

Baliyo Ghar Program

Enhancing Skills of Existing Masons Through 7 Days Training

Experience and Lessons



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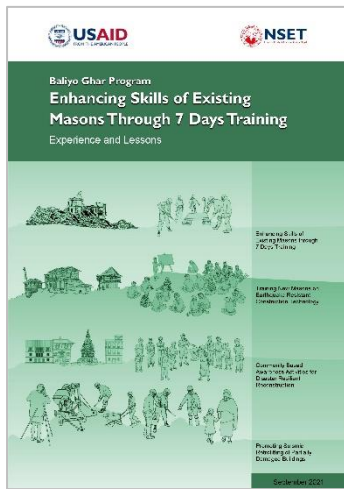
Training New Masons on Earthquake Resistant Construction Technology



Community Based Awareness Activities for Disaster Resilient Reconstruction



Promoting Seismic Retrofitting of Partially Damaged Buildings



Baliyo Ghar Program

Enhancing Skills of Existing Masons Through 7 Days Training

Experience and Lessons

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FOREWORD

National Reconstruction Authority Put forward a recovery vision allowing all the partners to align their actions with Nepal government plan and policy to build social harmony as a basis of resilience. National Society for Earthquake Technology-Nepal (NSET) found active on supporting Gorkha earthquake Reconstruction and Recovery prior to the establishment of NRA with National Planning commission. NRA is getting continuous support from NSET from the beginning of reconstruction and the technical support provided by NSET through its programme is commendable/ highly acknowledged.

Housing reconstruction program is one of the biggest challenges for NRA due to its sensitivity that it is directly related to the shelter need of affected families damaged by earthquake. The damaged was not limited to the physical losses of houses it's also impacted on socio-economic aspect of each family. The worriedness among the earthquake affected people was heightening. In such circumstances providing technical support and bringing hope to the individual family to stand with earthquake resistance house is supposed to be a nightmare which was converted into the reality now. And support of partners to the NRA is high.

NSET through USAID supported "Baliyo Ghar" program enlighten hope to about 60 thousand household with its socio-technical assistantship during house reconstruction. The capacity building trainings to masons, engineers and the policy makers are major deliverables that NSET complement on government efforts. On awareness raising component the utilization of mass media is remarkable. In specific the television program creates the opportunity to discuss the local challenges and reconstruction and recovery issues which is remains as a strong platform on advocacy as well as decisions dissemination. The technical research for innovative technology on retrofitting of houses is vital for enhancing the building resilience with minimum interventions on buildings are unique works done by NSET. The support provided by Baliyo Ghar program to draft the different type of training curricula, manuals and technical guidelines and standards are remarkable.

NRA acknowledge the technical support received during six years on reconstruction has high value and would like to express my gratitude for the NSET leadership and the working team and thankful to USAID for their support to NSET for implementation of Baliyo Ghar program.

Sushil Gyewali

Chief Executive Officer

National Reconstruction Authority

REMARKS

The housing reconstruction technical support program in a name of Baliyo Ghar designed for Gorkha earthquake housing reconstruction is strongly rooted on the NSET learnings and work experience on Pakistan housing reconstruction after 2005 earthquake. NSET engaged in **Training Support for Earthquake Resistant Reconstruction in Pakistan (TSERR)** for Earthquake Reconstruction and Rehabilitation Authority (ERRA) of the government of Pakistan for housing reconstruction. The experience of Gujrat reconstruction through the mason exchange program and the experiences working after Iran earthquake enrich the institutional experiences which is well reflected on Gorkha earthquake reconstruction and recovery through NSET different efforts. Before Gorkha earthquake NSET is engaged in different type of earthquake preparedness activities which may help to save many lives and property during gorkha earthquake. Unfortunately, the quantification of preparedness efforts and its contribution on saving life and property is not well studied so far.

Baliyo Ghar program is a one of the priority programs of NSET for housing reconstruction and recovery through which the institutional learnings and experience of NSET from around the world were systematically feed into the Nepal government reconstruction and recovery efforts. Being a professional organization the contribution of preparing PDNA with National Planning commission and engagement during preparation of PDRF are key involvement to shape the Nepal reconstruction and recovery. The technical support on development of Inspection mechanism, functions of enrollment camps and the support on developing institutional arrangement through the assign role of NRA-CEO technical advisor and the subject matter experts in a later course of NRA actions is a contribution of NSET as an institution.

Baliyo Ghar program at the field reaches to provide the socio technical support at household level. The training and capacity building of construction workforces are key contribution to create the reconstruction environment. The mass media mobilization helps NRA to understand the challenges raised during housing reconstruction which helps NRA to take a corrective measure. The local F.M stations brings the issues from the ground and discussed. The national and district level interaction conducted through the program brings synergy in reconstruction to resolve the issue at the different level of existing governance system making DLPIUs and district office more credible and accountable to the reconstruction beneficiaries.

I expressed my gratitude to the municipalities who support for the reconstruction efforts and thankful to NRA, CLPIU-Building, DLPIUs for their trust and providing us a working environment and providing the guidance. The partner organizations, HRRP and civil societies help us to be active and engaged us in different forum for discussion on reconstruction, thankful for their efforts. I acknowledge the support from USAID for providing funding and necessary guidance during program designing and implementation. And appreciate the dedication and professional work demonstrated by NSET staff during this reconstruction period.

Surya Narayan Shrestha

Executive Director

NSET-Nepal

PREFACE

Gorkha earthquake housing reconstruction is one of the successful efforts that Nepal deliberates to ensure the resilient reconstruction of private houses. Owner driven housing reconstruction adopted by Government of Nepal for such a large scale of housing reconstruction probably the largest owner driven reconstruction in the world so far. The topographical challenge of access road to supply construction materials at mountainous region is itself a complicated task. Despite all in a leadership of National Reconstruction Authority (NRA) is support from government, Nepalese people donors, I/NGO and civil societies the reconstruction of more than eight hundred thousand houses is about its completion within seven years after 2015 earthquake. However, the reconstruction of few urban settlements still has many issues and remaining reconstruction need to be completed.

The technical support provided by the partner organization is significant as mentioned by the NRA. NSET implemented Baliyo Ghar program to provide technical support to government efforts aligning with the government plan, policy, and procedures for reconstruction. The six-year Housing reconstruction technical support program begins on 1st October 2015 and ended on 30 September 2021 with the support from USAID. Most probably Baliyo Ghar program is one of the programs having longer program period almost similar life span of NRA effective life. Program support NRA in multitude of activities in three major aspects on technical support; policy, capacity building training and awareness raising for resilient reconstruction.

Baliyo Ghar program has a twofold of actions. On one aspect it has a direct reach to the reconstruction beneficiaries at household level to provide require socio-technical support on housing reconstruction through its program activities. On the other hand, the support on policy drafting and mass media activities its indirectly support to the entire beneficiaries among the earthquake affected district.

The mobilization of social mobilizers with engineers and construction technicians as a one mobile team for one ward of municipalities for about forty wards directly supported for the reconstruction of about sixty thousand houses which helps about thirty million people to assure the safe permanent shelter. The door-to-door technical support provided by the mobile teams remains instrumental to drive the result on physical reconstruction of houses at the initial days of reconstruction when in many areas people were completely unaware and confused about the rebuild of houses, reviving settlements from the ruins is a big challenge foreseen.

During reconstruction period, Baliyo Ghar program constructed 910 technology demonstration houses which trained 5,430 new masons where 26% percentage of participants were female. Similarly, the retrofitting technology demonstration on 74 houses trained 444 masons who were capable to retrofit the houses independently. The practicing masons were trained on earthquake resistant technology of houses, about 13,474 masons were trained. 2,554 engineers and architect trained in different professional skills. The elected local representatives were trained on Disaster Risk reduction and management. The television and radio program provided the platform of reconstruction, discussion information dissemination advocacy and policy decision which realize that the concept that the mobilization of mass media is equally important to support the reconstruction and recovery efforts.

I express my gratitude to all the housing reconstruction beneficiaries, local people, municipalities, CLPIU-building, GMALI, DLPIU; Dhading, Nuwakot and Kathmandu for their guidance and support during the program implementation. My sincere acknowledgement to USAID for continuous funding and supports, the program team who employed their tireless efforts on program implementation and thankful to the NSET-Board, executive director, NSET's divisions and experts at NSET for their contribution on program to make it successful.

Dr. Ramesh Guragain

Program Director and Deputy Executive Director
NSET-Nepal

LIST OF ABBREVIATIONS

ADB	Asian Development Bank
AIN	Association of International Nongovernmental Organizations in Nepal
BCRAC	Building Code Revision Advisory Committee
CBOs	Community-Based Organizations
CDO	Chief District Officer
CLPIU	Central Project Implementation Unit
CSO	Civil Society Organizations
DACFC	Development Assistance Coordination and Facilitation Committee
DCC	District Coordination Committees
DFID	Department for International Development
DLPIU	District Level Project Implementation Unit
DOR	Department of Roads
DOLIDAR	Department of Local Infrastructure Development and Agricultural Roads
DPR	Detail Project Report
DRCN	District Road Core Network
DRRM	Disaster Risk Reduction and Management
DRSP	Disaster Resilience of Schools Project
DUDBC	Department of Urban Development and Building Construction
DWSS	Department of Water Supply and Sewerage
ECED	Early Childhood Education and Development
EEAP	Earthquake Emergency Assistance Project
EIRR	Economic Internal Rate of Return
ESRP	Emergency School Reconstruction Project
EU	European Union
EXIM Bank	Export-Import Bank of India
GESI	Gender Equity and Social Inclusion
GIZ	The Deutsche Gesellschaft für Internationale Zusammenarbeit / German Corporation for International Cooperation GmbH
GMaLI	Grant Management and Local Infrastructure
GoI	Government of India
GoN	Government of Nepal
IEE	Initial Environmental Examinations
IDA	International Development Association
INGO	International Non-Governmental Organization
JFPR	Japan Fund for Poverty Reduction
JICA	Japan International Cooperation Agency
KOICA	Korean International Cooperation Agency
KVDA	Kathmandu Valley Development Authority
LRN	Local Road Network
MDTF	Multi-Donor Trust Fund
MoE	Ministry of Education
MoFALD	Ministry of Federal Affairs and Local Development
MoHA	Ministry of Home Affairs
MoHP	Ministry of Health and Population
MoUD	Ministry of Urban Development
NEA	Nepal Electricity Authority
NFN	NGO Federation of Nepal
NGO	Non-Governmental Organization
NNBC	Nepal National Building Code
NPC	National Planning Commission
NPR	Nepalese Rupee
NRA	National Reconstruction Authority
PCU	Project Co –Ordination Unit
PDNA	Post-Disaster Needs Assessment
PDRF	Post-Disaster Recovery Framework
PIU	Project Implementation Unit
PMC	Programme Management Consultancy
POs	Partner Organizations
PRC	People's Republic of China
RC	Reinforced Concrete
SEANep	Structural Engineers' Association Nepal

SDC	Swiss Agency for Development and Cooperation
SFD	Saudi Fund for Development
SMC	School Management Committees
TOR	Terms of Reference
TVET	Technical and Vocational Education and Training
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Education Fund
USAID	United States Agency for International Development
VRCN	Village Road Core Network
WASH	Water, Sanitation & Hygiene

EXECUTIVE SUMMARY

This is a final report of Baliyo Ghar program to consolidate the learnings of socio technical assistant for housing reconstruction after gorkha earthquake 2015. National Society for Earthquake Technology-Nepal (NSET) with the funding from USAID implemented the Baliyo Ghar program from october1, 2015 until September 30, 2021, to provide the socio technical assistant on housing reconstruction in coordination with National Reconstruction Authority (NRA). Baliyo Ghar program has three-fold of actions for socio technical assistance. The policy support to prepare the technical guidelines, manuals, training Curriculum and other relevant policy document related to the housing reconstruction, Training, capacity building of construction workforce and the awareness raising for the resilient reconstruction of houses. The policy document supported Nepal government to prepare the standard policy document related to housing for all earthquake affected area. Through the policy documents, mass awareness activities aired and broadcasted from radio and television program contributed for entire housing reconstruction efforts. However, capacity building efforts and technical support for household level was focused on four districts: Dhading, Nuwakot, Dolakha and Kathmandu named as program implemented districts. Within the program coverage districts one third the housing reconstruction beneficiaries were directly taken care off. In other area different partners provided the technical support. However, in technical aspect through the district reconstruction technology center formed by Baliyo Ghar program provided support to enhance the partners capacity on technical aspect of housing reconstruction. Training to the partners technical professionals, technical discussion and sharing were the key area of collaboration among the partners.

Similarly at the national level with the Center Level Program Implementation Unit (CLPIU-Building) the National Reconstruction Technology Center (NRTC) formed by the Baliyo Ghar program contributed to develop the different technical manual, curriculum, and policy documents. The training curriculum for masons, engineers, social mobilizers, correction manuals for houses, extension guidelines are few examples of policy document developed with the involvement of experts deployed by the Baliyo Ghar program.

At the end users' level, the mobile team consisting social mobilizer, engineer, and construction technician known as a mobile team provided the door-to-door technical support at household level to provide information related to the housing reconstruction such as government grant provisions, process etc. as a part of social mobilization and provided the technical supervision of houses by the engineers and construction technician during the construction of houses, for the planning and cost-estimate of the houses engineers work with the houseowner to meet the requirement and to plan the material and budget prior to the construction of house. This process of consulting individual beneficiaries helped a lot on timely completion of reconstruction at program areas. About 63000 household were benefited from this direct approach of intervention.

In this connection, the awareness raising activities conducted by the program at program implemented areas helps to prepare a reconstruction environment at the starting period when almost all of the stakeholders including government were not clear on steps of grant disbursement, housing inspection and its interlink. The campaign of social mobilization to disseminate government decisions at local level remains instrumental to rollout the grant disbursement process. This is how NRA came to start the grant agreement with beneficiaries from the Baliyo Ghar program implemented area. The rural market center of former VDC's- Singati bazar at Dolakha was chosen and grant agreement camp was first formed and tested. The learnings of which helps NRA to take the decision that the grant agreement must be done at former VDC office intending to decrease the challenges faced by the beneficiaries. The first enrollment camp was also chosen at Baliyo Ghar program district at Dhading where program mobile team were mobilized beforehand and certain level of awareness activities were conducted by the program. Both enrollment camp provided many learnings to the NRA and involved partner organizations. Enrollment processes were revisited, standardized on procedure, and scaled up to the other part of the reconstruction areas.

Baliyo Ghar program consider the theory of change (TOC) that if guidelines are standardized, local capacity and awareness increased the house owner will be able to reconstruct their houses to be disaster resilient. TOC further defined through the program goals which is to contribute to sustainable earthquake reconstruction. The program objectives to support disaster-resilient reconstruction of houses through standardized training, awareness, and demonstration in built with three intermediate results (IR) with its clear output level activities. The IR-1 improved policy and standardization of training, guidelines, and manuals for disaster-resilient construction technologies priorities its output level activities as curricula for awareness and training (including instructor development). The IR-2 Enhanced local capacity to apply disaster resilient construction methods and techniques designed with instructors' development trainings, construction workforce training, social mobilizers training, training to the government officers and support made for engaging local authorities in a process of institutionalization of safer building practices. The IR-3 increased awareness on disaster resilience construction in Nepal designed with the formal orientation sessions, Door-to-Door technical support, construction of demonstration models, Information Education and Communication (IEC) material designing and printing, radio program and dedicated television program on reconstruction are the key activities for achieve the attainment of desire outcomes under IR-3.

Targeting to the end users most of the activities were focused on program implemented districts which is one third part of Dhading, Nuwakot and Dolakha district were considered as a focused program areas where each house owners receive the technical support for their reconstruction not limiting to the reconstruction beneficiaries only. The provision of blanket technical support to each homeowner who were constructing their houses were the target groups.

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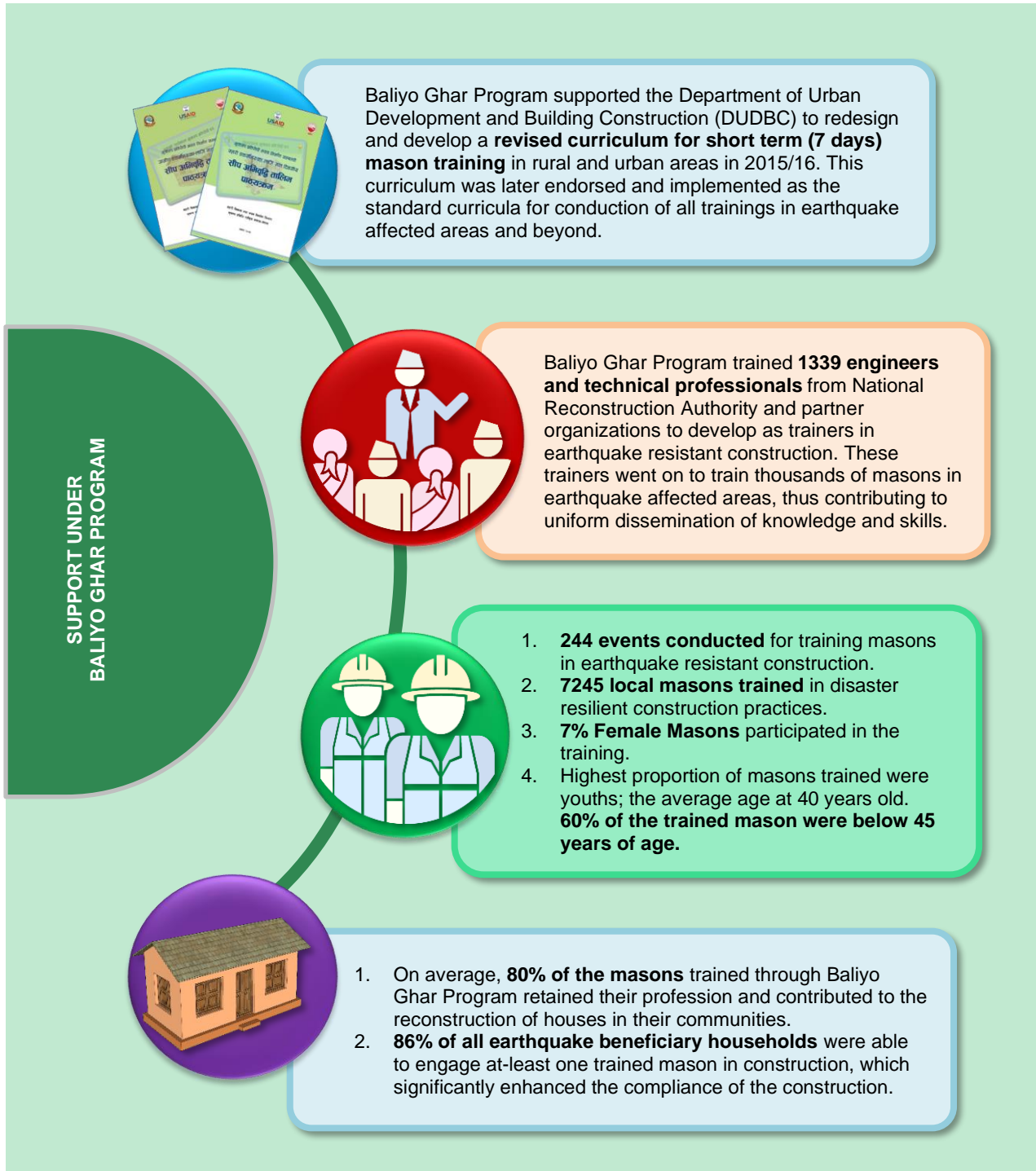
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ENHANCING SKILLS OF EXISTING MASONS THROUGH 7 DAYS TRAINING

KEY HIGHLIGHTS



I. SUMMARY

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, NSET has been implementing the “Baliyo Ghar Program” as a key part of the reconstruction portfolio of USAID/Nepal under the cooperative agreement AID-367-A-15-00005. Baliyo Ghar Program is providing comprehensive technical support to the GoN’s reconstruction project, by empowering and supporting communities to “Build Back Better”. The program primarily imparts 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 assists the government in developing policies, guidelines, norms and training curricula to standardize the entire process of reconstruction under the leadership of the Government of Nepal (GoN) National Reconstruction Authority (NRA) and its project implementation units.

One of the key activities of Baliyo Ghar Program was to enhance local capacity to apply disaster resilient construction methods and techniques. Baliyo Ghar Program conducted various capacity building activities targeted to home owners, masons, engineers, social mobilizers and government officials. These trainings formed the backbone of socio-technical assistance in the earthquake-affected communities. Among these, capacity enhancement of local masons was done via two approaches; for existing masons working in the field of construction, 7-day trainings were conducted, whereas, for construction workforce who had no experience in construction and only worked as apprentices, 50-day On the Job trainings were conducted to develop skills as a mason.

Training Events			Masons Trained				
Rural	Urban	Total	Rural	Urban	Male	Female	Total
164	80	244	5000	2245	6773	472	7245
67%	33%		69%	31%	93%	7%	

Baliyo Ghar Program implemented a total of 244 7-day mason training events in its program areas, subsequently imparting knowledge and skills on earthquake resistant construction to 7,245 masons. About 70% of the training conducted were for rural buildings, and 7% of all the participants were female. With these trainings, Baliyo Ghar Program contributed about 15%¹ of the total masons trained across the earthquake affected areas during the reconstruction campaign.

Subsequently, the trainings were able to fulfil the demand for skilled construction workforce in the program areas, where 86% of the house owners

¹ Comparison of Baliyo Ghar Program outputs against total masons trained (HRRP 5W)

employed at-least one trained mason in construction. Trained masons have not only aided the post-earthquake reconstruction and recovery process but have also contributed to the change in perception and culture of earthquake safe construction. They serve as ambassadors and tutors in ensuring the hand-down and sustainability of disaster resilience knowledge and skills in their communities.

Challenges in implementation such as seasonal roads, disinterest of masons and house owners in training participation, linguistic and cultural norms etc. were adequately managed through different strategies and primarily by the engagement of local communities, representatives and authorities in planning, mason selection and community mobilization. Moving forward, special focus on selection criteria, prioritization and necessary arrangements for participation of female masons and inclusion of local building construction technology and materials in course content will be crucial in further enhancing the outputs and impacts of these trainings.

2. BACKGROUND

The construction sector in Nepal is largely an informal one, with local workforce and contractors predominantly leading the construction of residential buildings. Similarly, the production of masons and workforce required for the construction is also informal; people generally start working in the sector as laborers in their early teens and gradually learn skills as apprentices, eventually working up the ladder. Although a formal training and skill certification institute and system has been established, very few pass through these processes. As a result, a large proportion of local construction workforce are unskilled in earthquake resistant construction.

Initiatives to formalize the capacity building of masons can be seen in Nepal in the early 2000s, when the Government of Nepal and partner organizations such as NSET started delivering trainings to local masons at construction sites, particularly during school construction and retrofitting. A more formal and structured approach for training was felt which led to the development of a standard curriculum for training masons; a 5-day training comprising of theoretical classroom-based sessions and hands on practical exercises on earthquake resistant construction of urban buildings was developed in 2005. The trainings were run in a number of urban municipalities across the country, particularly supported through the Building Code Implementation Program implemented by NSET and funded by USAID/OFDA during 2012-2018. In the aftermath of the 2015 Gorkha earthquake, these trainings and the lessons gathered were pivotal in planning and implementing capacity building trainings for more than 70,000 masons across the earthquake affected areas.

3. INTRODUCTION

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, NSET has been implementing the “Baliyo Ghar Program” and is providing comprehensive technical support to the owner driven model of housing reconstruction by promoting disaster resilient construction standards and design and empowering and supporting earthquake-affected communities to “Build Back Better”.



Figure 1. Baliyo Ghar Program strategy, key areas of interventions and relevant stakeholders

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 Government of Nepal (GoN) 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.

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. Capacity building of local masons through short-term and long-term trainings were a crucial component of the program’s socio-technical assistance. "Training for Masons on Earthquake Resistant Construction of Rural and Urban Buildings" was conducted as part of the technical assistance capacity building activity under the program.

4. MASONS' TRAINING ON EARTHQUAKE RESISTANT CONSTRUCTION

The massive scale of reconstruction required in the earthquake-affected areas prompted the need for huge number of skilled masons. Across the country, the National Reconstruction Authority estimated the requirement of more than 60,000 construction workers to complete the reconstruction of more than 825,000 fully damaged and retrofitting of another 70,000 houses. Preliminary data and information collected from different sources from the earthquake affected districts, and from the PDNA report showed that the existing masons in the earthquake affected areas covered 50% of the total needs for reconstruction. Thus, it was very important that skill enhancement of local masons would be a crucial step in the reconstruction process.

Masons' Training refers to the short-term (7 days) training that Baliyo Ghar Program conducted in its program implementation areas to enhance local capacity. The trainings were specifically targeted for local construction workforce to undertake construction of rural and urban buildings following the technical standards as guided by the National Building Code of Nepal and the Minimum Requirements (MRs) and other technical guidelines developed by the National Reconstruction Authority.

4.1 Objectives

Baliyo Ghar Program conducted intensive short-term training courses targeted to the existing local masons in its program areas. The main objective of the training course was to enhance knowledge and skills of masons and construction workers of the affected areas on the earthquake resistant construction technology. Generally, the existing masons have basic knowledge and skills required for construction of a house, but lack specific knowledge and skills on earthquake resistant technology. The training intended to serve two purposes.

1. Enhance local capacities to undertake earthquake resistant construction of rural and urban buildings at local levels with minimum external interventions.
2. Help in transfer of skills from existing masons to unskilled masons working as labors to increase the number of skilled human resource, thus supporting during the surge of the reconstruction process.

4.2 Curricula Development

Training for masons in Nepal started as an informal learning process; masons involved in construction and retrofitting of school buildings in early 2000s were provided with theoretical knowledge alongside the construction. Since then, witnessing the importance of training local masons in enhancing compliance of buildings, such trainings increased in number, and transformed into a much formal affair. To standardize the conduction of trainings, curricula for training

masons were developed. The first such efforts were done in 2005, when “Curriculum for Mason Training: Guidelines for Training Instructors”. The curriculum was based on the extensive experience gained during the implementation of the seismic retrofitting of school buildings under the School Earthquake Safety Program (SEP) of the Kathmandu Valley Earthquake Risk Management Project (KVERMP), under the Asian Urban Disaster Mitigation Program. This curriculum was later endorsed by the Department of Urban Development and Building Construction (DUDBC) and became the standard guidelines for training masons and contractors on earthquake resistant construction throughout the next decade.

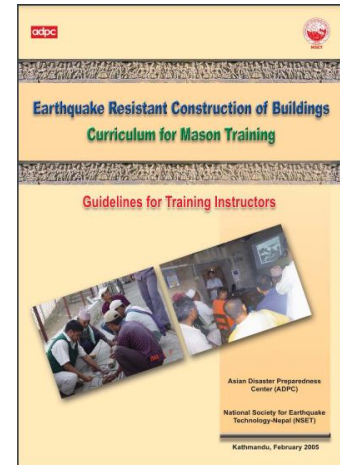


Figure 2. Theoretical session being conducted during a mason training in Nuwakot. As almost all buildings were damaged by the earthquake, Baliyo Ghar Program team made use of temporary shelters like these to conduct theoretical sessions of the trainings.



Figure 3. Training participants working together in construction of stone masonry walls using earthquake resistant construction techniques in Dolakha. Participants constructed a small scale model of masonry walls to apply hands on practice of the techniques of construction under close supervision of instructors.

Although widely implemented, this curriculum only covered aspects of earthquake resistant construction of urban buildings, typically reinforced concrete frame and brick in cement masonry buildings. Rural buildings constructed using stone or bricks in mud mortar and wooden roofs, floors and bands were not adequately covered. With heavy losses during the Gorkha earthquake happening in rural areas, and the highest need for training local masons in these regions, it was important to include rural construction in the training curriculum as well. Furthermore, various theoretical and practical concepts were found to be missing from the earlier curriculum.

As a result, in the aftermath of the 2015 Gorkha earthquake, Baliyo Ghar Program supported the Government of Nepal's Department of Urban Development and Building Construction (DUDBC) in developing and standardizing the curriculum for conducting short training (7 days) for masons in rural and urban construction. Two separate volumes of the training curricula were developed focused on different types of construction. The curricula was endorsed by the government and was used as the only standard curriculum for training masons throughout the earthquake affected areas during the reconstruction campaign.

4.3 Implementation

The implementation of training for masons was done following the guidelines and curricula endorsed by the National Reconstruction Authority. Similarly, all local



level policies and directives were duly followed to ensure inclusion and transparency in conducting the trainings. The figure below shows the implementation steps as a flowchart diagram.

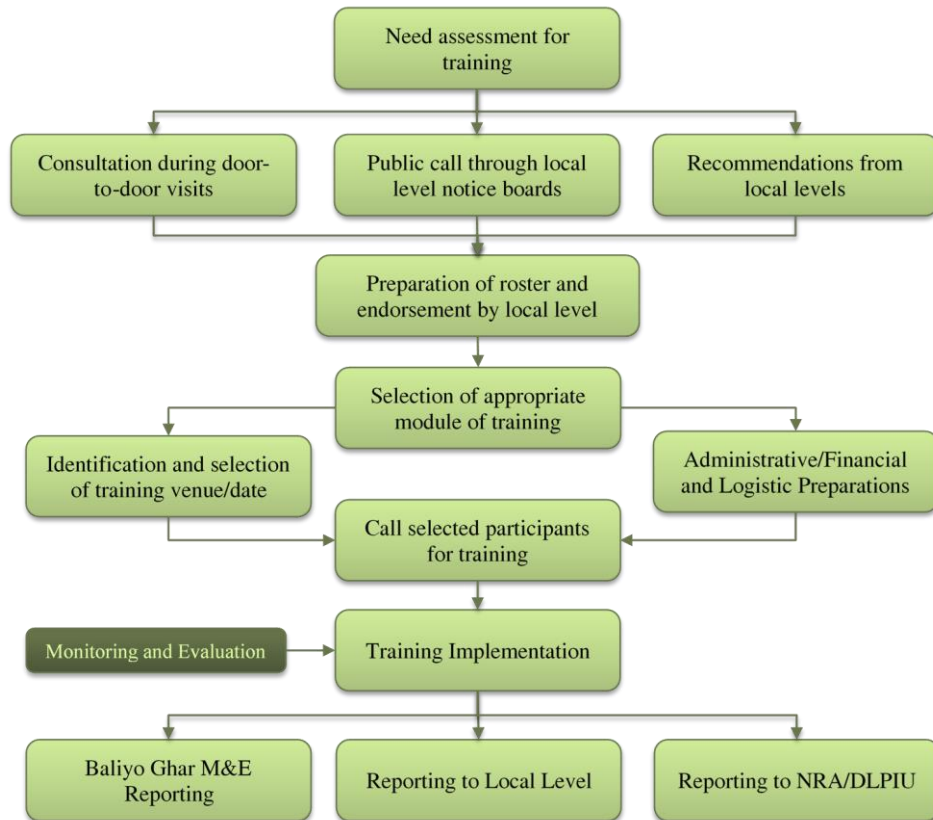


Figure 4. Steps in Training Implementation

Experience enriched with training: Story of Chatra Bahadur Gurung



Chatra Bahadur Gurung, 68, is renowned name in the village of Thanapati, Shivapuri Rural Municipality in Nuwakot. Although merely 30 kms away from Kathmandu, the village of Thanapati is primarily rural, with stone in mud masonry buildings abundant. Mr. Gurung, as he says himself, was one of the pioneers of stone masonry construction in his village and had been working as a mason for 40 years prior to the 2015 Gorkha earthquake.

"I started young, as an apprentice to an older mason in the village itself. We worked in groups of about 5 people. I learned the skills of construction from him; we did not have any formal education or training. We constructed houses the only way we knew, and did not even think about earthquakes," says Mr. Gurung explaining about the construction field in his village. Construction of residential houses, especially in rural Nepal is largely an informal affair, with house owners dependent on local masons and contractors for technical advice, supervision and construction. This resulted in lack of awareness and skills in earthquake resistant construction; the effects of which were seen during the 2015 Gorkha earthquake, where more than 800,000 houses were damaged. In Thanapati too, earthquake disaster effects were widespread. Mr. Gurung recalls, "Almost all of the houses we constructed were damaged by the earthquake. We were not able to understand the reasons, but concluded that our construction techniques were insufficient". More than 750 houses in Thanapati have been identified as fully damaged by the National

Reconstruction Authority, another 50 partially damaged and needing retrofitting interventions. The widespread damage of houses let masons like Mr. Gurung reeling with desperation to find better ways to rebuild.

"I had worked for more than 40 years as a mason, but that was the first training I ever received on how to build strong houses", says Mr. Gurung recalling of his participation in the mason training. The training he participated was the first one Baliyo Ghar conducted in his village, on 8th September 2016. Prior to conducting the training, Baliyo Ghar Program team had started community mobilization, consulting with house owners, masons and local authorities on aspects of earthquake resistant construction. Understanding the need of training, 35 local masons had participated in the training. "All of us were excited to learn, and since the construction had not started, we were free as well. That was the best time to learn to build strong houses". On what he learned from the training, Mr. Gurung further adds, "We learned on techniques required for making building earthquake resistant, and that the materials were readily available in our own villages. We learnt about the importance of bands, reinforcements and proper stone laying. We were also able to practice what we learned."



When asked how he started applying the knowledge and skills, he stated, "Immediately after the training, I started looking to persuade and convince the villagers to construct earthquake resistant houses. It was a difficult time, as government norms were not clearly understood by all. However, being an experienced mason in the village, I was able to persuade Ram Bhai (Ram Saran Pandey) in Bismure to follow the techniques. I also asked Baliyo Ghar Team to come and brief him about the technical provisions. After that, he readily agreed." Ram Saran Pandey's house in Bismure, Thanapati was the first house to be built by trained masons in Thanapati, and with adequate technical support from Baliyo Ghar Program, the house was constructed fulfilling all technical standards.



The house even became a demonstration model for the villagers, and Mr. Gurung turned into an influencer in earthquake resistant construction in Thanapati. Over the course of the reconstruction campaign, Mr. Gurung has constructed nearly 50 houses in the village and has subsequently trained 10 local masons himself. "The training provided me with ample opportunity to work in rebuilding my village, and also brought me good income and pride. It would not have been possible without their (Baliyo Ghar Program team) continuous technical support and guidance to house owners. Now that all houses are nearly complete, I think our village is safe now. I will continue advocating on earthquake resistant construction throughout my life."

5. OUTPUTS

Across the four program districts, **244** mason-training events were conducted through Baliyo Ghar Program. Among these, trainings were conducted in program wards with comprehensive coverage as well as in earthquake affected areas in program districts to facilitate the implementation of On-the-Job Trainings and with recommendation from the National Reconstruction Authority. The highest number of trainings were conducted in Dolakha where 90 events were conducted which resulted in 2745-trained masons. Following Dolakha, 85 events were conducted in Dhading with 2534-trained masons while 57 events were conducted in Nuwakot with 1653-trained masons. In Kathmandu, where only three wards of one municipality is covered, 12 training events were conducted from which 313 masons were trained.

The disaggregation of training events across the four program districts in terms of module of training is presented in the bar chart in figure below.

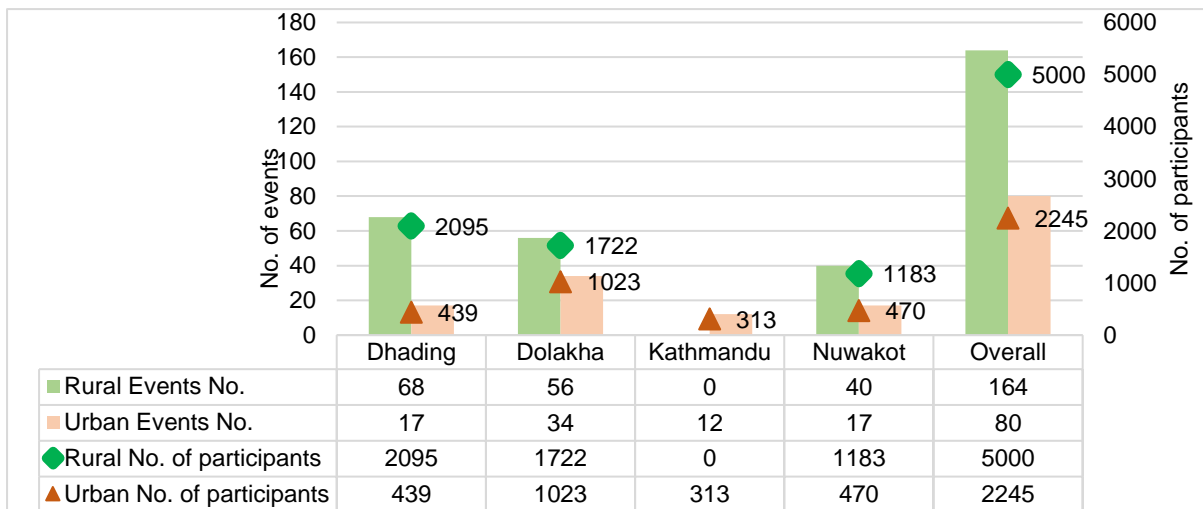
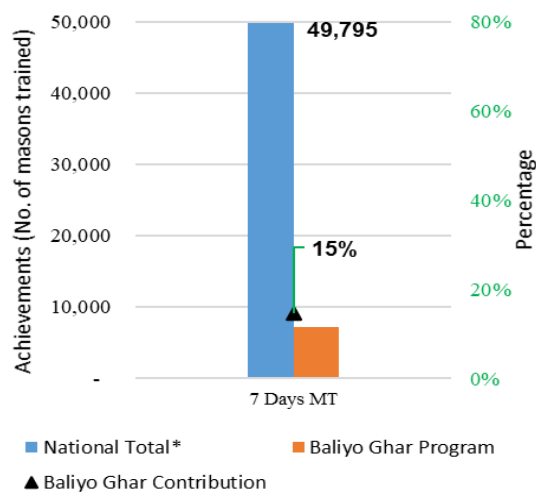


Figure 5. Distribution of urban and rural mason training events and participant numbers in four program districts.

Overall, more than twice rural mason trainings were conducted than urban trainings, largely owing to the geographical and topographical distribution of program areas. From 80 urban training events, 2245 masons were trained whereas from 164 rural training events, 5000 local masons were trained on earthquake resistant construction.

In district wise distribution, proportion of urban trainings is higher in Nuwakot, due to increasing urbanization in the program areas in Shivapuri RM. In Kathmandu, all training events were urban modules, as stone masonry or brick in mud construction was largely replaced by RC frame or brick in cement construction in Kageswari Manohara Municipality.



Source: HRRP5W

Figure 6. Baliyo Ghar's contribution in training masons compared with national figures

In terms of contribution to national reconstruction, the chart besides shows a comparison of training outputs in terms of trained masons through Baliyo Ghar Program and the national figures as reported by all partner organizations in the HRRP database.

Evidently, Baliyo Ghar Program contributed 15% of the total masons trained during the housing reconstruction program. Considering that the program only covered less than 10% of the total beneficiaries, it highlights the intensive levels of trainings that the program conducted in its program areas. This is in line with the program's principle and objective of supporting disaster resilient recovery and sustainable construction practices through capacity building of the affected communities. The wide coverage of trainings and higher proportion of trained masons also significantly helped increase supply of human resources and aided compliant construction by allowing house owners to engage trained mason in their construction as discussed in later sections.



Figure 7. Participants, including female masons working on construction of reinforcement frame of staircase during urban mason training in Bhimeswar, Dolakha. Although female masons are quite few in number, Baliyo Ghar Program made considerations to ensure their inclusion as much as possible.

5.1 Gender Wise Distribution

A distribution of gender of the trained masons is shown in the figure besides. In total, 93% (6773) of the masons trained were male whereas only 7% (472) were female.

This proportion was more or less consistent throughout all the program districts. A major reason for the low proportion of female trainees in these trainings is due to the eligibility criteria of the training, which required participants to have

prior experience in masonry construction. As women were largely involved in construction only as laborers, very few were eligible to participate in the 7-day trainings. However, these females were prioritized during the participant selection for the conduction of the 50 Days On the Job Training for developing new masons.

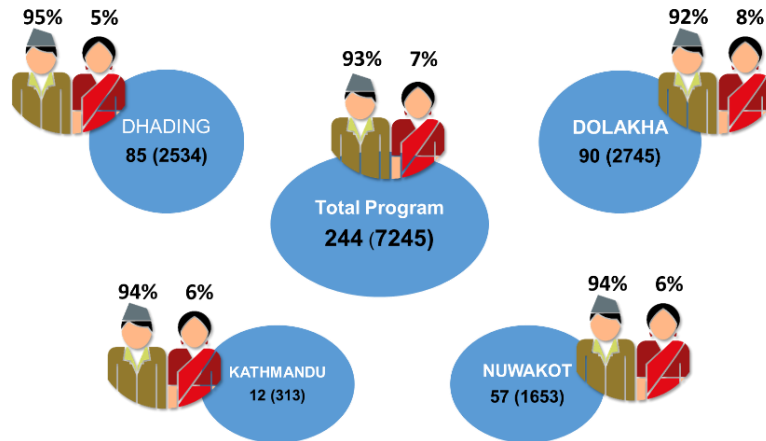


Figure 8. Distribution of trained masons in terms of gender in Baliyo Ghar Program areas

5.2 Ethnicity Wise Distribution

The figure above highlights the distribution of training participants based on five major ethnic groups; Janajatis, Brahmins/ Chhetris, Newars, Dalits and Muslims. Among these ethnic groups, nearly 51% of all training participants were Janajatis, owing to two major reasons; first, Janajatis are predominantly large ethnic groups in Baliyo Ghar Program areas and second, most of the construction work in rural communities are done by Janajatis. They are followed by Brahmin/Chhetri (22%), Newars (14%) and Dalits (12%). A small proportion of Muslims (<1%) and other ethnic groups (1%) participated in the trainings. Janajatis were also significantly higher in Nuwakot than any other district.

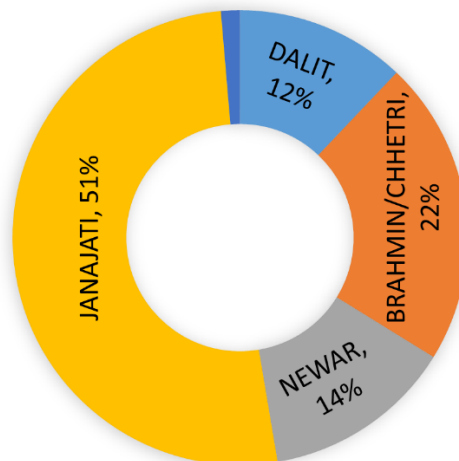


Figure 9. Ethnicity wise disaggregation of training participants

5.3 Age Wise Distribution

The average age of training participants was 40 years.

The proportion of participants in three age groups, 25-34, 35-44 and 45-54 were more or less similar, comprising, in total 82% of all participants. Similarly, around 12% of participants fell under the 15-24 and 55-64 age groups each. Only about 2% of the participants were 65 years or older.

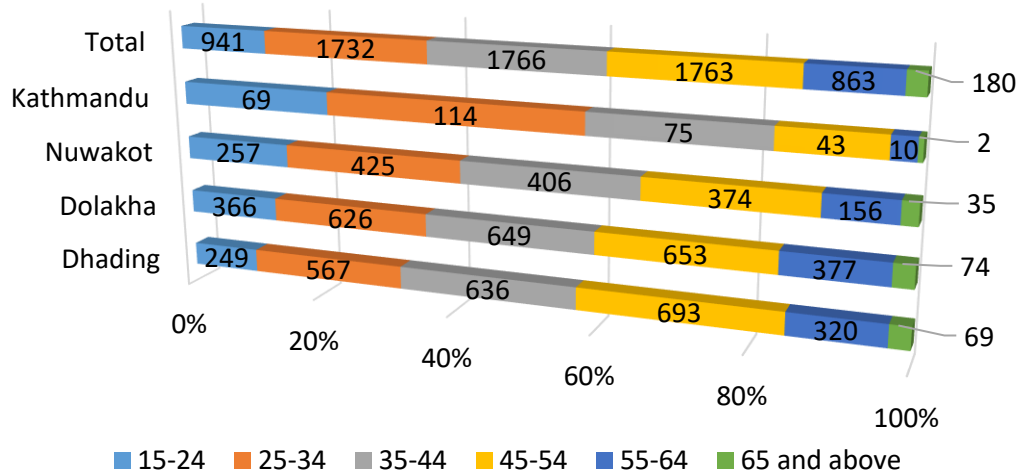


Figure 10. Age wise distribution of training participants



Figure 11. A group of participating masons try hands-on exercise in rebar placement and binding to construct RC frame columns and beams during urban mason training in Kathmandu.

6. CONTRIBUTION TO DISASTER RESILIENT RECONSTRUCTION

The masons trained through the 7-day training have had a direct impact on the post-earthquake reconstruction and recovery process of their communities. The major reason for this is that these trained masons were already working in their communities, had previously constructed a number of buildings, and were the prime source of information on technology and construction process for the house owners. Hence, with enhanced knowledge and skills gained through the training program, the masons were able to immediately apply them in the field, as well as become influencers in propagating information on disaster resilient construction across their communities.

The role of these trained masons in housing reconstruction were evaluated through two major aspects; first, whether or not trained masons continued working in the field of construction and second, whether or not house owners were able to hire and employ trained masons in their construction process.

6.1 Continued Professional Engagement of Trained Masons

To ascertain whether the masons participating in the trainings were applying the knowledge and skills in actual construction, field monitoring, surveys and focus group discussions were conducted with trained masons on a regular basis. These surveys not only provided information on the construction standards but also evaluated the impact of the trainings in construction, by analyzing the professional output of the trained masons. The chart in figure below shows the proportion of surveyed masons who continued their work in construction as a trained mason for at least one year period after the training.

The bar chart in the figure shows the proportion of trained masons who continued professional engagement in construction over a period of at-least one year since the trainings among surveyed masons over the course of the program period from 2016-2019 where majority of the trainings were conducted. In 2016-2017 and 2017-2018, when the reconstruction progress was at its peak, 88% of the trained masons were involved in construction after the trainings. In the subsequent period in 2018-2019, 80% of the trained mason continued working.

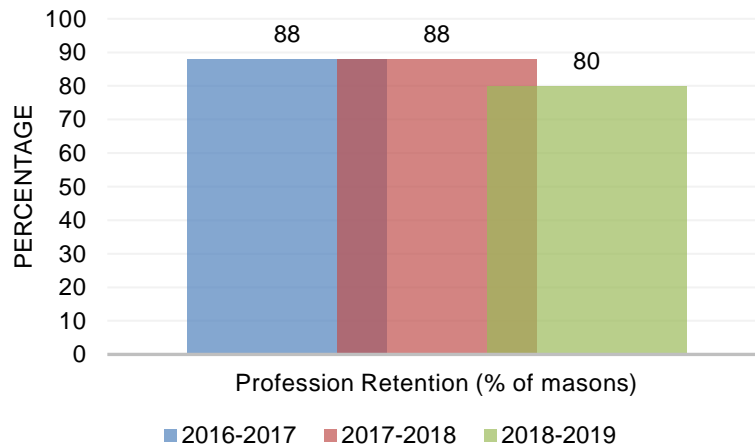


Figure 12. Proportion of trained masons who continued engagement in construction for at least one year after the trainings.

The continuous engagement of trained masons is one of the key factors contributing to the escalation of reconstruction and compliance. Further analysis from the studies show that masons thus trained were able to aptly utilize the knowledge and skills gained during the training program. The masons also stated that the trainings were especially helpful as it covered all important aspects of earthquake resistant construction relevant to the prevalent building typologies in their communities. This, particularly sheds light on the effectiveness of the training.

Trained mason continues engagement over the course of five years

Gobinda Lamsal, now 35, a permanent resident of Muralibhanjyang in Nilkantha Municipality, Dhading had worked for only a four years as a mason when the 2015 Gorkha earthquake rattled the country, and his community. Although his village falls within the boundaries of the Nilkantha Municipality, there is very little urbanization, and masonry buildings, primarily built with stone and bricks are abundant. Due to the poor quality of construction prior to the earthquake, his village suffered heavily damaging all but a few houses.



When Baliyo Ghar Program started its field activities in Nilkantha in January 2016, his village was only starting to think of reconstruction. The damage and need for training local masons was felt when Baliyo Ghar team first visited his village in late May, to collect information and conduct the Risk Perception Survey. Owing to the large need of masons, Baliyo Ghar planned for a training in the community on September 19, 2016. Gobinda was one of the 34 local masons who attended the training, learning about the skills of earthquake resistant construction. When asked why he decided to join the training, he recalls the day, "Reconstruction in our village hadn't started yet, as all of us were in a dilemma. I thought the training would be useful to learn about something new. Also, I had heard that trained masons would have more work and would earn more."



Over the course of five years since the training, Gobinda has directly led hand in the reconstruction of more than 50 houses in his community. "They are all safe and have been approved for the tranches too", he exclaims, smiling. What's more, in a recent survey conducted by Baliyo Ghar Program to study the retention of knowledge and profession of trained masons, Gobinda scored 91 out of 100 in the knowledge score. When asked how he was able to remember so much from the training, he states, "What we learnt were very simple things, which we had missed in our previous construction. Also, as we began applying, they (Baliyo Ghar team) continuously supported us, reminding us of the provisions. The more houses we constructed, the better we became." His contribution to the reconstruction campaign does not end here. Along with constructing houses, he also developed and trained five more masons under his wing, who have now

learned the skill and have moved on to form their own construction groups. This passage of knowledge skills through informal means is the backbone of the sustainability of the construction profession in Nepal; the involvement of trained masons in this skill transfer is important for the continuation of safer construction practices.



The story of Gobinda and thousands others is a testament of the impact that Baliyo Ghar mason trainings has had on the enhancement of local capacity for disaster resilient reconstruction in Nepal. However, as reconstruction campaign ends, Gobinda is worried about the continuity of his profession. He wishes to continue working as a mason, as the profession gives him enough income to support his family of four as well as earn good reputation in his village. "I want to learn new techniques of construction, perhaps even constructing urban buildings that they built in the 'Bes'i' (Nilkantha Municipality Center)." For now, Gobinda, and many more are in huge demand to complete the construction of houses in his community.

6.2 Engagement of trained masons in reconstruction

Baliyo Ghar Program not only provided capacity building trainings to the local masons, but also worked to enhance public awareness for the utilization of trained masons in the reconstruction process. For this, the program continuously advocated with the beneficiaries, local governments and local contractors to facilitate the engagement of at-least one trained mason during the construction of houses. The NRA also emphasized on the need for engaging trained masons and highlighted it as one of the aspects of private housing reconstruction. To ensure engagement, Baliyo Ghar Program conducted consultations with house owners, disseminated rosters of trained masons through the local governments

and provided on-site technical support to the masons and house owners during construction.

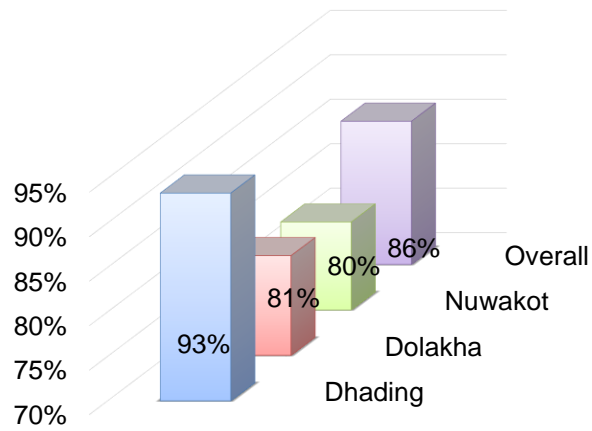


Figure 13. Proportion of reconstructed houses that utilized at least one trained mason during construction



Participants working on construction of wooden bands during hands on practical exercise of rural mason training in Dhading

7. CHALLENGES AND MITIGATION STRATEGIES

The various challenges faced during the implementation of the mason trainings and the strategies adopted by the Baliyo Ghar Program in overcoming those challenges are highlighted in the table below

Challenges	Strategies made and actions done to overcome
<p>Lack of road access during monsoon: As many of the program areas were situated in, rural hills of Nepal, road access were hampered for an average of four months during the monsoon season that hindered material transportation for conducting trainings.</p>	<p>In most cases, trainings were planned keeping these seasonal conditions in mind. Where training had to be conducted during monsoon (especially since masons were mostly free during this time), the following strategies were most effective:</p> <ol style="list-style-type: none"> 1. Procurement and transportation of construction materials beforehand. 2. Procurement of small quantity of construction materials from stock of house owners in the community.
<p>Masons/House owners uninterested in attending trainings: As masons work on a daily wage basis, they were uninterested in attending trainings for a 7-day period leaving their work. In several cases, even house owners were reluctant to send in their masons for training.</p>	<p>After the first few trainings, trained masons were mostly requested for assistance to persuade their fellow team members to attend the training. Similarly, consultations were done with house owners to convince them of the benefits of the training. Other strategies used were:</p> <ol style="list-style-type: none"> i. Request support from local authority (WCF/Ward) to help regulate masons involvement. ii. Conduct trainings during the morning (7-2) so that masons could still work half a day during the afternoon and earn a living. iii. Participate masons from a single group in small numbers to avoid hampering ongoing construction.
<p>Social/Political bias in selection of masons: Although the role of local authority or representatives was important, in many cases, biasness in selection of masons was seen concerning social status or political alliances.</p>	<p>To avoid selection bias, open calls for trainings were done through the local authority (VDC/ward office) and registration of masons was done. Similarly, to ensure inclusion of all existing masons, mobile teams prepared rosters of masons working in construction during door-to-door visits. Through this, all masons were given equal opportunity for participating in the trainings. Trainings were also conducted specifically for different social groups as part of the inclusion process.</p>
<p>Difficulty in managing appropriate training venue: Managing standard training hall/venue, place for model demonstration and training exercise was difficult. The participating masons had to walk a long distance due to lack of transportation facility and the geography.</p>	<p>As much as possible, training venues were selected to ensure that travel time for participants to and from the venue was minimum. To ensure standard training hall for theoretical sessions, most generally community buildings such as schools, community halls were used. Temporary shelters or tents were also used when appropriate. In municipal and urban areas, halls were hired during the training period. Similarly, for practical exercise and demonstration construction, as much as possible, communal open space was selected. However, in cases where not possible, private land was used with verbal agreement between owner, program and local authority to allow for demonstration for at-least a few months period.</p>
<p>Issues in participant selection: Although considerations were made to ensure that participants selected for the trainings fulfilled</p>	<p>To avoid the selection of unqualified participants, screening of participants was done, most preferably at-least a day before the training start date. Screening, where available was done via phone</p>

Challenges	Strategies made and actions done to overcome
<p>the training pre-requisites, many a times, participants attending the training were novice masons. Similarly, some non-masons also attended trainings with false information lured by the daily wages. The selection of wrong participant not only violated training criteria but also hampered effective learning during the training.</p>	<p>interview and field visits. On the day of the training too, screening was done prior to registration of participants for the training. If, however, an unqualified participant skipped the screening process and identified later, they were most often removed from the training. In such cases, interested participants who were unqualified for the 7-day training were suggested to sign up for the 50-day OJT training program.</p>
<p>Social, cultural and language related issues: As many of the program areas were diverse communities, several social, cultural and language related issues were widespread.</p> <ol style="list-style-type: none"> i. The most common was that many of the trainees were not literate and did not comprehend on theoretical sessions or tests. ii. In many cases, Nepali was not the mother tongue of the trainees, hampering fluent interaction between instructors and trainees. iii. Different social and cultural norms and festivals hampered training events (such as in Tamang community, when a person dies, the entire community left training on the day to support in funeral rites and mourning) 	<p>To resolve these challenges for effective training implementation, special focus was made to ensure that participants were provided with adequate time to understand and interact. Other strategies used were:</p> <ol style="list-style-type: none"> i. Seek support of construction technician (a local mason) to facilitate in translation of key terms. ii. Use oral methodology for conducting pre and posttest for trainees who had difficulty in reading or writing in Nepali. iii. Use of graphics, figures and photographs much more than texts during presentation and group works. iv. Allow time for interaction between the trainees themselves. v. As much as possible, consideration was done for social and cultural norms. However, when unavoidable, trainees who missed sessions due to such norms were allowed to either take an extra day of training or join the next training event in order to receive certification.



Mr. Krishna Hari Thapa, Mayor of Kageswari Manohara Municipality, Kathmandu felicitating a participant who successfully completed training on earthquake resistant construction of urban buildings.



National Reconstruction Authority (NRA) Chief Executive Officer Mr. Sushil Gyewali interacts with participants during an urban mason training event held in Nilkantha Municipality, Dhading in May 2016.

8. LESSONS

With 244 individual events, the training conducted under the program not only helped develop skilled masons for earthquake reconstruction but was also a great opportunity to test the process, curricula and implementation mechanism of such trainings on a wider scale. The following key learnings were gathered as part of the implementation.

- The mason trainings were conducted in a peer learning process where participants made stronger connections with other trainee participants and developed working relationships that went beyond the learning experience.
- The training model not only helped the mason to understand the new technology but also helped the community to visualize how their houses are going to be strong then before. Hands-on exercises were especially impactful in transferring knowledge on the various components but also why they were placed during construction.
- Training hall is hard to come by in rural areas, so alternatives should be sort out and for model demonstration, public place would be optimal for the model to be demonstrated for longer period.
- Participant selection criteria including, if necessary, a pre-training assessment is important to ensure that only masons with prior experience in construction are included. Social mobilization and mason selection for training is a key part to conduct an efficient and impactful training where the masons actually working on the field will get the chance to attend the training and implement the knowledge on field level.

9. RECOMMENDATIONS

The following key recommendations are made based on the challenges incurred during the implementation, the strategies used for short-term problem resolution and the learnings gained through the program.

- The qualification criteria must be reconsidered for female masons to encourage their active participation in such training. In some cases, training modality must also be adjusted to accommodate the various physical, social and other constraints of female masons.
- Transportation allowance provided to participants should be reviewed. Geographical conditions and time taken for travel must also be considered. Similarly, as trainees have to give up their day job to participate in the training, allowance should cover the basic living expenses. One of the best approaches would be to have allowances proportionate to the daily wages earned by the trainees.
- Proper notice and selection criteria should be set by implementing and partner organization for fair selection of masons. Screening of participants must be done prior to the training event. A simple checklist can be most helpful for this purpose.

- For trainings conducted in rural regions, slides should include detailed information about the use of rural construction materials like stones, mud mortar and wood. Special focus must be given to local construction techniques (and materials) beyond the standardized curricula.
- With increasing diversity in the building typologies, construction materials and designs, training curricula must be reviewed and updated on a periodic basis. Curricula, theoretical sessions and practical exercises must adequately address local construction techniques and challenges.
- Practical exercise on roof and floor construction using timber should also be included in training.

10. SUSTAINABILITY OF EFFORTS

Capacity building of communities is a crucial aspect in disaster risk management, preparedness and recovery and has been widely accepted as one of the key components of a successful recovery program. The National Reconstruction Authority, at the onset, had also emphasized on the need for strengthening capacity of the people and communities as one of the key strategic objectives, not just to recover from the 2015 Gorkha earthquake, but also enhance resilience to disaster risks. Capacity building through training to local masons to enhance knowledge and skills was implemented as a crucial component of socio-technical assistance by the NRA and several partner organizations. Baliyo Ghar's contribution of more than 15% highlights the significance of the program in achieving this objective. Furthermore, Baliyo Ghar's support was also instrumental in developing the national guidelines and curricula for the standardization of the training, which has resulted in uniform and consistent delivery of information on earthquake resistant construction.

Masons play an important role in our communities. In a largely informal building construction and infrastructure development process, local masons not only apply skills in construction, but also play roles as ambassadors of safer construction, helping infiltrate the information to the communities. Building their capacity and knowledge has helped propagate the awareness on mitigation of disaster risks on a much larger scale and on deeper levels than any other external inputs. The trained youth will serve as the backbone of disaster resilient construction in Nepal for the immediate future while the apprentices trained by these masons will, eventually, move on to continue such practice, changing our building culture and ensuring sustainability of earthquake resistant construction practices in the long term.

With learnings and enhanced national experience in trainings on earthquake resistant construction, such trainings should also be conducted to accommodate other forms of hazards, such as landslides and flood and their risk mitigation. Lessons from the trainings and the impacts have clearly shown that such an effort would be most effective in enhancing community awareness and action on disaster risk mitigation.

The huge scale of training to masons done during the period of reconstruction has not only aided the speedy recovery but will also contribute to sustainable disaster risk management in the affected communities, and beyond. These trained masons, on one hand can immediately support in propagating skills and knowledge in disaster resilient construction, and on the other, be a huge asset in human resource should another such large scale of reconstruction or recovery be required in the future. Hence, it is paramount that the Government of Nepal, at national, provincial and local levels, develop a database of trained masons as well as provide them with certification and recognition to boost their morale and engage them in construction. Skills and knowledge propagated through such as huge scale of efforts during the reconstruction and recovery program must be aptly utilized towards enhancing disaster resilience of all communities.

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Santosh Regmi
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Dundu Ram B.K
Bikesh Kila Shrestha
Manas Thapa
Shekhar Mahat
Sujeet Gurung
Dwaipayana Sharma
Suyog Bhandari
Dipesh Ray
Rajati Dahal
Dipesh Tiwari
Nilesh Rawal
Sabin Chand
Hemraj Bogati
Neeraj Upadhyaya
Sakar Maskey
Narayan Prasad Kharel
Manoj Bista
Aavash Ghimire
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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
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Ganesh Gautam
Binita Silwal
Kaushila Shrestha
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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
Ronak Bikram Thapa
Puspa Khadka
Yeknath Acharya
Sachin Chaudhary
Sishir Khatri
Bighnesh Regmi
Milan Hadkhale
Anita Rajlawot Khatri
Arati Shrestha
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Yogesh Khatri
Chitra Bahadur Lama
Bikash Paudel
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Experts

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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.



NSET
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National Society for Earthquake Technology-Nepal (NSET)

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