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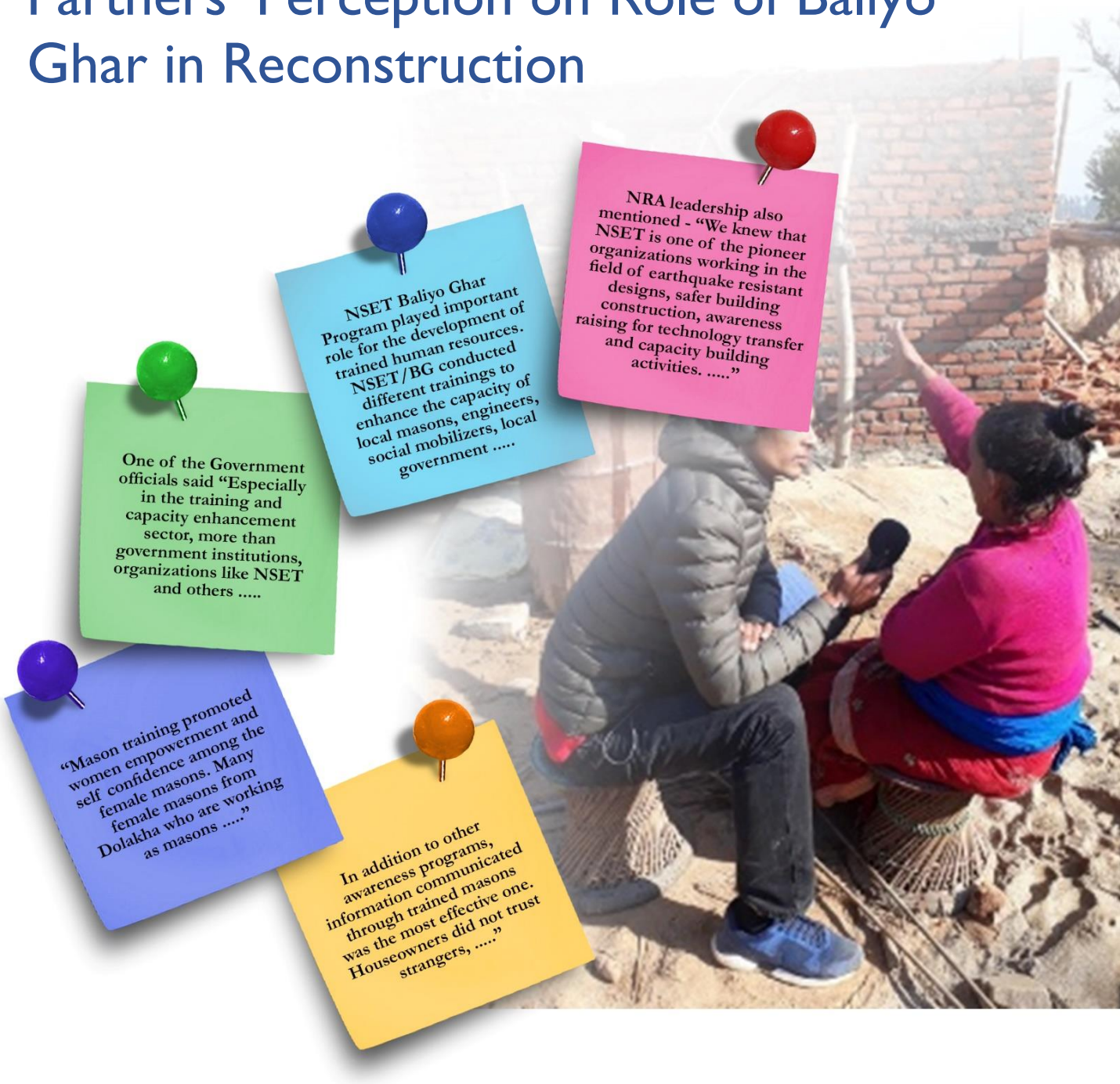
Baliyo Ghar Program

A Contribution Towards Disaster Resilient Nepal

Qualitative Study Report

Partners' Perception on Role of Baliyo Ghar in Reconstruction



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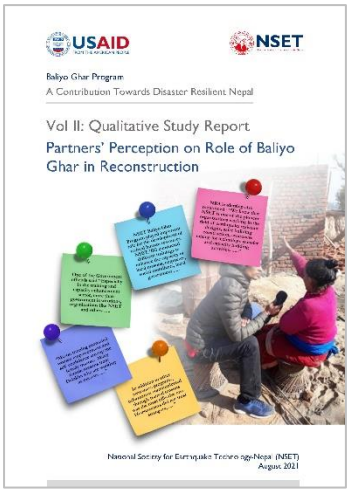

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Qualitative Study Report Partners' Perception on Role of Baliyo Ghar in Reconstruction

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NSET Disaster Resilient Communities in Nepal

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PREFACE

It is of great pleasure to share this report: Baliyo Ghar Program- A Contribution towards Disaster Resilient Nepal, Qualitative Study Report "Partners' Perception on Role of Baliyo Ghar in Reconstruction" an outcome of the evaluation study implemented under the Baliyo Ghar program. The Baliyo Ghar program was implemented during 2015-2021 by NSET with funding support from the United States Agency for International Development (USAID), Nepal and under the overall guidance and direction of the Government of Nepal, National Reconstruction Authority (NRA).

The Housing Reconstruction Technical Assistance Program, "Baliyo Ghar Program", is a key program of USAID-Nepal's reconstruction portfolio launched after 2015 Gorkha Earthquake that aimed to support Nepal Government's goal of "Build Back Better".

Baliyo Ghar program aimed to provide support to Nepal Government's owner-driven housing reconstruction program, which helped to empower and support homeowners, allowing them to build back safer. The program imparted knowledge, skills, and awareness about earthquake resistant building construction technology to house-owners and local masons. Furthermore, the program assisted the Government of Nepal, related authorities, and partner organizations to develop standards, guidelines, norms, and training curricula.

NSET executed this study to evaluate the effectiveness and impact as well as Baliyo Ghar program's contribution towards overall reconstruction in Nepal. The specific aims of the study are to:

- To examine the effectiveness of BG program in changing building construction practice.
- To understand the extent of social impacts of Baliyo Ghar program
- To assess the contribution of BG program towards sustainability of resilient reconstruction
- To capture and provide evidence and lessons useful for broader stakeholders

Various studies were carried out to measure the impact of Baliyo Ghar interventions and explore the institutional mechanisms and strategies that could maintain and build on the accomplishments of reconstruction and ensure the momentum of building disaster resilient Nepal.

This report highlights the objective, methodology, results, discussions and conclusions of those qualitative studies conducted as part of the Monitoring and Evaluation process of Baliyo Ghar program.

We are confident that this qualitative report will contribute on consolidating and sharing post-disaster reconstruction best practices both nationally and internationally. The outcomes of the study will also contribute to the improvement in future disaster management and the development of appropriate strategies for building disaster resilient Nepal. The report will be useful for decision makers, policymakers, and social leaders for future housing recovery planning after disasters. Relevant technical professionals and researchers may also find it a useful resource for better understanding the process of reconstruction in Nepal.

Mr. Surya Narayan Shrestha

Executive Director

NSET

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This study and the report "Baliyo Ghar Program- A Contribution towards Disaster Resilient Nepal, Qualitative Study Report -Partners' Perception on Role of Baliyo Ghar in Reconstruction" have been possible with sincere thoughts and inputs by several individuals, professionals and practitioners in the departments, municipalities, various organizations, and communities. We highly acknowledge the contribution by all institutions and individuals for the study and contribution to this report.

This evaluation of the Baliyo Ghar's experience and contribution towards Gorkha Earthquake Reconstruction was done by NSET's MEL team with support from the Baliyo Ghar program team.

We would like to thank the Baliyo Ghar program team for their excellent and tireless support in survey preparation, oversight, and data collection and analysis.

We are thankful to the National Reconstruction Authority (NRA), Ministry of Urban Development (MOUD), Department of Urban Development and Building Construction (DUDBC) and the respective local governments for their continuous guidance and inputs. The study might not have been possible without the active support from the reconstruction stakeholders and program beneficiaries. We express our sincere gratitude to all of them.

We extend our gratitude to the United States Agency for International Development (USAID), Nepal, for the funding support and for the continued guidance throughout the implementation of the Baliyo Ghar program.

Monitoring and Evaluation Team

NSET

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LIST OF ABBREVIATION

ANOVA	Analysis of Variance
BG	Baliyo Ghar
CGI	Corrugated Galvanized Iron
CL-PIU	Central Level Program Implementation Unit
CTEVT	Council for Technical Education and Vocational Training
DUDBC	Department of urban development and Building construction
DL-PIU	District Level Program Implementation Unit
EHRP	Earthquake Housing Recovery Program
FGD	Focus Group Discussion
GESI	Gender Equality and Social Inclusion
GIS	Geographic Information System
GMALI	Grant Management and Local Infrastructure
GoN	Government of Nepal
HRRP	Housing Recovery and Reconstruction Platform
IEC	Information, Education and Communication
INGO	International Non-governmental Organization
KAP	Knowledge, Attitude and Practice
KII	Key Informant's Interviews
LG	Local Government
LSM	Load Bearing Masonry
MDTF	Multi Donor Trust Fund
M & E	Monitoring and Evaluation
MIS	Management Information System
MoFAGA	Ministry of Federal Affairs and General Administration
MoFALD	Ministry of Federal Affairs and Local Development
MOUD	Ministry of Urban Development
NBC	National Building Code
NDRRMA	National Disaster Risk Reduction and Management Authority
NGO	Non-governmental Organization
NRA	National Reconstruction Authority
NSET	National Society for Earthquake Technology
OJT	On-the-job Training

ODR	Owner Driven Reconstruction
PDRF	Post Disaster Recovery Framework
PDNA	Post Disaster Need Assessment
PO	Partner Organizations
RC	Reinforced Concrete
RPS	Risk Perception Survey
SMM	Stone and Mud Mortar Masonry
SOP	Standard Operating Procedure
ToT	Training of Trainers
USAID	United States Agency for International Development
VDC	Village Development Committee

EXECUTIVE SUMMARY

The 7.6 Mw Gorkha earthquake of April 25, 2015, and the sequence of aftershocks caused 8790 deaths and around 25,000 injuries. Overall, eight million people have been impacted, which is almost one-third of the population of Nepal. The earthquake sequence destroyed or significantly damaged over 7,55,000 homes in Nepal. With more than half of the total losses and damages incurred during the 2015 Gorkha earthquake, the private housing sector was the most affected, and evidently became the most prioritized sector during the Gorkha earthquake reconstruction campaign.

With an aim of supporting the Government of Nepal's owner driven approach for the reconstruction of private houses damaged during the 2015 Gorkha Earthquake, the Housing Reconstruction Technical Assistance Project "Baliyo Ghar Program" was conceptualized, developed and implemented by the National Society for Earthquake Technology Nepal (NSET) as a key part of the reconstruction portfolio of USAID/Nepal. Baliyo Ghar Program provided comprehensive technical support to the GoN's reconstruction project, by empowering and supporting communities to "Build Back Better". The program primarily imparted knowledge, skills and awareness regarding disaster resilient construction techniques to earthquake affected communities in four of the most affected districts in Nepal. The program assisted the government in developing policies, guidelines, norms and training curricula to standardize the entire process of reconstruction under the leadership of the National Reconstruction Authority (NRA) and its project implementation units.

Baliyo Ghar program reached to 1,66,424 beneficiaries directly through 8,263 different events. 2,554 Engineers, 13,474 masons, 3,202 government officials, 635 social mobilizers and 139 instructors were trained and around 146,559 people were oriented on safer construction.

Baliyo Ghar program envisioned three intermediate results (IR), (1) Improved policy and standardization of training, guidelines and manuals for disaster resilient construction technologies; (2) Enhanced local capacity to apply disaster resilient construction methods and techniques and (3) Increased awareness on disaster resilient construction in Nepal.

The program assisted Government of Nepal for the formulation of reconstruction related policies and its field implementation. Apart from the capacity building programs for different stakeholders, Baliyo Ghar Program conducted large number of orientation and interaction programs targeted towards a wide range of stakeholders, house owners, masons, engineers, local authorities etc.

To measure the progress of the Baliyo Ghar program activities, a comprehensive Monitoring and Evaluation plan was developed which had framed the program output, outcome, intermediate results and impact along with its' indicators. Data

source, data collection methods, and mode of analysis were also defined for each indicator.

Along with other cross-sectional surveys, a follow-up qualitative study was subsequently conducted to further explore and expand on the insights gained from the surveys. The qualitative survey explored perceptions of different partners and stakeholders on the reconstruction efforts in Nepal and contribution of Baliyo Ghar program in the process.

In depth interviews (face-to-face/online semi-structured Key informants' interviews (KII)) and focus group discussions (FGDs) were conducted with different stakeholders of reconstruction including government senior officials, representatives from local government, partner organizations, and the beneficiaries group including engineers, masons and house owners. The interviews and discussions were conducted with the verbal and/or written consent of the participants. The interviews and discussions were guided by a prepared questionnaire and conducted in local Nepali language. A total of 113 respondents were reached through the survey (19 Key informants and 94 FGD participants).

The interviews and discussions were audio-re-corded, transcribed verbatim, then translated to English language for subsequent thematic analysis. The analysis yielded important information on a range of issues around reconstruction, including various stakeholders 'experience and involvement in reconstruction, their opinions on the overall reconstruction process and the strategies adopted for effective reconstruction. This report presents the results of the qualitative study.

The qualitative assessment is structured around five (5) main areas of progress and lessons of the reconstruction:

1. Progress and Achievements of Housing Reconstruction
2. Key Policies and their Roles
3. Critical Issues and Challenges of Reconstruction
4. Performance and Impacts of Baliyo Ghar Program
5. Sustainability and Future Directions

Information gathered from the qualitative and through the key informant survey, showed Baliyo Ghar program had a significant contribution in the successful implementation of owner-driven housing reconstruction program lead by National Reconstruction Authority (NRA). The program had main inputs and contributions on four main areas of housing reconstruction –

- Support on policy formulation and implementation
- Development of large number of skilled human resource through training and capacity building,
- Enhanced awareness of people on safer building construction practices
- Better coordination and collaboration among reconstruction stakeholders

Overall performance and objective-wise achievement of Baliyo Ghar were also evaluated by the key informants. The key informants rated overall Baliyo Ghar performance as **9** in the scale of 1 to 10. Key informants rated the achievement in first objective, which was on policy support as 8, the second objective which was on capacity building was rated **9** and third objective which was related to awareness was rated as **9.**

The stakeholders and beneficiaries view Baliyo Ghar program as one of the very useful and successful programs in terms of influencing the reconstruction process, to help people reconstruct timely and safe manner, and to help raise awareness of the people on disaster safety and earthquake-resistant construction.

The training of women groups to become new masons in the communities is one of the innovative ideas to influence the reconstruction process very positively. There are now several women masons who are actively working to build safer houses in the communities. This has also contributed in the livelihood and economy of the families in earthquake affected areas.

Reconstruction of earthquake resilient houses is the main output of the Build Back Better concepts followed during the owner-driven reconstruction program. The next logical step would be to continue the momentum achieved for safer reconstruction by adapting and changing the systems within our local governments to establish building permit systems and building code implementation mechanisms. Documentation of the learnings gathered from the reconstruction campaign of past six years is the other task ahead so that we can scale up and utilize the knowledge and skills for the next possible disaster. Retaining the large number of trained professionals developed during the reconstruction process is another major task for the sustainability of resilience building. Large number of trained engineers and other technical professionals, trained masons and contractors, government officials and elected local government representatives are great assets for Nepal for building resilient nation. The country should develop policies and systems to retain and continuously involve them in future recovery and reconstruction programs as well as in other development processes.

Reconstruction Scenario of Nuwakot, ©NSET

INTRODUCTION

Context of Nepal

Nepal is a small mountainous, land-locked country that lies between India and China. Three geographical division: Terai, Mountain and Himalaya, in a sequential order from south to north, define the county and its risk. The southern plain "Terai" ranges consisting of low elevated land covers only 17% of total land but the majority of population lies in this area. The mountain regions cover 68% of the total area. The northern part of the country is the Himalayan region, an area consisting of snow-covered higher peak, and is the remaining 15 % of total. The climate in Nepal ranges from sub-zero to tropical (DOIB, 2019). Flash floods, inundation and fire are common in the Terai region, debris flow and landslides mostly occur in the mountain and Himalayas whereas earthquake risk is same throughout the country. The entire length of Nepal straddles the boundary of Tibetan and Indian tectonic plates making it highly prone to earthquakes. Apart from these major disasters avalanche, torrential rain, drought, thunderstorm, windstorm, hailstorm are other natural hazards present in Nepal. Non-natural disasters like epidemics, traffic accidents and conflicts are also regular events disrupting human lives in Nepal. Nepal suffers an average of 900 disasters each year resulting in the loss of life and severe impacts on people's livelihoods (MoHA, 2009).

During the period of 1900-2005, 1674 flood events were reported in the Terai region of Nepal causing nearly 3 million casualties (Aryal, 2012). In 1988, an

earthquake of magnitude of 6.5 claimed the lives of over 700 people with over 65,000 buildings damaged (Dixit, Yatabe, Dahal, & Bhandary, 2013). Nepal has a long history of earthquakes, which may be considered the country's most prominent hazard. As many as ten major earthquakes have been recorded in Kathmandu in the past 750 years (Bilham et al. 1997). The destructive earthquake of 1934, and the more recent 1988 Udaypur earthquake are still in the memory of Nepalese people.

In 2011, the M6.9 Sikkim Earthquake resulted in widespread building damage disproportionate to the shaking intensity. Poor construction material quality, construction workmanship, and a lack of adherence to earthquake-resistant construction techniques were identified as important factors in the earthquake's devastation (Rai, Goutam, Singhal, Parool, Pradhan, & Mitra, 2012). In 2015, the M7.6 Gorkha Earthquake resulted in nearly 750,000 houses experiencing damage. Of those, one-third experienced partial damage, broken down as 67% being low-strength masonry, 26% being cement mortar masonry, and just under 7% being reinforced concrete. Among the two-thirds that experienced unrepairable damage or collapse, the vast majority, 95%, was low-strength masonry (GoN, 2015). Notably, while modern Nepali construction seems to perform better than vernacular construction, modern construction itself remains highly vulnerable to seismic shaking (EERI, 2015; Adhikary, 2016). Timber frame construction, however, performed well (Kaushik et al., 2016).

Both rural and urban construction in Nepal include material and construction techniques that result in seismic fragility. In its various geographic regions, cultural differences are also reflected in people's housing traditions. Several different typologies suited to the needs of different communities, occupations, geographic and climatic conditions have been built using local skills, materials, and resources. Housing typologies can be defined based on their design forms, building materials, various construction techniques and structural systems. In Nepal, the predominant walling materials are stone masonry with mud mortar, but one can also find other materials, such as adobe, rammed earth, or burnt brick masonry (Fig 1). Similarly, while thatch on wooden under structure may be the most common roofing typology, one can also find slate stones, wooden shingles or clay tiles. Nepal government has a strategy to replace the thatched roof with modern materials like corrugated iron sheets considering the risk of fire hazard (NUDS 2017). Similarly, recent years have witnessed an increased use of cement as mortar, burnt bricks or concrete blocks for masonry walls, reinforced cement concrete for the structural frame or roof slabs, or CGI sheets as roofing material. As a result, housing and building practices in Nepal presents a rather complex scenario with various newer typologies being practiced alongside the wide range of vernacular housing typologies. This complexity of housing typologies reflects affordability issues, new aspirations, and poses a wide range of socioeconomic and environmental challenges. And to note most of the dwellings in Nepal are planned and constructed by the homeowners themselves.

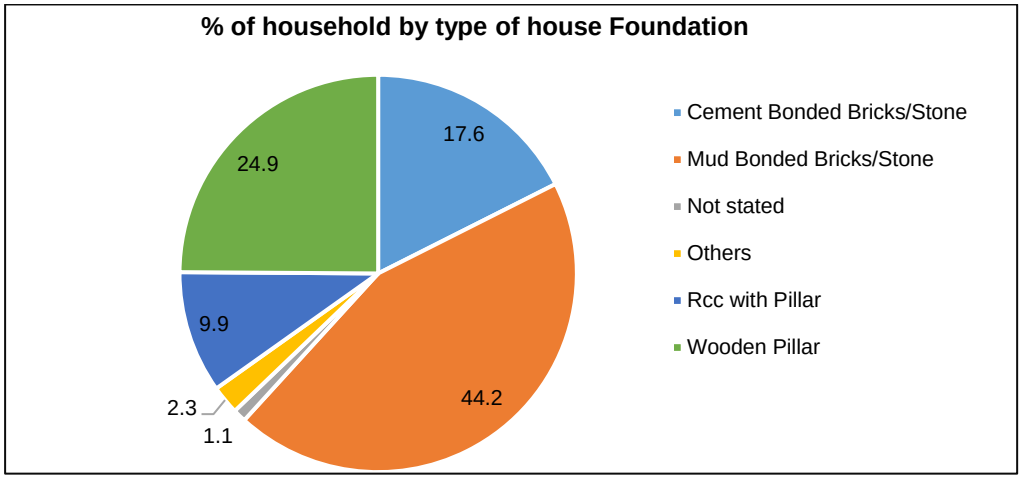


Figure 1: Housing Typology as per the foundation of houses (Source: CBS, 2011)

In urban areas, rapid urban growth and a lack of formal planning or robust adherence to a building code has also led to seismic risk. In particular, the introduction of steel reinforcement bars and cement has led to informal construction of reinforced concrete construction or the addition of new floors on older buildings (Anhorn, Kennartz, & Nusser, 2015). Structural analysis of reinforced concrete buildings with infill masonry walls has been found to be structurally deficient, with the possibility of heavy damage or collapse even at moderate shaking levels of 0.3g (Dumaru, Rodrigues & Varum, 2018). Use of these materials and the "(mal)-adoption of modern construction materials" had led to heightened building stock vulnerability in urban Nepal (Anhorn, Kennartz & Nusser, 2015). Such issues in both urban and rural construction led to the high rate of housing damage and collapse in recent earthquakes.

The 2015 Earthquake and its Impacts

The devastating 7.6 magnitude Gorkha earthquake of April 25, 2015, and its aftershocks severely affected 31 districts of Nepal in the central and western regions inhabited by 5.4 million people: The PDNA categorized these districts based on damages – 14 districts were categorized as highly affected and 17 as less affected (Fig 2). The GON designated fourteen districts which comprise 20 % of the population of Nepal as heavily affected areas. According to the assessments by the United Nations (UN) and the GON, these fourteen districts hold more than 90% of the deceased and injured people, heavily affected public facilities and individual housing.

The earthquake caused extensive structural damage; a total 8979 people lost their life while 22,303 reported injuries. More than 75 percent of the casualties and 22,303 injuries occurred in rural areas (NPC, 2015). A total of 854,992 eligible beneficiaries' houses require reconstruction, out of which more than 600,000 were in rural areas. It was estimated that the lives of eight million people, almost one-third of the population of Nepal, have been impacted by these earthquakes. The estimated damage in monetary terms was calculated at USD 7 billion. Post disaster assessments showed that the quakes destroyed at

least 498,852 private houses and 2,656 government buildings and partially damaged 256,697 private houses and 3,622 government buildings (NPC, 2015).

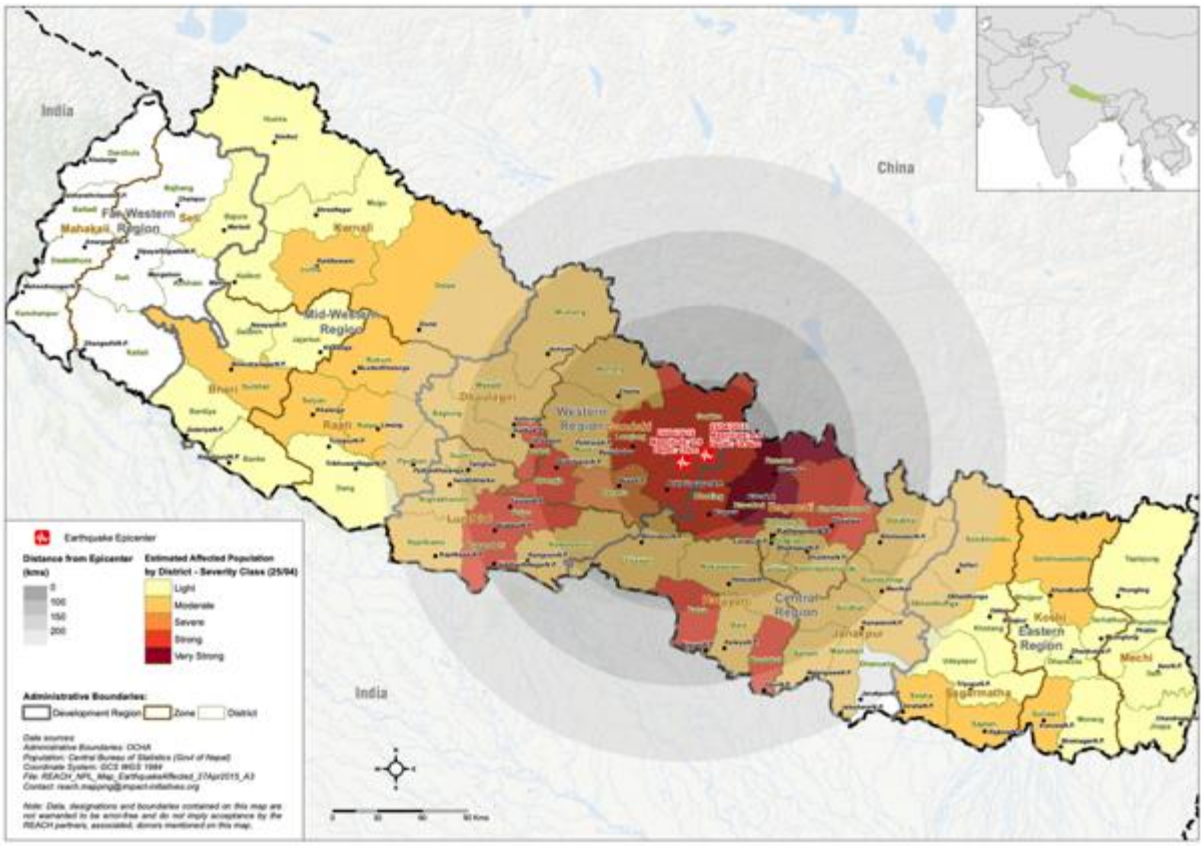


Figure 2: Map showing affected areas by 2015 Gorkha Earthquake

Source: HRRP

The PDNA describes the situation of damage including the estimated monetary amount in four sectors; 1) Social sectors, 2) Productive sectors, 3) Infrastructure sectors, and 4) Cross-cutting sectors, which further consist of relevant sectors. The estimated amount of damage indicated in the PDNA for entire Nepal is shown in Figure 3: Social sectors covered 58 percent of the total effects of which 86 percent included housing sector. This was followed by productive sectors (25 percent), infrastructure (10 percent) and cross-cutting issues (7 percent).

The Post Disaster Need Assessment (PDNA) report prepared in 2015 by the National Planning Commission indicated that the estimated monetary value of disaster effects (damages and losses) caused by the earthquakes in the public building and infrastructure component sums up to 159 billion Nepalese Rupees (1.59 billion USD).

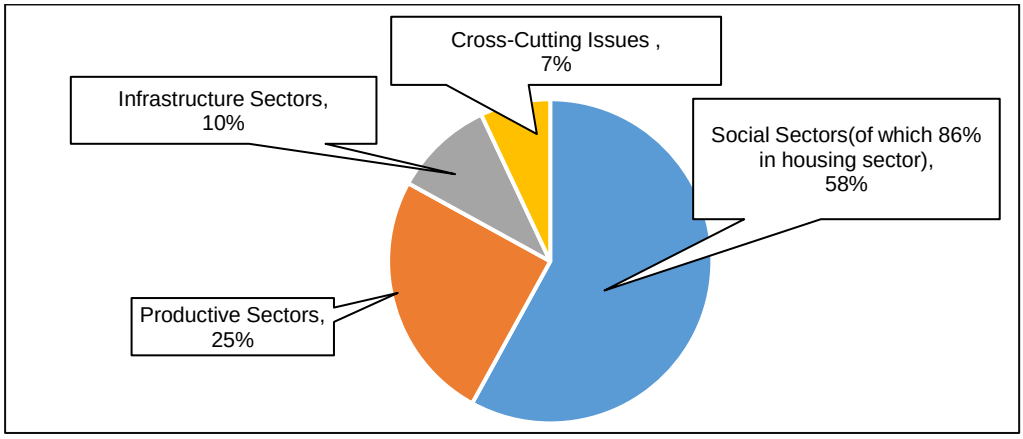


Figure 3: Share of Disaster effects across the sectors

(Soure: PDNA, 2015)

Damage to Housing Sector

Large majority of houses in Nepal are non-engineered and constructed by owners themselves through non-formal process. The existing building typology in the affected 31 districts is as given in Table 1:

Table 1: Existing building typology in the affected 31 districts (CBS 2011)

Low strength Masonry	Cement based masonry	Reinforced Concrete Frame	Wood and Bamboo based
58%	21%	15%	6%

Mostly, old, non-engineered, adobe and masonry buildings found in rural areas of Nepal were collapsed or were severely damaged by the 2015 Gorkha earthquake. In addition, some engineered buildings also severely damaged or collapsed due to poor workmanship and quality of construction materials. Buildings damaged at grade 5 were mostly found in rural mountainous districts, according to the damage survey by National Reconstruction Authority (NRA 2016a), where low-strength masonry is most prevalent typology. Masonry houses with mud mortar binders are the most common typology in rural context. According to National Planning Commission, in all the affected areas, 96 percent of the damaged buildings were load bearing masonry structures (NPC, 2015). Most of the post-earthquake damage surveys (Goda et al. 2015; Parajuli and Kiyono 2015; Bhagat et al. 2018) reported that these typical load-bearing masonry typologies sustained substantial damage due to the absence of seismic resistant features like seismic band, thorough-thickness stones, diaphragm actions. The large damage during the 2015 Gorkha earthquake was in SMM (Stone and Mud Mortar Masonry) typology and contributed significant economic and human losses. SMM typology was the most common construction typology in the country. The contribution of SMM housing typology to the overall damage was more than 60 percent in badly affected rural areas such as Dolakha, Dhading, Nuwakot and Sindhupalchowk (HRRP, 2018). The inconsistent application of seismic resistant features and poor implementation of Seismic design codes are the main reasons of the poor seismic performance of the residential building stock in the 2015 earthquake.

The earthquake severely affected 14 districts (Gorkha, Dhading, Rasuwa, Nuwakot, Kathmandu, Lalitpur, Bhaktapur, Kavrepalanchowk, Sindhupalchowk, Dolakha, Sindhuli, Makawanpur, Ramechhap and Okhaldhunga) and another 31 districts affected to varying extents. According to the Post-Disaster Needs Assessment (PDNA) report, at least 500,000 buildings require reconstruction, and another 250,000 buildings require retrofitting and/or repair. In this way, this devastating earthquake has affected vast parts of Nepal and left deep scars in the economy and infrastructure of the country.

Damage to Social Sector

In mega disaster like Gorkha Earthquake (2015), a nation can be socially and economically affected not just for days or months, but for many years. In PDNA report Housing, Health & Population, Nutrition, Education and Cultural Heritage damage and losses were incorporated within the social sector. Within the different sectors housing sector required largest need followed by education sector (Table 1). Nearly 80 % of public health facilities were damaged and many of the government offices providing social services have been destroyed during the Gorkha earthquake in earthquake affected districts (HEOC, 2015). About 5.37 million population of the most-affected 14 districts of remote rural communities had faced many challenges in accessing social and economic services. As per the Government polices community infrastructure has covered seven sectors: rural transport, water supply and sanitation, irrigation, electricity, community buildings, social infrastructure and solid waste infrastructure. The damage and losses to the components; trails bridges, footpaths, community buildings and micro communal works, amount to NPR 3.3 billion (US$ 33.5million) (PDNA, 2015).

The damage to community infrastructure has larger impacts of earthquake on 14 severely affected districts. Damage to community infrastructures has a negative social impact on villagers, particularly women who are responsible for household chores and looking after livestock as well. The damage to local infrastructure had a negative impact on economy, social and quality life by reducing productivity and access to key services such as electricity and drinking water.

Table 2: Summary of total needs within the social sector

Sector	Total Needs (NPR million)	Total Needs (US$ million)	Share of Needs by Sector
Social Sectors	407,747	4,077	60.9%
Housing	327,762	3,278	49.0%
Health	14,690	147	2.2%
Nutrition	5,056	50	0.8%
Education	39,706	397	5.9%
Cultural Heritage	20,553	206	3.1%

Source: PDNA Report

Post-Earthquake Reconstruction Process

Government of Nepal's housing reconstruction program was based on key principles derived from its own past learnings, international experiences and best practices of other housing programs. The program's four principles are: Owner driven construction, Equity, Safer Construction, Transparency and Accountability.

Owner Driven Construction: The program equipped homeowners with multi-faceted support to direct the reconstruction of their home. It provided socio-technical assistance, training, market facilitation and cash-based subsidies, among other forms of assistance.

Equity: All beneficiaries receive the same subsidy amount of NPR 300,000 (about $3,000) to rebuild their home. This cash assistance was provided in three tranches, to ensure that earthquake-safer techniques are used in alignment with the government's national building code (NBC).

Safer Construction: Reconstructed housing is being rebuilt in a more resilient manner in order to withstand future disaster events. Key components of the program included technical assistance on resilient designs for housing, recommendations on appropriate local materials and the training of engineers, masons, and homeowners regarding resilient techniques, practices, and earthquake-safer materials.

Transparency and Accountability: The program included many features to ensure that the principles of transparency and accountability are respected. They included third-party monitoring and evaluation of transparency, the fairness of the program, and beneficiary satisfaction. The program also included a formal grievance redress mechanism to register and address complaints by beneficiaries. In addition, the Management Information System (MIS) has been designed and implemented to monitor the project's physical and financial progress and to ensure fundamentals of transparency and accountability in the process (MDTF, 2015/16)

Additional elements of the government's housing reconstruction program included: A uniform and simple housing reconstruction and rehabilitation policy that is applied to all reconstruction, regardless of the funding source, with responsibility shared by qualified development partners, under the overall guidance of the Government of Nepal. The program promoted a harmonized approach to reconstruction; Updating and dissemination of earthquake-safer construction standards, housing designs and construction practices, using accessible, affordable, and culturally appropriate materials, and construction methods flexible to reflect local realities. This facilitated resilient construction in the rebuilding process; Primarily in situ reconstruction followed except where relocation is necessary due to land vulnerability or loss of original location and Effective communication to the public throughout the process, ensuring effective feedback mechanisms.

Major Stakeholders of Reconstruction

The National Reconstruction Authority (NRA) is the lead government agency for all post-earthquake reconstruction activities and has a wide mandate relating to the coordination and facilitation of recovery and reconstruction works. Owner driven reconstruction approach was adopted by NRA and implemented by multi-stakeholders. Different reconstruction policies, frameworks and guidelines were prepared and implemented as per the need.

The NRA was mandated to work closely with a number of other government ministries. The Ministry of Federal Affairs and General Administration (MoFAGA), through its Central Level Program Implementation Unit (CL-PIU) and District Level Program Implementation Units (DL-PIUs), held primary responsibility for the disbursement of the housing grant. Primary responsibility for technical standards and staffing for housing reconstruction were the responsibility of the Ministry of Urban Development (MoUD), through its CL-PIU and DL-PIUs, as well as the Department of Urban Development and Building Construction (DUDBC). Later, these CL-PIUs and DL-PIUs were brought under the umbrella of NRA itself and operated in coordination with MOFAGA and MOUD. A Multi Donor Trust Fund (MDTF) assisted the NRA and supported the government-led Earthquake Housing Recovery Program (EHRP). The main partners involved were the World Bank, USAID, SDC, the Government of Canada, and DFID. The fund also worked closely with JICA and other development partners. The Housing Recovery and Reconstruction Platform (HRRP) further provided assistance through strategic planning and technical guidance to agencies involved in recovery and reconstruction and to the Government of Nepal, supporting the coordination of the national reconstruction program and facilitating coordination with other stakeholders (http://hrrpnepal.org). Apart from the central governing bodies NRA and it's PIU's and local government, the role of civil society, development partners and private sectors was highly supportive. Civil societies were important actors for delivery of social services and implementation of development programs, as a complement to government action (Mercer 2002). Development partners like I/NGOs, local civil society organizations, academic sectors, research organizations were another important aspect of the reconstruction as they were equipped with high-quality resources and were thus critical to accelerate the reconstruction mega campaign.

The Owner Driven Approach

Owner Driven Reconstruction (ODR) is identified as a dignified approach encouraging individual homeowners to implement safe building design and construction in disaster affected areas. ODR is a participatory and bottom-up approach which places homeowners at the center of reconstruction, integrating homeowner's decisions on housing design and site selection for house construction with building techniques tailored to local environments and resilient to environmental hazards. Reconstruction mega campaign was initiated by Government of Nepal under the leadership of National Reconstruction

Authority (NRA) adopting the 'owner driven reconstruction' approach for the housing reconstruction. Effectiveness of owner driven reconstruction in the context of developing countries has been well documented in past similar recovery experiences (Duyne, 2006). Noticing concerns of the vulnerable populations identified in PDNA, strategic objectives of PDRF included specific points to guide policy formulation. In the owner-driven reconstruction process, financial assistance as well as support for technical, material, supervisory, training and social facilitation is provided by government assisted mechanisms by which homeowners build back better with improved hazard resilience. Public infrastructure and private houses are encouraged to use locally available materials. Tax concessions were granted for building materials for a certain duration, to facilitate material supply.

The Socio-technical Assistance

Socio-technical assistance refers to the combination of various tools and techniques aimed at enhancing the knowledge and skills of all stakeholders involved in the process of reconstruction. Socio-technical assistance broadly included three types of support to the house owners: i) raising the demand for safe housing by enhancing communities' awareness on earthquake resilient building technologies; ii) capacity building of local builders to deliver disaster resilient houses; and iii) ensuring compliance with construction guidelines at local, district, and central level through support, facilitation, and enforcement mechanisms.

To ensure the reconstruction of disaster-resilient housing and with the support of different donors and partners, NRA implemented various socio-technical assistance program through training, awareness raising and information dissemination efforts. Figure 4, shows the different components of socio-technical assistance being implemented in Nepal's Reconstruction.

Figure 4: Different Components of Socio-Technical Assistance Implemented in Nepal's Reconstruction

USAID/NSET's Support for Reconstruction – The Baliyo Ghar Program

The Housing Reconstruction Technical Assistance Program, "Baliyo Ghar", is a key program of USAID-Nepal's reconstruction portfolio launched after 2015 Gorkha Earthquake that aimed to support Nepal Government's goal of "Build Back Better". NSET implemented the program under Cooperative Agreement AID-367-A-15-00005 during the period from October 1, 2015 until September 30, 2021. "Baliyo Ghar" program aimed to provide support to Nepal Government's owner-driven housing reconstruction program, which helped to empower and support homeowners, allowing them to build back safer. The program imparted knowledge, skills, and awareness about earthquake resistant building construction technology to house-owners and local masons. Furthermore, the program assisted the Government of Nepal, related authorities and partner organizations to develop standards, guidelines, norms, and training curricula.

The Baliyo Ghar program has two-fold goals; in shorter-term, the program aimed at ensuring earthquake safer construction of all houses being reconstructed; and for longer-term, the program aimed to establish a system of disaster-resilient construction to achieve the goal of disaster-resilient communities in Nepal.

The goals are achieved through the following three Intermediate Results (IRs):

- IR 1: Improved policy and standardization of training, guidelines and manuals for disaster resilient construction technologies
- IR 2: Enhanced local capacity to apply disaster resilient construction methods and techniques
- IR 3: Increased awareness on disaster resilient construction in Nepal

Baliyo Ghar Program contributed to the overall reconstruction program of the Government of Nepal through mobilization of technical assistance at three levels: national, district and local. **Figure 5** shows the major program activities at the three levels.

Baliyo Ghar program implemented its activities in four (4) of the fourteen (14) severely affected districts by the Gorkha earthquake 2015, namely, Dhading, Dolakha, Nuwakot, and Kathmandu. Figure 6 shows the coverage of Baliyo Ghar Program.

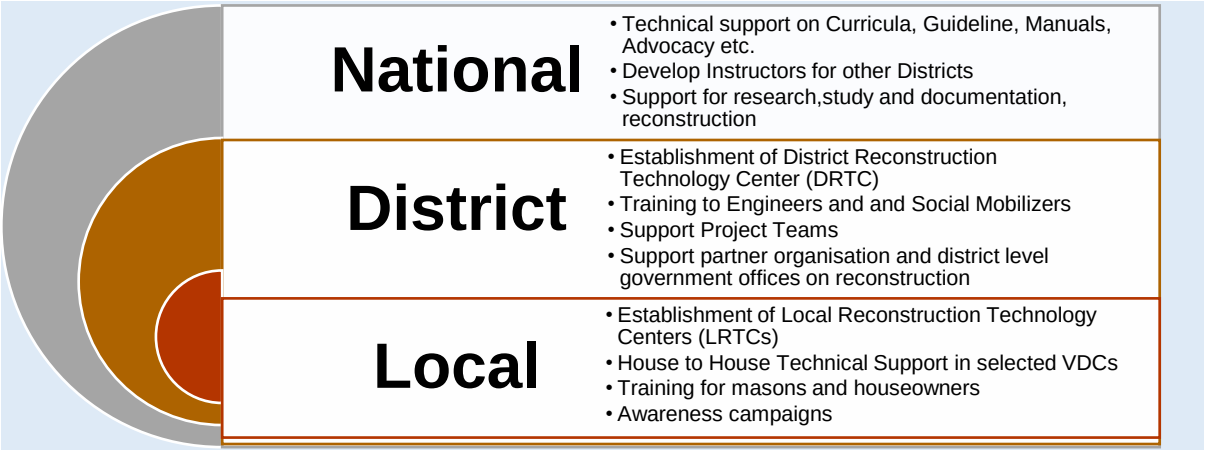


Figure 5: Baliyo Ghar Program activities at National, District and Local levels

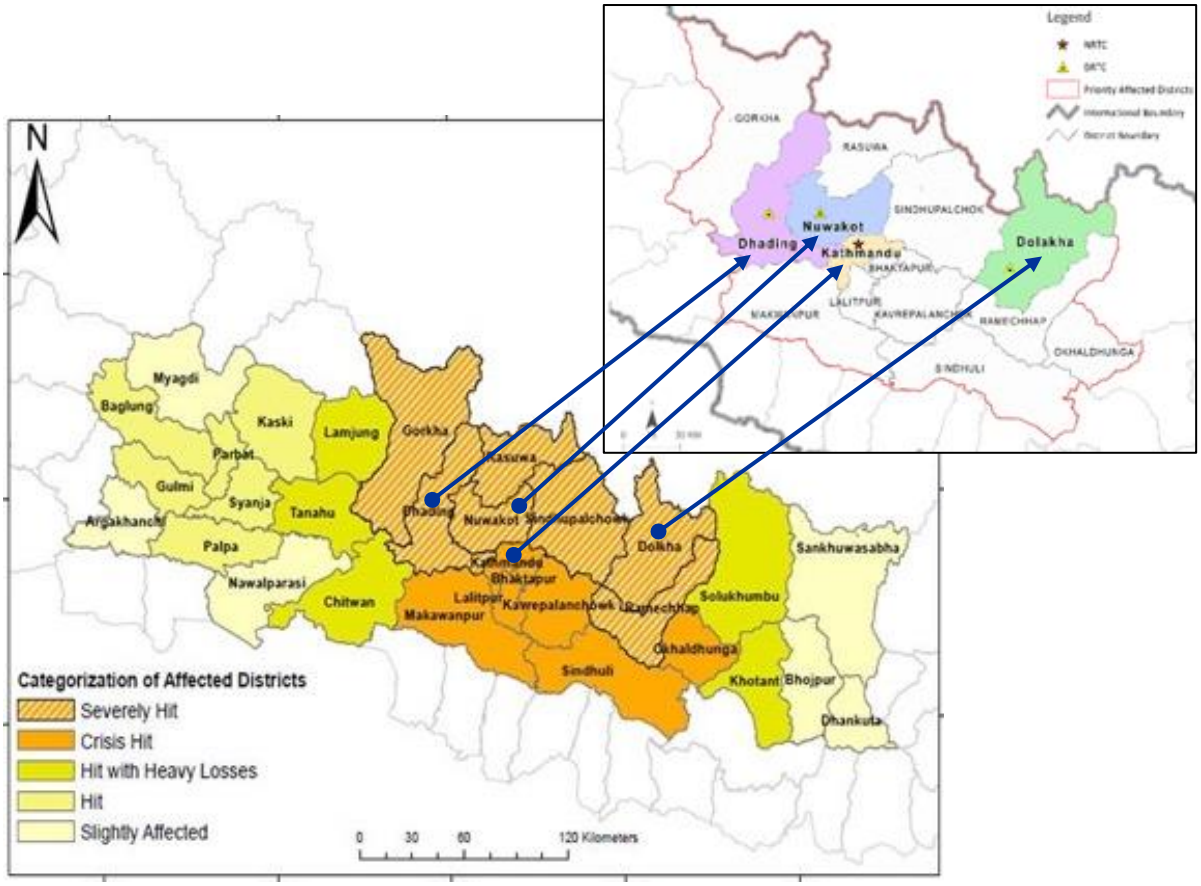


Figure 6: Earthquake affected districts and Baliyo Ghar Program districts

The **Table 3** below highlights the program coverage in terms of number of wards and beneficiaries within the four program districts. In these four districts, Baliyo Ghar program covered 23 wards of 3 Urban Municipalities (UM) and 43 wards of 12 Rural Municipalities (RM), 66 wards of 15 municipalities in total. Similarly, in terms of number of earthquake housing reconstruction beneficiaries, Baliyo Ghar provided direct technical assistance to 61,444 out of

total 274,910 beneficiaries in the four districts. In total, 16.6% of the wards and 21.74% of the listed beneficiaries of the four districts have been covered with blanket technical support through Baliyo Ghar Program.

Table 3: Coverage of Baliyo Ghar Program in terms of wards and beneficiaries

SN	Name of Districts	District Total		BG Coverage		BG Coverage (%)	
		Mun. (wards)	Beneficiaries	Mun. (wards)	Beneficiaries	Wards	Beneficiaries
1	Dhading	13 (104)	84,393	6 (31)	26,614	29.81%	31.54%
2	Dolakha	8 (67)	72,859	5 (21)	24,143	31.34%	33.14%
3	Nuwakot	12 (88)	78,770	3 (11)	8,983	12.5%	11.40%
4	Kathmandu	11 (138)	48,612	1 (3)	2,127	2.17%	4.38%
Total		**44 (397)**	**284,634**	**15 (66)**	**61,867**	**16.6%**	**21.74%**

Socio technical assistance under Baliyo Ghar Program

The program primarily imparted knowledge, skills and awareness regarding disaster resilient construction techniques to earthquake-affected communities in four of the most affected districts in Nepal. Further, the program assisted the government in developing policies, guidelines, norms and training curricula to standardize the entire process of reconstruction under the leadership of the National Reconstruction Authority (NRA) and its project implementation units. The program covered a wide range of stakeholders targeted through its comprehensive technical assistance for awareness, capacity building and institutional improvements as shown in **Figure 7.**

Figure 7: Baliyo Ghar Program strategy, key areas of interventions and relevant stakeholders

To enhance the local, district and national capacity to undertake the reconstruction process, the program targeted mainly six groups of beneficiaries at different levels:

1. **Construction workers** – masons (brick layers, stone layers, concrete workers), carpenters, bar benders, contractors; termed "mason" in general
2. **Social Mobilizers** – community mobilizers, social activists
3. **Technical professionals** – Structural and Earthquake Engineers, Civil Engineers, Architects, Sub Engineers, Assistant Sub Engineers deployed in earthquake affected areas by GON, local governments and partner organizations
4. **Common People** – house owners, beneficiaries, consumer groups, clubs, and community-based committees
5. **Policy and decision makers** – elected representatives and officials at local (rural and urban municipalities), provincial and central level governments, district and central level NRA officials and PIUs, political leaders, officials at ministries and departments; and

1. **Partner Organizations** involved in reconstruction and platforms

Given the scale of the reconstruction, vast numbers of trained and skilled human resources were required to undertake the massive campaign. Similarly, owing to the low level of existing knowledge on earthquake risks and mitigation, awareness raising through different approaches was also incorporated in the program. As such, Baliyo Ghar Program stipulated socio-technical assistance in six major themes, as categorized by NRA.

1. **Community Based Orientations:** In order to make the house owners aware on the need of earthquake resistant construction, massive level of awareness campaign consisting of classroom-based sessions on earthquake risks, mitigation measures and the technical and administrative provisions of reconstruction were conducted in program areas. Such orientations were very helpful to build people's confidence on the housing reconstruction program

2. **Short Trainings:** Short duration trainings (typically between 3 to 7 days) for engineers, masons and social mobilizers on different aspects of reconstruction and earthquake resistant construction were the other major component of socio-technical assistance. These trainings for enhancing the capacity of masons, artisans, social mobilizers, stakeholders and technical personnel were also considered of vital importance. The trained manpower was instrumental to raise awareness and to ensure construction quality through regular monitoring. Moreover, engineers and social mobilizers trained as part of these trainings were further developed into Master Instructors.

3. **On-the-Job Trainings:** These are the vocational trainings targeted towards developing new skilled masons to support the demand of human resources during surge of reconstruction activity.

4. **Door-to-Door Assistance:** Household level assistance provided to earthquake affected beneficiaries to support their decision-making as well as supervise their construction to help make the houses compliant to the standards.

5. **Demonstration Construction:** Construction of small and large-scale demonstration models to aid house owners, masons, engineers and other stakeholders to adequately visualize earthquake resistant construction techniques. Such demonstration houses helped to increase the understanding and confidence of the community in the prescribed building technologies.

6. **Information Desks:** These consisted of mobile outlets and information hubs aimed at providing information to a large group of beneficiaries in quick time and increasing outreach. These hubs also functioned as distribution points of free information and communication materials like flyers, posters, brochures, and books.

As a part of the evaluation of the Baliyo Ghar program, the team carried out a cross sectional qualitative survey towards the end of the program 2010-2020. This survey addressed different groups to know the perspective of these group in their collective voices through discussions and individual interactions. This report presents the findings of the qualitative study.

Female participant practicing during the Mason Training, Kageshwori Manahara, Kathmandu

INTRODUCTION OF THE STUDY

Aim of the Study

To explore the perceptions of different partners and stakeholders on the reconstruction efforts in Nepal and contribution of Baliyo Ghar program in the process

Objectives of Survey

To understand and evaluate:

1. Progress and achievements of reconstruction efforts during past six years
2. Key Policies related to recovery and reconstruction and their roles/impact
3. The performance and impacts of BG program (Awareness/Capacity building)
4. Critical Issues and challenges
5. Recommendations on elements of sustainability and future directions (For ERM/DRM in Nepal, For NSET)

The purpose of this qualitative survey is to understand the views and perspectives of the people regarding reconstruction.

Scope of the Report

This report highlights the objective, methodology, results, discussion and conclusions of the Qualitative Study conducted as part of the M&E process of Baliyo Ghar Program.

The report will be useful for decision makers, policymakers, social leaders and for reconstruction practitioners. Relevant technical professionals and researchers may also find it as a useful resource for better understanding the existing perception and the process of reconstruction in Nepal

Survey Methodology

For the study of the qualitative research the grounded theory methods are used. A qualitative approach involved face-to-face/online semi-structured Key informants' interviews (KII) and focus group discussions (FGDs) with different stakeholders of reconstruction including government senior officials, representatives from local government, partner organizations, and the beneficiaries group including engineers, masons and house owners.

1. Sampling technique and Sample size

Participants for the interview and FGD were selected using purposive sampling for the heteroscedastic population. NSET MEL team visited 4 working districts

of Baliyo Ghar to identify and select the potential FGD participants to the qualitative study. All the selected participants were contacted through telephone and were invited to take part in the survey. All potential participants for the interview were informed about the purpose of the study and were invited to take part. Prior appointments were made with them.

A total of 113 respondents were reached through the survey (19 Key informants and 94 FGD participants).

2. Data Collection

i) Desk Study

Before designing the surveys and methodologies the team conducted the desk review of the existing program and related documents. The review was done to review the achievement of key indicators and progress of outcomes, identify project achievements, impacts lessons, issues and challenges. Project reports, annual work plans, MEL plan, various evaluation documents of the program as well as other external reconstruction related documents were also studied.

ii) Key Informant's Interviews (KII)

Key stakeholders of reconstruction at the central level and the field were identified and contacted individually by the MEL team. Key-in-depth

Table 4: Selected Respondents for KII

Districts	Type of Selected Respondents	
Dolakha	Local Government Representatives (4)	LGR: Palika Chairperson, Bigu RM
Nuwakot		LGR: Palika Engineer, Shivapuri RM
Dhading		LGR: Chief Adminstrative Officer, Siddhalekh RM
Kathmandu		LGR: Mayor, Kageshwori UM
Dolakha	Government Engineers (4)	Palika Engineer: Focal Engineer, Bhimeshwor
Nuwakot		Palika Engineer: Focal Engineer, Shivapuri
Dhading		Palika Engineer: Focal Engineer, Shivapuri
Kathmandu		Municipality Engineer: Focal Engineer, Kageshwori
Central level	BG Officials (4)	Executive Director
		Deputy Executive Director
		Program Manager
		Program Coordinator
	NRA officials (3)	Executive member
		Chief Executive Officer, NRA
		DG-DUDBC
	Partner Organizations (4)	ASF Nepal
		HRRP Nepal
		Care Nepal
		CRS

interviews was conducted with the interested participants. They were informed about the objective of the study and their consent was taken for the audio recordings. Interviews were conducted through mixed approaches such as face to face, online platform and telephone. Interview was taken in Nepali language following pre-designed semi-structured questionnaire. Total 19 respondents were interviewed with the time duration between 40 min to 1 and half hour. Following table shows the selection of KII participants for the study.

iii) Focus Group Discussions (FGD)

As with the interviews, prior to starting the FGD, information about the study, objectives of FGDs and its process were explained to the participants. Semi-structured questions were asked in an interactive group setting where participants were free to present their ideas with group members. A homogenous group of 10 to 12 participants were gathered for the discussion. The discussions were facilitated by the moderators. Consents of the participants were taken prior to the discussions and audio recordings.

Total of 9 focus group discussions (FGDs) were conducted within the program area to know about the community people perception towards the reconstruction process. Participants of each FGDs were house owners and masons trained by Baliyo Ghar program. 94 participants in total were reached through 9 FGDs conducted throughout the 4 program districts. It was made sure that the group was representative of all groups present in the community. The table below outlines the details of the FGDs conducted.

Table 5: Detailed list of FGDs conducted

Districts	No.of FGDs	FGD venue	Male	Female	Total	Selection Criteria
Dhading	3	Nilkantha	6	5	11	Urban Program Area
		Kalleri	6	3	9	Highest increment in KAP Score within the district (Baseline to Endline)
		Jyamrung	8	3	11	Lowest increment in KAP Score within the district (Baseline to Endline)
Nuwakot	2	Chhap	6	2	8	Highest increment in KAP Score within the district (Baseline to Endline)
		Talakhu	9	1	10	Lowest increment in KAP Score within the district (Baseline to Endline)
Dolakha	3	Bhimeshwor	5	4	9	Urban Program Area
		Magapauwa	7	3	10	Lowest increment in KAP Score within the district (Baseline to Endline)
		Alampu	0	15	15	Highest increment in KAP Score within the district (Baseline to Endline)
Kathmandu	1	Kageshwori	7	4	11	Urban Program Area
Total			54	40	94	

3. Data Analysis

The Qualitative data for this report were gathered through different research tools and techniques as mentioned above. All the recorded audio of interviews and FGDs were transcribed in Nepali and then translated in English by the NSET MEL team. The transcription and translation were checked by the second team member to ensure that the translated transcripts were true to the original recordings. The translated interviews and FGDs were then thematically analyzed by the team and collective interpretation of the interviews and FGDs was conducted. At the end of the analysis, all of the themes and sub-themes were reviewed together and finalized based on mutual consensus.

4. Pilot Testing

Prior to data collection, the interview guide, FGD guide, participant information sheets, consent forms were pilot tested to ensure the questions were understandable and phrased appropriately. Pilot interviews /FGDs were conducted in Kageshwari, Kathmandu.

During the Social Mobilzers Training, Dhading

During KII with houseowner at Bhimeshwor, Dolakha

ANALYSIS AND FINDINGS

This section presents the results and findings from the analysis of the information collected from the surveys.

The qualitative assessment is structured around five (5) main areas of progress and lessons of the reconstruction. The findings, discussions, and recommendations in the five focus areas are as discussed in the following sections:

1. Progress and Achievements of Housing Reconstruction
2. Key Policies and their Roles
3. Critical Issues and Challenges of Reconstruction
4. Performance and Impacts of Baliyo Ghar Program
5. Sustainability and Future Directions

Progress and Achievements of Housing Reconstruction

The following figure shows the progress of housing reconstruction during the period. It was observed that almost 90% of the houses built in the Baliyo Ghar program area were compliant and they have already received the government's third tranche. Similarly, 95% are towards completion and have received the second tranche from the government. Fig (8) shows the cumulative progress of the third tranche received by the beneficiaries. When compared with the national average, although there was not much difference, but it was observed

that the Baliyo Ghar program beneficiaries received the tranches 3-9 months earlier than other areas indicating they were able to get the socio-technical assistance on time and hence complete the construction sooner

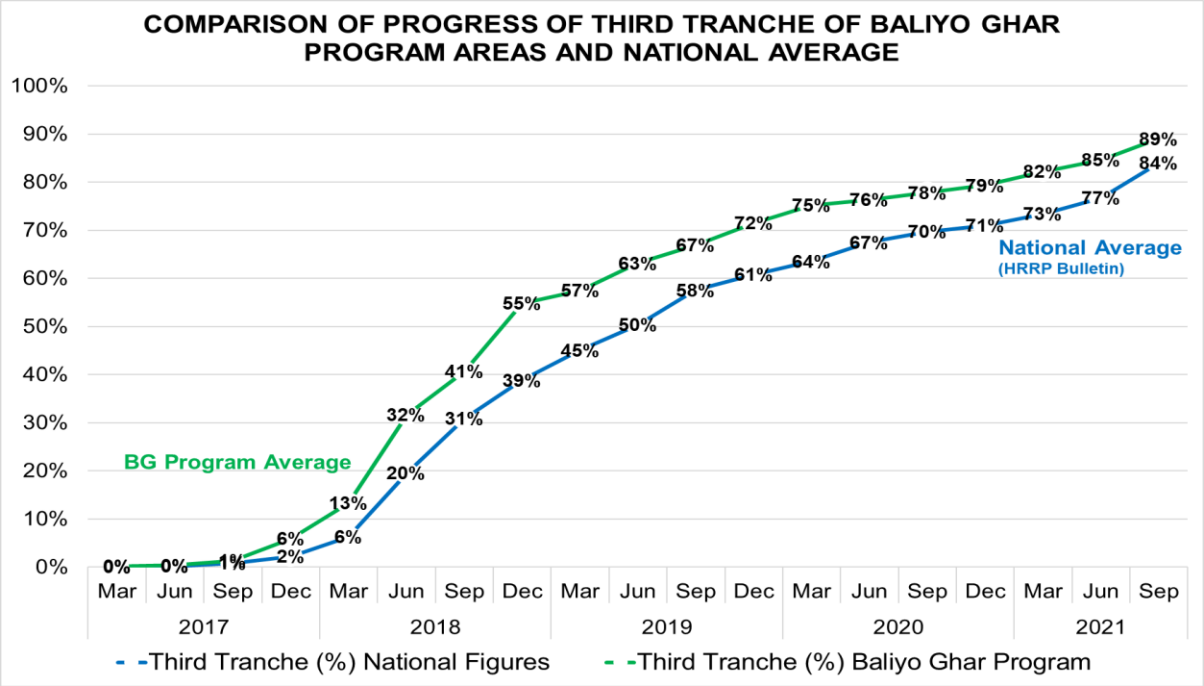


Figure 8: Comparative cumulative third tranche progress of housing reconstruction in Baliyo Ghar Program areas and National Average (as of total beneficiaries in Aug 2021). Data Source: HRRP/NSET

In addition to the physical progress, there are several other important and long-term achievements of the post Gorkha earthquake reconstruction and recovery. Key stakeholders have expressed their views on the achievements of the reconstruction programs. A few of them are as discussed below:

Senior leadership at NRA and other central level government institutions expressed that the reconstruction tasks are largely successful, and the role of NRA has been very satisfying. The most important achievement is to have a well-functioning reconstruction system in place which Nepal did not have prior to the Gorkha earthquake. The system of training of local masons and the pool of trained masons are other key achievements. Few other important achievements are:

- Several new institutions such as GMALI, DLPIUs have been created to support the reconstruction. These institutions will later bring the experiences and lessons of reconstruction to the existing ministries and departments of the government. This will be helpful for the institutionalization of recovery and reconstruction.
- People and officials in the authorities are now able to disseminate knowledge about the cause and effects of earthquakes, the risks, and preparedness measures to reduce the risks. This change is expected to be helpful for the promotion of disaster resilient communities.

- Involvement of trained masons in reconstruction of damaged houses helped to build the confidence of house-owners (beneficiaries) about the disaster-resilient construction.
- The involvement of technical persons for monitoring and ensuring safer construction practices and application of building permit system in rural municipalities has significantly contributed to promote safer construction of all the houses in rural areas.
- Beneficiaries strictly followed the technical requirements of the National Building Code while constructing their houses.
- Despite the preexisting initial challenges, the progress that we have achieved if we compare with our neighboring countries, it is relatively good.

Government professionals at local levels – All of the field engineers who were interviewed expressed that the development of SOP for Enrolment and Housing Grant along with other guidelines/policies and the established system has played a fundamental role in facilitating the grant distribution process and the reconstruction. It has helped in building back better and safer buildings with necessary interventions and monitoring by technical person. They also mentioned the following as additional achievements.

Leadership and professionals of Partner Organizations (POs) mentioned that Engagement of trained social mobilizers and mobile masons for reconstruction was very effective. Mobile masons provided the practical skills on site while the social mobilizers played significant role to increase community awareness on concepts of safer construction.

Large scale human resource development through training and capacity building programs has been one of the important contributions of the reconstruction process

Deployment of technical persons (one engineer and one overseer) in each ward of the VDCs for technical supervision of reconstruction was another important decision taken by NRA. Such program implementation strategies guided towards the successful implementation of reconstruction program.

Effective coordination mechanism and collaboration among NRA, CLPIU, DLPIU, NSET and other organizations was very effective which eased the reconstruction process.

Elected representatives at local governments expressed that the effective collaboration work among Government and different NGOs and INGOs for the grant facilitation at the local levels resulted a successful implementation of the policy on Grant distribution. The LG officials have realized that they should train their staff from all rural and urban municipalities on earthquake resilient construction and further mentioned that in every local government, at least one technical person who has experiences of reconstruction should be appointed by government of Nepal.

Instructor development process helped to build confidence of the trainers who later were involved in conducting further training courses for masons and technical professionals. The trained engineers visited and inspected every house and guided the masons which built confidence among the masons and house owners.

Baliyo Ghar program team members and leadership team expressed that the major success was building confidence among the government authorities at central level, district level and local level and community people. Engagement in communities either through different trainings and capacity building programs or through orientations has enhanced the owner driven reconstruction approach.

Standardized and tested curricula were used by all at all places. Simplified training curricula with standard terminologies and detail training content have been used during the trainings which was instrumental to enhance the applicability of trainings. The mason training curricula developed by NSET and endorsed by DUDBC prior to reconstruction was followed by all. This made a huge difference as whoever conducted the training the standard was maintained throughout. This was one of the biggest achievements in the training and capacity building.

Since there were very limited number of existing policies prior to the earthquake on reconstruction the policies were developed as per the need. The developed policies were just sufficient to take forward the reconstruction process. Wherever gaps were identified, necessary amendments to the polices were done which made the reconstruction success and the process dynamic

This reconstruction process has set good example of how the local human resources can be utilized for post disaster recovery reconstruction and for improving the community awareness.

The trained masons themselves became the advocates of safer construction.

Additional to these achievements as perceived by the main stakeholders, the beneficiaries of housing reconstruction program, the house-owners in the villages have expressed that the NRA-led reconstruction program was very effective and successful to help them rebuild their homes. The technical assistance provided was very useful to reconstruct their houses on timely and safe manner.

Many women masons have been trained. In places like Barpak and Khoplang, female masons even became contractors and built 6-7 houses. In Gorkha, out of the total trained masons, almost 5% are female masons. While tracking trained masons, it was found that one trained mason built 4-5 earthquake resilient houses during the period of 2-3 years.

Key Policies, Gaps and Challenges

The beneficiaries and other key stakeholders considered the reconstruction was very effective and successful. Among many other factors and elements of successes, the role of timely and appropriate policies has been almost undoubtedly acknowledged by everyone. The study tried to evaluate and understand the role of most important policies. Below sections highlight the important policies and their key roles and contributions.

Key Policies for Gorkha earthquake reconstruction

As Gorkha earthquake 2015 had major impact on private housing in terms of loss and damage, policies related to housing reconstruction are very important. According to most informants, there is no such most effective or least effective policy, all the policies were formulated as per the need and if any gap identified in the policy, then necessary amendments were made. The importance of policy documents depends as per the need and time.

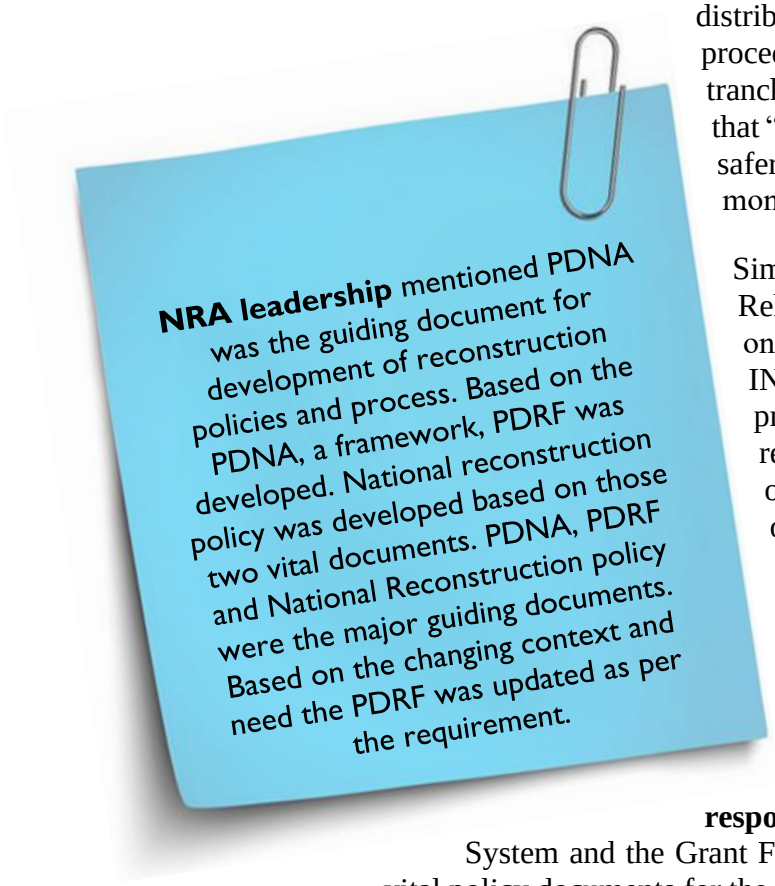
In the initial stage, assessment of the scale of damage was important. Therefore, PDNA/PDRF became the vital and guiding document for the reconstruction process. Based on the PDNA and PDRF, many guidelines and policy documents were developed. As per all KII respondents, every policy document and guidelines formulated and implemented has its own importance and contributed on reconstruction process. The Reconstruction Act provides brief insight on reconstruction activities. All the reconstruction activities, policies and guidelines were formulated based on the reconstruction act. Many working procedures were formulated like grant mobilization guideline, NGO mobilization guideline, concept of integrated settlements etc. are the important policies.

Policy and Procedures for Housing Grant Distribution - "Anudhan Bitaran Karyabidhi" has been the crucial and most important policy document for the successful reconstruction of private housing.

Once the beneficiaries started reconstructing their houses then the importance of inspection of houses was realized, and the Inspection Manual was drafted. Inspection-based tranche distribution system was important policy adopted by the government which also promoted safer construction.

NRA Act along with the required law and regulations were developed to ease the process. To implement the policies various other guidelines were developed such as the Grant Distribution Guidelines, Inspection Guidelines along with detailed Inspection Manual, Enrolment Guidelines, NGO Mobilization Guidelines, Grievance Handling Mechanisms etc.

All of the focal engineers interviewed highlighted how the SOP for Enrolment and Housing Grant has played a fundamental role in facilitating the grant



distribution process with its clearly stated standard procedures and formats for beneficiary enrolment and tranche distribution. One of the engineers mentioned that "the system has helped in building back better and safer buildings with necessary interventions and monitoring by technical person".

Similarly, the GON Policy for Reconstruction and Rehabilitation, 2072 has also been very crucial as one of the engineers quoted "Every NGO and INGO are working under NRA guidelines and their projects must comply the framework of national reconstruction plans and standards. Deployment of technical persons (one engineer and one overseer) in each ward of the VDCs for technical supervision of reconstruction was another important decision taken by NRA. Such program implementation strategies guided us towards the successful implementation of reconstruction program"

According to the local government respondents, the Building codes, Building Permit System and the Grant Facilitation and Distribution Guidelines were the vital policy documents for the Gorkha earthquake reconstruction.

The collaboration work among Government and different NGOs and INGOs for the grant facilitation in the local levels resulted a successful implementation of the policy about the Grant distribution.

Government has important role because all the policies has been formulated by the government. One of the LG respondents mentioned, "We are the policy implementers, and every policy were implemented based on the directives provided by governmental agencies. We formulated different policies, but implementation unit was not properly functional. For e.g., regarding the implementation of National Building code we have policy, but we couldn't establish implementation unit in every local government and we don't have sufficient technical human resources to lead the building code implementation in local government. Responsible authorities should take charge for the implementation of building code.

Senior representative of one of the leading nongovernment organizations working on recovery and reconstruction mentioned that

Post Disaster Needs Assessment (PDNA) helped to put together overall needs of the reconstruction and laid out main policies. Later, the Post Disaster Recovery Framework (PDRF) formulated through the series of consultation meetings with government and nongovernment actors has been another key policy document which was followed in all reconstruction related works. PDRF

outlined roles and responsibilities of all organizations related to recovery, reconstruction.

The current reconstruction followed owner-driven reconstruction approaches in which more than 8 hundred thousand houses were reconstructed which was not possible only by government agencies nor was it possible by NGOs/INGOs only unless the owner themselves realize and construct their houses. This owner-driven approach was chosen as the key policy of reconstruction in Nepal. The government approach of owner driven reconstruction is very good as instead of constructed by others constructing own house bring ownership and sense of responsibility in the house owner.

Government for the first time provided incentive to the house-owners along with social and technical assistance. Government decided to provide two hundred thousand rupees (NRs.200,000) each which was increased to three hundred thousand rupees (NRs.300,000) as the housing support grant for not just the construction of house but to construct **earthquake-resilient** house. Providing grants for all people equally was also commendable. Later, most vulnerable beneficiaries were categorized, and additional support was provided which was very good, NRs. 50,000 additional grant support was provided to the most vulnerable beneficiaries.

Also, government requested too many organizations for socio-technical assistance to the reconstruction beneficiaries to help them reconstruct their houses on resilient manner. This is another important approach.

Policies prepared regarding capacity building and local resources utilization for livelihood was also good. But still all have not been implemented due to several challenges for implementation.

Senior leadership of NSET expressed that there were very limited number of existing policies prior to the earthquake on reconstruction and hence the policies were developed as per the need. The developed policies were just sufficient to take forward the reconstruction process. Wherever gaps were identified, necessary amendments to the polices were done which made the reconstruction success and the process dynamic. However, there had been delay in formulation and implementation of some of the policies which complicated the process. For example, policy related to retrofit of partially damaged houses was formulated late; due to which most of the retrofit beneficiaries either changed to full beneficiary or demolished their house for reconstruction. Similarly, policy related to urban recovery and reconstruction of houses with multiple ownership was also formed lately. Due to which urban reconstruction has not been as successful as rural reconstruction**.**

Similarly, according to reconstruction program lead and professionals at NSET, not all the policies were perfect, but the process was dynamic. The learnings or the expertise on the related issues made the task easier. For instance, the urban houses have different characteristics and are complex, all of those houses could not be built earthquake resilient. Also, people faced difficulties

due to land issues. Approach of integrated settlement might have been useful. Also, convincing people on retrofitting could be done from some more year ago.

Gaps and Challenges of Policies and Policy Implementation

A. Gaps in Policies

While discussing with many stakeholders, the following main gaps in the policies have been revealed.

1. Insufficient grant amount and complicated procedure

Although the government provided financial support of NPR.300,000 for all beneficiaries requiring their houses to be rebuilt, this financial assistance in most of the cases was not enough to rebuild the houses. Additionally, technical support and extra financial support of NPR. 50,000 was provided to all vulnerable beneficiaries. Even most people felt, this financial support was not enough. Further, most of the vulnerable beneficiaries were old people, some were physically and mentally challenged who cannot go to the government offices for necessary process. The complicated process of getting the grant money also caused problems to the vulnerable beneficiaries and caused delay in rebuilding their homes.

2. Inadequate policies for building disaster resilient houses and communities

One of the respondents stated that the current policies and guidelines at national level are not adequate for building disaster resilient houses and communities at local level. It is due to that these policies mainly focus on the safety of residential houses for earthquakes but not for other disasters. There is lack of knowledge among common people on landslides and its causes. The current policies primarily focus on earthquake reconstruction. We need to work on the total cycle of disaster. Post-earthquake we are mainly focused on reconstruction and recovery, and now we need to work on preparedness and emergency response as well.

3. Delayed formulation and implementation of policies

Majority of the respondents who were interviewed highlighted that identification of vulnerable and retrofit beneficiaries was done very late by NRA. During the survey, respondents also highlighted that reconstruction policy related to the landless beneficiaries was drafted in 2074 but implemented in fourth year of the reconstruction which made reconstruction work delayed. Provision of additional financial support for vulnerable population was not very effective because of tedious bank process and government criteria. Major focus of the respondents was that the policy document should be enforced and implemented on time for the better result.

4. Not contextualized policies

Another major gap of the national level policy reported by the respondents were the policies not contextualized at the local level, no strict implementation in national level and lack of awareness among the general people about the polices prepared by central level.

5. Adequacy and acceptance of technical designs

Another gap observed was, 17 model drawings that NRA provided was not suitable to our rural context and less acceptance was there for model drawings as reported by the respondents. Building design without knowing real field scenario, design catalogue not incarnating diverse rural vernacular designs, lack of localization in building design etc. are few examples.

6. Insufficient technical standards and guidelines

"Our ancient monuments are completely destroyed by earthquake and traditional design of our village houses are also destroyed. If we see in Barpak, many houses were built in a block, but that traditional vernacular design is not seen now. After the earthquake, we are not able to design those ancient original houses. If the policy for the house design was brought before only then we did not have to lose originality of the house. Previously, the houses of rich and poor can be differentiated, those with the cement and pillar house they are rich ones and those the mud and stone house they are poor, one of the key respondent stated.

One of the engineers mentioned that "change in traditional practices of construction and adaptation of new technologies was the major challenge"

Additionally, due to lack of consistency in the technical standards published by various organizations also created some confusion in maintaining the compliance. One example, in a publication in which 10 key points were highlighted for safer reconstruction, many points were in conflict with NBC. Few people who constructed their houses following the 10 key points, had non-compliant houses.

Retrofit guidelines was published very late by the government. Due to this, the funds available for retrofitting could not be effectively utilized.

B. Challenges in Policy Implementation

Several challenges during the implementation of policies were identified by authorities, professionals and beneficiaries. Based on the interviews, the

challenges in the implementation of reconstruction policies can be summarized into following main categories:

1. Initial Challenges

Representatives from leading housing sector non-government organizations expressed that there are challenges in implementation of safer shelter even prior to the earthquake. There are initial challenges for the initiation of reconstruction programs, which are mainly:

- Firstly, the socio-political scenario was very complex and unstable; Nepal was in the process of constitution making; due to which there was not enough priority by the political parties for the recovery and reconstruction
- Frequent changes in NRA leadership
- Blockade in Nepal-India border for several months hampered the supply chain of construction materials and supply of fuel
- Occurrence of other seasonal disasters also hampered the reconstruction.
- Other reconstruction related factors like insufficient government planning, corruption and complex social and political situation.

Additionally,

- There wasn't any system/infrastructure nor any trained human resource in place prior to earthquake.
- Needed to work across a difficult geographical terrain, road accessibility was a problem which hindered transportation of materials.
- Information technology was just emerging in Nepal and hence faced challenges in establishing the networking system, IT infrastructures.
- Lack of full functioning banking infrastructure was another challenge faced during the reconstruction. Most of the banks were centrally located with limited access to the most affected people.
- COVID hampered the immaculate ending of the reconstruction programs

2. Lack of scientific and practical understanding about recovery and reconstruction

Nepal government and other organizations imagined the recovery of shelter would be completed during the emergency response period. However, even for the provision of emergency shelter to the earthquake affected population took very long period. Additionally, the emergency response period could have been utilized for appropriate preparation for the organized reconstruction. However, due to lack of scientific and practical understanding among the policy, decision makers, such policies, and plans could not be formulated.

At initial stage of reconstruction there was no policy guidance developed by government of Nepal for the reconstruction process. There were some technical difficulties faced by technical persons who were deployed to the field by National Reconstruction Authority (NRA).

3. Lack of presence of local governments

Absence of Local Governments at initial stage of reconstruction was the biggest challenge for the implementation of the policies. The initial documents developed were with assumptions of presence of local government and functional staff in the VDCs but the absence of local government for a longer period hampered the implementation process.

4. Limitation in and misinterpretation of the policies

People took the housing grant policy in a bit different way. In many places, people constructed one-room houses following the guidelines just to take the grant money. The authorities and reconstruction related organizations were unable to explain the importance of guidelines and significance of grant money for helping in safer reconstruction.

Respondents were asked about the challenges faced during implementation of reconstruction policy. The highlighted challenges are:

- Many actual damaged houses were not listed in beneficiary list. Biasness was felt in the selection of reconstruction and retrofit beneficiaries in many places.
- It was difficult to follow NBC during construction,
- People are unaware about the importance of NBC,
- Due to weak financial status beneficiaries couldn't apply basic requirements of earthquake resilient construction practices.
- Increased cost/rate of construction material,
- Lack of grievance management committee,
- Lack of tranche for vulnerable population and
- Slow tranche distribution were the major challenges faced during policy implementation.

As per the compliance and inspection system, for every house being constructed, inspection form is filled. In the inspection form, checklists related to site selection, landslide and flood proneness etc. are included and checked for such site related aspects. However, enough attention was not given to strictly follow these provisions. In areas where technical assistance is provided through partner organizations, these provisions are followed, whereas in many other areas inspection and certification are done without much attention on the site related provisions.

Likewise, for identification of geologically vulnerable sites, NRA coordinated with municipalities and rural municipalities in identifying and collecting information. The assessment focused on identification of three types of areas based on geo-hazards – first, highly hazardous areas requiring immediate relocation; second, areas where maintenance can be done and people can be settled; third, non-risky areas where people can continue live. In such hazardous

area assessment, focus was primarily given on landslide risks; however, other risks such as of floods are not considered appropriately.

5. Lack of trained human resources

Lack of capacity and trained human resources was the other major challenge faced during the reconstruction process. Nepal did not have the ready to go stock of manpower for damage assessment survey. The young engineers deployed did not have the required level of knowledge, experience and maturity, and as a result, damage assessment survey became difficult in many locations.

Limited technical knowledge, capacities and experiences of technical professionals (engineers) who were deployed to the field for technical assistance, supervision and inspection was another pertinent challenge that has been faced during the reconstruction process.

Another major challenge was the deployment of NRA Engineers after 4 months of the formal beginning of the reconstruction process. One of the respondents said, "Engineers hired by NRA were deployed after 4 months of the start of reconstruction which created huge gap in the earthquake affected VDCs to address the needs of beneficiaries which created confusion among the beneficiaries. They were even not clear about the grant receiving procedure. Additionally, the deployed technical professionals have limited capacity on the housing typologies and technical standards."

The deployment of technical persons in the field were done in mixed approach - technical teams from NRA and different NGOs and INGOs were deployed. One of the respondents mentioned, "Technical persons from NGOs/INGOs were seen in field for longer period than the technical persons from NRA." This implies that the involvement of the technical persons from different NGOs/INGOs played vital supporting role for the inspection of the reconstructed houses.

Further, NGOs only covered few municipalities and villages for technical support, rest of the areas were uncovered. Many people in the villages were not able to get socio-technical support.

6. Challenges in training and capacity building programs

Initially, it was difficult to convince masons to sit in skill enhancement trainings. They thought taking training was not fruitful, and waste of time and money as they were earning more than 1,000 Rupees per day. It was difficult to make them understand the training is important for their skill enhancement and wage increment. As they were earning and had to leave their work to attend the training, daily allowance was provided as the incentive to attend the training. In On-the-job training (OJT) also, daily wages were provided as masons have to work for a month. Training certificate was provided after completing certain hours or days of training, and masons thought it was so complicated and tedious, and they did not easily accept to sit in the trainings. However, later when they

understood the importance of training, a large group of masons wanted to attend the trainings.

In case of women participation for the mason training, it was very hard to make them participate as they have their own roles and responsibilities at home. But in some cases, large number of women wanted to get the mason training. For example, in Panchkhal, large group of women wanted to get on-the-job training (OJT) to become new masons; and managing this large demand was also a challenge.

After completion of the trainings, monitoring of the participants whether they continue to work as mason or not was needed. However, conducting such monitoring was also a challenging task as many of them were out of contact due to several reasons.

There was difficulty in training/teaching aid also. In most of the areas, electrical device such as multimedia projection system was used for the training. However, in highly remote areas in up-north it was difficult to use such tools as there was no electricity in many of these areas. We have to have alternate tools and systems of training for such areas.

Selection of appropriate participants – masons, carpenters was also another difficult task. Local civil society organizations and local authorities were consulted for selecting the participants; and in many cases these organizations did feverish and wanted only few specific persons or group of persons to attend such trainings.

Engineers deployed to the field had limited knowledge on earthquake safer building technologies – they are familiar with cement-based construction but had limited knowledge on safer technology for rural masonry houses. Therefore, engineers should be trained on all designs and types of houses.

7. Gaps in communication and information dissemination

There has been always challenge for integration of technical expertise and social understandings. At initial period, there was challenge on flow of information to the community level especially technical issues. Beneficiaries had doubts regarding the adaptation of technologies and this doubt was connected with its feasibility and technicality. To make the beneficiaries understand about the design and drawings was major challenge.

To communicate with community people effectively there was a need of social mobilizers and the political people who are the leader of that place, not everything can be communicated by technical persons. They should communicate with the community people regarding the grant support that it is not for building whole house but for earthquake resilient elements or components.

Also in the initial days, clear message regarding the house grant was not delivered as the grant provided was not for the whole house construction but

was for earthquake resilient materials. "We could not communicate to the beneficiary about the significance of housing grant of three hundred thousand rupees (NRs.300, 000) provided to beneficiaries. We couldn't disseminate clear message that housing grant was provided for additional support to make earthquake resilient houses. There was a misconception that construction of earthquake resilient house needs more financial resources than traditional houses. If we are able to flow clear messages to beneficiaries, it makes implementation of activities easier" said one of the field engineers.

17 model drawings of houses that NRA provided was not suitable to rural context and less acceptance was there for model drawings. 17 model drawings could not reflect originality of traditional houses.

Another major problem faced during the implementation of the policy documents was the misleading information flow about the construction stage and tranches to be applied, confusion among house-owner, locals and technicians about the policies and rules, lack of strict monitoring of the construction sites, no additional awareness programs and lack of proper counselling services, lack of awareness among public and authorities not being able to aware people about national building code.

8. Further Challenges and Concerns

- The policy was prepared in central level which was very new to local level except in some urban areas where building code has been already applied and municipal office and people are already aware about it. There was no compulsion of using building code in rural construction. Only few organizations were working in housing sector prior to the earthquake. We didn't have required level of capacity and even the government ministries and departments have limited resources. We didn't have long-term vision for resilience in budgeting and national planning. As it wasn't in priority, there were no budget in implementation of building code.
- Professionals of leading housing sector non-government organization mentioned that the policies and guidelines prepared to guide the reconstruction are good. However, the important aspect is the implementation; they should be implemented strictly. In many cases, we see such policies and guidelines were not followed. They did not reach to the local authorities and local people. Even if they reached, due to lack of proper guidance on the use of policies and guidelines, the local authorities and people were not capable to follow them appropriately. They didn't have the capacity to implement. Higher level authorities usually do not know the capacity and limitations at the local levels.
- There were lots of policies and guidelines with GoN but implementation was weak. Some policies are in LG level but those are also not implemented in community level. Vulnerable mapping should be done by using GIS technology. The information regarding vulnerable areas should be communicate in LG and community level so that new construction activities will not be done in risk sensitive areas.

Performance and Impacts of Baliyo Ghar Program

The performance of Baliyo Ghar program has been evaluated based on its contribution and impacts on four key areas of reconstruction. These four elements are:

1. Role of Baliyo Ghar in policy implementation
2. Contribution on human resource development through training and capacity building
3. Raising awareness of people towards safer construction
4. Coordination and Collaboration

Additionally, the program has also been evaluated based on some of its very innovative and impactful contributions such as the training of women masons and elements of sustainability.

Each of the above components is discussed in detail as below.

Role of Baliyo Ghar in Policy Implementation

As explained by NRA leadership, most of the NRA leadership team was from various other professional background and did not have much prior knowledge and experience on post-disaster recovery and reconstruction. At the initial stage, there was very limited number of experts with the understanding of background and need of post-earthquake reconstruction. There were number of institutions who supported NRA on developing policies and systems, and there was USAID's Baliyo Ghar program implemented by NSET whose support was worth mentioning.

NRA leadership also mentioned -
"We knew that NSET is one of the pioneer organizations working in the field of earthquake resistant designs, safer building construction, awareness raising for technology transfer and capacity building activities. NRA undoubtedly felt that NSET's support is required for this reconstruction process. NSET's involvement was noteworthy in the advisory and expert role, and NSET contributed significantly to develop policy documents, guidelines and to implement those at the field level."

NSET has been involved in advocacy and lobbying for disaster resilient reconstruction right after Gorkha Earthquake**.** NSET's Executive Director, himself served as the Technical Advisor to NRA in the initial period and supported in developing major reconstruction policies and guidelines. NSET demonstrated the first grant distribution process held in Singati, Dolakha. NSET has been involved in the three major processes of reconstruction i.e., advocacy for policy/ guidelines, formulation of policy/ guideline and demonstration of policy implementation.

Baliyo Ghar program team mentioned that three different approaches were taken by Baliyo Ghar for the application of the

developed policies in the field. First was the demonstration or the piloting of the activities, for e.g., demonstration of enrolment procedure in Singati; second, reaching out to individuals through door-to-door campaigns, orientation and trainings and third was through the use of mass media, key messages and information were disseminated through radio and television programs.

As stated by NSET senior officials, "Different training activities were conducted for the NRA field engineers for the inspection of houses and related guidelines. At some places, NSET was directly involved in field for the demonstration of inspection. Similarly, NSET was involved in drafting several SOPs, guidelines including development of training strategy. Approximately 3,000 newly recruited NRA engineers were trained by NSET for the operationalization of policies".

NGO's support was crucial from the initial stage of reconstruction process. Different technical trainings were given by NGOs like NSET which was fruitful for the professional development as well as personal career of many engineers. NSET provided trainings to many technical professionals and local construction workers. Such trainings provided knowledge to the trained professionals and also contributed for the implementation of reconstruction policies and guidelines. The trainings provided practical experiences to masons and engineers. Now, for continuous use of knowledge and skills of trained professionals, local governments should hire experienced and trained technical personnel by developing appropriate mechanisms.

Further, Baliyo Ghar played very important role at national to field levels. Baliyo Ghar helped in preparing guidelines related to socio technical assistance which was replicated by HRRP in other districts. There were 7 dimensions of socio-technical assistance at the initial stage, and many other dimensions evolved later. Few important types of socio-technical assistance are:

1. Mason training
2. Orientation and awareness programs
3. Door-to-door technical assistance
4. Training and support to social mobilizers
5. Help desks
6. Resource centers
7. Facilitation and technical support for formation of reconstruction committee for community ownership in house reconstruction

The HRRP team recalled that Baliyo Ghar program has significant contribution in developing mason trainings curricula and also in developing manual of socio technical assistance and its implementation. Also, support to vulnerable population by Baliyo Ghar served as example to many others while advocating with government regarding the vulnerable not being able to construct their houses in 3 lakhs provided by government. Training of social leaders who can influence the community is another important activity done by Baliyo Ghar which have been shared in national level as an example. Baliyo Ghar Program

package of socio technical assistance was very important. Baliyo Ghar also have contributed in providing technical guidelines and providing technical assistance to the communities.

During initial phase, Baliyo Ghar provided technical support to the HRRP Technical teams. Baliyo Ghar provided trainings on earthquake resilient construction for local masons as well as technical professionals. Training approaches provided by the Baliyo Ghar has helped to implement theoretical knowledge on practical field. Those trainings were very helpful for shelter recovery activities. NSET Baliyo Ghar also constructed a demo house in Stone Masonry in Mud Mortar (SMM) in rural areas which served as a very good model of safer construction. Baliyo Ghar team provided technical support to many NGOs in the field where there were difficulties in initiating technical support programs.

NSET Baliyo Ghar updated the curriculum for Mason Training in coordination with DUDBC which helped in maintaining uniformity on knowledge and skills among the masons developed from different mason training courses conducted by different organizations throughout the 32 earthquake affected districts. Skilled masons developed through 7-day mason skill enhancement training were not enough for the scale of reconstruction. So, later 50 days On-the-Job (OJT) training to develop new masons was designed and implemented. Inspection guidelines, evaluation forms have been developed based on which technical inspection of under construction houses were done.

Additionally, HRRP team also mentioned that HRRP and NSET worked on promoting use of hollow concrete block in reconstruction, which was covered in building code but was not properly used by people. The design of hollow concrete block has not been mentioned in guidelines. The problem was identified in areas where hollow concrete block has been used for reconstruction where minimum criteria to be followed was missing. Next was collection of evidence about how many such houses were constructed, what materials were used, what type of design were used and how many houses became noncompliant but received first tranche of housing grant (NRs. 50,000) and how many did not receive the grant. All evidence were collected through NSET and HRRP, which was presented in national level meetings. The problem was further diagnosed by collecting the block samples from all the areas and tested its strength as per the criteria of national guidelines, and report was prepared. This helped in knowing the types of houses being constructed. Around 6,000 houses were constructed till then and to solve the problem NRA formed a Technical Committee where technical professionals from NSET, HRRP and other organizations served as technical experts. Then, type design and guidelines were prepared which was also one of the influences of Baliyo Ghar.

All of the NRA focal engineers interviewed highlighted the role of NSET Baliyo Ghar Program in the field of reconstruction. NSET BG program has been helpful for the implementation of reconstruction policies through different activities like training to technical personnel who were deployed to the field, door to door campaign and awareness raising activities. Similarly, technical guidance provided to the house owners through social mobilization was also

highlighted by the respondents. In overall Baliyo Ghar program has played important role for building earthquake resilient community.

One of the engineers mentioned that "BG helped in analysis and correction of houses that were wrongly constructed and also facilitated in getting the tranches of grant money for those houses".

One of the elected representatives of Shivapuri RM, Nuwakot mentioned "Local government has an important role to play in implementing the policies. However, we required technical support for the implementation of the policies, and NSET/BG provided that required support in our VDC. The Baliyo Ghar Program provided technical supervision during the construction of the house".

Another elected representative from Sidhalekh, Dhading expressed "In our VDC Baliyo Ghar started its activities when there were no other organizations. They taught people on how they can construct earthquake resistant houses. They helped us in developing skilled masons which was very important at that point of time. Baliyo Ghar was also regularly in touch with us for coordination while performing program activities in the VDC areas. They have done exceptionally good in our VDC."

Baliyo Ghar Officials expressed engagement in communities either through different trainings and capacity building programs or through orientations has enhanced the owner driven reconstruction approach. In Baliyo Ghar working area, the level of awareness has increased in terms of disaster resilient constriction practices. In most of the places, females were not working as masons but there was need of large human resources at the time of reconstruction so female masons were chosen. On-the-job trainings were conducted to those women who wanted to work as masons. In Alampu village Dolakha, female masons are working like male masons and they got the similar daily wages like other male masons. Baliyo Ghar not only trained human resources but also advocated to the local authority for the utilization of trained human resources in local level construction work. Baliyo Ghar program had set good example of how the local human resources can be utilized for post disaster recovery reconstruction and also for improving the community awareness.

NSET leadership team mentioned that the major success was building confidence among the government authorities at central level, district level and local level and community people. In every sector, different reconstruction activities helped build confidence among the people like female masons. We have been able to build confidence among the different reconstruction actors. Different activities and technologies have been demonstrated and used on field which made reconstruction successful. This confidence should continue for future construction efforts.

Most of BG working areas were marginalized community due to topography, accessibility, and socio-cultural aspect of community. One of the major challenges faced was difficulty in mobilization of team for trainings and orientation programs. It took some time to manage the problem and due to

topographic conditions, there was difficulty in reaching to communities especially during rainy season.

Convincing people at different level was the major challenge of reconstruction. When Baliyo Ghar started to work at local levels, political leaders (VDC chairpersons, secretaries) raised question on working modality. Few other organizations reconstructed the houses of the people, but NSET Baliyo Ghar provided only socio-technical assistance to reconstruct. This created confusion among the people and leaders at local level. However, with continuous engagement at local level, later, Baliyo Ghar team could generate strong support from the local governments towards the socio-technical assistance programs. The continuous involvement with local, district and central level stakeholders helped to make the efforts successful.

Contribution of Baliyo Ghar on human resource development through training and capacity building

Stakeholders and key partners expressed that Baliyo Ghar had several important contributions and impacts towards the successful implementation of Owner Driven Reconstruction programs.

One of the important contributions is on large scale human resource development through training and capacity building programs. NRA engineers expressed that training and capacity building was one of the core elements of the reconstruction program.

Majority of the respondents (14 out of 19) highlighted that NSET Baliyo Ghar Program played important role for the development of trained human resources. NSET/BG conducted different trainings to enhance the capacity of local masons, engineers, social mobilizers, local government representatives, social and political leaders, media personnel and various other stakeholders involved in the reconstruction process.

> One of the NRA officials said "Especially in the training and capacity enhancement sector, more than government institutions, organizations like NSET and others played pivotal role, they also introduced socio technical assistance packages. NRA was mostly hardware oriented, not much was done from our side on the software part which is also one of our limitations."

Training and capacity building activities under the NSET Baliyo Ghar program have been analysed in the following main areas:

1. Main components and approaches of training and capacity building
2. BG achievements, impacts by training and capacity building

3. Critical aspects, problems and challenges
4. Lessons and suggestions for continuation and sustainability of trainings

1. Main components and approaches of training and capacity building

Training or capacity building programs are considered an important part of the reconstruction process. Socio technical assistance has been very important as technical experts reached to every village. It was evident that houses have been built faster and safer in those areas where technical assistance was provided.

Baliyo Ghar training activities were focused on developing common understanding among the different stakeholders like local government representatives, local social and political leaders, DLPIU engineers, technical persons deployed by different partner organizations and social mobilizers. The ultimate goal of the training and capacity building programs was to assist house owners and beneficiaries on successful and timely completion of reconstruction work.

Standardized and tested curricula were used by all at all places. Simplified training curricula with standard terminologies and detail training content have been used during the trainings which was instrumental to enhance the applicability of trainings as mentioned by 7 Out of 19 respondents. The mason training curricula developed by NSET and endorsed by DUDBC prior to reconstruction was followed by all. This made a huge difference as whoever conducted the training the standard was maintained throughout. This was one of the biggest achievements in the training and capacity building.

DUDBC Officials said "Mason training has promoted women empowerment and self confidence among the female masons. Many female masons from Dolakha who are working as masons mentioned that they can work independently in the construction sector."

NSET BG had major focus on three aspects of training: one is training to real construction workers like masons and contractors for their capacity enhancement. Another is training of trainers who were directly involved in providing training to construction workers. The third aspect was the training of social mobilizers who were very active in motivating the house-owners and trained masons for constructing earthquake resilient houses.

The milestone activities for Nepal's reconstruction were the development of trained human resources. Before the earthquake, only very few organizations gave priority for development of trained human resources. But later, mason trainings conducted by NSET for rural and urban masons was one of the most appreciable efforts for reconstruction. Later, every organization working in housing sector had some form of training packages.

Mason Training Programs

Among all the capacity building programs, skill enhancement of local construction workers through mason training programs was highlighted as the most crucial by most of the respondents interviewed.

NSET trained total 13,474 masons and contributed significantly to capacity building component of the national reconstruction campaign.

Among the training components, Mason Training for the existing masons and developing new masons through on-the-job training (OJT) had been very effective for the reconstruction process.

On the job trainings (for both new construction and retrofitting of existing damaged houses) provided the working opportunities for new masons and during the OJT they were supervised by technical persons which increased the level of confidence of the new masons. OJT trainees were confident as they can guide others in earthquake resilient construction.

Many house owners had deployed trained masons during reconstruction and some of the LGs had mandatory provision for deployment of trained masons during construction. This helped to construct the houses compliant with the provisions of the technical guidelines. Another benefit of the mason training was that it helped to increase the social status of construction workers.

One of the NRA Senior Officials stressed "We could have called people and conducted trainings in city centers and send them back to villages, but we prioritized on-the-job (OJT) training. OJT model was very effective as the people learned during process and built other houses following the same technology

One of the respondents reported, "The concept of 7 days mason training and 50 days on the job training conducted by NSET/Baliyo Ghar was very good. The concept of technology transfer of retrofitting was also nice."

One of the NSET representatives saw another benefit of the mason trainings as he said, "In the earthquake affected districts wherever there have been massive mason trainings, the trained masons themselves became the advocates of safer construction".

Training of Trainers (TOT) - Training the Engineers of Partner organizations

Training of Trainers (ToT) courses provided at central and district level are other important parts of reconstruction efforts. Series of ToTs enhanced and promoted the disaster resilient construction practices at local community level. Similarly, instructor development process helped to build confidence of the trainers who later were involved in conducting further training courses for masons and technical professionals. The trained engineers visited and inspected each and every house and guided the masons which built confidence among the masons and house owners.

Through series of TOT courses, technical person working in NRA were informed and guided about NRA policies, instructed about important aspects to monitor during building inspection which helped in grant distribution.

NRA Focal Engineer said, "Apart from training the local masons, NSET/BG has trained the technical persons, engineers and social mobilizers through the TOT so that they can train other people, this was very helpful to spread the skills.

NSET/BG provided trainings to the technical professionals of other NGOs/INGOs (such as CARE, CRS, ASF, Oxfam etc.) working in the area which helped them smoothen their work in their working districts. Respondent of one of the organizations mentioned, "We were having difficulties to work in Okhaldhunga. We observed trainings conducted by Baliyo Ghar in Dhading and also learned about retrofitting from them. Now, 7 houses are retrofitted in Okhaldhunga."

Training of Social Mobilizers

One of the officials from the partner organization stated, "After we got training from NSET, we trained and transferred our knowledge to other people from different partner organization, we covered 14 VDC of Gorkha, 6 of Sindhupalchowk and 6 of Dhading, altogether 26 VDC."

Training of Social Mobilizers was another important component of capacity building program. Trained social mobilizers played a vital role in the reconstruction mega campaign.

Engagement of trained social mobilizers and mobile masons for reconstruction was very effective. Baliyo Ghar program deployed trained social mobilizers, trained masons and engineers together in mobile teams for door-to-door technical assistance. Mobile masons provided the practical skills on site while the social mobilizers played significant role to increase community awareness on concepts of safer construction.

Senior DUDBC Officials said "NSET/BG played a vital role in reconstruction by integrating social mobilization along with technical assistance. Socially excluded group of people also got the information through social mobilizers and mobile masons. With the help of social mobilizers and mobile masons many vulnerable households could construct their houses which was one of the best examples of effectiveness of social mobilization in reconstruction".

Baliyo Ghar team mentioned that "Role of Social Mobilizers was equally important as that of engineers and masons. From information dissemination to convincing and motivating people, and to increasing the construction rate, social mobilizers have done everything to support disaster resilient construction. They went to each and every doorstep and disseminated the technical messages in a simplified and understandable form".

NRA Official expressed "In promoting earthquake safer technology, there is not just technical aspects, but there are social and other aspects as well. For example, in case of promoting retrofitting, technically retrofitting is possible and technology is available, however, people need to accept it. In many places, initially people did not easily accept the idea of retrofitting, they were reluctant

to do retrofitting of their houses. It required significant time and efforts to convince people. Social Mobilizers put their significant efforts to convince people on retrofitting."

2. Success and impacts of training and capacity building

The following are few major impacts and successes of training and capacity building by Baliyo Ghar:

Increased awareness and capacity of masons and construction workers on safer building construction

- Capacity building and awareness of local construction workers on the need of safer homes were the biggest achievements of the capacity building programs. One of the respondents (NRA Engineer) said, "We cannot stop earthquakes and other disaster events. But by making people aware of building strong homes, we can promote safer houses, and ultimately, we can reduce the effect of disasters. Therefore, capacity building and awareness raising can be treated as major successes of the program. Gorkha earthquake convinced people the need of making strong homes."
- Most of the respondents mentioned that mason training has been the most important part of the reconstruction process and was very effective. The respondents from all the surveyed areas (Jyamrung, Kalleri, Nilkantha, Kageshwori, Talakhu, Chhap, Magapauwa, Alampu and Bhimeshwor) have said that the trainings have been very fruitful. Respondents mentioned that they learned about the government standard design, and about the quality materials. One of the masons from Jyamarung (Dhading) said, "We received the training when we were in desperate need of the training, it taught us about the earthquake resistant construction techniques. We could apply those learnings during the reconstruction of our house and other houses in the community.
- Masons spoke most often about how the program gave them new skills and knowledge on earthquake resistant construction technology. One mason stated that "prior to this training, we didn't know about earthquake resistant building construction technology and methods; after training, I am a certified trained mason now."
- Almost all the trained masons used to work as masons before taking the training. Majority of the masons took this training to enhance their knowledge and skills.
- Majority of the masons are continuing the mason profession. Few of them could not continue as they didn't find work since reconstruction of many houses have already been completed. Hence, they are engaged in other professions like farming, working as carpenter and others.
- While tracking the trained masons it was found that the trained masons built average 5 earthquake resilient houses during the period of 3 years.

Empowering the women

- According to the masons, the reason for participating in masons training program was to get more employment opportunity at local level, being competent on new technology, promote safer construction practices at local level was the objectives of participating in mason training. Female masons involved in the FGD of Alampu mentioned that they participated in mason training for women empowerment, to make living and to generate new skills.
- Even few trained female masons have now became contractors
- Female masons of Alampu (Dolakha) mentioned that, boosted confidence, women empowerment and equality in family was the major changes felt after receiving mason training.

> One of the masons from Chhap, Nuwakot said, "Before the earthquake, I was not aware about the methods and techniques of building Earthquake Resilient Houses. Now, I know how to build earthquake resilient house. The mason training provided by Baliyo Ghar has helped me and other people to become empowered and independent.

Changed role, perception and social image of masons

Mason training programs have not just helped to enhance their knowledge and skills on safer construction practices, but it also helped them to realize their changed role in the society, have changed about the perception of their own work, and also changed their status in the society.

- One of the masons said "My responsibility to make the house earthquake resistant is very important because if I don't build the house without considering the seismic criteria, the house could collapse at any time
- As a house owner and as a trained mason, we think we possess great responsibility. We have to flow information regarding the importance of eq. resistant houses to those houseowners who don't pay attention for making earthquake resistant houses.
- After training masons also experienced a growing sense of pride and confidence. Masons stated they felt confident in their work and in convincing colleagues and house owners about building safer and stronger houses
- Throughout the interaction with the masons, increased access to jobs was mentioned. There were positive statements indicating that access was "enhanced" or that masons had more work opportunities.
- Masons from Kalleri, Dhading mentioned "After participating in the Baliyo Ghar Mason training, we got more working opportunity after we received training which led us being more financially strong. Also, we felt more

competent in new technology of earthquake resilient building construction and could convince people about the technology.

- During the discussion it was evident that masons seem to understand the importance of having a roster of trained mason in the municipality. Majority of the participants of the FGDs mentioned that they are not aware on any such provision at their municipality. They further mentioned that it will be beneficial if they have the system as it will lead to recognition of skilled masons, more job opportunities for them such as in the local government development works etc.
- One of the Mason of Kageshwori, Kathmandu said, "Before there was no provision of listing of trained masons in our local government unit. The listing of trained masons might be helpful for us for getting jobs in our locality."

Hand holding and training of other masons by trained masons

Several other fellow masons were helped by trained masons to learn the earthquake-resistant construction techniques. They trained the fellow masons at the construction sites that they worked together. This process helped to multiply the capacity building efforts and to develop further large number of skilled construction workers.

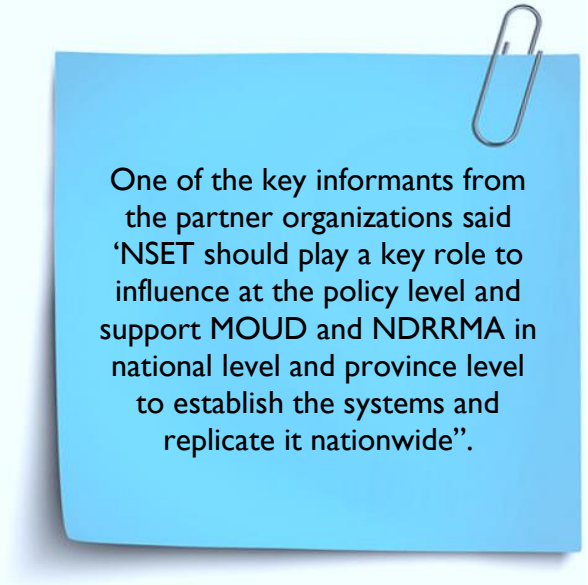
- Trained masons from Jyamire, Dhading mentioned "Nearly 30-40 new masons have been further trained by us, and we will continue to help other masons in the coming future. The masons trained by us are also following the knowledge they learned from us, they are constructing the resilient houses."
- Another mason from Kageshwori, Kathmandu said "What we have learned in the training we have taught the new masons in our workplace under our supervision and they have also built the new houses as we taught them."
- Mason from Talakhu, Nuwakot mentioned "I have taught many masons. Few of them have also became contractors. I taught about 25 people."
- Mason from Alampu, Dolakha expressed "We have taught unskilled male or female labors and helpers who show interest in construction."

3. Challenges for implementation of training and capacity building

These are some of the critical challenges as observed by the masons who were involved in getting the trainings and also in reconstructing the houses:

- Delay in the reconstruction process, which delayed the training to the construction workforce the beneficiaries wanted to construct their house immediately, but the required trained construction workforce was not ready.
- Absence of local government in the initial days further delayed the process.
- Due to difficulty on selection of participants for the training, real masons were not selected for the training.

- Masons stated that they had difficulty convincing the houseowners to use earthquake resistant construction because of the extra cost associated with it.
- Most masons spoke about continued competition with untrained masons. They believed untrained masons tended to construct in low-cost ways with lower quality construction, compromising the building code requirements. Masons spoke about untrained masons, especially untrained masons from neighboring districts and "untrained workforce from India" competing for work.



- One of the Mason from Jyamarung, Dhading mentioned, "As there is no listing of the standard and uniform wages for masons, untrained mason from outside worked in low wages which prevented us from getting work even in our own community.
- Masons mentioned that in some cases House owners didn't want to follow the guidelines as they were not satisfied with the new designs. 3 feet attic system in new design was not satisfactory to them.
- In one of the discussions in Jyamarung (Dhading) participants mentioned that "In retrofitting, lower caste masons are not included in the construction of the upper caste people houses. Through representatives from NSET called us but the house owner was still hesitant to involve us".

4. Lessons and suggestions for continuation and sustainability of trainings

Suggestions for institutionalization of the training system

For the sustainability/continuation of the training system, majority of the key informants 12 out of 19 stressed that first, all the training curricula should be standardized and endorsed by the government and adopted and implemented by academic institutions such as engineering colleges, CTEVT affiliated training schools etc.

Local governments should also built-in the provisions of training and capacity building of local people in their system. Trained human resources should continue related work through leadership of local government. Local Governments should adapt this human resource development process. Overall system of trainings should be continued by Ministry of Urban Development, NDRRMA and other associated agencies.

Respondents further mentioned that Central Level authorities like DUDBC, NDRRMA and provincial government should play supportive role for sustainability and continuation of training and capacity building program.

Relevant NGOs should continue advocacy and lobbying for continuation of training and capacity building programs at grass roots level.

In view of the large need and potentials of training and capacity building on safer construction throughout the country, all the key informants mentioned that the TOTs and Instructor development process is extremely important and needs to be continued. This has to be started from the central level, academic institutions and CTEVT affiliated training institutes can play major role in developing such trained resources.

Suggestions for retention of trained human resources developed

Role of local governments is crucial to retain and sustain the trained human resources developed during the reconstruction process. Those trained human resources are the assets to the nation and should be integrated into the local government system. All the key informants highlighted that all trained masons should be licensed or provided with the training certificates, and the local governments should have proper listing mechanism for the trained human resources. Further, refresher courses should be conducted for those who are still in the field of construction.

According to the NRA officials, local governments should have the provision of keeping the record of trained masons and engineers and accordingly priority should be given to trained professionals for any kind of construction works within the municipality.

Certification process of trained masons through CTEVT has already been started. NRA in association with CTEVT have started the process of certifying the trained masons. Roster of trained masons and technicians along with their phone numbers is being prepared. Skill testing of 3000 masons is in the process and after that NRA is targeting for certifying another 40-50 thousand masons trained during this reconstruction process. Once the municipalities have the list of certified masons then they can implement rules of using at least one trained mason as lead mason during construction which will ultimately support building code implementation in the municipalities.

LG should have proper monitoring mechanism for newly constructed houses. Similarly, LG should have proper registration mechanism of newly constructed or reconstructed houses. Buildings catalogue and its localization should be done. Another LG informant mentioned, "In every local government, at least one technical person who has experiences of reconstruction should be appointed by government of Nepal".

Large number of development works are being conducted under the local governments and as such trained human resources should be retained by the LG for those works like construction of retaining wall, construction of road etc. There should be a provision of listing of trained masons into the local government system and mandatory rules for deployment of trained masons while constructing houses. Also, local governments should enforce policies that motivate the contractors for using of trained masons in the construction works.

One of the LG key informants mentioned- "we should train our technical staff from all rural and urban municipalities on earthquake resilient construction. I feel TOT and trainer development process is very important and organization like NSET should continue this.

It was observed that the local trained masons demand higher daily wages for the construction work compared to untrained construction workers. In most of the construction works implemented by local contractors hire construction workers from other districts who are not trained. Such differences in daily wages decreases the working scope of local trained masons. Therefore, local governments should fix the standard daily wage for the construction workers and have a policy to use only the trained workers.

In Baliyo Ghar area, roster of trained masons and engineers have been developed which will be very useful resource for future development activities.

Through Baliyo Ghar program, NSET has been advocating for the use of trained masons in other development works, e.g. In Alampu (Dolakha), the local government prioritized the local trained masons for the construction of local roads, group of trained female masons were also involved in the road expansion program of the municipality.

Role of various stakeholders to make mason job more effective

i) Role of Local Government

Local government should assure the job opportunities for the trained masons. Daily wages of the masons should be uniform and should be implemented by the local government for the retention of trained masons. Similarly, trained masons should be recognized with identity card, proper listing mechanism should be there in local government unit. FGD participants of Jyamrung mentioned, "There must be regular training, refreshers mason training and local government must play an essential role in order to create more opportunity."

Local government should fix the work rate and also utilize the trained masons from the community. One of the masons interviewed mentioned, "There are lots of constructions work going on in the community and ward and the local government should help in facilitating and deploying us in the work. These things would help us being employed in the locality and we could invest our knowledge in our community".

To make the mason profession more dignified, the names of masons trained by the local government should be listed, and provision should be made to build houses only by trained people

LG should list trained masons so that they can be provided job opportunities through municipality, Identity card for those masons, providing more job opportunities and Creating mason groups.

ii) Role of organizations

FGD participants highlighted the role of NSET and similar organizations for the effectiveness of the mason's job. As per the participants NSET and similar organizations should conduct refresher training for the masons so that masons can update themselves and be more competent on newest technology.

NSET **should conduct refresher training for the masons** so that we could get updated about the new technology and recall our previous knowledge. Also, if NSET finds opportunities in other parts of districts also, we would go, and work said one of the Mason.

iii) Role of masons

The trained masons have an important role for the effectiveness of their own job. Participants of the discussion mentioned, mason must be more updated on new technologies, male masons should include female masons in reconstruction work, and mason must apply skills they have learned during the trainings. Trained masons participating in the discussion at Magapauwa mentioned, "Masons should use their own capability, skills and knowledge and practically use the lessons learnt in trainings."

Raising awareness of people towards safer construction

Raising awareness of stakeholders has been another important effort of reconstruction. A number of awareness raising activities were conducted by government and different organizations to increase the awareness of stakeholders involved in reconstruction. The informants were asked about the different awareness raising activities conducted which they found most effective and why.

One of the senior government officials, stated, "Baliyo Ghar TV program was very effective in simplifying the technical knowledge and disseminating in simple, understandable form. The program helped raise awareness of the people as it provided detail information on the process, mechanism, and guidelines to be followed during the reconstruction process".

Majority of the informant's highlighted door to door socio-technical assistance was the most effective one. It disseminated the technical aspect of reconstruction and related policies in simplified way to the communities.

One of the NRA officials mentioned, "**In addition to other awareness programs, information communicated through trained masons was the most effective one. Houseowners did not trust strangers, but they listened to the masons of their own community and their decisions were as per the suggestions of the trained masons"**

One respondent mentioned – the demonstration of earthquake resistant techniques has been another effective way for raising awareness.

One of the LG informants mentioned that "The concept of demonstration house was very good. People are more convinced by seeing rather than just by hearing".

Another major awareness raising tool was the use of media. Media played an important role in disseminating the information. Through television and radio programs like Baliyo Ghar, Milijuli and others, housing reconstruction and other key messages could reach to wider mass. Baliyo Ghar Radio/TV program has been very effective approach adopted by NSET for housing reconstruction. It was effective because it talked about the problems faced by the people especially in the rural context and its solution. The program simplified technical knowledge and made it understandable to common people. Baliyo Ghar Radio/TV program was helpful not only for community people but also for the social and political leaders of the community.

Respondents were specifically asked if they have listened to or watched Baliyo Ghar Radio and Television program and how effective did they find the program. On this, all respondents mentioned they had watched or listened Baliyo Ghar program.

According to a senior government official, Baliyo Ghar TV program was very effective in simplifying the technical knowledge and disseminating in simple, understandable form. The program helped raise awareness of the people as it provided detail information on the process, mechanism, and guidelines to be followed during the reconstruction process. The programs also raised issues of local people, issues of trained masons, how they have been working, what they are practicing for making earthquake resilient houses and many.

One of the NRA engineers said, "I have been watching Baliyo Ghar program through social media. I liked one of the episodes in which masons and homeowners shared their experiences of building earthquake resistant houses with smaller amount of extra money. Such experiences helped to inspire other people to build earthquake resistant houses. This aspect helps to adhere to safe construction standards".

One of the LG respondents said, "Engineers, technical persons and masons also played an important role at the ground level. We further needed to communicate the earthquake resistant techniques with the house owners and technical words should be avoided, so social mobilizer who can relate to the community along with masons were mobilized. Mayors and Deputy Mayors also played a major role to inform the communities about the NRA guidelines since they can influence the community people and get it implemented. Lastly the decision maker is the community where the problems are generated, and the solutions are also implemented then the lifecycle from house construction to completion comes to the end. This requires the role of many people.

Coordination and Collaboration

Many organizations and partners were mobilized during the reconstruction and rehabilitation process and the proper coordination among different stakeholders made the reconstruction efforts more effective and successful. The legal framework of NRA provides strong basis of highest level of coordination at all levels. NRA achieved required level of coordination through mechanism of horizontal and vertical communication. NRA Advisory Council where Prime Minister is the Chairperson, Leader of the main opposition party is Vice Chairperson, several ministers, former prime ministers, and leaders of earthquake affected areas are members in the Steering Committee of NRA. These forums provided possibility for maximum coordination and every issue can be discussed, suggested and decided in transparent way.

Likewise, different leading agencies within the government have been established for e.g., GMALI were formed for grant facilitation process of private housing. For technical support in reconstruction CLPIU and DLPIU were formed. At the central level NRA and the CLPIU played important roles in mobilization of resources and organizations and also provided the overall guidance to the reconstruction activities. DLPIU played important role in coordination among district level organizations and local governments. Due to proper coordination among the partner organizations and stakeholders, duplication in terms of activities and working area could be minimized. DDMC also played major role in overall coordination of reconstruction activities at district level. HRRP played important role for coordination and collaboration among different reconstruction stakeholders.

However, in practical terms, coordination was not easy as there were people from different walks of life within NRA itself. Also, the political transitions, in between, further aggravated the situation. Another challenge was, initially CLPIU's accountability was not with NRA, CLPIU's parent ministry was different, NRA was just in advisory role. Reconstruction fund was with the Ministry of Finance, though NRA developed the guidelines for mobilization of resource, but it was not practically possible for NRA to have the control over the funds.

For INGO/NGOs they first need to make agreements with donors and once the fund is secured, then only, they come to NRA and due to this sometimes the real criteria and need did not match.

Despite the challenges, the overall coordination and collaboration among the NRA and various other stakeholders during the reconstruction process was found to be impressive.

NRA Focal Engineers expressed the coordination mechanism and collaboration among NRA, CLPIU, DLPIU, NSET and other organizations was very effective. According to the interviewees, the coordination and collaboration with NSET/Baliyo Ghar was also very easy. One of the LG respondents said,

"NSET made their presence at the beginning when no other organizations did. Coordination and collaboration with NSET were very good."

Local government representatives felt effective coordination mechanism made things easier. The collaboration work between government and different NGOs and INGOs for the grant facilitation at the local levels resulted a successful implementation of the policy about the Grant distribution.

Challenges in coordination and collaboration

One of the NGO representatives mentioned that they did not face problem to collaborate with CLPIU and DLPIU. However, they faced two problems at local levels at the initial period: before the local government elections there was only VDC Secretary as the main official, and while conducting any program they had to take approval of VDC Secretary which made it little difficult as they would not be available in VDC office. NRA engineers have helped a lot but they used to go to villages for only limited time, and was difficult to match with their availability.

The collaboration and communication with NSET was good. NSET helped a lot in training and capacity building, NSET even helped to train technical persons of several partner organization. They could observe trainings of Baliyo Ghar in the districts and learned how to conduct trainings at local levels. NSET Baliyo Ghar even supported in design for retrofitting of partially damaged houses.

Another NGO representative mentioned, they worked with CLPIU and provided necessary support to finalize model designs. They also worked closely with NRA, DLPIU and LG for providing support to vulnerable population. To avoid the resources duplication problem, VDCs were assigned to different partner organizations in coordination with NRA. Series of discussion meetings were conducted with district level partner organizations like NSET CRS, Red Cross etc. and such platform provided the chance to share the knowledge and ideas among different partners organization. The works done by them have been widely accepted by the community people. Reconstruction mega campaign is now heading towards the end with great success because of the effective coordination and collaboration among the partner organizations.

Assessment of Baliyo Ghar Objectives by Key Informants

Total 19 officials were interviewed as key informants to assess the results of Baliyo Ghar program. In each interview, key informants were asked to assess Baliyo Ghar Overall objective and Intermediate Results on a scale of 1-10 with 0 meaning poor and 10 meaning excellent (Annex1). The minimum, maximum, median and quartile scores are shown in the given boxplot (Fig 9).

Overall, the key informants are positive about the Baliyo Ghar objective and its Intermediate Results.

Overall objective - Support disaster- resilient reconstruction of houses through standardized training, awareness, and demonstration

On asking to rate overall objective of Baliyo Ghar, **10 officials rated 9 on an average** as BG has played vital role by providing technical support to build earthquake resilient houses in rural context by providing awareness to house owners, training to masons and by building demonstration retrofit houses. Some of the expressions/thoughts about the overall objective of BG by the officials are summarized below:

1. Partner organization – "NSET Baliyo Ghar and its technical support helped local community people to build earthquake resilient houses in rural context also."
2. NRA officials – "Baliyo Ghar conducted many activities to support disaster resilient reconstruction and it contributed through different activities like trainings, awareness activities, demonstration which supported the local people and enhanced local capacity and awareness."

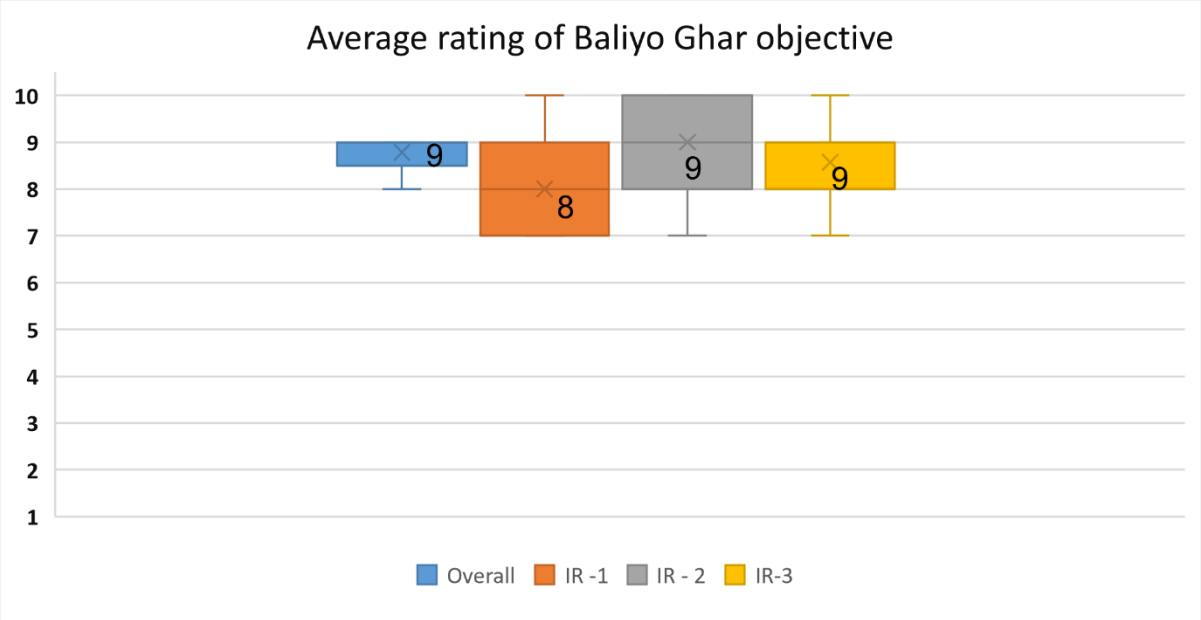


Figure 9: Average Rating of Baliyo Ghar objective

IR-1 - Improved policy and standardization of training, guidelines, and manuals for disaster-resilient construction.

Officials were slightly less confident on meeting the first Intermediate result of Baliyo Ghar. **On an average, 11 officials rated 8 with score ranging from 7 - 9.** These officials stated that technical persons from both NRA and BG were available in every construction site. They observed faulty construction in some sites. According to the officials, most of the policy and guidelines were prepared as per the need but some guideline could not be effectively implemented in field.

1. NRA focal engineers – "NSET Baliyo Ghar program has played vital role in reconstruction campaign, reached to every door of reconstruction beneficiary. Prepared training guideline for 7 days rural and urban mason training."
2. BG officials/field engineers – "We have provided the support to NRA for policy formulation as well as its implementation in field. Some guidelines could not be implemented in field like hybrid manual. In some places there was some gaps in information flow regarding to the construction practices and construction materials. Such gaps in information flow hamper the reporting back mechanism to NRA and correction of policies."

IR-2 - Enhanced local capacity to apply disaster resilient construction methods and techniques

Interviewees were positive regarding the enhancement of capacity building by Baliyo Ghar and most of them rated 9, score ranges from 7-10. Many people got trainings from Baliyo Ghar which helped in overall reconstruction process. All the trainings conducted by BG were at the right time. NRA engineers and local government representatives explained their scores by their saying as:

1. NRA focal engineers – "NSET Baliyo Ghar provided information regarding acts, policies of reconstruction before training, conducted very effective trainings, large number of local masons were trained through BG program, which is one of the milestones in the field of reconstruction."
2. Local Government representatives – "Most effective, change in people perception towards earthquake resilient construction."
3. BG officials/field engineers – "Maximum resources and efforts was invested for the capacity enhancement. As according to time and places modification and revision were done as necessary. NSET Baliyo Ghar program fully utilized our expertise for the capacity enhancement of local community."

   "Large number of human resources has been trained through NSET's Baliyo Ghar program and other organizations, the local capacity has been enhanced but the retention of trained human resources is the key questions. Retention of trained human resources in local level is one of the big challenges of the reconstruction program."

4. NRA officials – "Delivery of trainings was properly done. Especially in the training and capacity enhancement sector, more than government institutions, organizations like NSET and others played pivotal role, they also introduced socio technical assistance packages.

IR-3 - Increased awareness on disaster resilient construction in Nepal.

Regarding the increased awareness on disaster resilient construction, interviewees were positive about the change in perception brought by Baliyo Ghar awareness and orientation programs. **Most of the interviewees rated 9 and the score given by officials ranges from 7 -10**. They noted that by providing awareness NSET fully supported government. Here, officials stated that:

1. NRA focal engineers – "Messages on earthquake risk were conveyed through different media very effectively. Video and audio materials disseminated through national and local media were very effective. Video materials presented during the orientation session were also very useful to increase awareness on disaster- resilient construction practices."
2. BG officials/field engineers – "Our awareness activities were focused on reconstruction. There was some gap for sustainable disaster resilient reconstruction. Our awareness activities and efforts were most important at that point of time and helped to addresses the need of time. Later, awareness materials and efforts mainly focused on reconstruction. Secondly, those people who got the information through our programs fully utilized or not is another important question. Awareness efforts has less focused on multi hazard risk reduction and utilization of knowledge obtained from awareness program is another main point of discussion. Our efforts how much provided community people utilized the knowledge obtained from awareness program for community-based disaster risk reduction."
3. NRA officials - NSET is pioneer from beginning so in the case awareness NSET deserves all point.

Important contributions of Baliyo Ghar

(Key Informants' views on important successes and areas of Need)

Key informants across all the sectors indicated what they saw Baliyo Ghar's largest contribution to the country.

Baliyo Ghar significantly contributed in developing large number of trained human resource required for the reconstruction works, from building the capacity building of the existing construction workforce, to developing totally new construction technicians and as well-built the instructors' capacity through the series of Instructor development processes. Several noted that it was through the standardized training system and curricula that there was uniformity across all the reconstruction areas.

Key official from DUDBC mentioned "Baliyo Ghar conducted many activities to support disaster resilient reconstruction and it contributed through different activities like different trainings, awareness activities, demonstration which supported the local people and enhanced local capacity and awareness. Trainings were provided to many technical professionals as well as local construction workers. Such trainings provided knowledge to the trained professionals and contributed for the implementation of reconstruction related policies and guidelines.

Key informants also noted that the massive awareness activities conducted through the Baliyo Ghar program has been able to change the mind-set of the houseowners for making their home earthquake resilient.

With this came direct improvements in building safer homes, and hence reduced risk as seen from the level of compliance achieved in this reconstruction.

Beyond these obvious changes Baliyo Ghar played a major role in National level advocacy for earthquake resilient construction. NRA officials mentioned that NSET's role was noteworthy in policy level intervention. From being involved in the advisory role in the reconstruction process, NSET contributed in developing documents, guidelines and also supported in implementing those at the field level. It also supported development of training and education standards.

Key informants also explained about the uniqueness in the approach of Baliyo Ghar program. According to them, the local level intervention of Baliyo Ghar played major role. Baliyo Ghar team the technicians/social mobilizers reached to the locals and had very good coordination with the local community Local government and all other related stakeholders involved.

Local capacity was enhanced including local masons, contractors, engineers, houseowners, social mobilizers, local leaders, and local government representatives etc. This also led to the creation of local level jobs.

Key informants also noted, Engagement with the local government and the local leaders as the contributing factor. The reconstruction activities at the local level also depend on the level of understanding of leaders, mainly those local government who had better understanding of the reconstruction policies, reconstruction process and implication of policies had achieved greater success on reconstruction for e.g. Alampu village of Dolakha district. Key informants further explained that Baliyo Ghar program implemented its activities along with the guidance and continuous engagement of local government. In coordination with the central government (NRA, DLPIU), Baliyo Ghar program conducted training to enhance the capacity and understanding of the local government and the local leaders and provided continues support to facilitate the reconstruction process.

Baliyo Ghar Contribution to Develop New Women Masons

In most part of the country, women do not work in the construction sector, same as in BG working areas in construction sector, females were limited to do household works or can say they were just behind the walls. Only male population work to earn, before 2015 Gorkha earthquake.

But after 2015 Gorkha earthquake, there was huge demand of technical manpower for the construction work. With the limitations of technical manpower, in addition to the trained ones there was huge demand of additional technical manpower for the reconstruction purpose. Unavailability of adequate construction workforce is one of the reasons among others for slow reconstruction process in the village. In a bid to defy the construction workforce scarcity for reconstruction of earthquake-flattened houses the 50-day On the Job Training (OJT) has been introduced in reconstruction districts. At that time Baliyo Ghar technical team contacted many untrained male and female masons. Many female masons had to take training in order to reconstruct their own houses further contributing on being independent and more over being confident after the training. Significant number of female masons completed the OJT for construction of load-bearing stone masonry house and has acquired the skills related to stone masonry and has been applying those skills in her work further (Table 6). Some of the work experience and saying of female masons are quoted down below:

Table 6: Number of total masons trained, and total women masons trained by Baliyo Ghar Program

Total masons trained	13474	
Female masons trained	1886	14%
Male masons trained	11588	86%

Ms. Nirmala Shrestha of Simle village, Jyamrung-11 of Nilkantha Municipality of Dhading District was a housewife confining herself within the four walls of her house. "I am a professional trained mason and credit solely goes to the On-the-Job Training (OJT) conducted by Baliyo Ghar program as part of ongoing reconstruction campaign."

"I had never imagined that I would be a mason one day. But NSET/Baliyo Ghar Program, which provided technical assistance to the house owners and construction technicians at the village, helped to transform my life."

"I am carrying out masonry works alike senior masons; I learned important stone masonry skills with the guidance of head mason and nobody has made complain against my works so far. I am very happy from the progress so far,"

Radhika kami states "Due to my poor economic condition I started working as mason, but also income was not enough, and male mason used to taunt because of this reason I felt the necessity of training. After I heard about the training from NSET Baliyo Ghar I took it and it helped to build confidence."

Laxmi Thakuri, "After Gorkha earthquake, me and my husband used to work as labour in reconstruction process, I heard about the training and took the 7 days mason training. My family supported me in this work, they never told me that being female I cannot work as female labour. I built 30 houses after training. Before I used to get 500 daily wages now its 1000. It has helped me to run my family."

Niramla Tamang, "After the 50 days mason training, I built 5 earthquake resilient houses which has helped me financially. Before I was dependent on my husband but now I can pay my son's school fees and save 15-20,000 per month."

"I am 12th pass and people have taunted me for my work like being educated I should not be doing the labour work, but I had full confident and satisfaction towards my work. Though our main profession is agriculture I will continue my work."

Bimala Basnet "Before I used to work in agriculture sector, but income was very less and was not enough. In 50-day mason training we learned to make building layout, to cut stones, building walls, to cut rod, tying knot and many more. Because of which my income has increased."

Effectiveness of Training

Sushila Pandit, one of the female masons mentioned that "she became a role model for other females of the community. People appreciated her work and dedication during the construction of earthquake resilient houses".

Phulmaya B.K mentioned that she has been involved in construction since long period of time. She was working as helper for construction work. She added that there was huge discrimination between male and female construction workers before training. Female mainly worked as helper and use to work for the transportation of construction materials. Community people said that female should not allow to work on construction of houses and there were some traditions like female should not climb to the wall of the houses while constructing. After receiving the training male and female masons is working together and the workload were equally distributed as per the skills and knowledge of the masons.

When asked about the objective of taking the training, Female masons in Alampu mentioned that they participated in training to be empowered and to learn new skills.

In Khartal, a village of Bigu Rural Municipality-05, Chilankha Dolakha there is a girl named Doma Sherpa. She is an unmarried girl of age 23 who lost her father 7 years ago and her mother is housewife who also does agrarian activities. There is the system of early marriage in Bigu but she was determined to get married only after she was financially independent. Doma experienced the Gorkha Earthquake and witnessed her house collapse. Doma has been seeing from her very childhood days that only males get involved in construction work and lay walls in house. After the involvement in 50 days On-the Job Training (OJT) conducted by Baliyo Ghar in April 2017, Doma turned as trained mason who is now in field with shovel and other tools and can lay walls and lead other masons.

She said, "I couldn't speak at all with strangers before the OJT, but now I have learnt to speak." Soon she had to go to kitchen in her temporary house nearby, we followed her. She managed woods for fire to boil water in order to cook to feed the co-workers involved in rebuilding her home.

In her under-construction house, Doma's family have deployed 4 more masons and among them 2 of them are trained masons. Doma said, "Due to lack of trained masons and conflicting rumors about the earthquake resistant house, we couldn't start reconstructing our house for 2 years, but after I was trained through Baliyo Ghar's OJT, I took the initiation to start reconstructing our house." During the training, Doma learned the idea and techniques of building earthquake safe home. She said, "The main outcome of the training to me has been my confidence which I am using right now." During the April 2017 OJT, 6 new masons were developed in Khartal and now they all are contributing in their own village by rebuilding houses better and safer.

Pic: Doma washing dishes in her break

Pic: Doma in front of a house that was built during Baliyo Ghar's OJT implementation where she was trained for 50 days.

Doma's family is very pleased to have a trained mason in their own family and to have started building their earthquake safe home. Doma's mother Chyangbuti Sherpa, 52, said, "We didn't dare to rebuilt our house because of not having any idea about the earthquake resistant house but after the OJT training and having our own daughter as trained masons, we got confidence to do it." Chyangbuti is now confident enough that their house will not collapse in future earthquakes.

Bimala Basnet, 38-year-old is a single woman living in Thanche Tole of "Dwalkha" Sampada Basti. Her husband died of jaundice 10 years ago. After his death, Bimala Basnet was left alone with her two children. Her life has been difficult since then. She has been raising her children with the little agricultural works she used to do.

After getting to know about the 50-day OJT training program being organized by Baliyo Ghar program, she showed her interest and participated in the program. It is unlikely that her neighbor did not troll her or pass comments on her joining the building construction training, but due to her self-confidence and need, she continued and completed the training. After the training, not only Bimala Basnet started working with other trained male masons/colleagues to build houses of others, she also built her own house by "Armaparma" system. She got the same wage as her male counterparts while building 15 houses in the community. She added, "If I had worked in other sector other than construction sector than I would be getting less wage than male." She also took refreshers course and 25 days retrofitting training. She said, "I am full confident that if someone asks me to retrofit their mud stone house, I can do it."

By seeing her confidence and her work DLPIU has involved her in their team as a mobile mason. Likewise, she has been honored and got felicitated from various organizations including her municipality and NRA for her invaluable contribution to housing reconstruction that she could make with knowledge & skills USAID's Baliyo Ghar program taught her.

Evaluation of Reconstruction through the Eyes of Beneficiaries

A number of Focused Group Discussions (FGD) were conducted to understand the perception and opinion of the beneficiaries at grassroots about the overall achievements, impacts, challenges and lessons from the reconstruction in Nepal. Several houseowners and trained masons attended such FGDs and provided their insights. The following paragraphs highlight the insights from those beneficiaries.

Majority of the participants in the FGDs were full reconstruction beneficiaries. 2015 Gorkha earthquake destroyed the houses of majority participants. The reconstruction of the houses was done with the locally available construction materials following the guidelines published by National Reconstruction Authority.

The reconstruction had not been easy, the houseowners during the FGD highlighted some of the major challenges as: financial problem, high cost of construction materials, lack of trained human resources at initial stage, transportation of construction materials, and lack of technical persons in the

field for monitoring and increment in daily wages of the construction workforce i.e., masons. Similarly, according to them, reconstruction mainly relied on the tranche provided by the government and delay in receiving the tranche slowed down or even halted the reconstruction work in some areas.

Despite the challenges, beneficiaries reconstructed their houses. Majority of the FGD participants highlighted that they have been utilizing the existing social practice - Arma Parma system (Exchange of labour) to fulfil the demand of construction workforce as well as to decrease the financial burden. They have also taken loan from relatives, neighbours, and financial institutions. Similarly, different organizations provided mason trainings to fulfil the demand of construction workforce.

Information on reconstruction and source of information

During the discussions, participants highlighted that they have received information like earthquake resilient construction techniques, causes of earthquake, safety measures that should be adopted for minimizing the earthquake risk etc. Besides these, information related to the tranche distribution criteria and design provided by the NRA were disseminated by different stakeholders working in reconstruction.

Houseowners received information through various trainings, orientation programs and door to door visits. Local government representatives, Radio/TV programs and ward offices were also the sources of reconstruction related information. Ward offices had been flowing messages through notice board at ward office and other public places.

Radio/TV program and local government notice were reachable for large group of the people. While trainings, orientations, door to door technical assistance and individual meetings for information flow were highlighted as effective as there is the possibility of direct interactions between information providers and receivers.

Some of the participants also highlighted the importance of IEC materials for the flow of reconstruction related information.

When asked what they have done to make their house safe, majority of the participants highlighted that they have been following NRA reconstruction guidelines while reconstructing their individual houses. It was noted that participants were aware on the quality construction materials, selection of construction site, deployment of trained mason during the reconstruction, uses of vertical reinforcement bars, corner stitch, sill band, lintel band etc.

Most useful support

FGD participants when asked which specific support has been the most helpful and necessary while constructing their house, majority of them (90%) highlighted Door to door technical assistance and different types of mason

trainings provided by different organization as the most effective support provided during the reconstruction.

Different stakeholders working in the field of reconstruction like Local governments, I/NGO's, NRA field engineers provided necessary information and support during the reconstruction. During the trainings, orientations, at the time of visit by technician on construction site and various other events, they provided the required information.

The houseowners interviewed specifically mentioned, that NSET Baliyoghar program has been very effective as it helped them with various activities such as technical counselling services, public awareness programs, door-to-door programs and orientation programs. All these aspects helped build strong houses. First the community was made aware that the house should be made earthquake resilient and then the program helped to make the house stronger by organizing door to door program to prevent any mistakes in the house while the house is being built. In the discussion conducted at Magapauwa, Dolakha participants mentioned that training program has effectively produced new masons and enhanced skills of existing masons. It has helped female masons become economically stable. Also, orientation has been helpful to raise the awareness of house owners regarding the basic component of earthquake resilient construction technologies.

One of the Houseowners in Dhading said, "We learned about the government standard design, the tranche system and the codal provision from NSET technical team, ward members, radio and television programs. It was very helpful for us.

The FGD participants seemed confident that similar types of earthquake resilient construction technology will be adopted in future constructions by the community.

As they collectively mentioned "The reconstruction process has created the availability of trained masons and qualified and skillful manpower in our community with whom we can consult and ask for the technical difficulties. This will allow us in constructing the houses which are earthquake resilient and safe."

FGD participants of Nuwakot echoed technical assistance during reconstruction and Training for local masons was more effective and those trained masons were involved in reconstruction. Technical assistance provided by the NSET was helpful for the implementation of NRA reconstruction guideline.

NSET Baliyo Ghar technical team had supervised the house, made sure if they were technically sound and earthquake resilient as per the government design. Also, NRA technician visited and provided necessary technical assistance.

One of the masons in Nuwakot said, "After receiving the training as we pass by the construction site and see if somebody is doing it wrong, we used to correct the person by sharing the knowledge that we received during the training.

Expectations for future

Most FGD participants expressed that:

- Baliyo Ghar should conduct Refresher courses for the trained masons so that they can be updated on the new technologies.
- Baliyo Ghar program should provide technical assistance to the municipality by providing at least one technical person in the RM so that they can convey information about the technical updates and monitor and supervise the newly reconstructed houses even later
- Baliyo Ghar program should support in coordination with the house owners who have halted or not started construction and know the reasons of doing so and provide the necessary support.
- Baliyo Ghar program should provide support to vulnerable population, both economic and social help because tranche provided by NRA is not enough to construct the house.
- BG program should provide support to the community having old traditional houses, so that it can demonstrate on how to conserve the traditional old buildings/settlements by retrofitting.

Trained Masons when asked if they have any suggestions to improve the trainings provided by Baliyo Ghar, majority of them mentioned there is no such improvements required in the existing training. However, they demanded for more such trainings and refreshers training for them.

Increased Role of Trained Masons

The masons are clear about their role as a mason. Their role as a trained mason is to build earthquake resilient houses for all the beneficiaries and also to motivate the houseowners to build earthquake safe houses.

They further mentioned Convincing people to construct the earthquake resilient buildings, telling them on how to construct the buildings, usages of quality materials are also their role.

Making earthquake resilient houses

Constructing earthquake resilient houses/buildings, demolish existing houses, non-structural mitigation and proper site selection (houses should not be constructed on landslide prone areas and near river) are the practices to be followed for earthquake safe community. One of the discussion participants mentioned that "Disaster preparedness measures like Jhatpat jhola, managing fund for emergency, identification of the safe site for emergency, managing food for the emergency should be managed."

Government standard should be followed to make community and individual houses safe from earthquake. Similarly, during the FGD discussion participants highlighted the role of trained masons for earthquake resilient community and houses. One of the participants mentioned that houses should be "constructed by placing lentil band and DPC band which helps masonry wall to bind together, and foundation of house should be stronger".

Sustainability and Future Directions

This qualitative evaluation also tried to identify aspects of sustainability and future directions for effective disaster risk management and earthquake risk management in Nepal. There are very important and critical suggestions to NSET as well.

Key informants were also asked about the largest areas of continued need to address in future. The following suggestions came up from the study:

- There is a need of comprehensive study to assess the changes that has been brought about by Baliyo Ghar and other programs related to reconstruction.
- NSET/BG efforts needs to be extended for multi-disaster activities in coordination with local governments. Some key informants also wanted to incorporate livelihood aspects into the future programs.
- Key informants also identified urban reconstruction and retrofitting as the areas that still needs to be continued in future.
- Key informant from NSET mentioned that the issues of urban reconstruction and retrofitting could not be addressed timely through the policy enforcement. If we could do this on time obviously urban reconstruction, repair and maintenance of partially damaged houses would have better result. NSET is working in some of the urban areas like Kageshwori and Bhimeshwor municipality of Dolakha for urban reconstruction and have gathered some learnings, but it was only a small pilot area.
- Reconstruction is now near to its completion; houses being reconstructed were found to have very limited functional spaces and people have started the extension or expansion of the constructed houses. Considering this, NRA with support from NSET has developed the Extension Guidelines. However, this has to be followed properly. For this, monitoring of the modification of reconstructed houses is necessary. In addition, capacity building of the local municipal engineers is required as they have limited idea and experience in extension of houses and guidelines to be followed
- Several key informants noted that the Owner Driven Reconstruction approach that was followed by the government was good, but it could have been even better if the design and drawings prepared by the government as the Model design catalogues focused on specific location and the requirements of the community people as those model drawings were followed by most for constructing their homes.

- We were unable to conserve vernacular architecture during this reconstruction. Traditional housing pattern has been lost from our rural settlements. In future reconstruction programs, we should prioritize activities that could conserve traditional architecture.
- One of the senior government-respondents mentioned "Safer houses was the focus of this reconstruction, but we were not being able to make integrated settlements by ensuring facilities like road, drinking water etc. Open spaces should be managed in integrated settlements and relocated settlements."
- If we can strictly follow the National Building Code during the reconstruction as well as new construction, it will be sufficient for the achievement of disaster resilient community. During the surveys there was certain recommendation like: local government should have sufficient technical manpower, newly constructed as well as reconstructed house should have listing provision in LG, trained construction workforce should be deployed in all constructions, timely revision of policy documents should be done as per the requirement etc.
- A policy should be developed and implemented by local government where there should be a mandatory provision that in every local government, while constructing a house, trained masons should be involved.
- There are many houses that are not registered; so, there needs to be a database of buildings with the local government, and such database is extremely useful for damage assessment. This way damage assessment after any disaster becomes easier. This system has to be developed throughout the nation. Now the damage assessment is done by other organizations, but it should be done by local governments so that people can be mobilized quickly. Government should be aware and should keep track on people's property. So, these should be done for preparedness and still need to go far.

There are many critical suggestions to NSET as well.

- NSET should focus on pre-disaster preparedness activities. Similarly, different types of training and awareness raising activities should focus on moderately affected and other districts of Nepal. One of the LG informants mentioned that "Baliyo Ghar/NSET should have major contribution on counselling for retrofitting of partially damaged houses and existing houses.
- Continue working in rural municipality by setting up an office in the RM
- NSET have different specialists/experts working on resilient community and hence continue working in close coordination with the government for disaster risk reduction
- NSET should continue and extend its geographical coverage, should diversify the technical counselling services to other parts of Nepal as well.
- Provide necessary consultation, facilitation and support for various disaster risk management programs

- NSET should think of continuing the program. The documentation of learning and experiences along with evaluation of program will help globally
- NSET activities should be focused on advocacy as well as technical guidance to all the LG throughout the country. NSET should have advocacy related to the establishment of building code implementation unit in every LG so that future disaster risk could be minimized.
- NSET needs to work on enhancing its focus and capacity for synthesizing the lessons of the past few decades on disaster risk reduction and to provide its input more on strategic and broader concept related to DRR.
- NSET needs to have strategic engagement with the high-level government authorities in Nepal to have greater influence on DRR policies and implementation.
- Local government should be taken as partners and even funding through local authorities should be considered for sustainability.

NRA Officials mentioned "NSET has been doing the capacity building works very efficiently from the beginning. NSET has the capacity and the technical expertise, NSET can provide various trainings such as retrofit training, engineers, and mason trainings. NRA have planned for other new trainings in an integrated format, eg, building code related trainings where NSET can support even in course designing". NRA is developing a road map for building disaster resilient nation by 2030. NSET can support in development of the road map and can help government to implement the road map through training and capacity building to develop required human resources for the implementation of the road map.

The LG representatives interviewed stressed that NSET should continue working on reconstruction and also at the government level. NSET should work on other disasters too rather than focusing only on earthquake resistant building construction.

Retrofitted house, Dolakha

CONCLUSIONS AND RECOMMENDATIONS

Key Policy Aspects

The following important aspects of the policies made Nepal's reconstruction successful and allowed potential for making it sustainable:

1. Nepal developed appropriate policies and institutions to guide the massive reconstruction process based on the analysis of country context and by utilizing the recent examples and experiences from around the world. Many development partners and relevant organizations brought their inputs to help the reconstruction process in Nepal.
2. Policy frameworks were supported by detailed procedures (SOPs), guidelines and manuals. Associated training and orientations to concerned officials, professionals and beneficiaries helped to properly apply the policies and principles.

3. The overall policy framework was very dynamic. Continuous monitoring and feedback system was in place which helped to make timely amendments in the policies.
4. Training and capacity building system established at many government institutions and other organizations, involvement and leadership of local governments to help and facilitate the reconstruction process at local levels, engagement of communities in the form of community reconstruction committees or other informal forms are important elements of sustainability.

Evaluation of Baliyo Ghar

Analysis of the data and information gathered from the qualitative survey and through the views expressed by key informants of the survey, it can be considered that Baliyo Ghar program had a significant contribution in the successful implementation of owner-driven housing reconstruction program lead by National Reconstruction Authority (NRA). The program had main inputs and contributions on four main areas of housing reconstruction

1. Support on policy formulation and implementation
2. Development of large number of skilled human resource through training and capacity building,
3. Enhanced awareness of people on safer building construction practices
4. Better coordination and collaboration among reconstruction stakeholders

Overall performance and objective wise achievement of Baliyo Ghar were also evaluated by the key informants. The key informants rated overall Baliyo Ghar performance as **9** in the scale of 1 to 10. And objective-wise, the achievement in first objective, policy support was rated as **8**, the second objective capacity building was rated **9** and third objective awareness achieved a score of **9**.

This means the stakeholders and beneficiaries view Baliyo Ghar program as one of the very useful and successful programs in terms of influencing the reconstruction process, to help people reconstruct on timely and safe manner, and to help raise awareness of the people on disaster safety and earthquake-resistant construction.

Also, there are significantly new and innovative outcomes and impacts of the Baliyo Ghar program. The training of women groups to become new masons in the communities is one of such innovative ideas to influence the reconstruction process very positively. There are now several women masons who are actively working to build safer houses in the communities. This has also contributed to the livelihood and economy of the families in earthquake affected areas.

Recommendations and Way Forward

Reconstruction of earthquake resilient houses is the main output of the Build Back Better concepts followed during the owner-driven reconstruction program. The next logical step will be to continue the momentum achieved on

safer construction by adapting and changing the systems within our local governments to establish building permit systems and building code implementation mechanisms. Such system needs to be established in all local governments - urban as well as rural municipalities.

Proper documentation of the learnings gathered from the reconstruction campaign of past six years is another task ahead so that we can scale up and utilize the knowledge and skills for the next possible disaster. The National Reconstruction Authority (NRA) is a special purpose short-term organization, the main objective of which has already been achieved. Once NRA's term is completed and the institution does not exist, the institutional memory should retain in other relevant government organizations. Central level agencies such as Ministry of Urban Development (MOUD), Ministry of Education (MOE), National Disaster Risk Reduction and Management Authority (NDRRMA) should carry on the vast experience of NRA on the recovery and reconstruction so that these institutions can lead any future recovery efforts in Nepal.

Retaining the large number of trained professionals developed during the reconstruction process is another major task for the sustainability of resilience building. Large number of trained engineers and other technical professionals, trained masons and contractors, government officials and elected local government representatives are great assets for Nepal for building resilient nation. The country should develop policies and systems to retain and continue involve them in future recovery and reconstruction programs as well as in other development processes.

Nepal's experiences and lessons of the recent recovery and reconstruction are potentially useful for similar contexts in the region and at the global level. Nepal should utilize existing mechanisms and forums to share such experiences and lessons to the regional and global community to enhance the applicability and replicability.

REFERENCES

Adhikary, J.R. (2016). Barriers to Career Progression: A Study of the Perceptions of Nepali Women Employees.

Anhorn, J., Lennartz, T., & Nusser, M. (2015). Rapid urban growth and earthquake risk in Musikot, Mid-western Hills, Nepal. Erdkunde, 69(4), 307-325.

Aryal, K. R. (2012). The history of disaster incidents and impacts in Nepal 1900-2005.*International Journal of Disaster Risk Science, 3*(3), 147-154.

Bhagat, S., Buddika. H.A.D., Adhikari, R.K., Shrestha, A., Bajracharya, S., Joshi, R., Singh, J., Maharjan, R., & Wijeyewickrema, A.C., (2018). Damage to Cultural Heritage Structures and Buildings Due to the 2015 Nepal Gorkha Earthquake, Journal of Earthquake Engineering, 22:10, 1861-1880, DOI: 10.1080/13632469.2017.1309608.

Bilham, R., Larson, K. & Freymueller, J. GPS measurements of present-day convergence across the Nepal Himalaya. Nature 386, 61–64 (1997). https://doi.org/10.1038/386061a0

Dixit, A., Yatabe. R., Dahal. R., & Bhandary, N. (2013). Initiatives for earthquake disaster risk management in the Kathmandu valley. *Natural Hazards, 69,* 631–654.

Duyne, J. (2006). Housing reconstruction in post-earthquake Gujarat

Dumaru, R., Rodrigues, H., & Varum, H. (2018). Comparative study on the seismic performance assessment of existing buildings with and without retrofit strategies. International Journal of Advanced Structural Engineering, 10(4), 439-464.

EERI. (2015). Buildings (EERI Earthquake Reconnaissance Team Report: M7.8 Gorkha, Nepal Earthquake on April 25, 2015 and its Aftershocks). https://pubs.er.usgs.gov/publication/70189834

Goda, K., Kiyota,T., Pokrel, R., Chiaro, G., Katagiri, T., Sharma.K., & Wilkinson, S. (2015). The 2015 Gorkha Nepal earthquake: insights from earthquake damage survey. https://doi.org/10.3389/fbuil.2015.00008

Government of Nepal (GoN). (2015). Post-disaster needs assessment. National Planning Commission. Kathmandu. Retrieved on August 5, 2020 from https://www.npc.gov.np/images/category/PDNA_volume_BFinalVersion.pdf

HEOC (Health Emergency Operation Centre). (2015). "Health Sector Response: Situation Update Report." 201

HRRP (Housing Recovery and Reconstruction Platform) Bulletin. (2018), Nepal.

Kaushik, H., Bevington, J., Jaiswal, K., Lizundia, B., & Shrestha, S. (2016). Buildings, in EERI Earthquake Reconnaissance Team Report: M7.8 Gorkha, Nepal Earthquake on April 25, 2015 and its Aftershocks. Retrieved on July 30, 2020 from

http://www.learningfromearthquakes.org/images/LFE_site/ResilienceObservatory/Nepal/Nepal-Gorkha-Earthquake-Report-Reduced.pdf

Mercer, N. (2002). Developing Dialogues. In G. Wells, & G. Claxton (Eds.) Learning for Life in the C21st: Sociocultural Perspectives on the Future of Education. Oxford: Blackwell. http://dx.doi.org/10.1002/9780470753545.ch11

MoHA (Ministry of Home Affairs). (2009). Nepal Disaster Report: The Hazard and Vulnerability

NRA (National Building Authority). 2016. Rebuilding Nepal.

NUDS (National Urban Development Strategy). 2017. Part A, Main Document. Government of Nepal, Ministry of Urban Development.

NPC (National Planning Commission). 2015. Post Disaster Need Assessment (Vol. A and B). Government of Nepal.

Parajuli, R.M., Kiyono. J. (2015). Ground Motion Characteristics of the 2015 Gorkha Earthquake, Survey of Damage to Stone Masonry Structures and Structural Field Tests. https://doi.org/10.3389/fbuil.2015.00023

Rai, D. C., Goutam, M., Singhal, V., Parool, N., Pradhan, T., & Mitra, K. (2012). Reconnaissance report of the M6.9 Sikkim (India–Nepal border) Earthquake of 18 September 2011. Geomatics, Natural Hazards and Risk, 3(2), 99-111.

ANNEXES

ANNEX 1:

Table 1: Assessment of Baliyo Ghar program objectives by the stakeholders

BG Objective	Average Score by different group of stakeholders	Quotes/ Justification
Overall objective - "Support disaster- resilient reconstruction of houses through standardized training, awareness, and demonstration'	PO – 9,9,9,9 Average -	NSET Baliyo Ghar and its technical support helped local community people to build earthquake resilient houses in rural context also.
	NRA focal engineers - 8	awareness in house owners, training for masons, trainings for technical person, and demonstration houses of retrofit houses
	BG officials – 8.5, 9,10	Baliyo Ghar program was successful for disaster resilient community and also drive local community for resilient construction. But some of the aspect of the program in which NSET itself has expertise like retrofit we could not promote it properly and lack of lobbing from initial phase of the program. Some delays and gaps was there in the promotion of the retrofit technology
	NRA Officials – 8, 8.5	DUDBC- "Baliyo Ghar conducted many activities to support disaster resilient reconstruction and it contributed through different activities like different trainings, awareness activities, demonstration which supported the local people and enhanced local capacity and awareness
IR -1 - Improved policy and standardization of training, guidelines and manuals for disaster-resilient construction	PO – 7,8,8	Local capacity enhancement, mason trainings, social mobilizers etc. have been done but if there was a culture set in the municipality for capacity building then Baliyo Ghar program running phase would have been fruitful.
	NRA focal engineers – 7,9	NSET Baliyo Ghar program has played vital role in reconstruction campaign, reached to every door of reconstruction beneficiary. Prepared training guideline for 7 days rural and urban mason training.
	Local Gov representatives – 7, 10	Though BG helped in policy development, technical persons from both NRA & BG were available in every construction site which result in faulty construction in some sites. Provide full support to government

BG Objective	Average Score by different group of stakeholders	Quotes/ Justification
	BG officials – 9, 7.5, 8	We have provided the support to NRA for policy formulation as well as its implementation in field. Some guidelines could not be implemented in field like hybrid manual. In some places there was some gaps in information flow regarding to the construction practices and construction materials. Such gaps in information flow hamper the reporting back mechanism to NRA and correction of policies.
	NRA officials - 9	
IR -2 - Enhanced local capacity to apply disaster resilient construction methods and techniques	PO- 8,9	Baliyo Ghar has given a lot of effort to enhance local capacity through different training activities. Many people got trainings from Baliyo ghar which helped in overall reconstruction process. All the trainings were conducted at right time.
	NRA focal engineers - 10	Provided information regarding acts, policies of reconstruction before training, conducted very effective trainings, large number of local masons were trained through BG program, which is one of the milestones in the field of reconstruction.
	Local Gov representatives – 7,9, 10	Difficult to rank. Most effective, change in people perception towards earthquake resilient construction. Main reason to build up capacity.
	BG officials – 10,8,9	Maximum resources and efforts was invested for the capacity enhancement. As per the time and places the modification and revision was done as per the necessary. NSET Baliyo Ghar program fully utilized our expertise for the capacity enhancement of local community. There are so many human resources trained through Baliyo Ghar program and local capacity has been enhanced but the retention of trained human resources was key questions. Retention of trained human resources in local level is one of the big challenges of the reconstruction program.
	NRA officials – 9	Deliverance was properly done but local government could not receive it.

BG Objective	Average Score by different group of stakeholders	Quotes/ Justification
IR-3- Increased awareness on disaster resilient construction in Nepal.	PO- 9,9	Considering all the programs done by NSET in its working districts.
	NRA focal engineers - 9	Earthquake risk message was conveyed through different media very effectively. Different video materials and audio materials disseminated through National and local media was very effective on information flow. Video materials presented during the orientation session was very effective to increase awareness on disaster-resilient construction practices.
	Local Gov representatives – 8, 10	Supported government
	BG officials – 8,7 ,10	Our awareness activities was focused on reconstruction. There was some gap for sustainable disaster resilient reconstruction. Our awareness activities and efforts was most important at that point of time and addresses the need of time. Later, awareness materials and efforts mainly focused on reconstruction. Secondly those people who got the information through our programs fully utilized or not is another important question. Awareness efforts has less focused on multi hazard risk reduction and utilization of knowledge obtained from awareness program is another main point of discussion. Our efforts how much provided community people utilized the knowledge obtained from awareness program for community-based disaster risk reduction.
	NRA officials – 10	NSET is pioneer from beginning so in the case awareness NSET deserves all point.

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Ved Prakash Chaudhary
Nirman Devkota
Hari Prasad Aryal
Shrawan Dhakal
Krishna Prasad Dhakal
Biwash Kafle
Ashok Dhungana
Sudip Raj Adhikari
Prakash Kumar Shrestha
Bipin Kumar Chand
Ganesh Bhattarai
Arunachal Pokharel
Ramesh Poudel
Janaki Somare
Nirmala Nepali
Surina Kayastha
Dirge Tamang
Ramesh Shah
Jagadish Shiwakoti
Laxmi Baniya
Sharada Kumari Joshi
Rojeena Timilsina
Sabitri Khatiwada
Dipak Kumar K.C
Bhabana Dhakal Bhantana
Ram Bahadur Nepali
Hemraj Itani
Dhan Bahadur Basnet
Subhash Tamang
Binata Bhurtel Paudel
Ganesh Gautam
Binita Silwal
Kaushila Shrestha
Janaki Sapkota
Dipendra Karki
Chiranjibi Bhusal
Susma Adhikari
Samjhana Lama
Arbin Adhikari
Shova Koirala
Indira Kumari Thapa
Tika Kumari Budhathoki
Bijay Kumar Baruwal
Nabina Dulal
Nita Bhandari
Sanu Maiya Shrestha
Sabita Wosti

Srijana Tiwari
Bimala Adhikari
Rajendra Bhattarai
Reshma Rai
Ranju Dhungana
Sujan Rai
Dewan Sing Maden
Dorje Lama Tamang
Krishna Bahadur Moktan
Rabindra Dhakal
Min Kumar Thapa
Kamala Aryal
Narendra Bahadur Shahi
Dipak Raj Ojha
Bhim Bahadur Nepali
Shambhu Ram
Niraj Bahadur Ayadi
Ishwor Dutt Joshi
Sushil Pandit
Utsav Rai
Simon Thapa (Tamang)
Sushila Bhandari
Bijay Tamang
Sushil Kumar Gurung
Mek Bahadur Tamang
Dhruba Neupane
Susmita Puri
Rikesh Maharjan
Bhuvan Khanal
Puskar Basnet
Nabin Raj Ruwali
Parbati Thapaliya
Yam Kumari Uchai
Pratima Parajuli
Sajaya Shrestha
Duni Ram Saru
Nimesh Bogati
Summit Maharjan
Mahendra Acharya
Sanita Sainju
Ronal Bikram Thapa
Puspa Khadka
Yeknath Acharya
Sachin Chaudhary
Sishir Khatri
Bighnesh Regmi
Milan Hadkhale
Anita Rajlawot Khatri
Arati Shrestha
Hridaya Man B K
Rammaya Silwal (Upadhyay)
Aang Dorje Lama
Yogesh Khatri
Chitra Bahadur Lama
Bikash Paudel
Subarna Thapa Kshetri

Experts

Amod Mani Dixit
Surya Narayan Shrestha
Shree Ram Singh Basnet
Bijay Krishna Upadhyay
Surya Bhakta Sangachhen
Bhubaneswari Parajuli

Nisha Shrestha
Rabindra Kumar Suwal
Kashyap Kumar Sharma
Hikmat Adhikari
Pradip Sedhain
Anjali Silakar

Khadga Sen Oli
Chandan Dhoj Rana Magar
Ram Krishna Sharma
Mahananda Timalsina

Niva Upreti
Adutiya Narayan Kanth
Dhirendra Kumar Dawadi
Mamata Banskota
Sumit Shrestha
Nischal Sedhain
Ashwash Akash Parajuli
Kundan Kumar Sah
Nirmala Rai

Dammar Singh Pujara
Kuber Bogati
Aditi Dhakal
Jyoti Mani Bhattarai
Sumit Maskey
Om kala Khanal
Ichcha Ram Parajuli

Hima Shrestha
Rajani Prajapati
Kirty Tiwari Jaisi
Rachana Kansakar
Rabin Chaulagain
Prayash Malla
Vibek Manandhar

NSET
Earthquake Safe Communities in Nepal

National Society for Earthquake Technology-Nepal (NSET)

About NSET

National Society for Earthquake Technology-Nepal (NSET) was founded on June 18, 1993, with the vision "Earthquake Safe Communities in Nepal by 2020". NSET was conceptualized with main objective "to foster the advancement of science and practice of earthquake engineering and technology for mitigating the earthquake risk and increasing the seismic safety, and to enhance professionalism, professional engineering and scientific ethics. Bringing “substantial change in the application of technology to the many facets of earthquake disaster management for saving the lives of the people” has remained the guiding philosophy of NSET ever since its inception.

Today, NSET is considered as one of the major contributors in the field of earthquake risk management. Its seismic risk reduction approaches are now being replicated beyond the borders of Nepal. Consolidating the experience, knowledge, learning in disaster vulnerability reduction and preparedness to policy drafting and strategy development, and working with variety of stakeholders for more than two and half decades, NSET has now realized the need and decided, as stipulated by global thoughts, to expand its scope and works to managing multi-hazard situations, climate change adaptation and risk management, and integration of this synthesis of DRM and CRM into economic development efforts.

Vision

“Disaster Resilient Communities in Nepal by 2050”

Mission: “To contribute in enhancement of disaster resilience of the communities through development and implementation of appropriate technologies, inclusive and collaborative approaches in order to minimize and manage disaster risks.”

Strategic Objectives

SO1: Develop and implement integrated and inclusive interventions related to Multi- Hazard Disaster and Climate Risk Management through development and enhancement of understanding, capabilities and resources of communities in Nepal and region

SO2: Assist in Institutionalization and Integration of validated understanding, approaches and technologies related to Disaster and Climate Risk Management into the laws, regulations, policies, initiatives and mechanisms in order to strengthen Disaster Risk Governance in Nepal.

SO3: Devise and integrate innovative, cost- effective and appropriate methods and measures in order to increase involvement and investment of public and private sector in Disaster and Climate Risk Management

SO4: Develop and promote effective and inclusive collaboration in order to enhance and scale-up innovation and R&D in the area of Disaster Risk Management.

SO5: Be a dynamic, sustainable and learning organization through enhancement of capabilities, networks and collaborations.

Photo caption (in clock-wise): 1) NRA CEO and Mr. Jagat Bdr. Chettri, first beneficiary to receive government grant, of Laduk, Dolakha after signing participatory agreement 2) Closing ceremony of basic training to the engineers in the participation of Hon. Prime Minister KP Shama Oli 3) Hundreds of engineers being trained before they get deployed to the field 4) Distinguished professionals during closing ceremony of basic training to engineers 5) NSET professionals discussing with Tipling dwellers in Dhading about using timbers in reconstruction of the houses. After the interaction and discussion in using timber bands available in northern Dhading, beneficiaries started reconstructing Tipling using timber bands. Earlier they were confused in doing so.

NSET
Disaster Resilient Communities in Nepal

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Get Involved ! Visit the NSET website: www.nset.org.np; Follow us at

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