argued that owners driven reconstruction may not work in our situation. We are ignoring private sector in this reconstruction campaign. Our social structure is different than other countries. Most of the youngsters are in foreign country. There are only women, children and elder people in the community. There is lack of labor and masons. Young people wants security in their job throughout the year. Hence reconstruction only through owner-driven approach may not be successful in Nepal (Pokhrel, 2016).

Hence we need to analyze the relevancy and significance of owner driven reconstruction approach in Nepalese context. Another big question is when government should stop reconstruction campaign, should it lasted as people wanted or need to stop after five years as mandate received by NRA.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Research Design

This study was carried out mostly on the basis of exploratory research design as because the study focused on challenges and opportunities of homeowner driven reconstruction approaches in terms of policy perspectives and local perspectives. The study explored and tries to cover all the aspects of housing reconstruction and its role for the rural development in the study area.

Besides, the study made an attempt to describe the things that can affect the housing reconstruction, such as lifestyle of the community, availability and type of labor, literacy level, age factor, family size, income source, expenditure priority, house typology before and after earthquake, availability of local resources and level of technical assistance provided by NGOs and government. Thus, this study is both descriptive and exploratory.

3.2 Rationale of the Selection of the Study Area

We had great opportunity to totally change the current scenario of our villages without disturbing their ancient importance. It is really necessary to access our current reconstruction approach, whether we are on the way to grab this disaster as an opportunity or not. The particular area was chosen for the study because it is homogeneous in socio-economic, cultural, and geographical structure and community represents the scenario of other rural area of Nepal.

The study area is located southern part of Dolakha District. These villages were highly damaged during the earthquake and people are eager to reconstruct their house. All the Villages lie in the Melung Rural Municipality according to new government structure.

Ghyang Sukathokar Village borders Sailungeswor to the north and it is considered a religiously important area. It has a population of about 4,200 and after the earthquake 1,276 houses were classified as damaged. In the new system, the village has been split into two wards, 2 and 3 of Melung Rural Municipality.

Bhedapu village has a population of 3,705 with the earthquake damaging 1,171 homes. 1 ½ storey dry-stone construction was more prevalent in this VDC. In the new system the village is ward 4 of Melung Rural Municipality.

Melung village has a population of around 3,500 and is the southernmost village on the west side of the river. The total number of damaged houses after the earthquake was 1,020. In the new system the village (previous Melung VDC) has been split into the few parts of ward 6 and ward 7 of Melung Rural Municipality.

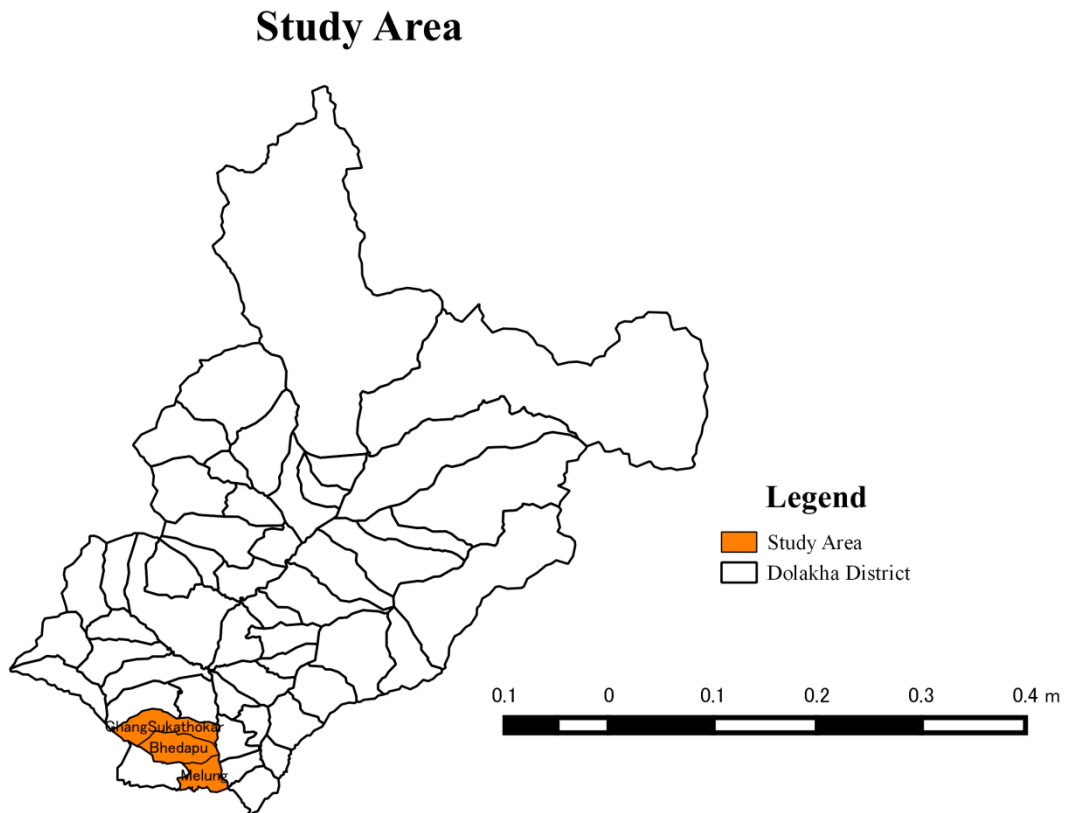


Figure 3.1: Working Area

3.3 Nature and Sources of Data

This study has been conducted in order to explore the challenges and opportunities of homeowner driven reconstruction approach in three villages from different data. Basically primary data was collected from the households of the study area, whereas secondary data was collected from published and non-published written documents from individuals, experts, and organization related to the Nepal Housing Reconstruction Project. Where-as data collected was both in qualitative and quantitative nature as needed. Qualitative data like photos, observation and interview was collected and Quantitative data like number of ongoing and completed houses, Masons, social status related data etc. was also collected.

3.4 Sampling Procedure

The universe of the study was the households of Melung, Ghyangsukathokar and Bhedapu villages of Melung Rural Municipality in Dolakha district. First the sample household was selected by random sampling. The selected sample HH was proportionally distributed in three villages of Melung, Ghyang Sukathokar and Bhedapu. Whereas in case of collecting information from local NGO workers, accidental sampling was followed. There are total 3469 households in three village sand 3093 are beneficiary of Nepal Housing Reconstruction Project. Household under construction and completed was chosen as major sample for the study using quota sampling procedures. Beside those household not starting reconstruction was taken as sample using random sampling procedure. Other information was collected from key informants like social worker, representative of NRA and DLPIU, political leaders and local bodies.

Assuming the 95% confidence level and 5% margin of error the sample size has selected which will be around 11% of the total households which will be 342 HH. This sample has distributed to Bhedapu, Ghyang Sukathokar and Melung villages as 127, 123 and 92 respectively. Following formula provided by Survey Monkey is used to calculate the sample size.

$$Sample\ Size = \frac{\frac{z^2 * p(1 - p)}{e^2}}{1 + \left(\frac{z^2 * p(1 - p)}{e^2 N}\right)}$$

Where,

z= Z score of the population at Confidence Level 95% (1.96)

p= Proportion of the population (0.5)

e= Margin of error or desired level precision (0.05)

N= Population Size (3093)

3.5 Data Collection Techniques

In order to meet the objective of this study both primary and secondary data was collected as a following techniques.

3.5.1 Household Survey

To generate accurate and realistic data structured questionnaire has been prepared and asked with local people. This questionnaire was used to find the current challenges faced by the people during the process of reconstruction and status of their construction.

3.5.2 Key Informant Interview

The key informant interview was carried out with the representatives of NRA and DLPIU, government engineers assigned in the Rural Municipalities and wards and local elected bodies. The challenges faced by the local people in key informants perspectives was understood to cross check the result of HH survey.

3.5.3 Observation

During the research period different reconstruction components like status of construction, number of ongoing construction, and status of temporary shelter, completed houses was observed. Basically natural resources, house typology, mason's skills and availability of the local people of the study area will be observed to cross check the results obtained from HH survey and key informants survey.

3.5.4 Review of Government Documents

The plans, policies, guidelines and procedures of the governments has been reviewed thoroughly and compared with field observation and analysis of HH survey to find out the gap between government procedure and local scenario.

3.6 Method of Data Analysis

Bothe the qualitative and quantitative data collected from the field was compared and grouped. After comparing and verifying all types of data conclusions were made.

3.7 Limitation of the Study

This present study is based on and limited to the people of Melung, Ghyangsukathokar and Bhedapu village of Dolakha district. The study is very specific like that of case studies. So, the conclusion drawn from the study might not be conclusive for other villages and part of the country. The conclusion might not be generalized for the whole reconstruction project. But the interferences might be valid to some extent to those areas, which have similar geographic, socio-economic and environmental settings.

CHAPTER 4: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Socio Demographic Characteristics

Dolakha district lies 130km east of Kathmandu, Solukhumbu District and Ramechhap District in the east; Ramechhap and Sindhupalchok District in the south, Sindhupalchowk District in the west; and Tibet in the north. The district covers a large area of over 2000 km², has a population of approximately 200,000 and its headquarters are in Bhimeshwar municipality. Dolakha is a district with a strong religious affiliation and has Buddhist, Hindu and Christian. Agriculture is the main employment.

Table 4.1: Basic Information collected from Secondary Data.

S. N.	Villages	Ward of RM	Population	Total Damaged House	Population below Poverty Line
1	Bhedapu	4	3705	1171	1282
2	Ghyang Sukathokar	2,3	4230	1278	1464
3	Melung	6,7	3566	1020	1234

There are very few roads within the villages and therefore access to communities was somewhat limited to those settlements near the single dirt track. Whilst the track is of adequate standard, getting to the villages is very time consuming as there is only one access point onto each of the side tracks from the semi-tarmacked road in the valley.

4.1.1 Population Structure

The population for this study is total beneficiary of Nepal Government for Housing Reconstruction Project from 2, 3, 4, 6 and 7 ward of Melung Rural Municipality of Dolakha District. There is altogether 3093 beneficiary and sample was proportionally distributed among three zones. Following Table shows the population and sample size selected according to zones;

Table 4.2: Total Beneficiary of NHRP and Sample Size Selection.

S. N.	Previous VDC	Ward of RM	Total Beneficiary	Sample Size
1	Bhedapu	4	1148	127
2	Ghyang Sukathokar	2,3	1116	123
3	Melung	6	829	92
Total			3093	342

Following Figure shows the distribution of population and sample across three villages:

Population Distribution Across Working Area

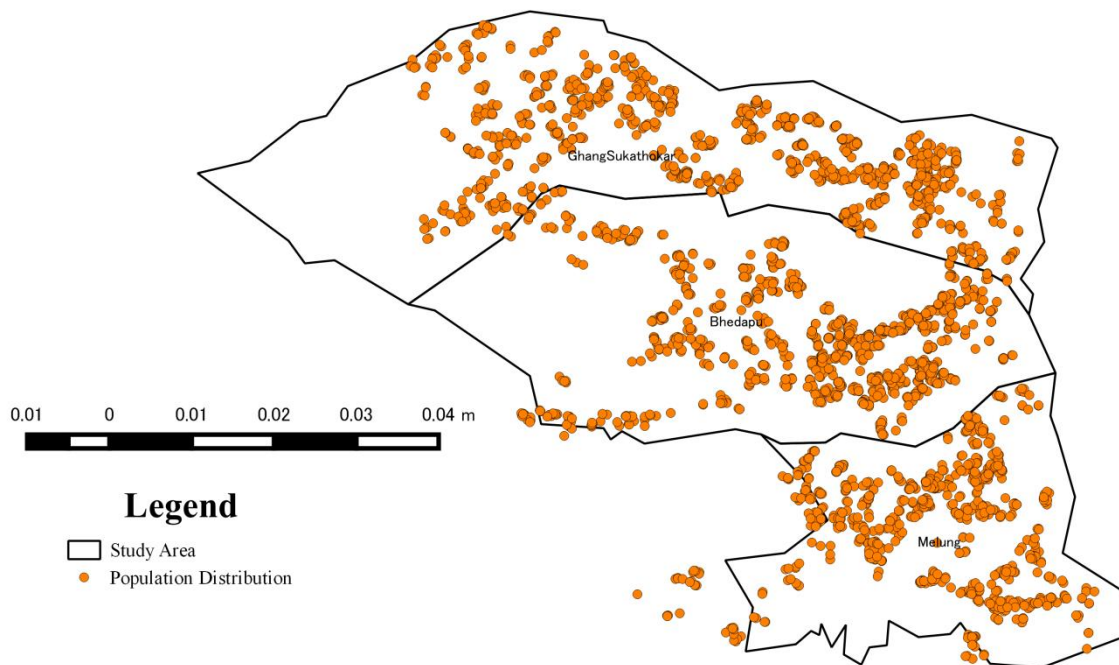


Figure 4.1: Distribution of population Across the Study Area.

Sample Distribution Across Study Area

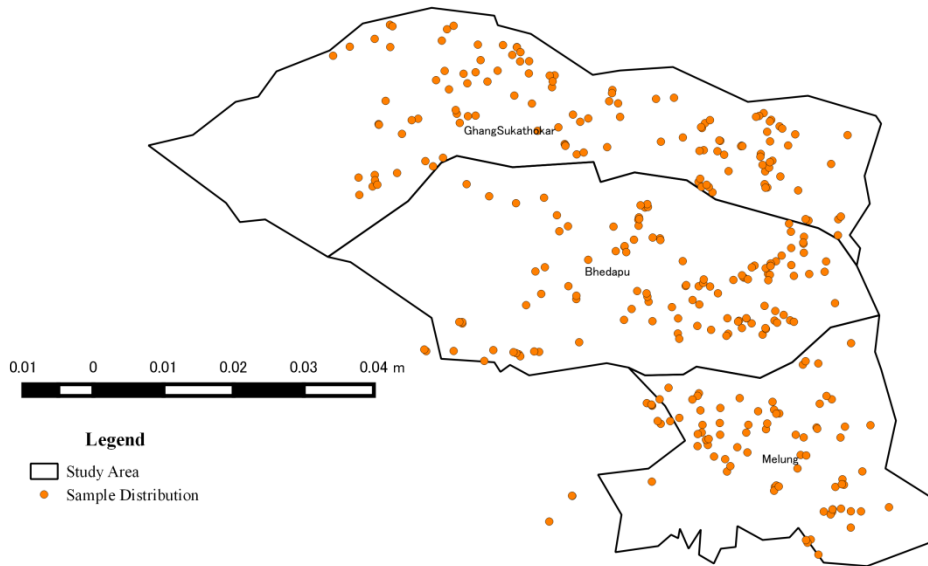


Figure 4.2: Distribution of Sample across Study Area.

4.1.2 Gender of Respondents

During the study, respondents were both male and female, questionnaire were asked to respondents randomly without pre mind-set whether to ask for male or female. So the findings of the respondent’s gender are presented in following table.

Table 4.3: Respondents by Sex

Gender	No. of respondents	Percentage
Male	237	69
Female	105	31
Total	342	100

Source: Field survey, 2018

From the above table it can be understood that among the total respondents 237 were male and 105 were female who were chosen as sample for collecting information to fulfill the primary data needed for the study.

4.1.3 Educational Status of the Respondents

Education is the key for the success of any kind of project and programs. It is the cornerstone of the development also. Higher the level of the education means better will be the opportunities and better knowledge in disaster resilience. The education level of the local respondents has been listed on the following table;

Table 4.4: Educational Status of the Respondents.

Levels	No. of Respondents	Percentage
Illiterate	246	72
Literate	50	15
Above SLC	46	13
Total	342	100

Source: Field Survey, 2018

From the above tabulated data it can be said that 72% of respondents were illiterate.

4.1.4 Age wise Distribution of the Respondents

During the study questions were asked to head of the households to gather as much information as possible. The sampled respondents are separated here below in four different categories i.e. below 30, 31-45, 46-60 and above 61, which is presented in figure below.

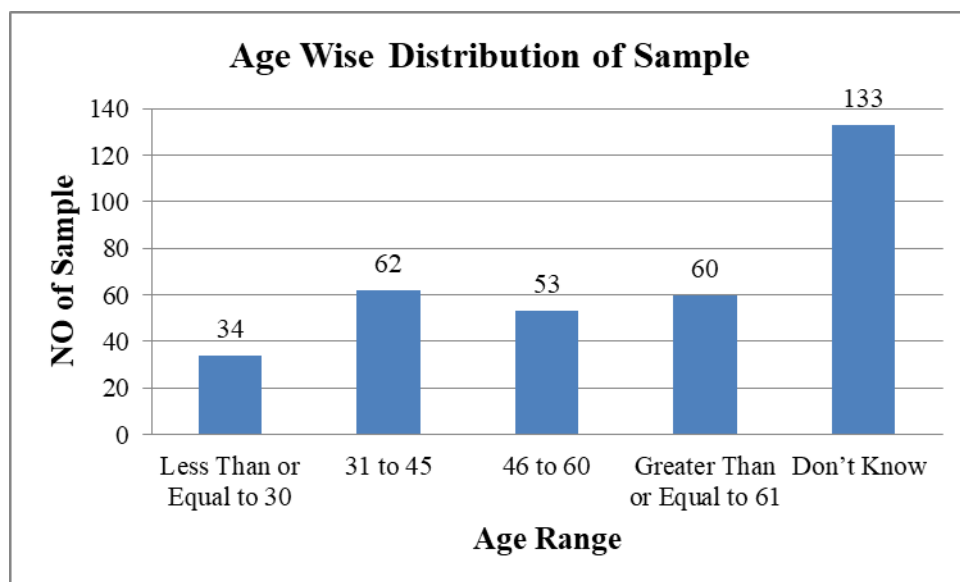


Figure 4.3: Age Wise Distribution of the Sample.

Source: Field Survey, 2018

According to above table majority of the head of the households seems above the age of 30. Most of the people couldn't give the answer about the age of their household head, which means we can easily predict that household head is elder enough.

4.1.5 Ethnicity wise Distribution of Respondents

This area is mostly dominated by Chhetri and Janajati and community. So following Figure is presented to see the caste distribution of the respondents. Among Janajati Majority are Magar.

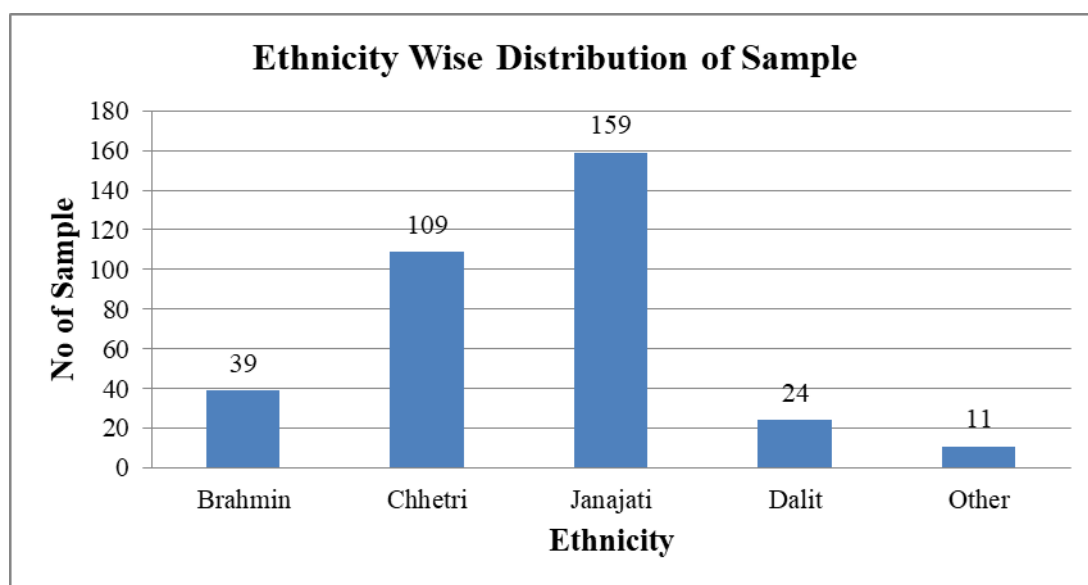


Figure 4.4: Ethnicity Wise Distribution of Respondents.

4.1.6 Family Size of the Respondents

The following table shows the family size of the respondents. Size of the family also represents the availability of labor force for reconstruction works.

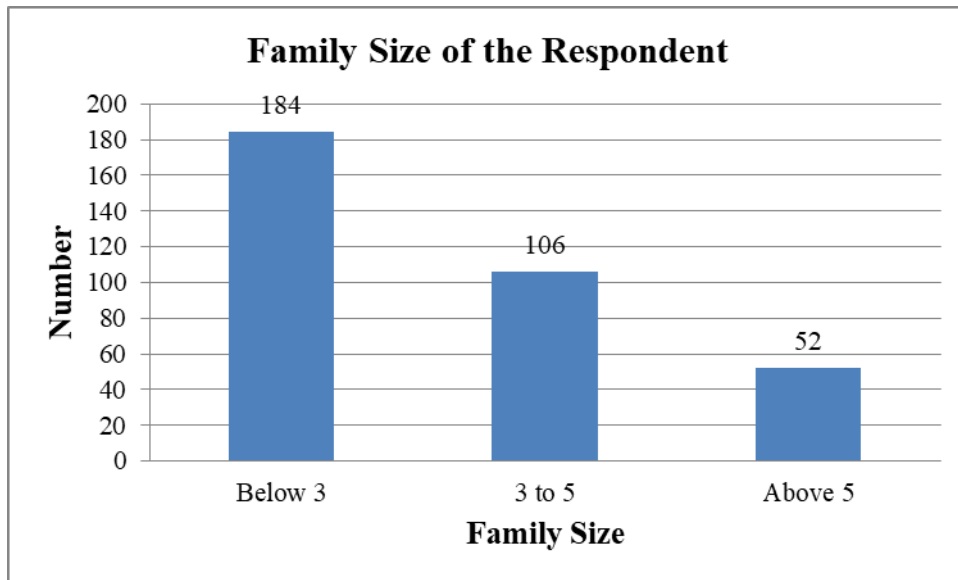


Figure 4.5: Family Size of the Respondents.

From Above Figure we can conclude that more than 50% people need to totally depend on other for masons and other labor work to construct their house.

4.1.7 Major Occupation of the Respondents

Most of the people of the study area were involved in agriculture beside some of them are found to be engaged in different other sector as well. From the sampled population they were distributed in following tables on the basis of their involvement in different occupation. Most of the people don't have regular income Source.

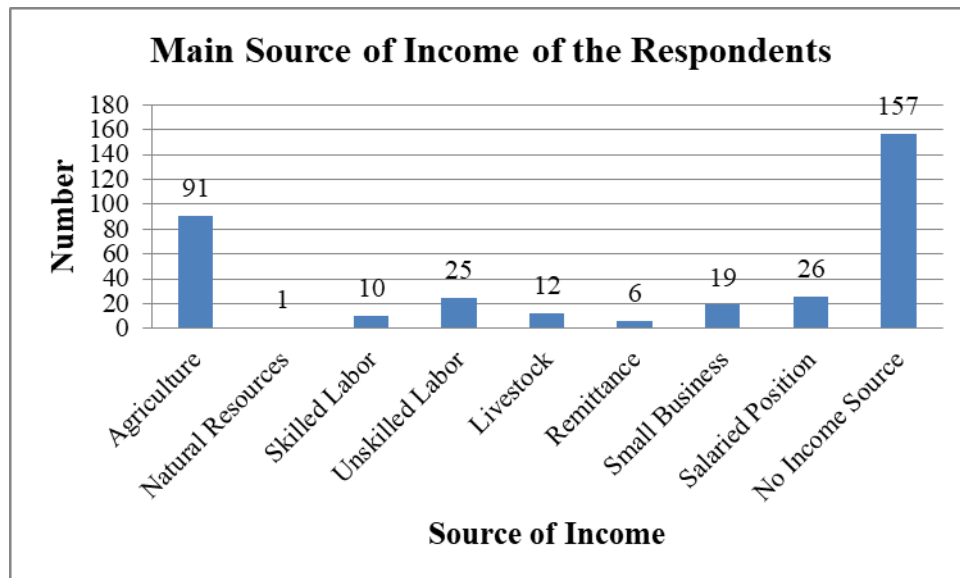


Figure 4.6: Main Source of Income of Respondents.

4.2 Reconstruction Status in the Study Area

Throughout the area visited, housing is often found in clusters with buildings spaced a relatively good distance apart. The existing houses are mostly 2 ½ storey buildings with the first floor used for livestock, the second for living and the attic for storage. The buildings are constructed from stone masonry with mud mortar (SMM) and typically have a heavy tiled roof on timber trusses. The gable wall is often also made of bricks or stones.

1 ½ storey dry-stone houses are another traditional form of construction in this region and were observed across the villages although to a lesser extent. Reinforced concrete construction is gaining a greater presence within the area due to the reconstruction and communities' perception.

Building damage varied significantly both across the villages and within each one. However, the overall level of damage was lower than expected and often constituted small cracking in a wall or partial collapse of a gable wall. For this reason, retrofitting should be considered as a suitable option particularly in Bhedapu and Ghyang Sukathokar.

4.2.1 Number of House under Construction

All the data from the field were collected in second half of the February 2018. Following figure shows the construction based on the data collected at that time.

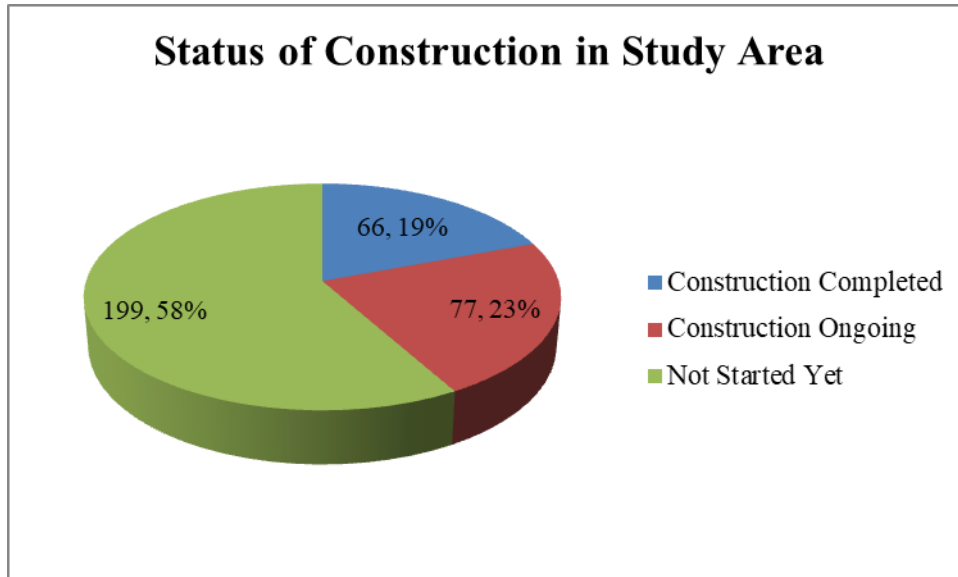


Figure 4.7: Status of Construction in Study Area.

From the survey it is found that only 19% people have completed their house, 23% building and 58% hasn't started construction yet.

Among the people who have already started construction following figure shows the stages of construction.

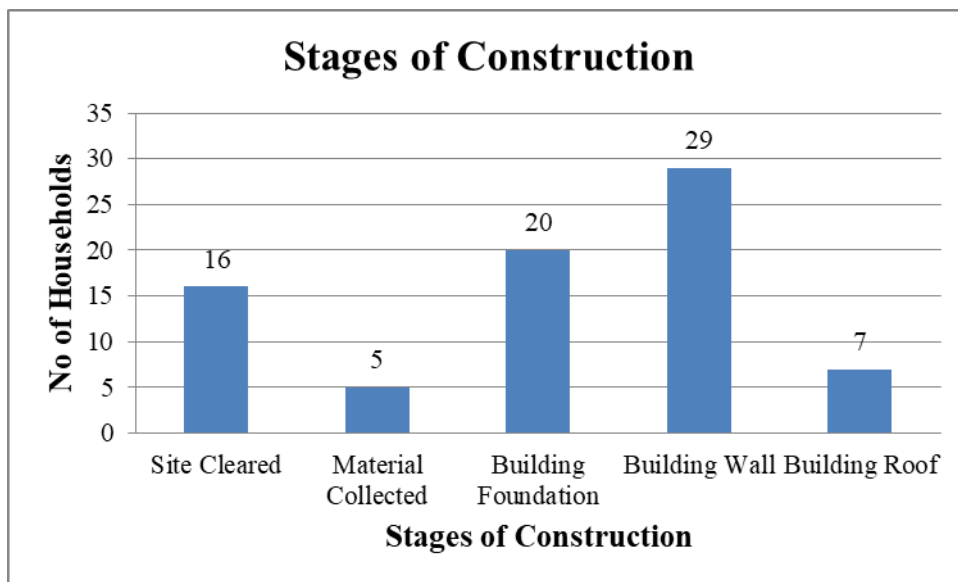


Figure 4.8: Stages of Construction.

Among the people who haven't started construction 114 people have not done project agreement with government of Nepal. While asked about the reason of not doing agreement majority of people answer that house hasn't assessed by engineer yet, few are rejected, few people don't have land certificate and other documents.

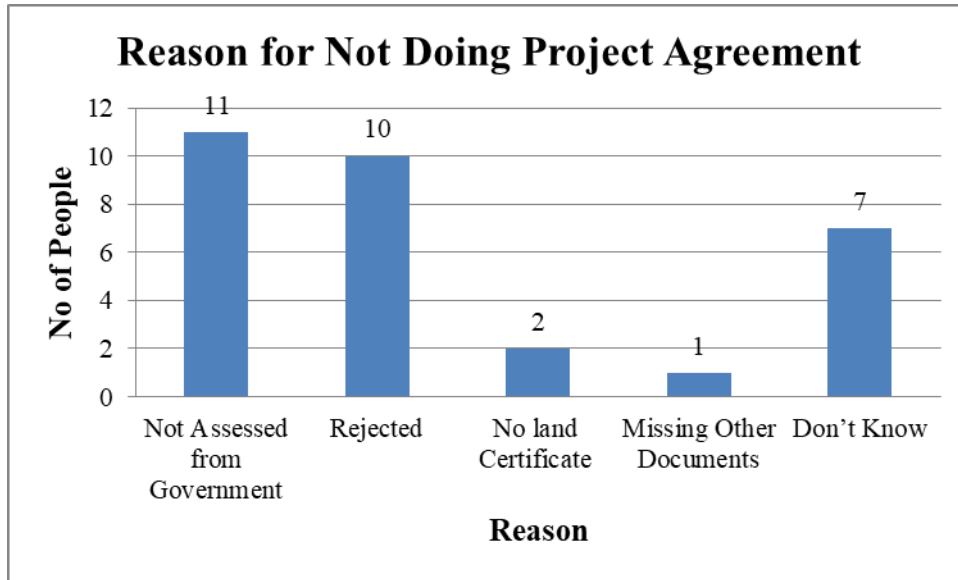


Figure 4.9: Reason of not doing Project Agreement with Government.

Among 342 beneficiary 206 people has already received first tranche, 65 has received second and 57 people has received third tranche.

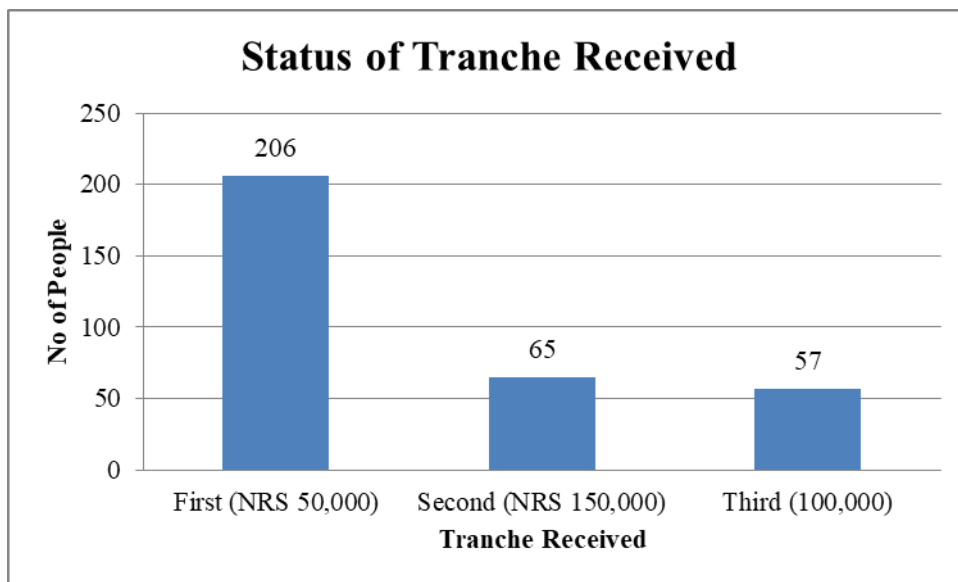


Figure 4.10: Status of Tranche Received.

While comparing the sample data with national data as of 18th February, 2018 accessed from Housing Reconstruction and Recovery Platform (HRRP). The Progress in study area is less than in the national average except in third tranche received.

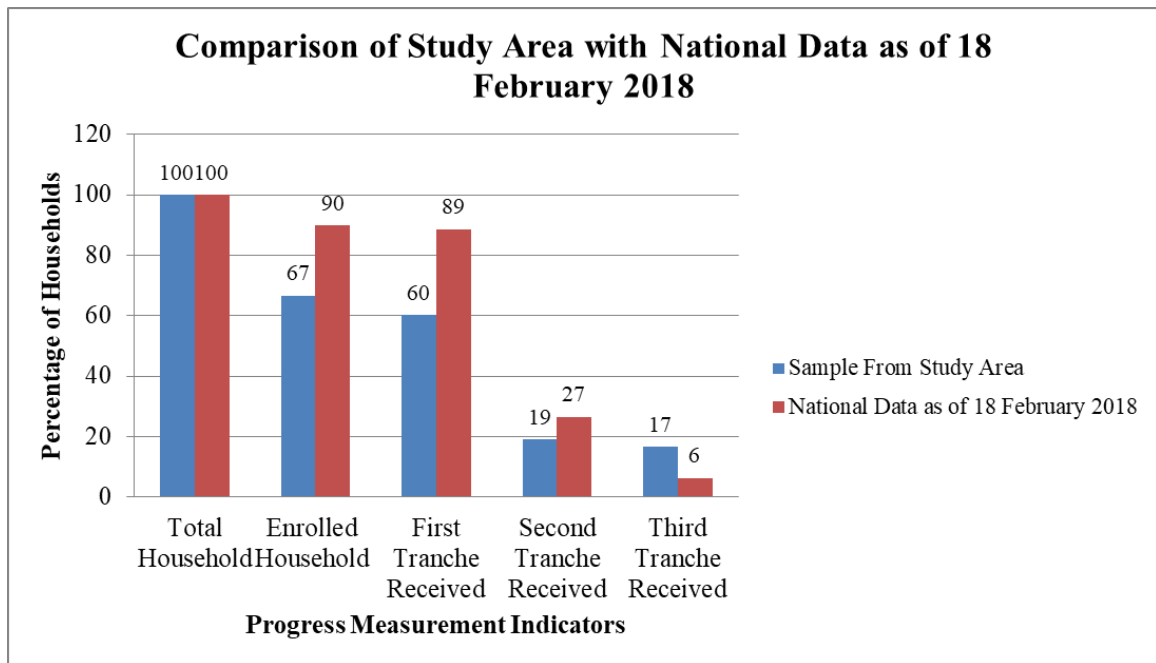


Figure 4.11: Comparison of Study Area with National Data as of 18 February 2018.

There are 149 households who have already received first tranche from the government but haven't completed their house. These people have already spent money in construction related or non-construction related fields. While asking about the remaining amount of money from first tranche majority of people has already spend it.

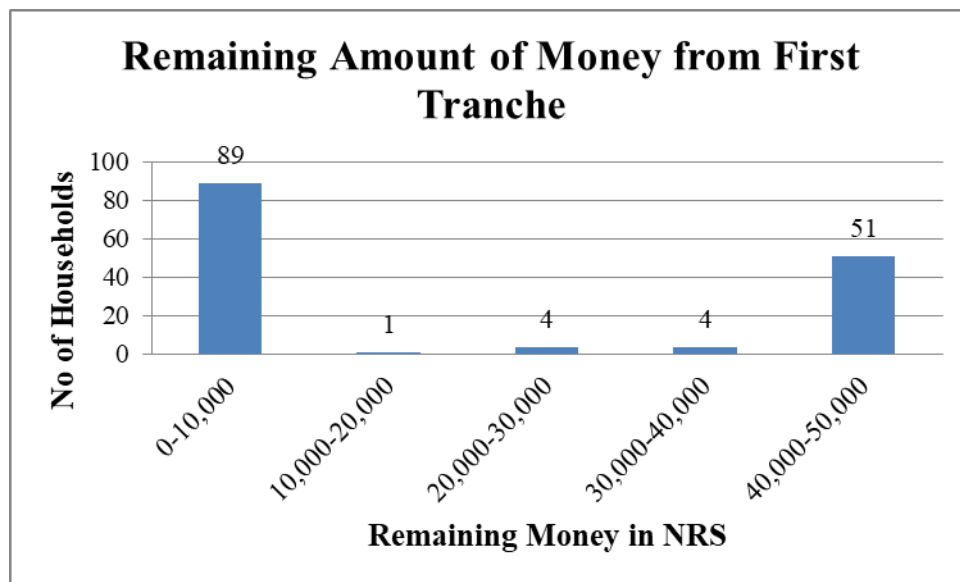


Figure 4.12: Remaining Amount of Money from First Tranche.

From the figure it can be seen that majority of people (60%) has already spend money and 34% hasn't. While asking about the field of money spend majority of people (72%)

responded it was spend on house reconstruction. However other people spend in their other priority majority is food.

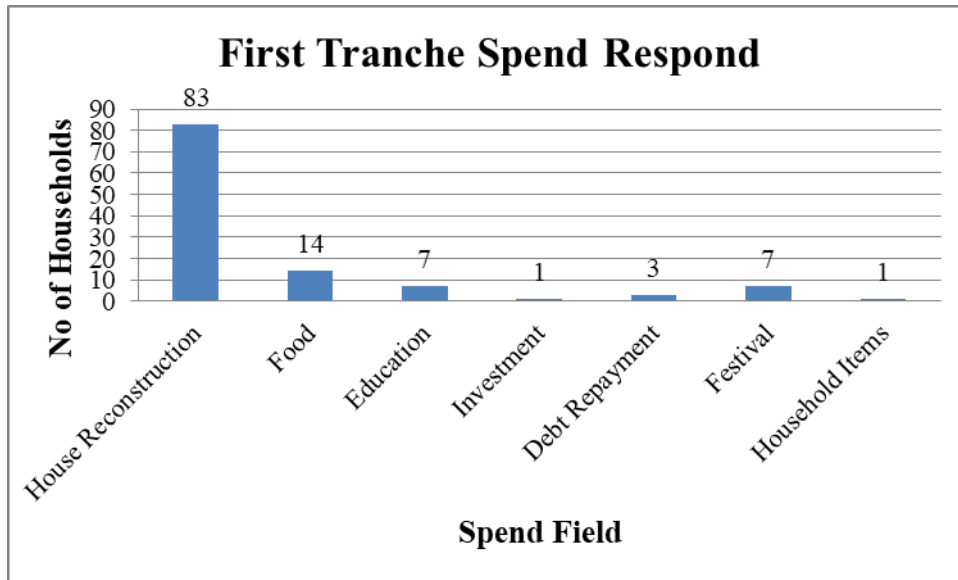


Figure 4.13: Beneficiaries report on their spent of first tranche.

From the Above discussion we can summarize the overall progress of the sample population as follows.

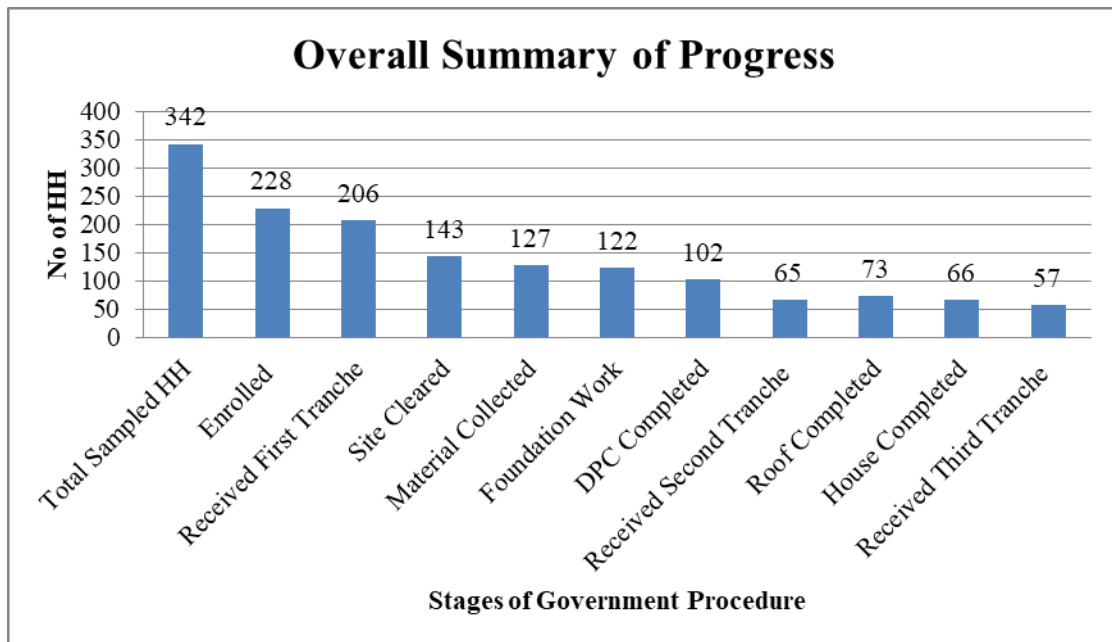


Figure 4.14: Overall Summaries of the Sampled Population.

4.2.2 Typology of House Chosen

Most of the people from study area choose the stone as construction unit rather than brick and RCC. It can be clearly seen from the observation that stone is readily available in this

area and also available from the damaged house. Following figure shows the choice of people for house typology.

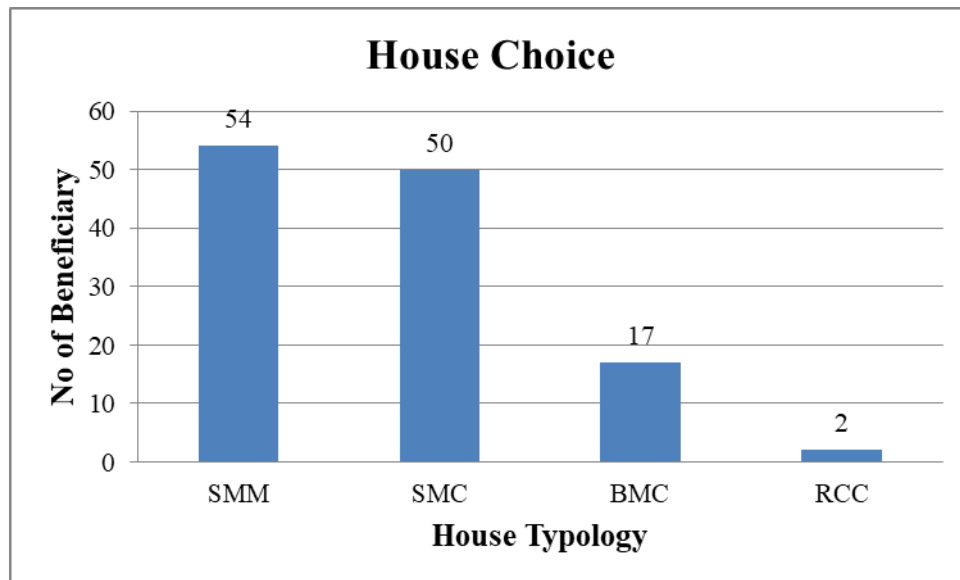


Figure 4.15: Typology of house chosen by Sample HH.

4.2.3 Availability of Salvage Material

It was seen from field observation that, most of the people have salvage material to use for the new construction. Major salvage materials seen in the study area are stone and wood. There are also roofing materials from previous house and CGI sheet received during emergency responses.

4.2.4 Availability of Manpower

From Figure 4.5 it can be seen that the available manpower for reconstruction in each house is less. Most of the people are in foreign country and outside of the village for job. Majority of households has smaller family size available for construction.

It was seen that trained masons are not available in the village. Very few masons received training but are working outside of the village. After receiving training they demand high wage which is another conflict in the village.

4.2.5 Presence I/NGO

In the study area it was found that there is no any I/NGO present till date. The area is remote from the main market and most of the I/NGOs are concentrated in accessible area of the district. From Next month United Nations Office for Project Support (UNOPS) is

going to implement Vulnerable Family Assisting and Targeting Programme with the concept of Leave No One Behind.

4.2.6 Availability GON Engineer

Government has planned to deploy engineer, overseer and sub-overseer in all the earthquake affected districts in the ration of 1 technician equal to 500 HH. This ration is not enough if there is large number of construction ongoing simultaneously. Still government is unable to fulfill this plan. There is always conflict between the engineers in the field and DUDBC/NRA regarding the facilities. In the study area it is seen that the technical assistance through government engineer is not sufficient.

4.2.7 Access to Drawing and Design

People are totally depending on the Ward Office and Rural Municipality Office for design and drawing. The major drawbacks of this are they will have only access to the design available in the catalogue of the government. It was found that few people still believe that they are only allow to build house according to the design published in the catalogue which is not true. From this we can conclude that they have access to very limited number of designs.

4.2.8 Access to Construction Materials

People depend on the community forest for wood and other natural resources. They follow “turn by turn basis resource use” especially for the timber required for reconstruction.

The study area is not in a very bad situation regarding the local material availability like stone, aggregate and sand. They can be found in local area and in the nearest river.

However, another problem is the transportation of the hardware material. The road is earthen which is worst in rainy season but okay in other season.

4.2.9 Earthquake prone Opportunities

The people who have completed their house seems satisfied, however there are few people constructed single roomed house just to consume the tranche provided by the government.

The people who have constructed their house are safer. If we look into the life of the house and life value of the human, the investment in the house or investment per year will be very less.

In terms of sustainable and resilience community government hasn't focused on long term. Government is just focusing on the number of houses which has received tranche. Local people's participation and strong community to deal with future disaster should be another target along with construction. Any kind of preparedness committee hasn't found in the study area. Nobody has participated in the earthquake drill and simulation. Cultural identity hasn't maintained in the current reconstruction campaign, because governments policy forcing people to live in box type of house even if people don't want. We also lagged to construct basic facilities like WASH, road, park and open spaces along with construction of house. We also lagged to integrate livelihood activities to strengthen community's economy.

4.2.10 Gap between Plan policies and field level implementation

For any kind of post-earthquake reconstruction program to be successful three major elements need to be balanced which are money, manpower and technology.

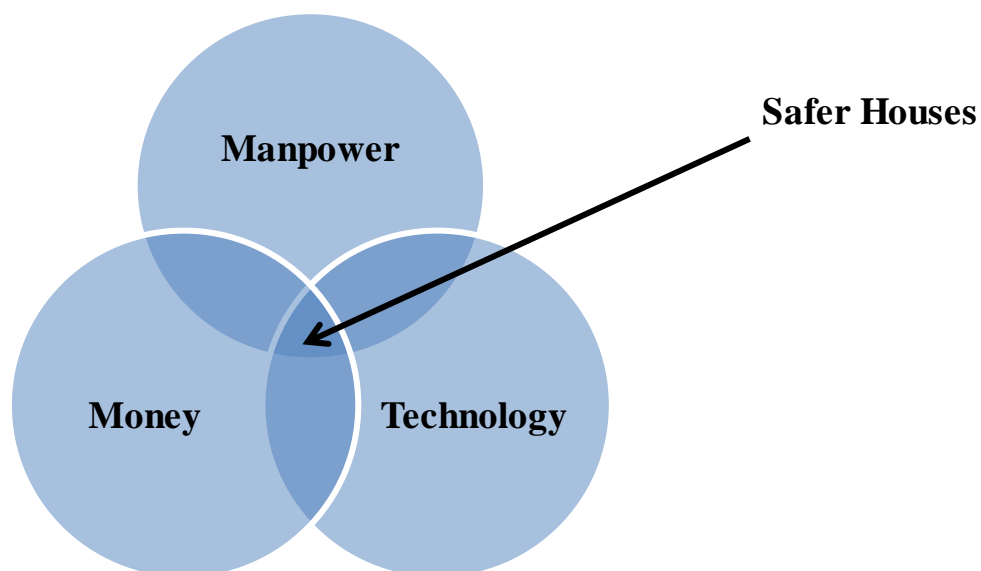


Figure 4.16: Major Elements need to Consider for Safer Houses.

The main aim of the reconstruction projects should be to maintain balance between these three elements and increase the intersection of these circles that is “Safer Houses”.

From the reviews of several plans, policies and regulations of government the gap between plan and field level implementation is tries to identified under following points:

1. Government has announced the deadline to receive last tranche in June 15, 2018. Government is forcing people to build faster whatever the quality of the construction is. Because of this deadline people are building just to receive money. In most of the places people are building one roomed house and putting livestock and fodder in it.
2. Government is only counting number as the progress not the quality of the construction and their satisfaction. Our policy becomes donor oriented rather than people oriented.
3. Government is not accessing the people's capacity to build. The tranche from government is not sufficient to build house. People wants to build larger house but don't have enough money, so it takes time to collect some money to become ready to build house.
4. The economy of the most of the villages of rural Nepal based on the remittance. People are in foreign countries and in other district for employment. In the village there are only elders, children and women. Our policy hasn't considered these factors of the deficit of the manpower in the villages.
5. Another deficit is technical manpower. Government in not successful to deploy the enough technical manpower in the community. The plan was to deploy one technician per 500 households which was never met. Government couldn't attract and motivate technical manpower in this reconstruction campaign. There are frequent conflict among technicians and government agencies which stopped the work several days in the past.
6. The government has formulated the syllables of the mason training. The mason training is not sufficient in the villages. The major problem is unavailability of the young people to participate in the training. Even if they participate they started to seek better and attractive job in cities like Kathmandu. Unless effective involvement and training of the women this masons problem never going to be solved.
7. The cheapest design published by the government costs itself 600,000 rupees. There are several ways to reduce the cost per house but people are not aware of that. The mobilization and awareness seems weak here. Also the government

couldn't publish and distribute friendly design to beneficiary. Among those 17 drawings hardly 4/5 designs are being used now. In the study area also majority of the people don't have regular income source (Figure 4.6). It means either they need to build box type smallest house in 300,000 or they need to wait until enough saving.

8. Talking about the awareness again, this is the most lagging part ever seen in the earthquake affected areas. There is no dedicated social mobilizer from government side to deal with reconstruction. The information received by people is through local ward offices and local political leaders. Most of the people still not clear about the process of asking technical assistance and to process for tranches. Inter-Agency Common Feedback Project (2017) also identifies that several people still believes that they are only allow to build house only according to the 17 design published by the government which is not true, but this is due to the lack of awareness.
9. All these kind of pressure and deadline from government side forcing people to build small box type house just to utilize and receive government tranches.
10. There are two types of loan provision from government, which is only in the documents and plans. The processing of the loan is not clear. Similar case is for the subsidy in timber. Government has documented that earthquake affected people will receive 25 ft³ wood from district forest office in 90% subsidy. This process is also not clear.
11. The general scenario of understanding of people has totally changed after the earthquake. In earthquake almost all the SMM house damaged but RCC stays as it is with minimum damages even if it was not according to the National Building Code. Then people started to think RCC buildings are stronger than the any other types of house. Government and PNGOs are unable to make people understand that properly built masonry structure is also stronger and safer.
12. If we look at the overall process beginning from project agreement to house completion, the process is tedious and time consuming, which is more difficult in case of municipality (specially design approval part). People irritates with the process.
13. Another blunder mistake was not able to put the provision of retrofitting of damaged house. Most of the people don't want to demolish their damaged house

because of demolishing cost, sentimental value, larger living spaces and cultural and religious indications. However because of poor policy people are demolishing their larger house and building box type house. Retrofit could save 200,000 number of houses from demolishing, 33.4 Mega Ton of construction materials, 1.6 million of workers and 105 billion Nepalese rupees (Build Change, 2017). Which will helps to preserve and protect our cultural identity. In the study area around 1,000 houses are retrofittable and among the sample following figure shows the potential of the retrofit. It was asked with the people about the typology of house before earthquake only 209 people could clearly answer this question.

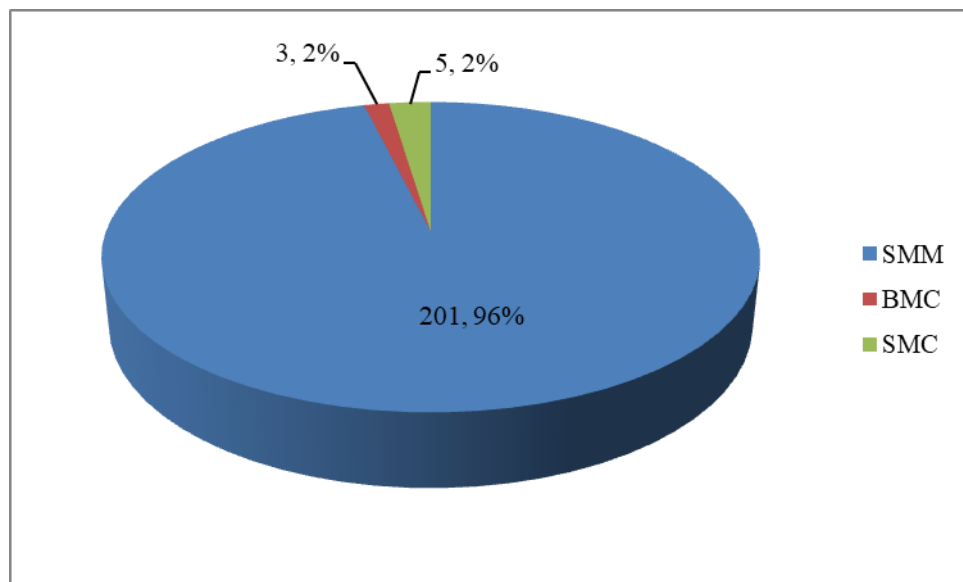


Figure 4.17: Typology of the house before earthquake.

From the figure we can clearly see that more 96% of the house is stone in mud masonry type. Another question was asked with these people about the damage level of the house after earthquake.

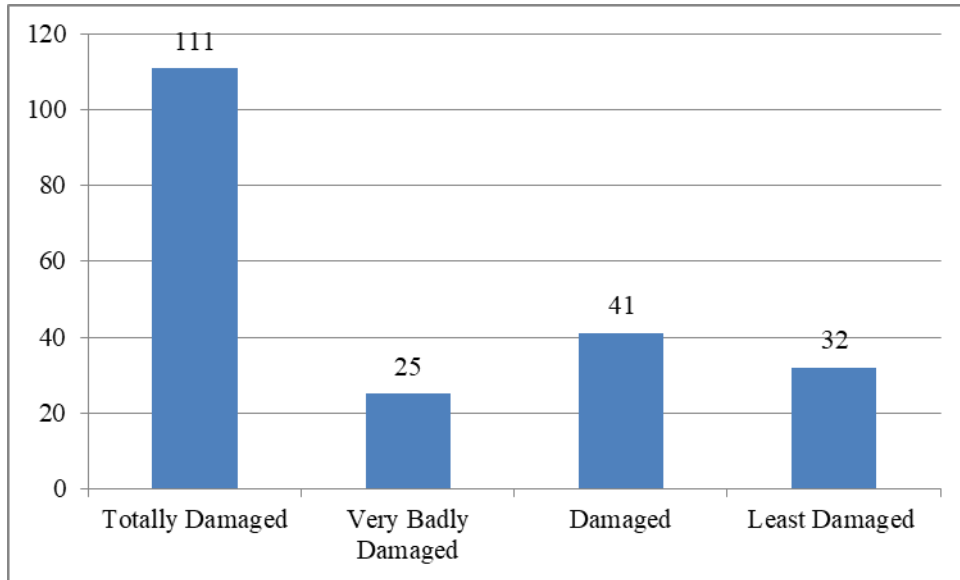


Figure 4.18: Respond of People on damage level of the house after earthquake.

From the above figure we can see that 53% of the houses are totally damaged which means they collapsed in the ground. Remaining 47% houses (98) were standing after earthquake with different damage levels. These are the house which could be retrofit. Another question was asked with these 98 people whether they already demolished house or not. Among 98, 15 people were already demolished their house and 83 hasn't.

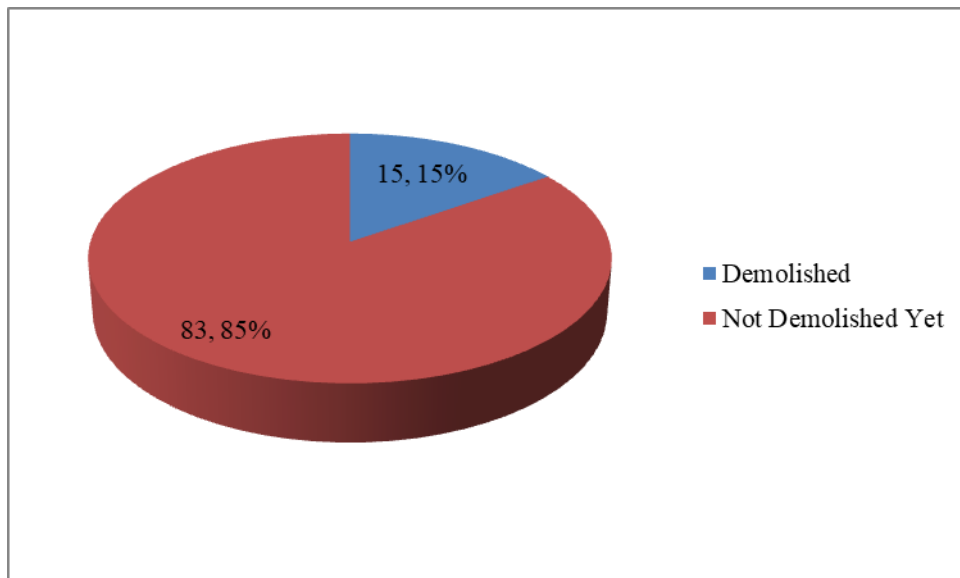


Figure 4.19: Response of people on whether they demolished damaged house or not.

Another question was asked with these 83 numbers of people that whether they want to stay in the previous house making safe or not. People were totally surprised about the questions because they were totally unaware about the methodology and techniques of making damaged house safer. Even if so, 30 number of people were exited and want to

live in previous house if it could be safe. It can be definitely concluded that most of the people will be interested to make previous house safer if they really knows what retrofitting technology is.

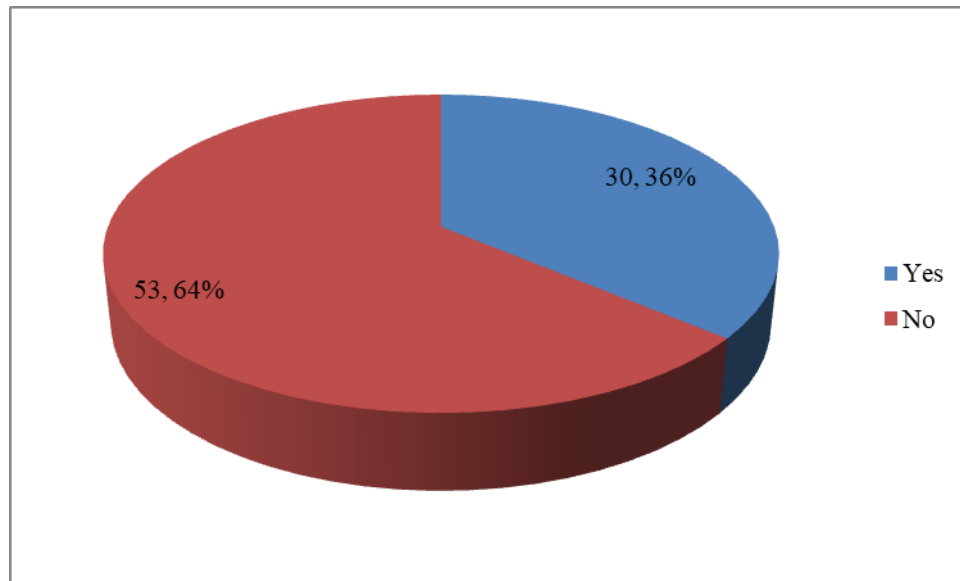


Figure 4.20: Response of the people on the question "Will you want to stay in old house if it is safe?"

14. In theory owner driven reconstruction approach should be less influenced by the national level politics. However in Nepal, in three years of period three CEO of NRA has already changed which is definitely affecting the overall reconstruction scenario. After restructuring of the local levels, and after local level elections, the condition becoming worse. Local leaders interpreting the process in their own way, which may results in differences in the procedure in each village.

4.3 Discussion

Using the simple statistical formula the sample size of 342 was selected, which later proportionally distributed to the three villages called Bhedapu, Ghyang Sukathokar and Melung. The sample was selected randomly so that it will represent all the area across the three villages. The data was collected with the head of the households in most possible ways. Most of the respondents were male, majority of them were found illiterate and elder. The major ethnic group across the study area found Chhetri and Janajati. Most of the people don't have regular source of the income and remaining based in seasonal agriculture.

From the data it is found that 19% people have completed the construction of their house, 23% started construction and 58% hasn't started yet. The overall progress of the study area is less than the national average. Majority of people are choosing stone and mud masonry house, which is one of the cheapest house typology.

People have few salvage material for construction but there is scarcity of working manpower and labor. The technical assistance provided by the government is not sufficient. In summary the progress of the owner driven reconstruction is not satisfactory in study area.

CHAPTER 5: SUMMARIES, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Bhedapu, Ghyang Sukathokar and Melung villages of Melung Rural Municipality of Dolakha District were selected for this study. Among the 3093 total households as population 342 sample households was selected randomly using statistical analysis. Primary data was collected from the field using three different methodologies. Household level data was collected using structured questionnaire. General information of the area was collected through key informant's interview and visual observation was done to observe other technical and non-technical situation of the study area.

Secondary data was collected from different NGOs, INGOs, Organizations and Governmental agencies involved in Nepal Housing Reconstruction Programme. All the plan, policies and guidelines of the government was thoroughly reviewed and compared with field level implementation. All the data was summarized in the simple excel tabular form and different dimensions were analyzed and presented in tabular and graphical form to extract results.

The overall reconstruction progress of the study area is less than the national average. Few people have already spent money in non-construction activities. Most of the people have chosen similar building methodology as previous which is stone in mud mortar. But with the recent government guideline doesn't allow building house with enough space as before. Traditional Houses and architecture are almost disappeared with current reconstruction approach. There are several areas in Nepal having similar problem as of study area. So it can be concluded that owner driven reconstruction approach must be modified or revised according to Nepalese context to preserve our culture. After analyzing all these data and documents conclusions is made to address the objective of this study.

5.2 Conclusions

According to this study, the overall reconstruction status in the study area is slower than the national average. The challenges faced by local people during the reconstruction are lack of enough money to add above the government subsidy, lack of skilled manpower in the community, lack of access to the suitable house design, lack of access to the

government engineers and not comfortable with the governmental process to receive all the tranches.

Also it is found that, the opportunity to build a planned settlement and model village is already missed because of this reconstruction approach. This approach makes homeowner powerful in decision making, that's why homeowner thinks in individual approach rather than village approach.

Also this study found several gaps between the government plans and field scenario. The current government guideline demands high level of manpower and close monitoring of the house being constructed, which major gap is observed. People are demolishing the larger damaged house and building small box type house which is another gap because there wasn't timely provision of retrofitting of damaged house. The governments deadline for the tranche distribution forcing people to build small box type house. However according to the announced deadline the government system is not effective which is another gap observed during this study.

5.3 Recommendations

Following recommendations were made from this study:

1. It is recommended to focus on the awareness activities more effectively to push up the reconstruction. The awareness activities should include process of the reconstruction, minimum standard of the construction and clear understanding of all the provisions of the government. The awareness material should be beneficiary friendly in terms of gender, literacy level, age and ethnicity.
2. It is strongly recommended that owner-driven reconstruction approach must be modified and revised in terms of Nepalese context even if it is successful in other countries.
3. Government should remove the deadline of the people need to give enough time to people for construction. The deadline reducing the quality of the construction and people are building box type of house. Government should stop to count their progress by number of tranche received by the beneficiary. It should be counted according to the quality of construction, sustainability and cultural indication.
4. It is recommended to establish one technical support center to provide design and drawing along with other technical advises to homeowners. The manpower should be enough for supervision and to facilitate in the process of the government.

5. Government has announced several other loans and subsidy. However people are not clear about the process. It is recommended to ease the process of such subsidy and clearly communicate such provision through awareness activities.
6. Government must prioritize retrofitting along with new construction. The building fell in the grade 1-3 can be easily retrofitted without demolishing. Retrofitting provision saves money, preserves our traditional culture and architecture and people will have larger space with less investment. This need to communicate as soon as possible before people demolishing their damaged house. We can also implement “Retrofit-As-You-Go” technology. We can demonstrate and train people by model retrofit building and on-the-job-training.

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ANNEXES

Annex I: Indicators for HH Survey Questionnaire

Challenges and Opportunities of Homeowner Driven Reconstruction Approach					
HH Survey Questionnaire					
Main Objective	Specific Objective	Parameters	Breakdown of Parameter	Indicators for Questionnaire	
To explore Challenges and Opportunities of HODRA	To explore the challenges facing by local people to rebuild their house	Lack of Enough Money		Typology of House Chosen	
				Availability of Salvage Material	
				Availability of Manpower	
				Income of the Family	
				Employment of the family	
				Main Livelihood Activity	
				Monthly Income	
				Bank Account	
				Saving	
		Lack of Technology Technology		Presence of I/NGOS	
				Distance of Ward office	
				No of visits from GON engineer per month	
				Mason Training	
				Access to Drawing of the house typology	
		Lack of Material	Wood		Access to Forest
					Type of Forest
					Process of Forest Resources Used
			Stone		Stone from Old House
				Stone Query (Self/Nearest)	
				Type of Stone (Analyze by Yourself)	
	Sand, Aggregate			Nearest Crusher	
				Price of sand/aggregate per truck	
	Rebar, Cement, CGI			Distance to Nearest Hardware	
				Transportation Type (Vehicle)	
			Transportation Road Type		
	To assess the opportunity of disaster to build back better.	Safe House		Safety of the people, Life Value	
		Per Year Investment	50-100 year for Concrete Structure, 40-50 year for Timber Structure	Investment in the house	
		Resilience Community		Type of House	
				Earthquake Preparedness Committee	
		Sustainable Community		Participation in Earthquake Drill or Preparedness Training	
				Use of Local Material	
				Bought from Local Market	
				Cultural Identity Maintained	
			Basic Facility WASH, Road, Park, Open Spaces		
To analyze the challenges for developing study area as model village		Literature	Involvement of Private Sector		
	Dhurmus Suntali Foundation				
	Planning of Village				
			Affect in livelihood Activity because of New Construction		