Handbook on Owner-Driven Housing Reconstruction

Source: UNDP

UNITED NATIONS DEVELOPMENT PROGRAMME

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Preface

The number of disaster events has almost doubled in the last 20 years and the frequency, magnitude and impact of these crises is on the rise. Although significant advances have been made in reducing the loss of life related to some types of events, the direct economic losses from such disasters have increased significantly due to damage to both private and public infrastructure. While damage to infrastructure disrupts services, for a poor family, losing their home can have devastating consequences.

The images of anguish and suffering of those who have lost their homes and belongings after a natural hazard event are stark, compelling and all too frequent. It is often the poor and the vulnerable who are the most affected and those are also the populations who find it most difficult to rebuild their homes because of a lack of resources, capacities and access to the knowledge needed to help themselves or obtain institutional support. For most people, a house is much more than just a structure in which a person lives. It is a place that is vital to our identity, security and sense of belonging.

In the aftermath of the 2015 Nepal earthquake, UNDP supported the construction of 26,912 houses in the Gorkha district, assisting homeowners to access the funds, technical guidance and information needed to build or rebuild their houses. This experience has further increased our in-depth experience and knowledge in housing reconstruction. An integral part of this success story has been the adoption of an owner-driven housing reconstruction approach that enables the transfer of skills to beneficiaries, reaching remote areas and adopting local solutions through participatory methodologies.

This Handbook aims to provide guidance and support for all those who will be involved in housing reconstruction in the future, from decision makers and reconstruction experts to project technical staff. By sharing the UNDP Nepal experience and the lessons learned there, the Handbook provides guidance on all the phases of housing reconstruction, discussing damage assessment, programme design, implementation and reconstruction while encouraging risk reduction programme components and promoting the sustainability of project interventions and their achievements.

By developing the Handbook, we want to share the knowledge gained by UNDP and support inclusive future housing recovery efforts. While the Handbook provides technical information on housing reconstruction and its processes, it never loses its focus on the most vulnerable, supporting the reader to develop participatory, inclusive and transparent housing recovery programmes.

Although the handbook originates from the experience of one organization and its interaction with its governmental and non-governmental partners and beneficiaries, our wish is that it will be used broadly as a reference to support future post-disaster housing recovery efforts.

Ronald Jackson
Head
Disaster Risk Reduction & Recovery for Building Resilience
Crisis Bureau
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Foreword

The earthquakes that shook Nepal on 25 April and 12 May 2015 were the most devastating in recent years in terms of their human and physical impact as well as their geographic extent. Approximately 9,000 people lost their lives, more than 22,000 people were injured, and more than 800,000 houses were damaged.

Reconstruction was a daunting task, given the challenging topography of Nepal and the lack of skilled personnel able to carry out the work. The National Reconstruction Authority (NRA) took on the task, and planned the housing reconstruction component, allocating funds and developing a portfolio of housing designs to support the disaster-affected populations as they built or rebuilt their houses. There were however several challenges in its implementation which could have obstructed the NRA objective of constructing disaster resilient houses using local practices and local artisans. This Handbook demonstrates that with sustained technical assistance to families, it is possible to not only achieve the targets but to do so much more.

With funds from the Government of India, the United Nations Development Programme (UNDP) assisted families in building 26,912 houses in the Gorkha district of Nepal, the epicentre of the earthquake, applying its owner-driven housing reconstruction approach. The initiative not only enabled homes to be re-built, but also contributed to the localization of viable disaster-resilient technologies that reduce the risk of earthquake damage through participatory approaches. The Handbook offers insights into the role of the federal government, local municipalities, communities, masons and women who led housing reconstruction efforts. It also offers an understanding of the complex processes which need to be addressed during the planning of a large-scale housing programme, such as the approvals process, policy directives, capacity building, awareness and education, managing funds and monitoring reconstruction. The social technical assistance provided by UNDP and its partners helped families navigate the different processes for accessing support for housing reconstruction. The success of the Owner-Driven Housing Reconstruction was instrumental in influencing the National Disaster Risk Reduction and Management Authority (NDRRMA) to recommend ODHR as the most appropriate approach to post-disaster housing reconstruction.

The Owner-Driven Housing Recovery Handbook has been developed based on our Nepal post-earthquake housing reconstruction experience and seeks to inform and guide post-disaster housing recovery efforts in any context. We look forward to sharing this experience globally with countries that are planning housing reconstruction programmes.

I would like to express my gratitude to the Government of India for financing the Nepal post-earthquake housing recovery programme, and to UNDP for providing the technical knowledge and expertise necessary to the implementation of the housing recovery programme, building on continuous support as a means of strengthening infrastructure resilience in Nepal.

Mr Sushil Gyewali
Chief Executive Officer

Statement

The notion of Owner-Driven Housing Reconstruction (ODHR) has gained currency over the last two decades. Giving affected communities agency not only enables better long-term outcomes in the built environment, but also provides immediate co-benefits to communities, such as strengthening and expanding building skills and revitalizing the local economy. However, each disaster setting is different and ODHR principles cannot be applied in a dogmatic way. It is in this context that UNDP socio-technical facilitation of the ODHR programme following the 2015 Gorkha earthquake assumes great significance. This publication encapsulates the knowledge and experience gained from those efforts. The Handbook demonstrates that ODHR is a key building block of "Build Back Better" not just in a physical, concrete sense, but more holistically, incorporating and fostering other social dimensions of recovery.

I am reminded of an event on the theme of "Build Back Better" organized by the School of Planning and Architecture and SEEDS in Delhi some years ago. The organizers, rather playfully, deconstructed the notion of BBB into three inter-related themes: a) back to building better, b) better build back and c) build back better.

To me, this deceptively simple formulation encapsulates the multiple dimensions of BBB. The first refers to its baseline conditions: regular building practices, with or without a disaster. If we do not have building practices that focus on the qualities of resilience, we can scarcely hope to turn the practice around overnight in the wake of a disaster. The second articulates a sense of urgency to build back. If we build back too slowly after a disaster – on the pretext of building back better – then that itself will compromise community resilience. And finally, recovery provides an opportunity not only to improve the quality of the built environment but also to improve livelihood systems, reduce inequalities, enhance people's participation and strengthen the institutional systems that proactively seek to assess and reduce disaster risks.

This publication is a contribution to all of those three dimensions of BBB. It will help convert the theory of ODHR into concrete action, thus enabling communities to exercise their agency and build a resilient future for themselves.

Kamal Kishore

Kamal Kishore is a member of National Disaster Management Authority, India.

The views expressed here are personal.

Acknowledgements

This guide was written by independent consultant Jitendra Kumar Bothara and was finalized by Prabir Kumar Das under the guidance of Rita Missal, Recovery Adviser a.i, United Nations Development Programme (UNDP).

This Handbook is primarily based on the experiences gained and lessons learned by UNDP during the implementation of Owner-Driven Housing Reconstruction (ODHR) after the 2015 Nepal earthquake. Many persons informed this Handbook by sharing their first-hand experience and participating in meetings and interviews: government officials, UNDP current and former staff at country and field level, disaster risk reduction managers and consultants, housing experts, recovery stakeholders, and international and non-governmental organizations. Among them:

1. Krishna Vatsa, Member, National Disaster Management Authority Delhi, India
2. Rajendra Desai, Hon. Joint Director, National Centre For People's Action In Disaster Preparedness, India
3. Vivek Rawal, Housing Reconstruction Adviser, UNDP
4. Vijaya Singh, Nepal Country Office, UNDP
5. Ruben Vargas, UNDP, Geneva
6. Reshmi Theckhithil, UNDP
7. Bhubaneswori Parajuli, HRRP National Technical Coordinator, Housing Recovery and Reconstruction Platform
8. Chandra Bahadur Shrestha, Executive Member, National Reconstruction Authority, Nepal
9. Kamran Akbar, Task Team Leader, World Bank
10. Kozo Nagami, Deputy Director General, Japan International Cooperation Agency (JICA)
11. Maggie Stephenson, Independent Consultant, Canada
12. Nigel Fisher, Independent Consultant, Canada
13. Surya Bhakta Sangachhe, Senior Technical Adviser, National Society of Earthquake Technology - Nepal
14. Yogeshwar Krishna Parajuli, Former Development Commissioner, Kathmandu Valley Development Authority, Nepal

We would particularly like to acknowledge the support given by Pragya Pradhan and Ramraj Narasimhan (UNDP Nepal Country Office) for sharing their housing reconstruction experience in Nepal and their rigorous efforts in documenting the experience through this handbook. We would also like to recognize the role of Dr Krishna Vatsa in conceptualizing the idea of social technical facilitation for owner-driven reconstruction, the key factor in the success of the programme. The Handbook retrieves knowledge documented in relevant research papers, manuals, guidelines on housing reconstruction and recovery strategies prepared by various institutions and researchers.

We are grateful to Joana Sampainho (UNDP) and Geraldine Becchi (UNDP) for their invaluable support as reviewers of the document and to Abha Nigam for support in publishing this handbook.

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1 About this Handbook

1.1 Introduction

This Handbook is based on the United Nations Development Programme (UNDP) facilitated post-earthquake owner-driven housing reconstruction (ODHR) programme in Nepal, financed by the Government of India and implemented after the 2015 earthquake (Figure 1 and Figure 2). A total of 26,912 houses[1] were rebuilt, repaired and retrofitted under the programme and the knowledge UNDP gained through that experience forms the backbone of this Handbook (Annex A). Although it is based on UNDP experience in Nepal, the Handbook has been designed as a guide for post-disaster housing reconstruction programmes in any context. Wherever relevant, the Nepal experience has been put up as box items in the Handbook to enable readers to visualize what actually happens during the housing reconstruction process. The Handbook is intended to help governments, international and national agencies and civil societies to respond quickly after a disaster and prepare them for future hazards, as well as enabling them to support resilient reconstruction.

This Handbook is designed to serve as a guide for those tasked with responding to post-disaster housing reconstruction using an owner-driven housing reconstruction (ODHR) approach. It details the various processes, tasks and interventions involved in designing and managing ODHR programmes. The Handbook focuses on two critical aspects of ODHR: (i) principles and key processes, and (ii) methods of facilitation.

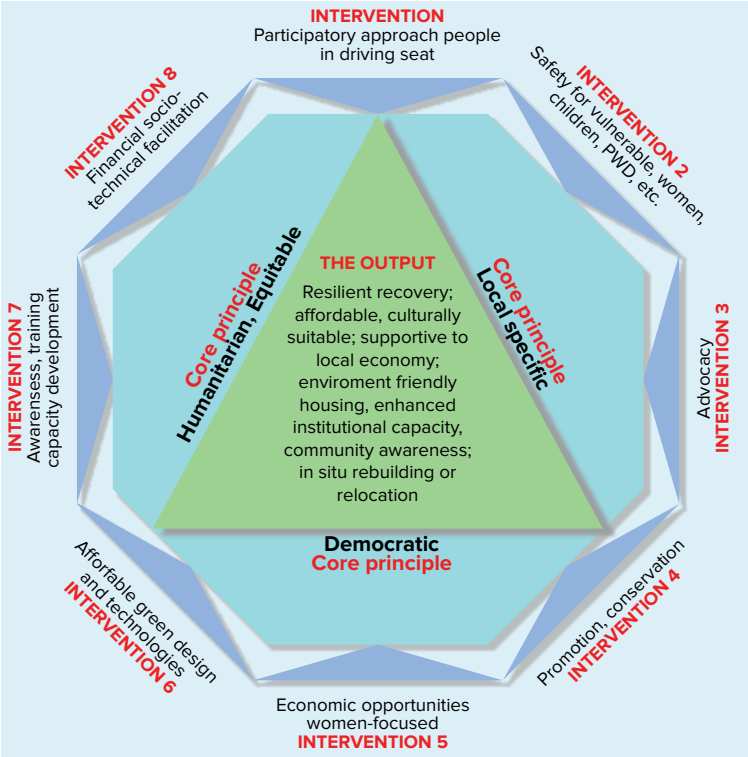


Figure 1. The domain of UNDP support to post-earthquake housing reconstruction, Nepal

1 Government of India partnered with UNDP to provide socio-technical facilitation for housing reconstruction to the affected house owners of 42 wards of 2 urban and 6 rural municipalities in Gorkha district. The programme commenced on 8 March 2018. https://www.np.undp.org/content/nepal/en/home/projects/GHRP.html

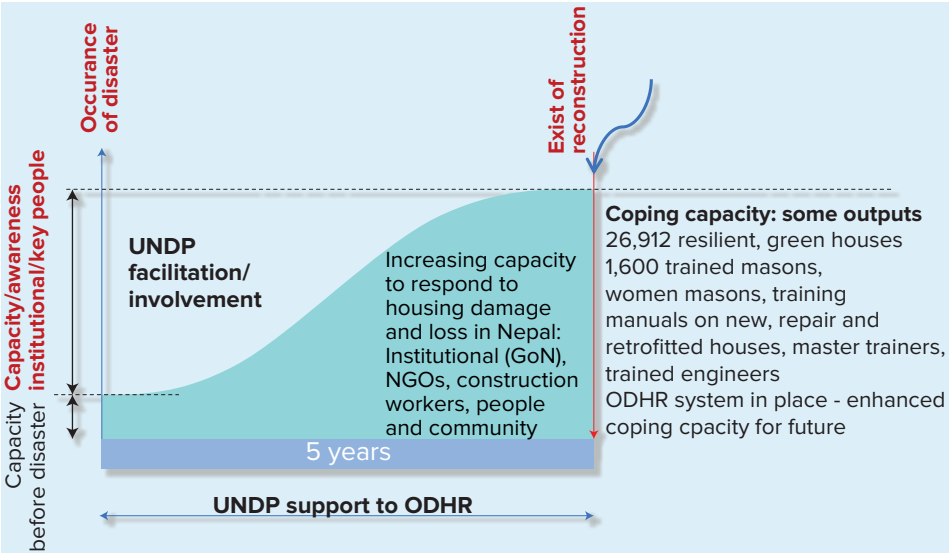


Figure 2. UNDP facilitation and involvement in post-earthquake housing reconstruction, Nepal

1.2 Who is this Handbook for?

The intended primary audiences of the Handbook are:

1. Local and central governments engaged in ODHR
2. UNDP – Global, country office, project managers, engineers and architects, local and central governments
3. UNDP partners and partnering organizations, such as International and local non-governmental organizations (INGOs / NGOs), contributing to the housing reconstruction
4. Community-based organizations (CBOs)
5. Private sector entities

The Handbook provides a broad framework for ODHR and looks at the entire process, with a particular focus on implementation. It is divided into four parts and 13 sections (Figure 3). Part A describes the background of the post-disaster housing reconstruction process and comprises Sections 2 to 4. Part B, made up of Sections 5 to 8, analyses programme development. Part C, composed of Sections 9 to 12, presents ODHR programme implementation. Part D -- Section 13 – discusses ODHR sustainability.

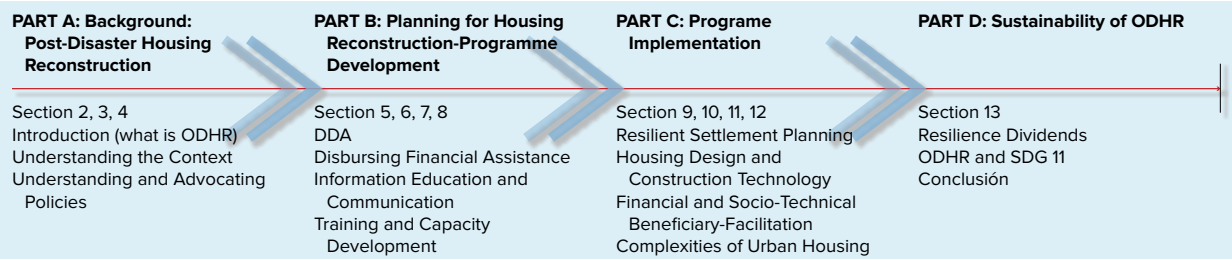


Figure 3. The layout of the Handbook

*This Handbook includes a number of box items, shown in blue, containing salient facts concerning **UNDP-facilitated** post-earthquake housing reconstruction, repair and retrofitting in Nepal. Shown in brown boxes are comparable facts concerning housing reconstruction in other countries. In this way, Handbook users can form a good understanding of the realities of post-disaster housing reconstruction.*

1.3 Objective of this Handbook

This practical Handbook is based on actual UNDP field experience in planning, designing, building, repairing or retrofitting 26,912 houses under the ODHR programme in Nepal after the 2015 earthquake. It highlights the ODHR framework and the related issues to be considered during a housing reconstruction programme. This Handbook will help to:

1. Gain a good understanding of the advantages and risks of ODHR
2. Develop strategies and manage an ODHR programme, depending on the context
3. Support house owners in making decisions on the effective use of available resources
4. Promote community efforts for effective and efficient reconstruction
5. Set up appropriate financial and socio-technical support mechanisms
6. Decide on methods for the disbursement of financial assistance through Banking and Financial Institutions (BFIs)
7. Access manuals and other relevant documents relating to OHDR through the links provided
8. Promote community resilience and reduce future risks

The Handbook can be used immediately after a disaster in contexts where housing reconstruction will be required, as it contains a policy framework addressing housing reconstruction, repair and retrofitting -- the backbone of any housing reconstruction programme. It can be used for:

1. Devising a policy framework for housing reconstruction
2. Understanding the ODHR approach, principles, advantages, and risks
3. ODHR planning, programme development and implementation
4. Designing a housing reconstruction programme, including community facilitation
5. Implementing the housing reconstruction programme

1.4 Scope of this Handbook

This Handbook was written from a perspective wherein disasters, whether caused by the impact of natural hazards or human-made, can serve as an opportunity for promoting a sustainable and resilient community. It aims to reduce the disaster-struck communities' future vulnerabilities through improved and resilient shelter and infrastructure, expanded connectivity, increased awareness and socioeconomic empowerment, with a focus on supporting the most vulnerable. It pursues, although not exclusively, long-term development goals concerning settlement, livelihood, quality of life and socioeconomic well-being rather than simply limiting programme interventions to rebuilding houses (Figure 4). At the same time, it takes into account the four

priorities of the Sendai Framework for Disaster Risk Reduction (UNISDR, NA)[2], 2015-2030, as they pertain to housing reconstruction.

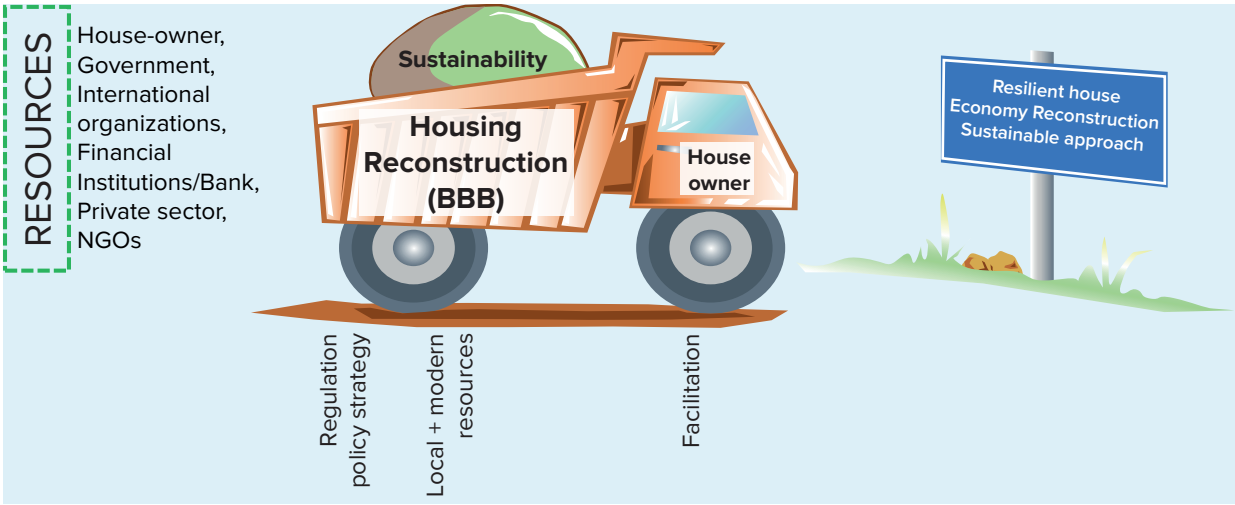


Figure 4. The relationship between the different stakeholders in ODHR

Figure 5 is based on UNDP past experience in conducting Post-Disaster Needs Assessment (PDNA) missions in Nepal, India (including in Kerala, Odisha and Maharashtra), followed by the implementation of the housing and settlement reconstruction programme. The diagram shows a reconstruction period of 60 months (as agreed to by the relevant governments), which has proved to be realistic. The first 18 months of housing reconstruction after the PDNA has been carried out are the most crucial, as they lay the foundation for the entire intervention and show some immediate results. The next two periods are very intensive and all the key players can be expected to experience challenges. The starting point for all three periods has been set at "zero" because preparedness must start from the day reconstruction needs are identified if implementation of ODHR is to be successful. The Handbook has been designed to respond to the needs of its users during all three periods of housing and settlement reconstruction.

2 Four priorities for action to prevent new and reduce existing disaster risks: (i) Understanding disaster risk; (ii) Strengthening disaster risk governance to manage disaster risk; (iii) Investing in disaster reduction for resilience and; (iv) Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction.

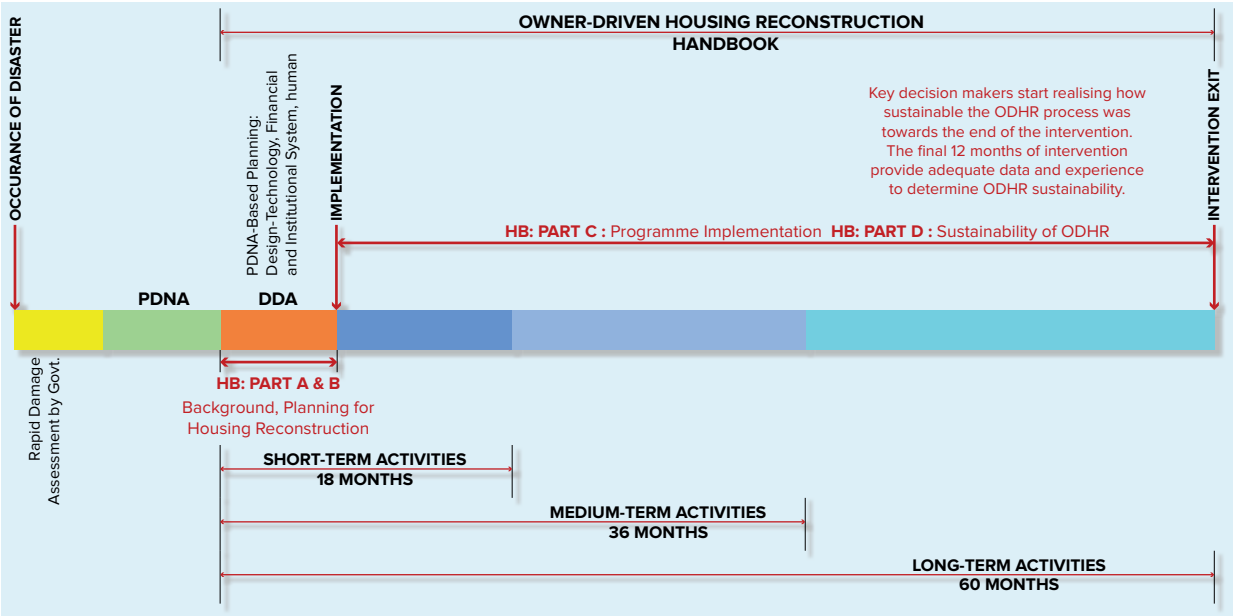
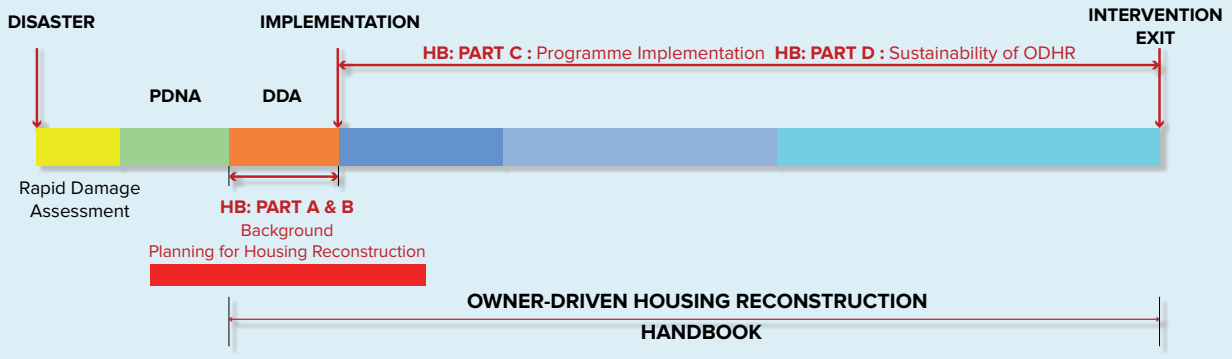
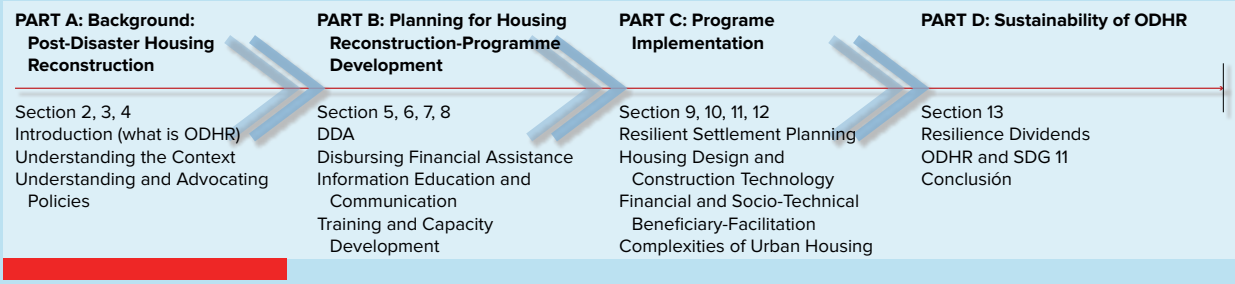


Figure 5. Position of parts A, B, C and D of the Handbook in the ODHR process

This Handbook addresses housing reconstruction primarily for rural and small urban centres. The post-disaster reconstruction of large urban centres is outside the scope of this Handbook. However, many of the provisions presented in this Handbook may also be applied to larger urban centres.

Part A. Background: Post-Disaster Housing Reconstruction





2 Introduction

2.1 What is owner-driven housing reconstruction (ODHR)?

ODHR is a housing reconstruction approach, in which the house owners themselves (with or without land ownership certificates, including lessees) are in the driving seat when it comes to making decisions on materials, building design type, management, implementation and achieving the final product - the home - in compliance with government regulations and using socio-technical support and conditional financial assistance. For example, house owners may carry out rebuilding or repairing themselves, involving only their own family members or on the contrary, choose to involve the entire community. They may employ local labourers, procure materials and take help from the facilitators or from an NGO or a CBO. The government provides conditional financial assistance, accompanied by regulations and socio-technical support to ensure that houses are built back better (BBB) (see Figure 4). Households generally contribute[3] financially to reconstruction, obtaining funds from various sources to supplement the government's financial assistance.

ODHR is a process-driven housing reconstruction approach that promotes the active role of the beneficiaries. It builds self-reliance and explores new opportunities for livelihood, improved quality of life, enhanced resilience, improved connectivity and the increased empowerment of the disaster-affected people. Conversely, a product-driven approach that is limited in scope to the delivery of a house pushes people into passive dependency.

2.1.1 Benefits of ODHR

ODHR has significant benefits:

1. Through fostering a participatory and transparent process, it enables disaster-affected individuals or communities to take ownership of the reconstruction process and make the decisions that best suit their needs.
2. It provides beneficiaries with high levels of satisfaction, ownership, and self-reliance.
3. It supports the local economy by employing the local workforce and using, reusing and recycling locally available materials.
4. By promoting local businesses, it improves the community's socioeconomic conditions.
5. It helps sustain efforts for the betterment of the community over the long term.
6. It reduces grievances concerning the final product.

2.1.2 Potential risks of ODHR

While ODHR has many benefits, care must be taken during the planning stages so to avoid or minimize any potential pitfalls:

1. House owner responsibilities under ODHR may appear overly demanding for some individuals, leading them to want to opt out.

3 Disaster Reconstruction Guidance Series: Housing and Settlements Recovery (P-9), GFDRR, Housing and Settlements Guidance Note GFDRR.pdf

2. Beneficiaries may go into debt if the grant amount or other financial resources are not sufficient.
3. Financial assistance may not be spent as intended, resulting in low construction quality, non-compliance and delays.
4. Participants are held accountable for non-compliant construction issues, but they know very little about the technical requirements of safe construction.
5. Vulnerable families may not be able to participate actively in reconstruction activities and may require special support.
6. The knowledge and skills acquired during reconstruction may not be in demand after construction has been completed, leading to unemployment, reduced quality of life and frustration.

Although there are potential risks to the ODHR approach, the UNDP Nepal experience has shown that the above-mentioned risks may be overcome by adopting good planning and sincere efforts and by providing financial and socio-technical facilitation at the doorstep.

2.2 Community-driven housing reconstruction

A cohesive community has an inherent capacity to respond to disasters **(Box 1)**. As a result, in specific sociocultural and economic settings, the ODHR approach may be extended to a whole settlement or to multi-family buildings or apartments. It may further take the form of community-driven housing reconstruction (CDHR). CDHR is generally feasible in communities with social harmony and equality, homogeneity, low economy and strong collective feelings, such as clans or tribes. It enhances community cohesion to tackle the impacts of the disaster. Additional benefits to developing ODHR into CDHR may be:

1. It improves the community support system and fosters self-help among community members;
2. It enables better identification and support mechanisms for the vulnerable in the community;
3. It encourages vulnerable populations (women-headed households, the elderly, persons with disabilities) to participate actively in building the homes they aspire to and provides them with more opportunities for involvement in the process and empowerment;
4. It improves affordability and purchase capacity to procure construction materials in bulk. easing the transport of construction materials and reducing logistical, management and handling costs;
5. It strengthens shared responsibility and supports community-based disaster risk reduction (DRR).

It is important to note that this Handbook focuses only on ODHR.

Box 1. Community cohesion, Nepal

In Dharche, a village in the Gorkha region of Nepal predominantly inhabited by Gurungs, a people indigenous to Nepal's mountain region, the community completed most housing reconstruction within the first year after the 2015 earthquake, even before the announcement of the official housing reconstruction policy. Unfortunately, the houses were later classified as non-compliant and house owners were required to remedy the issues in order to receive the governmental financial grant. The community had a high social capital, coherence, inbuilt support and a self-help system.

Photograph of Dharche (UNDP, Nepal)
Source: Gorkha Housing Reconstruction Project implemented by UNDP with financial support from Government of India.

2.3 Key players

Depending on the size of a disaster, different players play a role in ODHR. Figure 6 shows the key players in the reconstruction process:

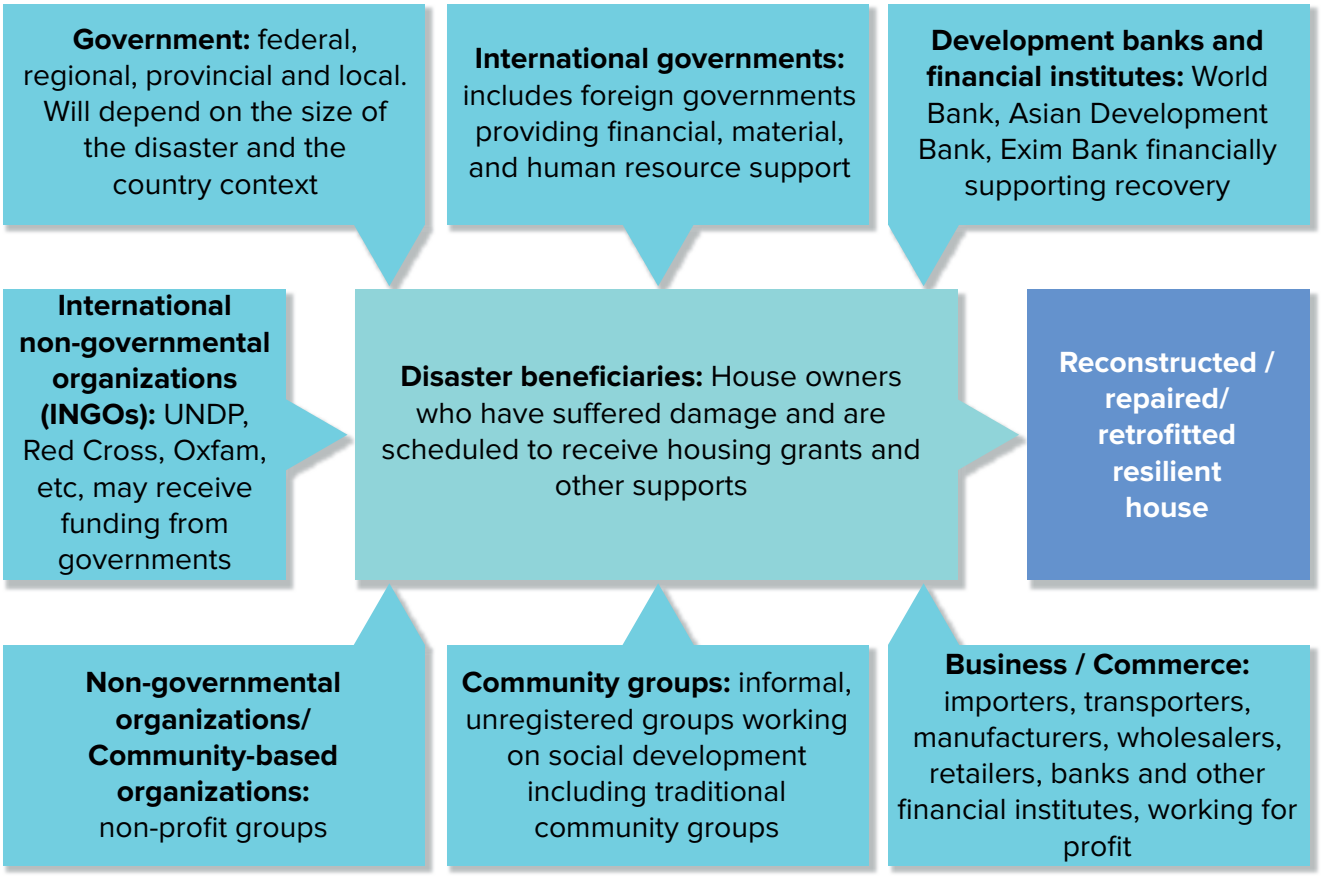


Figure 6. The key players in post-disaster housing and settlement reconstruction

Box 2. Institutional arrangement for post-earthquake housing reconstruction, Nepal

The National Reconstruction Authority (NRA) in Nepal was formed on 25 December 2015. It was a legally mandated agency for leading and managing earthquake reconstruction and reconstruction in Nepal. NRA provided strategic guidance to identify and address the priorities for reconstruction, repair and retrofitting, taking into account both urgent needs as well as those of a medium and long-term nature. Its overall goal was to complete reconstruction works promptly in a sustainable, resilient and planned manner so as to promote the national interest and provide social justice through the resettlement and relocation of the populations displaced by the earthquake[4].

2.4 Approach to ODHR

Core characteristics: The approach to ODHR should be humanitarian by focusing on the vulnerable, equitable, neutral, based on social justice and implemented through an appropriate institutional arrangement **(Box 2)**. It should be context-specific, democratic, resilient and sustainable, and should be participatory by keeping people, especially women, and communities at the centre. Affected people, especially the vulnerable community, should be empowered to participate in the decision-making process. Disaster risk reduction measures should be an integral part of the process. The communities should be informed, trained and educated regarding multi-hazard resistant construction and resilient settlement planning.

Opportunities: Despite its obviously adverse consequences on people and property, a disaster may be an opportunity to deliver a range of economic benefits for the affected population if an appropriate ODHR process is adopted. ODHR can create local level livelihoods by adopting local materials-based technologies, production centres for local materials, etc. Reconstruction is a good opportunity for revitalizing the wisdom embedded in traditional construction practices to conserve and rejuvenate local culture and architecture.

The vulnerable: ODHR processes should advocate for housing reconstruction policies that address and prioritize the vulnerable, the elderly, orphan children, female-headed households, the landless and persons with disabilities. Moreover, it should support the policies that enhance household and community resilience.

In situ reconstruction: As far as possible, reconstruction should adopt in situ interventions to support the core principles of ODHR. Helping people return to their original places of residence is always desirable as the relocation site may lack economic opportunities and basic requirements as well as potentially disrupting social networks and safety nets. However, the relocation of settlements may be unavoidable to some extent after a major disaster.

Support: For ODHR to be successful, there is a strong need to provide financial, socio-technical and managerial support to affected people to ensure that reconstruction is fast, high-quality, cost-effective, green and climate-change sensitive. People need efficient financial management for the implementation of reconstruction, repair and retrofitting. This can be done through facilitation centres established close to the disaster-affected communities. The ODHR approach to achieving people-centric, sustainable and resilient reconstruction is described in Table 8, Annex B.1, in Principles of ODHR. Their interrelationship is illustrated in Figure 7.

4 https://www.devex.com/organizations/national-reconstruction-authority-nepal-nra-131840

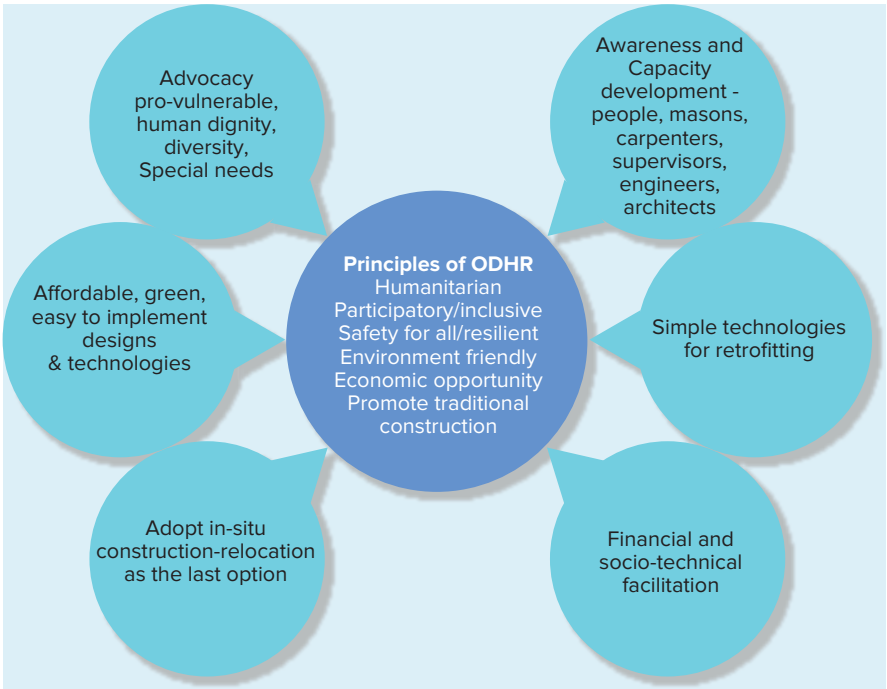


Figure 7. Core principles of ODHR and its supporting strategies

Women and housing reconstruction: As shown by UNDP experience countrywide, women have a very clear idea about the kind of house they envisage as being suitable for the spatial, emotional, economic and future expansion needs of their households. Developing housing designs based on women's participation should thus be a key objective of ODHR. There may also be a need to consider the spatial requirements of women's home-based enterprises or other forms of income-generating activities and include such spaces in the house design.

Women need economic independence and empowerment to free themselves from sociocultural constraints. This is especially relevant in developing and less developed countries. ODHR should be viewed as an opportunity for income generation and skill building among women thus fostering and strengthening **their social dignity**. Because ODHR is carried out within a limited timeframe, focus should be maintained on developing women's skills in the areas of reconstruction, repair and retrofitting so that trained women continue to earn beyond the programme period as skilled human resources for future construction work, which at present is a male-dominated domain. It should be noted, however, that there are a number of barriers to the development of women's construction skills. HRRP[5] (2018) reports that, while reconstruction in Nepal did provide women a scope for employment, training and increased confidence, there are instances of discrimination on several accounts that need to be resolved: a) equal pay for women must be ensured, b) adequate socio-technical assistance has to be provided, c) women's experiences in reconstruction should be documented on a continuous basis, (d) a platform for women involved in reconstruction should be created, e) training courses for women should be of longer duration, with fewer hours per day so that they can carry out their other tasks and priority obligations.

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3 Understanding the context

The first step in planning an ODHR programme is to understand and analyse the community's essential attributes so as to deliver a comprehensive housing reconstruction response. Such an analysis will help tailor the housing reconstruction plan to suit the local situation and establish priorities for reconstruction efforts. These attributes include the local demographic situation, social setting, economic status, financial resources, livelihood, political conditions, legislation, culture and housing traditions. A crucial aspect of understanding the context in housing reconstruction is identifying the vulnerable populations, such as the elderly, persons with disabilities, children, socially disadvantaged groups, etc. Failing to do so adequately could lead to a situation where the vulnerable may not receive reconstruction support through the organized programme. The following sections cover the different aspects of understanding the contexts involved in housing reconstruction.

3.1 Demography

The composition and changing structure of a community can be seen through its demography. Demographic information and analysis are essential to determining the demand for services among different segments of the population. These determine which programmes are likely to improve livelihood and quality of life. This information also helps to understand possible social and civic involvement and determine how community members can contribute to the reconstruction process. Moreover, it sheds light on how the population will change over the reconstruction period and helps to inform decision-making.

Demographic information commonly required for ODHR planning includes age groups, marital status, women-led families, household size, gender composition, religion, ethnic groups, castes and their proportion, education level, occupation, income level, house and land ownership, and migration patterns **(Box 3)**, etc.

Box 3. Migration

The reconstruction plan and ODHR work period must consider seasonal work migration, as the income-earning members of the community may not be available to participate in reconstruction, repair and retrofitting during certain months of the year. In addition, based on UNDP experience in Nepal, some of the families who rely on remittances may not have working-age members available to support reconstruction.

3.2 Understanding the community

It should be recognized that housing reconstruction plans need to meet personal and community ways of life, their values and customs. Culture and tradition are essential factors in identifying housing patterns. Moreover, in traditional societies, house owners' decisions are predominantly influenced by the community's sociocultural and economic characteristics. A single solution cannot meet the housing reconstruction needs of individual households and communities where there are diverse socioeconomic and cultural contexts. The various elements in the context, such as language, socio-cultural characteristics, micro-economy, power structure, existing traditional institutions, social cohesion, and the communities' awareness of and

attitudes towards disasters, etc. should be carefully considered so as to understand the needs of the households and communities before planning and proposing any housing reconstruction solutions and interventions. Refer to Table 9, Annex B.2 for details of the various attributes and their corresponding significance in this regard.

3.3 Addressing the needs of vulnerable people

In line with the core principles of reconstruction (Figure 7), it is crucial to identify and support the vulnerable, such as the elderly, persons with disabilities, children, etc. and ensure that "nobody is left behind". These groups and individuals may not be able to receive reconstruction support through the organized programme. They have little voice and hence, extra efforts have to be made to include them in the programme. Because they need specifically tailored assistance programmes, their identification and mechanisms for their support should be incorporated in the programme design. This section discusses identification and provision of support.

Depending on the region and local legal framework, there may be variable criteria for a person or a household to be considered vulnerable **(Box 4)**. The requirements may be set by the government and identified through surveys and community consultations. Some possible attributes of the vulnerable are listed below:

1. Economic: Poor economic status of the household, possibly characterized by a meagre source of income, high debt and unemployment. The vulnerable may also have a lower asset base and income below the minimum threshold.
2. Land tenure: Landless, land renters and refugees.
3. Ethnicity: Socially, culturally or ethnically disadvantaged, ill-treated and excluded, such as members of lower castes, out-castes and indigenous groups.
4. Gender: Women-headed households, including single women and widowed women.
5. Age: Orphan children, underage children, the elderly and senior citizens.
6. Ability: persons with disabilities, physical and mental issues or chronic diseases.

Box 4. Criteria for identifying vulnerabilities

After the 2015 Nepal earthquake, vulnerable households were identified by NRA based on four criteria: i) single women, ii) elderly people, iii) children below 16 years of age and iv) persons with disabilities. In addition, the landless were identified through a separate mechanism.

Despite having clear and specific criteria for identifying vulnerable households, the disparities in terms of coverage and inclusion indicate significant implementation challenges. This may have been due to the vulnerable population's lack of voice and influence as well as to social dynamics. The inclusion of local governments, community members and CBOs in the process may help to identify the vulnerable.

3.4 Settlement pattern

The settlement is where people live and work. It may have different shapes, sizes and locations determined by the population and available facilities, livelihood sources, local topography, climate and potential hazards. It may be temporary (seasonal) or permanent. Table 10, Annex B.3 outlines a few attributes that need careful analysis to understand the context before replanning in situ settlement, re-clustering or planning in a new location.

The first step towards understanding a settlement is to obtain its land-use map. The land-use map helps to understand the logic of the existing settlement form, the layout of its circulation system, such as its streets and trails, as well as the hierarchy of streets and their relationship to congregating places. By involving the community, the clustering of ethnic groups, kin and neighbourhood groups can be identified for social cohesion and harmony.

Site-specific hazards (landslides or rockslides, liquefaction, steep terrain, flooding, etc.) must be considered. In resilient settlement planning, community wisdom is a valuable source alongside satellite mapping, microzonation of hazards, codes, etc. In case of repeated disasters, the community may desire to relocate to a new place but relocation should be adopted only if the community is willing to shift to a safe place.

3.5 Housing traditions and potential changes

Housing traditions include a broad range of architecture, construction materials and techniques, planning, etc. Each tradition has its unique features, which are commonly influenced by a number of factors, as shown in Figure 8.

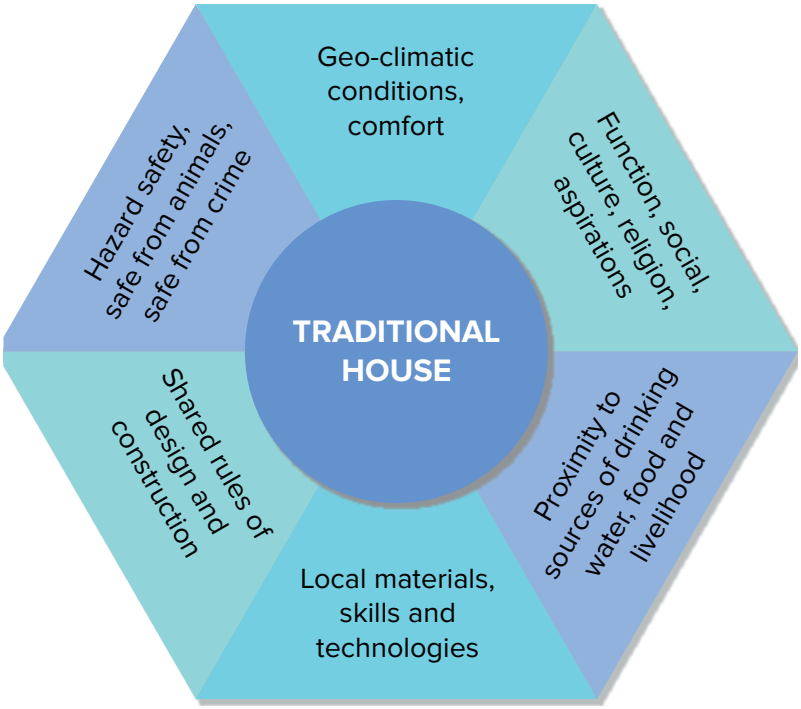


Figure 8. Factors influencing traditional housing characteristics.

The following attributes should be analysed to understand housing topology, traditions and basic requirements:

1. How do people define their house as a complete unit? What are the spaces?
2. Prevailing construction technology
3. Local architecture, building typologies and their cultural significance **(Box 5)**
4. Availability of construction materials and skills, and their suitability for multi-hazard resistant construction

5. Vulnerability of existing building stock to multi-hazards
6. Functional needs of the house
7. Division of internal and external spaces, means of maintaining privacy
8. Interrelationship between the house and the source of livelihood
9. Potential for BBB for improved living (not limited to multi-hazard resilience)
10. Potential changes to housing typology, construction materials and technology
11. Suitability of demolition and reconstruction versus repair and retrofitting. Possibility of recycling construction materials if demolition is preferred

Box 5. Use of space in a house

In the hills and mid-mountains of Nepal, houses are typically two stories plus an attic. The bottom, middle and top stories are used for keeping animals and/or the kitchen, living space and grain storage and storage of other household items, respectively. During winter, the animals on the ground floor, together with the thick stone or brick and mud mortar keep the houses warm. Typically, there is no formal space for congregating, such as a living room, in these houses.

Source: UNDP, Nepal

3.6 Accessibility

Accessibility addresses both physical accessibility (remoteness- **Box 6**) and non-physical accessibility (information and resources). A community's ability to access resources and information, and a programme's accessibility to communities play a crucial role in the design of the ODHR programme and service delivery. Physical accessibility has a large bearing on the cost of reconstruction both to house owners and the programme.

Box 6. Inaccessibility

Inaccessibility due to a lack of motorable roads to the affected area results in a higher cost of construction materials such as sand, cement, steel, etc. It also imposes logistical complexities and uncertainties. The construction materials either have to be transported by humans or by animals. Therefore, wherever possible, the use of local materials should be maximized to reduce complexities and dependency on external sources.

Means of transportation of materials in affected areas with no road access, Nepal
(source: Rajendra Desai, National Centre For People's Action In Disaster Preparedness, India)

3.7 Affordability and financing

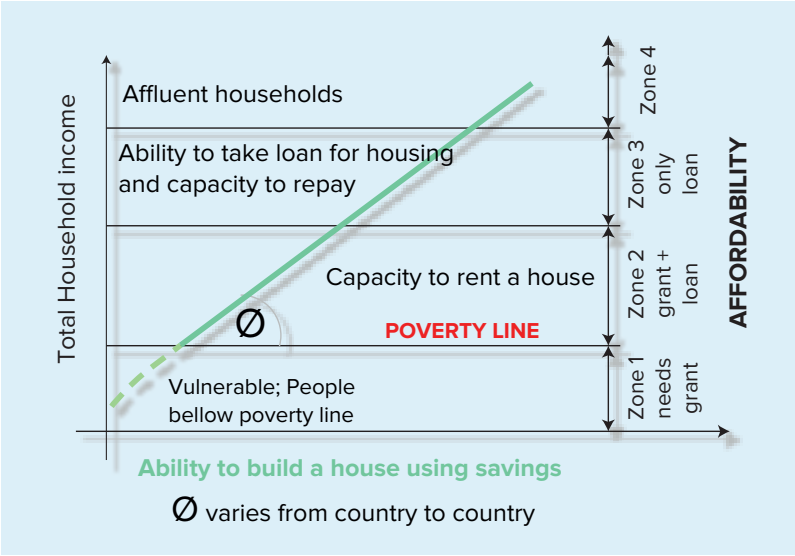


Figure 9. House building capacity of households
(In **Nepal, 16.7% of the population of 30 million are BPL**[6])

People need adequate funds to rebuild, repair or retrofit their homes. Figure 9 shows the different levels of affordability to retrofit or build a house and the income levels at which a grant and/or loan will be needed to complete work. If a household is entitled to a government grant, it is important to make procedural arrangements, setting terms and conditions, so that the beneficiaries get the money as soon as possible. The cost of a house with resilience features will largely depend on the different options available for materials and technologies and the household's preferred minimum space requirements. Socio-technical and financial management support is critical in reconstruction, especially for the vulnerable. For these reasons, the following points need to be evaluated to understand affordability **(Box 7)** as it affects households:

1. Compare affordability for a household and prevailing house prices. Calculate the balance amount required and check if the government's financial grant and other financial assistance are adequate to complete reconstruction. Consider the most appropriate time the house owners can spend on purchasing materials and accessing skills.
2. How quickly can financial resources be accessed from local financial institutions such as banking and credit? Check if there is a local, informal, community financial transaction system such as labour barter, self-help groups or similar institutions. Check if local financial support systems for the vulnerable such as revolving funds (see Section 6.4) could potentially be established through local institutions or the government.
3. Potential to link local construction material business with houseowners so that construction materials can be provided on short-term credit

6 https://www.developmentaid.org/#!/news-stream/post/98443/undp-nepal-head-poverty-reduction

Box 7. Case study: Affordability and financing, Nepal

Needs assessment: A study in Nepal completed in 2017 in areas affected by the 2015 earthquake indicated that the housing reconstruction process has not been equitable for everyone, especially for the poor and most vulnerable population. The poor and vulnerable struggled to make ends meet and lacked both a basic source of income and family or community support. Many had no access to the knowledge of affordable and appropriate technology, finance and construction materials. This contributed to the slow progress of housing reconstruction, even with government grants. Moreover, people in rural areas were not able to borrow from banks due to the complicated procedures and their extremely low capacity to pay back loans. As a result, they ended up borrowing through informal channels with exorbitantly high interest rates.

The high cost of housing reconstruction forces the vulnerable into a vicious cycle of poverty, due to their already weak economic situation. In the future, they will be the first to struggle to cope with food scarcity and other consequences of extreme weather conditions and they will be severely affected.

Response: To address affordability and financing, income resources were diversified through new livelihood opportunities such as timber treatment and brick or block production. It was proposed that such opportunities be maximized to benefit households from the poorest strata who otherwise would not have the chance to initiate income generation. The microbusinesses will explore collaboration with organizations already working in the earthquake-affected areas.

4 Understanding and advocating policies

Disasters disrupt the working and effectiveness of government and the administration and their delivery mechanisms. If the magnitude of the disaster is very high and the damaged buildings are spread over a wide geographical area, the existing government structure may not be able to cope with the new demands posed by the disaster. Moreover, the planning and management of reconstruction efforts are likely to require that additional tasks be undertaken by the government and public administration. Special instruments, institutions, governance and policies may be required for effective housing reconstruction planning and management. Depending on the size of a disaster and local dynamics, it is common practice either to set up a new institutional mechanism **(Box 8)** under a sunset law or use existing mechanisms for post-disaster reconstruction.

Before undertaking an ODHR approach, it is very important to understand the institutional arrangements, local legislation and governance structures as well as what policies and mechanisms are being promoted for post-disaster reconstruction, etc. For housing reconstruction to be smooth and effective, there is a need to identify any gaps in the existing laws, regulations and governance structures. Based on that understanding, it becomes possible to formulate the support to the government needed to fill the gaps and advocate for people-centric legislation.

People generally start rebuilding early following a disaster and so reconstruction policies, standards and support systems must be set as early as possible. Otherwise, the reconstruction process may be inconsistent with ODHR core principles (see **Section 2.4**).

Box 8. Formation of new institutional mechanisms after earthquakes in Nepal, Pakistan and Iran

After the 2015 Nepal earthquake, the National Reconstruction Authority was set up under a sunset law with overarching powers to facilitate earthquake recovery and reconstruction. Similarly, after the 2005 Kashmir earthquake in Pakistan, the Earthquake Reconstruction and Rehabilitation Authority (ERRA) was set up to facilitate recovery and reconstruction, working with partner organizations for housing recovery (Quazi, 2010). After the 2003 Bam earthquake in Iran, the Bam Reconstruction Headquarters was formed, which appointed the Islamic Revolution Housing Foundation (IHF) as the leading executive organization for reconstruction in Bam (Ghafory-Ashtiany & Hosseini, 2008).

4.1 Relevant legal instruments

The planning, design and implementation of ODHR should be done in line with existing legislation regarding buildings, professionals, land, urban or settlement planning and local government acts. Planners should be aware of the agencies responsible for the approval and safety of building structures, the issuance of completion certificates, professional liabilities, land distribution and the land ownership system. ODHR should comply with local government legislation and powers.

Building codes are the principal public policy instruments that traditionally govern occupant and building safety. Progressively, building codes have incorporated better living conditions, energy efficiency, reduced environmental impact of building materials and construction technologies as well as the requirements concerning accessibility for persons with disabilities.

Generally, building codes cater to modern industrialized construction materials and skills and standardized construction practices focusing on new construction. Building codes in many countries neither address the retrofitting of an existing building nor traditional buildings **(Box 9 and Box 10)**. However, traditional buildings may constitute a significant proportion of the local building stock and comprise an active housing construction practice. Updating building codes and other associated standards and guidelines may be necessary. Alternative instruments should be formulated to address the immediate needs of reconstruction, repair and retrofitting and the use of traditional technologies in housing reconstruction.

Box 9. Use of traditional construction

After the 2015 Nepal earthquake, many international development agencies protested against the use of mud mortar for the reconstruction of buildings. Later, they accepted the technique because earthquake-resilient construction of stone and brick buildings using mud mortar was included in the Nepal National Building Code (DUDBC, 1994). It was most welcomed for housing reconstruction in remote or inaccessible areas and for economically disadvantaged people.

Box 10. CR -- containment reinforcement[7] technology

CR technology was developed after the 2015 Nepal earthquake for earthquake-resilient construction of stone masonry buildings in mud mortar as a cost-effective option for remote areas where carrying cement and rebar is practically prohibitive. CR technology employed galvanized wire and welded mesh, which are easy to carry by humans or animals and easy to install.

Shock table tests were conducted to verify the compliance of the proposal with the Nepal Building Code and showed satisfactory results. The test included mounting reduced-scale model buildings on a mechanical table and subjecting the table to impulse load.

Testing of a strengthened stone masonry building on the shock table (Source: UNDP, Nepal)

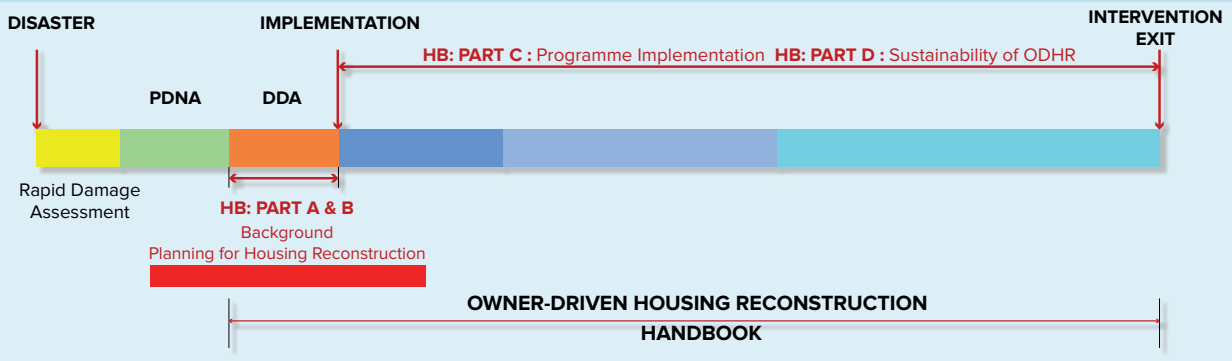
4.2 Key players and coordination

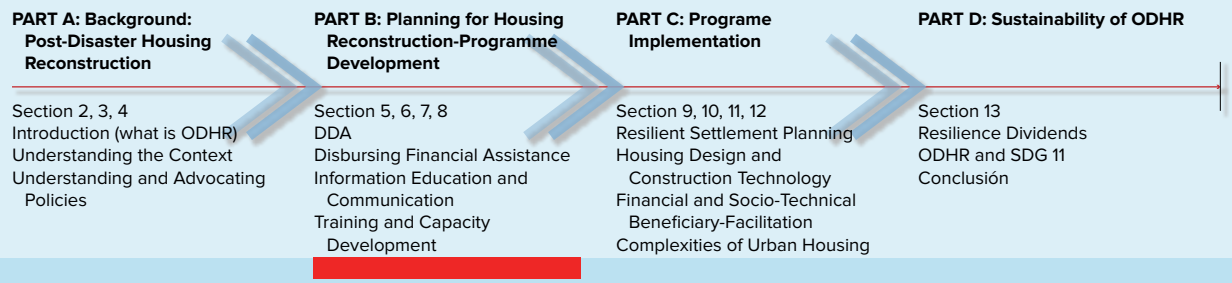
Figure 6, section 2.3 provides a list of key players whose roles range from support for housing reconstruction to product delivery. A harmonious and well-coordinated relationship between them is essential for smooth and streamlined post-disaster housing reconstruction and to avoid conflicts and overlaps.

A structure should be established to coordinate, facilitate and regulate these key players under the leadership of the government-authorized institution for reconstruction. Working relations with the relevant government authorities and local government, line departments, private sector, local institutions, INGOs and NGOs, community organizations and partnering organizations are essential for a smooth housing reconstruction programme and to avoid duplication and conflicts. A cordial relationship with them also helps to share resources. Good governance and an active role played by the local government and other partners, with the support of the central government, are necessary for successful ODHR.

7 CR technology includes laying out welded wire mesh at different layers of the stone mason wall to improve connection between return walls. This welded wire mesh also improves the deformability and ductility of walls. The walls are also provided with containment steel wires on both surfaces of the walls which are tied together with cross links made of wires. This arrangement helps to basket the masonry.

Part B. Planning For Housing Reconstruction: Programme Development





5 Detailed damage assessment

The fundamental premises of a post-disaster housing reconstruction programme are its detailed damage assessment (DDA) and beneficiary identification survey. DDA is a method of evaluating the post-disaster structural conditions of buildings, based on a set of engineering safety criteria. It identifies and classifies buildings into different categories such as undamaged, partially damaged or totally damaged. This information feeds into the identification of potential beneficiaries. While planning and designing a DDA, it is important to look at the post-disaster need assessment (PDNA) report when available, which provides a basic idea of the type and extent of building damage and the cost of housing and settlement reconstruction.

5.1 Post-disaster needs assessment (PDNA) and the Reconstruction Framework

Before the PDNA team is deployed and within three to four weeks after the disaster, the government team carries out a rapid damage and loss assessment **(Box 11)** of the housing and settlement sector. Based on that initial rapid assessment, the first cycle of data verification is carried out by the PDNA expert members through limited site visits to the heavily affected areas and interaction with the affected people, especially women, and local masons, materials suppliers, government engineers, NGOs, etc. (**Box 12**, UNDP support to PDNA, Nepal).

The PDNA report on housing and settlement sector analyses the pre-disaster context and baseline data obtained from a range of authentic sources and lays out the perceived reconstruction needs. The total housing reconstruction cost is calculated based on the cost of reconstruction of the completely damaged or collapsed buildings, the repair and retrofitting of damaged buildings, debris clearance, acquiring new land wherever applicable, techno-managerial support (awareness-raising and capacity development, etc.), socioeconomic support (local materials-based production centre) and the cost of environmental damage, etc. Before carrying out a DDA, it is prudent to study the PDNA report on damage and loss and develop a suitable methodology for assessment, considering all the related issues.

Box 11. Damage caused by the 2015 earthquake in Nepal

PDNA Volume B, Nepal (2015): A large-scale survey by the Ministry of Home Affairs (MoHA) following the earthquake showed that a total of 498,852 houses collapsed or were damaged beyond repair and 256,697 houses were partly damaged. However, this rapid assessment was not a technical assessment and did not categorize the damage by building type or urban / rural context. To operationalize the recovery strategy, a more rigorous technical household assessment should be undertaken.

The PDNA suggested that the entire housing recovery was likely to take up to five years. The reconstruction process had to empower communities and households to take charge of their own recovery through the ODHR approach wherever possible. Households needed significant technical assistance to manage reconstruction. Housing reconstruction grants had to be provided in tranches based on GoN disaster-resistant construction guidelines.

Box 12. UNDP support to PDNA, Nepal

UNDP contributed to the preparation of PDNA after the 2015 earthquake by providing experts. It also advocated for the adoption of ODHR for the reconstruction process.

Additionally, it also provided advocacy at both the national and local levels on three major topics: i) support to the vulnerable, ii) longer-term DRR, and iii) a revolving fund.

UNDP advocated alternative technology for earthquake-resilient reconstruction of stone masonry buildings. It supported the development of the technology and implemented it in earthquake-affected areas.

5.2 Objectives of the detailed damage assessment (DDA)

The main objective of DDA is to carry out the detailed damage assessment of buildings and to identify beneficiaries **(Box 13)**. Socioeconomic and site hazard surveys may also be coupled with DDA to reduce planning efforts and logistic requirements. DDA must meet the core principles of ODHR (see Section 2.4). In DDA, the identification of potential beneficiaries is one of the most contentious issues and must be carried out following clearly defined criteria and transparency. There is a need for a separate policy to identify the landless, land tenants and leaseholders and address their issues. Special support should be provided for the identification of socially vulnerable households.

Before proceeding to carry out an exhaustive DDA, a rapid sample survey of the affected regions should be conducted by expert teams to understand the extent and type of damage, identify building typologies and develop the framework for conducting DDA. The collected information may be extrapolated to assess the size of the reconstruction and retrofitting programme and to plan housing interventions. If there are confirmed instances of disaster-affected people being left out, they should be included through an appropriate grievance redressal process.

Box 13. Detailed Damage Assessment in Nepal (2015)

In Nepal, the detailed damage assessment (DDA) was completed in two stages: i) verification of the beneficiaries and damage assessment, and ii) signing of MoUs with the verified beneficiaries. The DDA may also be completed in one go as was done after the 2005 Kashmir Earthquake.

DDA and the beneficiary verification survey are the two main pillars of ODHR and form the basis for calculating the number of households affected by the disaster, the scale of damage, cost of reconstruction, required human resources and type of institutional structure needed for implementing the programme. The steps involved in typical damage assessment and beneficiary identification are laid out in Figure 10. For detail, refer to Table 11, Annex B.4.

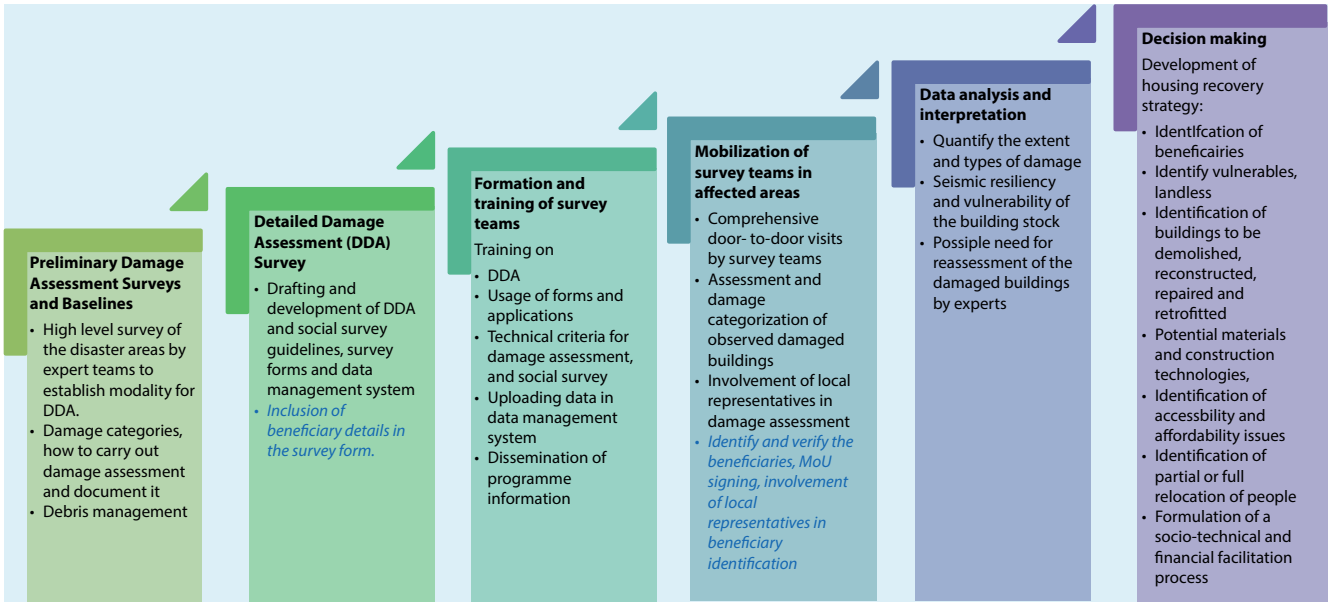


Figure 10. Detailed damage assessment and beneficiary verification survey
If beneficiary verification is also conducted during DDA, the sub-steps highlighted in blue should be initiated.
Refer to Table 11, Annex B.4 for the various steps in carrying out DDA.

Categorizing buildings according to their damage grades (Figure 11) and identifying those buildings that may be either repaired or retrofitted and those that will need to be completely rebuilt is the most important component of DDA. The process also helps to identify partially damaged buildings that can be used as accommodation for people whose houses are being repaired or reconstructed. Identifying the frequent causes of building damage will help to prepare disaster-resistant design and reconstruction and will serve as a basis for updating building codes and standards.

DETAILED DAMAGE ASSESSMENT

(Prepare DDA format, select and train surveyors and make logistic arrangements

Carry out DDA as per the table

Damage categorization and likely solution for each house		
	Damage Category	**Likely Solutions**
Non-Serious Structural Damage	No distress to very minor plaster cracks	No action for the time being, may need retrofitting for future hazards
Structural Damage	G1 Negligible to slight damage (no structural damage, slight non- structural damage G2 Moderate damage (slight structural damage, moderate non-structural damage	Repair and retrofitting
	G3 Substantial damage to heavy damage (moderate structural damage, heavy non-structural damage	Possibly repair and retrofitting
	G4 Very heavy damage (heavy structural damage, very heavy non structural damage) G5 Destruction very heavy structural damage	Demolish and reconstruct

Figure 11. DDA, damage categorization and potential solutions
(Damage categorization adapted in Nepal)

After DDA is completed, verified and approved, the houses should be marked on the settlement map as per the damage categories (Figure 12): a) no-colour indicating no need for any intervention, b) green indicating damage category G1/G2, requiring repair and retrofitting, c) yellow indicating damage category G3, substantial damage that may be repaired and retrofitted, and d) red indicating damage category G4/G5, very heavy damage, requiring reconstruction.

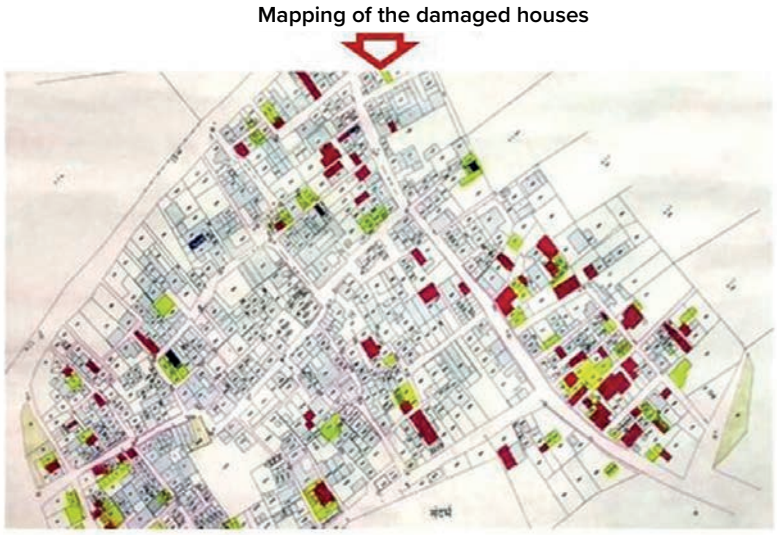


Figure 12. Mapping of houses according to damage category.

5.3 Risks and challenges of DDA

There are a few risks involved in DDA, which may be mitigated by adopting simple measures when developing the system. The timing of DDA is crucial as people have been found to start repairing or rebuilding their damaged houses right after a disaster, without any resilient features[8], and thus potentially increasing their vulnerability. This risk could be mitigated by providing techno-managerial and financial supports to the affected people soon after the disaster. This calls for conducting DDA as early as possible after a disaster. Ensuring accurate and socially relevant damage data collection is a highly challenging task, considering the constraints of time after a disaster. The risk in this context could be mitigated by a robust public awareness campaign and the active participation of the affected people, local community leaders and local government officials in the assessment team.

The selection of adequately qualified assessors, hands-on training and a DDA in a simple, clear format would largely mitigate the risk related to data accuracy and ensure that no one is left behind. DDA is not just a technical mission, it needs strong social mobilization skills, a capacity to negotiate, sensitivity to the vulnerable and to women, etc. Appropriate training of the assessment

8 https://www.recoveryplatform.org/assets/publication/PDNA2019/Web-version%20Cyclone%20Fani%202019%20Odisha%20DLNA%202019.07.16%20(Re-revised%20-%20Final).pdf (P-7)

team in this regard would mitigate the risk related to data quality. It is important to include women in the assessment team to ease access to households and to interact with women members of the households. There may be a security threat to the assessment team while conducting DDA, since the affected communities might be agitated as a result of the post-disaster situation or due to exacerbated pre-existing issues. Suitable arrangements should be made in this regard to avoid unpleasant situations during the DDA mission. The most important mitigating measure is to be proactive and prepare for future disasters in areas prone to hazards such as seismic events, cyclones, landslides, floods, etc.

6 Disbursing financial assistance

In a post-disaster situation, a smooth disbursement of financial assistance is key to the successful implementation of housing reconstruction. This includes government-announced financial grants **(Box 14)**, loans or any other form of financial support through revolving funds or diversified livelihood sources. After a disaster, households usually struggle to pool the financial resources required for rebuilding, repair and retrofitting of a house. Often the government grant is not sufficient to construct a house. Households may not have savings or whatever they had might have been spent for food, accommodation, medicines and other basic needs after a disaster. There may be a lack of employment due to the disaster. The situation can be alarming for poor and vulnerable households.

6.1 Banks and financial institutions

Banks and other Financial Institutes (BFIs) play a vital role in any financially assisted ODHR programme. There are several issues regarding BFI support to a housing reconstruction programme which should be taken into account in programme planning. BFIs may have limited coverage, particularly in rural areas. Lack of awareness and limited access to BFIs constrain many households to rely on informal financial institutions such as local money lenders. Another crucial issue is that BFIs require guarantees or collateral before lending credit, including a repayment plan and a regular income source. This may not be available to many disaster-affected people, especially where the economy is informal. Even the disaster-affected people's permanent assets, such as land, may not qualify as collateral because of banking regulations. A comprehensive plan should be prepared based on BFI requirements and the socioeconomic conditions of the disaster-affected households. There may be a need for policy amendment in this regard.

6.2 Setting up a system for a financial assistance programme

At the implementation planning stage, a system should be set up for the smooth disbursement of financial assistance to address the needs of ODHR. To do so, the programme team must coordinate closely with BFIs for the timely release of the tranches. The mechanism needs to support the disbursement of financial assistance to individual households. Tranche-based

financial assistance is complex since its release is subject to the condition that hazard-resistance standards are complied with in reconstruction. The tranche release mechanism needs to be closely tied to the inspection and certification of housing reconstruction. The process should have enough resiliency to cater to a large number of incremental disbursements as houses are rebuilt or repaired and retrofitted step-by-step.

Generally, poor and vulnerable households do not have the savings (cash in hand) needed to pay for materials and daily labour charges if the tranche release is delayed, which may happen for a number of reasons. This issue could be resolved by setting up a revolving fund scheme where members could access short-term loans for the continuation of reconstruction. Another important issue in the financial assistance programme is the potential misuse and diversion of funds by beneficiaries. At the planning stage, socially suitable mitigating measures should be formulated. The beneficiaries should be made duly aware of the consequences of any misuse or diversion of funds. All the factors discussed above should be considered when developing the financial disbursement system.

Box 14. Financial packages offered by NRA in Nepal

After the 2015 Nepal earthquake, the NRA offered individual households the following packages of financial assistance for the reconstruction of houses:

- NRs300,000 (approx. USD 3,000) to each beneficiary as grant, spread over three tranches
- An additional NRs50,000 (approx. USD 500) as a grant to vulnerable households
- Concessional loans up to NRs. 300,000 (USD 3,000) with a repayment term of five years under the Integrated Working Procedure for Subsidized Credit for those who did not have enough funds to complete the reconstruction of their houses. Under the procedure, the government covered a five per cent interest rate. The financial institutions have been allowed to scale up profits up to two per cent on their base rate (ReliefWeb, 2018). For logistical reasons, however, this provision did not work.

6.3 Mechanisms for disbursing financial grants

Grant payments to beneficiary households begin once the eligible beneficiaries have been identified, contracts such as an MoU have been signed with them and the key elements of the programme have been decided.

All the funds should be directly transferred into the bank accounts of the beneficiaries to bypass middlemen, maintain transparency and reduce misuse of funds. For this reason, each beneficiary household, once declared eligible and with a signed MoU, must open a bank account. Opening bank accounts for beneficiaries living in inaccessible, remote, dispersed and rural areas requires a significant mobilization of beneficiaries and coordination with banks.

In a tranche-based financial assistance programme, the grant is provided at various stages after achieving the set milestones. At each stage of tranche release, the inspection team checks compliance with hazard-resistant reconstruction, as agreed in the MoU signed between the agency and the beneficiary.

Since the precondition of tranche release is adherence to a set building standard, the grant payment mechanism must be closely linked to facilitation, inspection and certification. Separate schedules are required for tranche release for new construction, repair and retrofitting. Indicative

tranche release stages have been presented in Table 1 and Figure 13. For details of the process of tranche release, refer to Figure 22, Annex B.1. Once the reconstruction, repair and retrofitting have been certified as achieving a milestone and the resulting certification has been processed by a centrally managed beneficiary database, grant payments for that particular phase are released directly into beneficiary bank accounts.

Table 1. Tranche release stages: reconstruction, repair and retrofitting

Tranche	Demolition and reconstruction	Repair only	Repair and retrofitting
First tranche	After signing the MoU	After signing the MoU	After signing the MoU
Second tranche	Completion of plinth level, including the incorporation of all hazard-resistance compliance requirements	Completion of repair	Completion of all repair and all retrofitting elements
Third tranche	Completion up to eaves level, including the incorporation of all hazard-resistance compliance requirements		

In particular contexts, the same team can provide facilitation, inspection and certification services. However, separate teams for these three activities could be mobilized to avoid conflicts of interest. In the second case, additional coordination will be required between facilitation, inspection and certification teams.

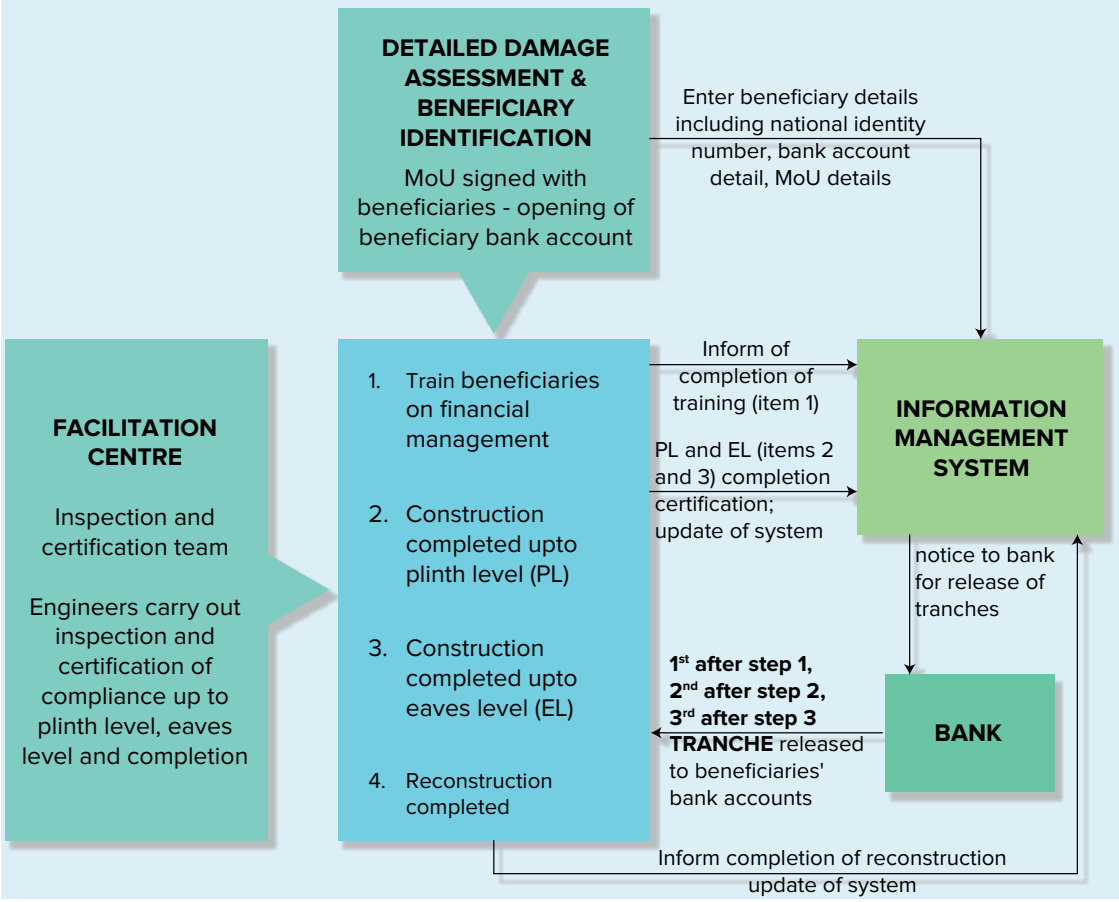


Figure 13. Indicative tranche release mechanism for new construction
(Adapted from the 2015 Nepal earthquake reconstruction tranche release mechanism for the reconstruction of masonry building)

6.4 Revolving fund scheme

Setting up a revolving fund scheme is an innovative way to support families who are willing to start or complete the reconstruction of their houses or who cannot reach a designated milestone for releasing a tranche **(Box 15)**. The revolving fund allows them to access financial support without interest on the principal. Different modalities can be developed for setting up revolving fund schemes. In one possible model, the local governments own the revolving fund. They decide the amount of seed-money required to provide funding for a certain number of target beneficiaries who either have no savings or are unable to access financial support from formal channels. Grantees secure the immediate funds required to complete a certain level of housing reconstruction before the next tranche of the government housing grant is disbursed. On receiving the upcoming government tranche, the amount they borrowed must be paid back into the revolving fund. The funds are redistributed among other grantees once earlier recipients have been able to repay their loan (Figure 14).

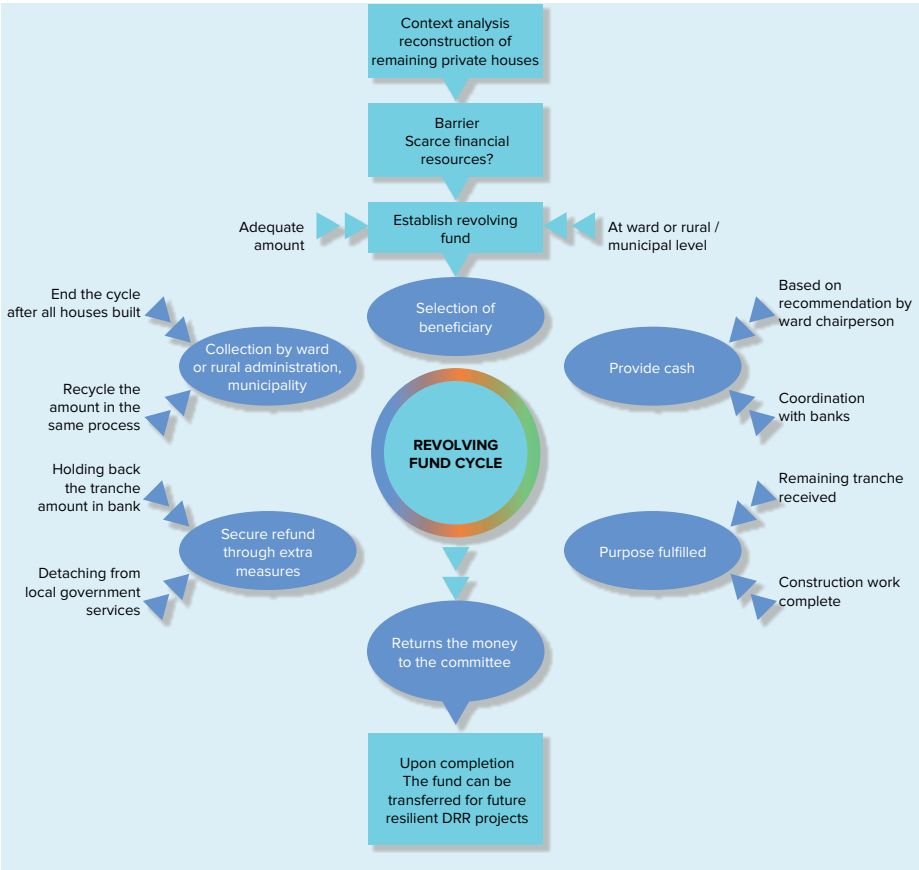


Figure 14. Structure of a revolving fund after the 2015 Nepal earthquake (Box 15)

Box 15. Revolving fund in 2015 earthquake in Nepal

After the 2015 Nepal earthquake, a revolving fund scheme was developed and implemented by the local governments so that house owners could receive short-term loans from the fund for the continuation of reconstruction. Revolving funds support vulnerable households through short-term loans of specific amounts, which are reimbursed by the house owners as soon as the tranches are released to their bank accounts. Then the funds are disbursed to another needy household. This was successfully practised in the earthquake-affected areas in Nepal, where the local government established funds to facilitate the housing reconstruction programme.

6.5 Risks and challenges

As discussed earlier in this section, the success of a housing reconstruction programme largely depends on the smooth and timely disbursement of financial assistance in the form of grants and loans to the beneficiaries **(Box 16)**. If financial assistance is not disbursed in time, it slows down the reconstruction of the individual houses and results in extreme hardship for the house owners, who may have to procure loans at high interest rates to continue reconstruction. This leads to new debt cycles and damages the credibility of the programme.

The risks and challenges of assistance disbursement should be well understood, and necessary remedies should be built into the financial disbursement system to avoid the above-mentioned scenario. These risks and challenges and their possible remedies are outlined in Table 2.

Table 2. Risks, challenges and remedies

Risks and challenges	Remedies
Limited coverage of Banking and other Financial Institutions (BFIs), particularly in rural areas	1) Increase the number and coverage of BFIs in the disaster areas, particularly in rural areas, for smooth assistance.
People's limited awareness of and access to BFIs	2) Orient house owners on the banking system and include financial facilitation in programme design.
Ensuring coordination with BFIs	3) Necessary changes in prudential regulations for increased cash retention capacity of local BFIs. 4) Coordinate with BFIs to resolve policy and logistic issues.
Leakage of grant funds through malpractice	5) Mandatory bank accounts for beneficiaries and cash transfer to beneficiaries through BFIs only.
Tranche disbursement not in time, programme could potentially lose the trust of the beneficiaries	6) Accelerate efforts to complete the eligibility survey and sign MoUs with the beneficiaries, 7) Timely inspection of progress in building construction and release of tranches, 8) Coordination with BFIs as to when the next tranche release is required so that banks can retain cash.
Ensuring up-to-date information and data management system	9) Establish a centralized real-time information management system.

Box 16. UNDP coordinated between households and banks

UNDP had to ask the relevant authorities to take the action necessary to resolve hardship caused by the monsoon in Nepal and by the limited cash retained in rural banks so that tranches could be disbursed to the house owners affected by the earthquake. UNDP held meetings with local banks to facilitate tranche release and became a bridge between households and banks. The UNDP District Support Team supported the government of Nepal in its efforts to expedite the tranche release process through the timely processing and transit of beneficiary files.

6.6 Microinsurance as risk transfer mechanism

In hazard-prone areas, there is always a risk of households facing damage to property and / or a loss of crops and land productivity. This becomes a heavy financial burden, especially for those who are economically and socially vulnerable. Microinsurance supports are provided in lieu of regular premium payments proportionate to the likelihood and cost of the risk involved.

Microinsurance is also suitable for people who cannot afford other commercial insurance available on the market. It becomes part of their coping mechanism when absorbing shocks and losses caused by sudden onset disasters, such as earthquakes, cyclone, landslides, fires and floods.

Municipalities can play a vital role in promoting microinsurance, which can be one of the means for expanding social protection. This has been successful when the insurance initiative is embedded in a broader climate and a disaster risk management programme. Reliable, efficient service distribution is the key to gaining the confidence and trust of insurance policyholders and to further expanding coverage. However, there is a need for raising awareness concerning the concept and mechanism of microinsurance and harnessing trust in the system. Women should be trained in financial literacy, as such training can increase microinsurance uptake and foster gender empowerment. Municipalities should consider microinsurance as a long-term policy initiative while continuing to invest in the system.

7 Information, education and communication

Information, education, and communication (IEC) materials play a critical role in raising awareness of the various aspects of housing reconstruction. They are essential for a successful response and for the implementation of housing reconstruction plans and policies. IECs include infographics, posters, flyers, leaflets, brochures, booklets, radio or TV broadcasts, social media posts, billboards or murals, models, etc.

The IEC strategy and materials should be based on the popular media of communication at the local level, particularly in remote areas or where Internet connections are poor or non-existent. For example, studies show that in Nepal, radio is the most popular medium of communication, followed by television[9] **(Box 17)**. Since communication is context-specific, IEC should be based on such studies so that the means of communication adopted reach the most difficult terrains and the most vulnerable populations.

9 R.K. Sharma, A. Baskota, M. Timalsina, K. Sen Oli, H. Adhikari, An analysis of use and effectiveness of communication channels, media and tools in post-earthquake private housing reconstruction in Nepal, NSET, Nepal, ELSEVIER, Progress in Disaster Science, Volume 10, April 2021.

Box 17. Effectiveness of different communication media in Nepal

A study conducted on the effectiveness of different communication media during the 2015 earthquake reconstruction in Nepal showed vast differences in media preferences among respondents with different education levels. It was found that respondents with higher education levels retrieved information from multiple platforms. In contrast, those with lower education levels mostly depended on the radio. The study also showed that respondents mostly relied on partner organization officials and government officials for earthquake-resistant construction techniques. However, for information on reconstruction policies and tranche disbursement, local representatives were extensively consulted.

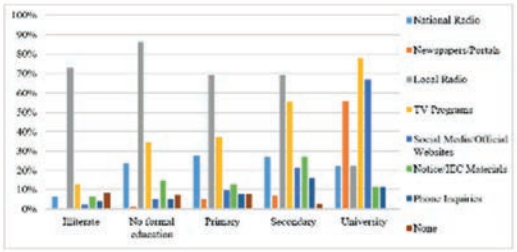


Fig 1. Distribution of means of communication among different level of education of beneficiaries

Source: Sharma et al. (2020)

7.1 Objectives of IECs

Effective, regular communication with the people affected and supplying them with relevant information and education through available media increases householders' awareness of safer, more sustainable construction practices and administrative procedures. In housing reconstruction, IECs should cover topics such as a) answering queries related to the technical, administrative and financial aspects of housing reconstruction, b) motivating audiences to adopt features of multi-hazard-safe construction, c) publicizing available government support, financial schemes, administrative procedures, grant release and certification, d) promoting the use or reuse of locally available materials and presenting different options for cost-effective, green construction materials for new construction, e) publicizing simple, appropriate technologies for repair and retrofitting, f) encouraging beneficiary participation through meetings and discussions, g) giving model demonstrations, training and workshops.

7.2 Designing IECs and tools

IEC should clearly define the roles and responsibilities of the government and the people in housing reconstruction, as well as the consequences of non-compliance with regulations. When designing IECs and tools for housing reconstruction, the sociocultural and economic background of the disaster-affected people, especially the local language and the level of education, should be kept in mind. IEC messaging should explain why and how hazards turn into disasters and how to prepare for future disasters. It should illustrate the types of building damage and the interventions proposed under the reconstruction programme. To disseminate IEC messages, consider the availability of reliable communication tools in the disaster area such as radio, television, telephone, mobile phones, Internet and other local traditional means of communication such as story tellers, singers, etc. When designing the information dissemination system, care should be taken to avoid any gaps in communication that could create confusion, rumour, conflict or stress. IECs should be gender-sensitive and suited to the most vulnerable sections of society, the illiterate and persons with disabilities.

7.3 Building on existing knowledge and successful materials

When developing IEC materials, it can be very helpful to look at the existing national and international IEC materials developed and used in post-disaster housing reconstruction programmes in other regions with similar building types and sociocultural and economic backgrounds. A wide number of IEC tools such as online articles, reports, manuals, and guidelines are available that have been developed by various national and international agencies, such as UNDP[10]. Adapting existing tools would speed up the development and dissemination of cost-effective, high-quality and socio-culturally relevant IEC materials.

It may be useful for disaster-affected people to know about the experiences of other disaster-affected communities elsewhere. The stories of the experiences of field staff, construction workers and technical teams working in post-disaster housing reconstruction in other regions may make IECs more effective. It may be cost-effective to adapt computer or mobile applications for surveying, quality assurance, monitoring and evaluation methods and forms that were developed and used elsewhere.

7.4 Types of IEC delivery tools

Depending on the geo-climatic and topographic conditions, socio-cultural characteristics, education level, language, etc. of the disaster-affected country, appropriate tools from the following list can be adopted so as to meet the needs of effective housing reconstruction messaging:

1. Mass awareness campaigns, street theatre, rallies and special events
2. Exhibitions on building designs, materials, construction technologies and supply chains
3. Distribution of IEC materials (booklets, flyers, brochures, posters, handbooks, and jingles) prepared in the local language
4. Door-to-door visits, community or ward level meetings
5. Clubs and community groups, such as radio listener groups
6. Tools such as social media, newspapers, radio, television, online platforms
7. Mobile van technology clinics **(Box 18)** and mobile video vans
8. School-based knowledge competitions such as quizzes, poem recitals and debates
9. Toll-free two-way communication mechanisms, including telephones
10. Public address systems such as microphones, amplifiers and loudspeakers
11. Building centres with full-scale and reduced-scale building models and components
12. On-site demonstrations of construction technology and methods for correcting construction errors
13. Application-based video clips on construction details
14. Radio and television broadcasts
15. Training and orientation

10 UNDP developed extensive IEC materials for UNDP-facilitated ODHR during the 2015 Nepal earthquake. These materials are uploaded to the UNDP portal (Gorkha Housing Reconstruction Project |UNDP in Nepal) and can be accessed through the Internet.

Box 18. Mobile van technology clinic, Nepal

UNDP used Mobile Van Technology Clinics (MTC) extensively. These are autonomous IEC systems powered by solar power and consisting of a TV, video camera, computer and audio system to disseminate information. They can also carry physical models of safe construction, posters, brochures and other IEC materials to conduct awareness campaigns at the community level.

Communities participating in MTC campaigns
Source: UNDP, Nepal

8 Training and capacity development

This section focuses on three aspects of capacity: a) training for creating new skills, b) capacity development for existing construction workers and other personnel with prior training and c) awareness building for house owners and other key players involved in the housing reconstruction process. The orientation and training of all stakeholders engaged in housing reconstruction should be based on a common understanding of the goals of the programme. Care should be taken to ensure that uniform information is provided to the key players. Training and orientation should be provided to all stakeholders, including technical and non-technical advisers and supervisors, construction workers such as masons, carpenters, electricians, plumbers and machine operators, etc. and social mobilizers. Enumerators engaged in surveys, such as damage assessment personnel, programme implementers and affected households and communities should also receive appropriate training. Moreover, training and orientation in income-generating activities and entrepreneurship should be a component of reconstruction programmes. Training vulnerable people in semi-skilled activities so that they can work as helpers to skilled masons, or sort debris for appropriate recycling materials for example, will enable the trainees to earn income from reconstruction. The skills acquired may help vulnerable populations secure their future livelihoods. Training can be provided through formal classroom instruction, hands-on training and demonstrations. Skill-upgrading programmes **(Box 19)** and refresher courses are also necessary and should be part of an ongoing training and education process.

Box 19. UNDP delivered training for masons, Nepal

UNDP delivered extensive training for masons to upgrade their skills in earthquake-resilient construction.

Source: UNDP, Nepal

After a major disaster, the need for construction workers increases significantly. It cannot be met through the regular supply chain nor by bringing in labour from outside the country. Meeting the increased need calls for fast-tracked intensive training programmes to produce a new workforce, especially by engaging semi-skilled people. Many of the technical specialists, such as architects and engineers, who join the housing reconstruction workforce may be fresh graduates lacking field skills. Moreover, most graduate engineers lack knowledge regarding traditional construction techniques, which might be the prevailing construction system in a specific disaster-affected area. Apart from technical knowledge, they need training on social skill building to cope with the dynamics of ODHR, especially as regards effective communication with distressed individual households.

As housing reconstruction progresses, new challenges may emerge that require new solutions. Intervention is a process and some aspects may be unclear in the early stages of reconstruction. New building typologies based on local materials may emerge and new types of construction errors may crop up. Often, these are not things that can be foreseen during the planning stage and as a result, there is a need to be able to modify technologies and designs and update orientation and training courses to address any emerging issues **(Box 20)**.

Box 20. Provision for updating training curricula

The Nepal experience demonstrated that construction errors, which are inevitable in ODHR, require additional training to correct. As the type and magnitude of the errors that come up cannot be predicted at the outset, they cannot be specifically planned for in advance. To avoid surprises at later stages, it is important to incorporate a degree of flexibility into the training program so as to be able to adjust training courses to accommodate the unforeseen.

8.1 Training audience and objectives

While the main target of training and awareness-building in ODHR is to achieve sustainable and context-specific housing reconstruction, it has great potential for influencing future development programmes to move towards a resilient built environment. A few well-trained lead trainers, master crafts persons and community facilitators can form a large number of trained construction workers in a cost-effective manner. This makes ODHR fast, green, cost-effective and high quality. Building the awareness of media personnel, authorities and banks concerning the principles of ODHR helps to create an enabling environment for the reconstruction process. Building the capacities of construction material retailers, suppliers, manufacturers and importers as regards green building materials will not only help the reconstruction process, but will also have a far-reaching, positive impact on society. Training is also necessary also for social and financial facilitators and other field-level staff. Refer to Table 12, Annex B.5 for details of training audiences and objectives.

8.2 Training curricula

To maintain consistency, the curricula or framework for training, orientation and delivery of information should be developed to meet the programme's training objectives[11] (Table 12, Annex B.5, training audiences and objectives) and address the needs of the various stakeholders. This can be done by the central authority in collaboration with national and international partners

11 https://drive.google.com/file/d/13qfDkGgu5YvPlbcGNjDNwDVsEoifhwAr/view?usp=sharing

and with inputs from a range of technical experts. Once the curricula have been developed and approved, they feed into training and orientation materials and into training methods such as classroom delivery and on-the-job training. In instances where sites are remote and high-quality trainers in construction theory cannot be brought in, it may be very useful to keep an option open for online classes by experts with the help of local level trainers and using hands-on exercises. Training is required at various levels of the construction and building disciplines to address all aspects of housing reconstruction. Developing human resources on a large scale requires a cascading training approach through the creation of a cadre of master trainers. In a cascading approach, special care should be taken in training design to minimize transmission loss. There is a need to develop the capacity of the existing masons, carpenters, plumbers and electricians in line with BBB by recognizing their pre-existing construction skills.

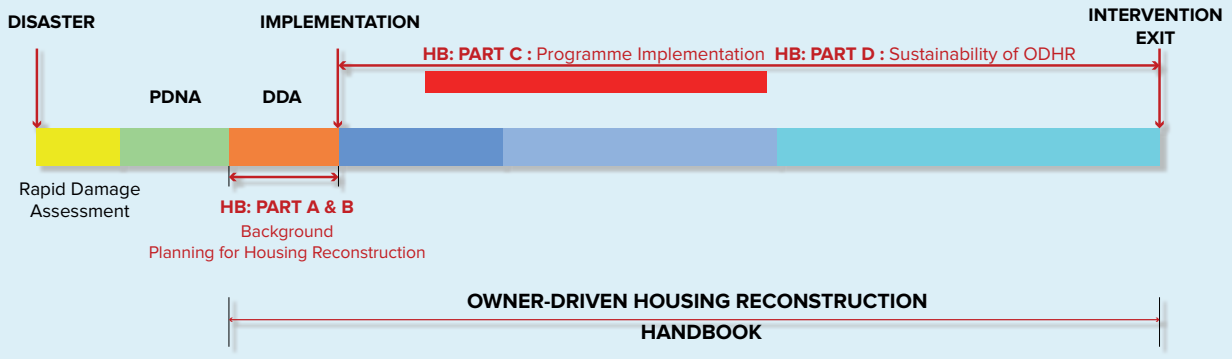
Training materials: IEC materials should be suited to the needs of a specific audience and their roles in reconstruction **(Box 21)**. Training materials should be graphic, preferably with less text. These materials may include, but are not limited to:

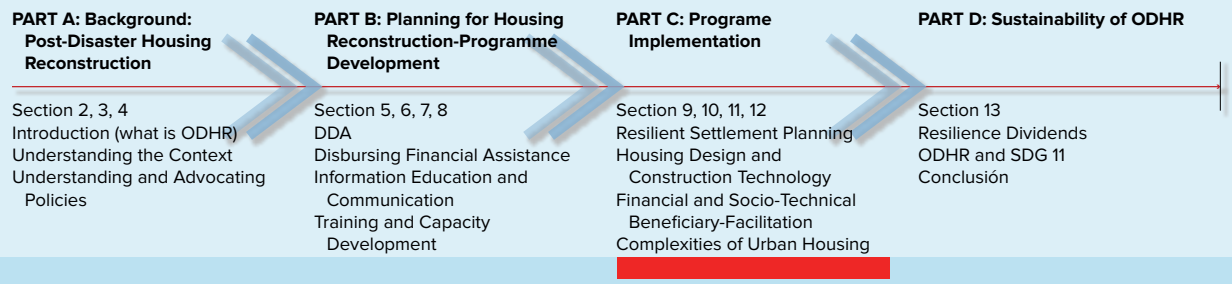
- Print media such as handouts, flyers, brochures, posters, booklets and printouts of PowerPoint presentations
- CD or pen drives loaded with relevant information, handouts, flyers, posters, booklets and printouts of PowerPoint presentations
- Membership in online platforms and social media
- Links to relevant online materials on YouTube or other platforms
- Membership in chat groups, WhatsApp or similar groups with specific topics

Box 21. Special information kit *"Gyan Jhola"*, UNDP Nepal

As part of its efforts to improve socio-technical facilitation services for house owners, UNDP distributed a special information kit called *"Gyan Jhola"* ("Wisdom Bag") to all field staff involved in housing reconstruction after the 2015 Nepal earthquake. The bag contained government guidelines and procedures, educational materials on the technical aspects of housing reconstruction and contact details for local officials.

Part C. Programme Implementation





9 Resilient settlement planning

Settlement planning is a technical and sociopolitical process for developing and upgrading community infrastructure and common spaces, water supply, waste management, energy and other services. This section is on resilient settlement planning, which is based on UNDP experience during post-earthquake interventions in Nepal. While this is not a general discussion on settlement planning, many of the lessons learnt in Nepal may be used to enhance the resilience of existing settlements located in hazard-prone, high-risk areas in other countries. In a post-disaster scenario, settlement planning may be either in situ or in a new location (relocation), provided that the community is willing to relocate.

One of the major issues in a post-earthquake situation is the debris resulting from building collapse, which blocks the roads and damages infrastructure and houses. Debris is also a major issue in a post-landslide situation. Before initiating any settlement planning, it is important to manage debris. The following section elaborates further on debris management.

9.1 Debris management

Debris management should be initiated immediately after a disaster **(Box 22)**. Debris may be from both collapsed and partially collapsed buildings as well as brought by landslides. Post-disaster debris management should attempt to maximize the recycling of debris for reconstruction. If necessary, it should be disposed of efficiently and in a cost-effective and environmentally friendly manner. Disposal should reduce risk and facilitate recovery and reconstruction efforts. Wherever necessary, dismantling experts should be consulted for the safe, systematic demolition of buildings, debris processing and maximizing the salvaging of reusable and recyclable materials.

Debris management should be based on the type of debris: collapsed building waste, appliances and electronic items, vegetal waste, soils and sediments, etc. Urban building debris is more complex and expensive to process and recycle (Table 3). Care should be taken in handling structurally dangerous buildings, hazardous materials such as asbestos, dust particles and chemicals. The options for collection and disposal of wastes include reuse, recycling, composting, combustion and landfilling. It is important to ensure that safety gear, such as masks, gloves, safety boots, eye-ear protection, etc. are used and that the machinery required for debris management, processing, salvaging and disposal is available. In building and other infrastructure design, maximize the use of recycled construction materials so as to reduce debris disposal and minimize negative environmental impacts.

Table 3. Rural versus urban building debris

Rural area	Urban area
Post-disaster waste is simple, mostly comprising timber, vegetation, rocks, mud, soil and sediments, among others.	Post-disaster waste is complex, mostly comprising concrete, steel, electronics, hazardous materials and chemicals, among others.
Most of the debris can be easily salvaged and recycled. 40 to 60% of construction and demolition waste from rural buildings can be recycled.	Limitation of space to collect, store, treat and dispose of selected debris. Processing and recycling urban debris is complex and expensive.
Local unskilled people can contribute to debris management, providing opportunities for cash-for-work programmes.	Demolition experts, a skilled workforce and special machinery are required.
Most of the disposed debris breaks down naturally over time.	Urban debris may create higher levels of problems in congested areas, and thus requires careful disposal.

Box 22. Debris management, Nepal 2015 earthquake

With support from UN Volunteers (UNV), UNDP mobilized a team of 100 experts and civil engineers to assess, demolish and manage debris. Part of the ongoing debris work focused on public structures such as schools and health posts, enabling public services to be restored. UNDP developed a number of manuals, guidelines and brochures on debris salvaging, management, removal and disposal.

Manual collection and sorting of post-disaster debris in Nepal
Source: UNDP, Nepal

9.2 Settlement planning: general considerations

Settlement planning should be considered once any potential risks, such as financial and political issues and disagreements among beneficiaries, have been thoroughly evaluated **(Box 23)**. In situ development is the most desirable option in reconstruction. Relocating the whole settlement, or only those areas exposed to risk, should be considered as a last resort in order to safeguard lives and livelihoods Relocation, if required, must be done in consultation with the community as early as possible.

The first action in settlement planning is to examine whether the required resources are available and manageable within the time frame. Many problems in settlement planning may be resolved or mitigated by participation. Interventions in settlement planning often involve layout changes, which may trigger land tenure issues, a difficult and time-consuming process. In settlement planning, it is important to ensure that disadvantaged people are involved in the process. Settlement planning should be done following the legislative framework and governance system of the location.

The community should play a significant role in decision-making in settlement planning. They should be clearly informed through communication messages explaining the existing risks and benefits. DRM should be an intrinsic part of settlement planning. Historic buildings and structures should be respected, conserved or restored. Settlement planning will require extensive services by qualified, experienced specialists for planning, design and implementation. It should be done in collaboration with other stakeholders, such as community members, local governments, line departments and CBOs.

Box 23. Issues of relocation: Laprak village, Nepal

In agrarian communities, flat, irrigable land is reserved for agriculture to guarantee food security. Non-arable land is usually allocated for housing construction. However, earthquake engineering and modern settlement planning consider flat land suitable for earthquake-resistant construction and settlement planning, thus running counter to the principle of food security. This issue needs to be carefully considered so that the food security of a community is not jeopardized.

Laprak village, located in the epicentre of the 2015 Nepal earthquake in the Gorkha region, was scheduled for relocation because of the lateral movement of the village land. By 2018, however, because of delays in developing and building houses at the new site, the construction of most houses had been practically completed on the original site. The houses did not comply with the minimum earthquake safety standards. The house-owners were thus not eligible to receive any assistance for rebuilding their houses on the original site, on the grounds that the village had been scheduled for relocation.

Photograph of completed reconstruction in Laprak, which was scheduled for relocation
Source: UNDP, Nepal

Understanding interlinkages in settlement planning: It is important to establish macro-level interlinkages among the various hierarchies of settlement planning. For example, households in settlements may live, work and depend on both rural and urban environments to sustain human life. The flow of people, goods, financial and environmental services (urban-rural linkages) between rural, peri-urban and urban locations are interdependent. They are the reality of socio-spatial arrangements, creating places with distinct yet interwoven social identities (UNHabitat, 2019). Though the Handbook focuses on planning at the settlement level planning, it is essential to investigate macro-linkages between various planning stages (Table 4). For details on the methodology of settlement planning, refer to Figure 23, Annex B.2.

Table 4. Levels of settlement planning

Level of settlement planning	Key features and issues
Regional level	● Hazard risk ● Development priorities ● Land utilization at macro level ● Regional infrastructure

Level of settlement planning	Key features and issues
Subregional level (districts or cluster of villages)	● Topography and existing land-use pattern ● Development constraints or potential
Settlement level	● Local hazards and risks ● Location (in situ or new) and layout ● Land management ● Socio-physical infrastructure at settlement level ● Services (water, sanitation, energy) ● Environmental management

9.3 Settlement planning: in situ versus relocation

In any reconstruction programme, in situ intervention is far more common than relocation, which is problematic and consumes a lot of time, money, land, infrastructure, etc. In general, people do not want to relocate[12]. This is primarily due to the complexity of the process and for poor households, a lack of resources. As a result, it is important to carefully assess relocation to determine if it is in fact the right solution. As far as possible, all possibilities of in situ reconstruction should be explored, and relocation chosen only as the last option **(Box 24 & 25)**. For details of relocation, refer to Figure 24, Annex B.3 (Checklist for relocation). Table 5 shows the conditions of in situ development and relocation, which will help communities and administrators make a decision in this regard.

Table 5. Conditions for in situ settlement planning and relocation

In situ	Relocation
1) If services can be improved with minimal disturbance to the existing settlement 2) New infrastructure networks such as transport corridors improve access to markets and other facilities. 3) If people accept that land-use patterns change from rural to semi-urban or agriculture to industrial use and there is a change in the demography of the area.	1) Risk due to existing or potential site-specific hazards such as landslides, rockslides, avalanches, flooding or man-made disasters that cannot be mitigated through reasonable means. 2) People have already relocated or are in the process of relocating due to a disaster. 3) People are relocating because of changes in livelihood patterns, changed accessibility and better facilities in other areas. Sometimes in- or out-migration may be accelerated by disaster.

Box 24. Ground liquefaction, Canterbury earthquake, 2010

Ground liquefaction triggered by the 2010 Canterbury Earthquake severely damaged a part of the eastern suburbs of Christchurch city in New Zealand. The area was declared a Red Zone. The government and insurance paid approximately 8,000 house owners in the area for their land and houses so they could relocate to other suitable areas – anywhere they wished to move to. The vacant land became Crown (government) land.

12 See Maharashtra floods recovery report, prepared by a UNDP recovery mission, 2 October 2019, p. 10.

Box 25. Rural to urban migration, 2015Nepal earthquake

A disaster may play the role of a trigger mechanism, expediting the relocation of rural populations to urban areas and alongside roads, where accessibility and other civic facilities are better than those in their original settlements. Disasters may also provide an opportunity for out-migration from the city core to suburbs for people who had previously been strongly attached to their ancestral properties. Nevertheless, migration from rural to urban areas is usually more prevalent.

After the 2015 Nepal earthquake, many families moved from rural to urban areas or alongside roads due to increased affordability and changes in income options such as transitioning from agriculture to remittances.

9.4 Resettlement of the landless

Traditionally, financial and socio-technical assistance to disaster-affected people has been tied to a land ownership certificate. The landless, renters or people who had been living on public land for generations were not considered eligible for assistance. These groups face severe crises as their resilience and ability to cope are usually very low and they are exposed to a much higher level of vulnerability (Figure 15). Therefore, they should be included in the housing reconstruction policy framework from a social justice perspective **(Box 26 & 27**).

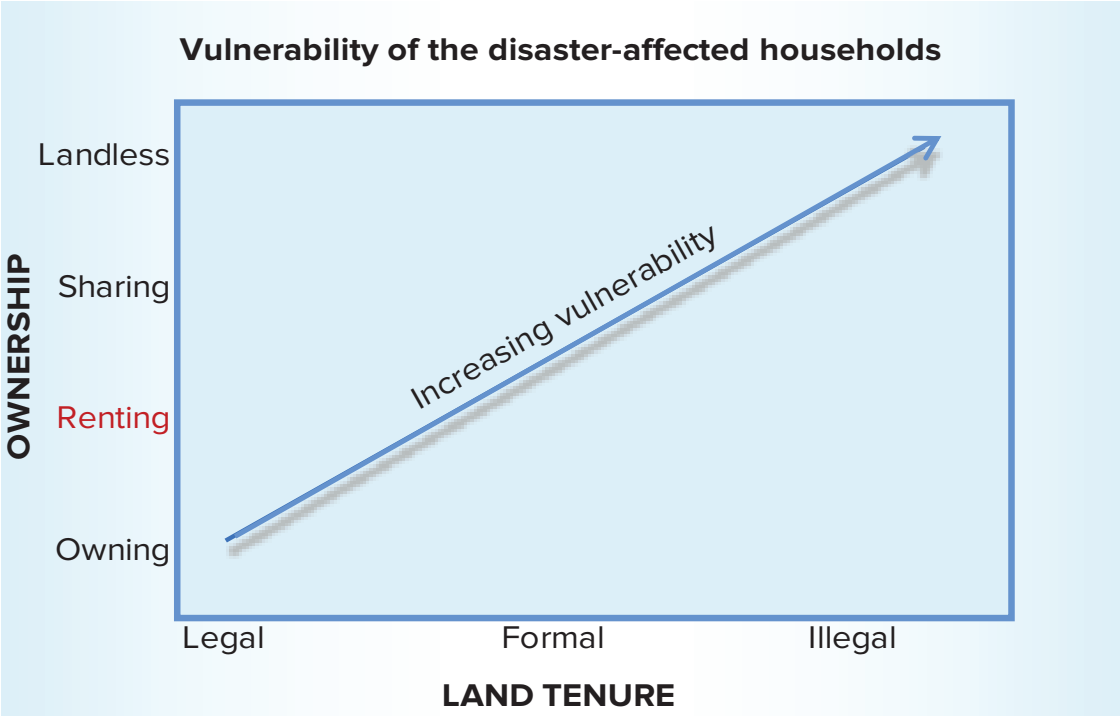


Figure 15. Vulnerability of disaster-affected households in relation to land tenure and land ownership
Adapted from Shelter, 2006

Box 26. Case study: Relocation (Shrestha & Bhatta, 2020)

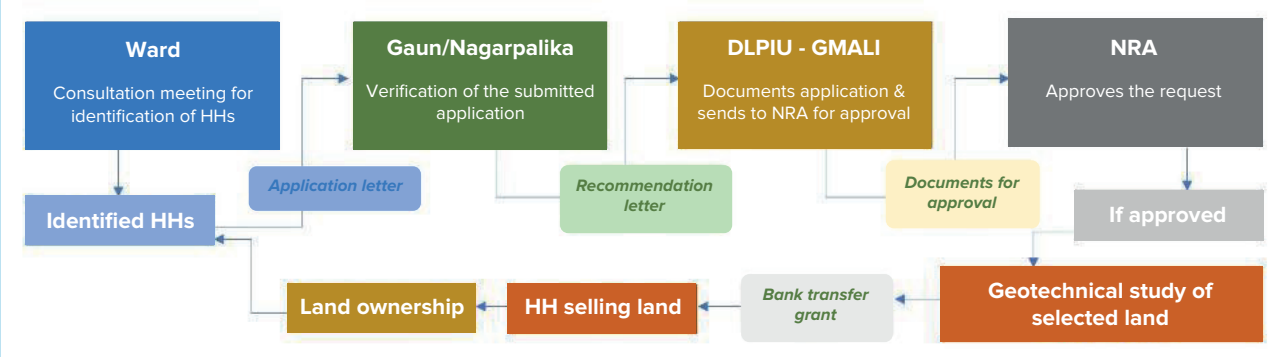
Tadi Rural Municipality in Nepal was severely damaged by the 2015 Nepal earthquake. In Tadi Municipality, 31% of the population were living in landslide areas, and 52% lived on steep slopes exceeding 30 degrees in incline.

In compliance with the Land Bank Act and regulation provisions, the local government acquired land from absentee landlords and handed it over to vulnerable households. The agreements under which the land was provided to the vulnerable households had provisions for practising livelihood activities wherein the government provided infrastructural and financial support for developing the area. This practice benefited landowners by providing certain financial benefits while enabling them to retain ownership. The internally displaced community found shelter and livelihood opportunities in safe locations.

Photograph of a new relocated settlement, Nepal
Source: UNDP, Nepal

Box 27. Framework for receiving government grants for land purchase in Nepal

After studying the landlessness issue in the disaster area, the National Reconstruction Authority (NRA) in Nepal amended its assistance policy. It expanded its policy to allow squatters, people living on unregistered or informal land or unregistered farmland to receive financial assistance for house reconstruction from the government. To be entitled to the land grant, those affected were required to show their utility bill payment slip or produce two statements from neighbours to verify that they lived on the unregistered land. In addition, the NRA provided financial assistance up to NRs. 200,000 (equivalent to about USD 2,000) to the landless to purchase land if the government could not provide a suitable parcel or tract of land. The following diagram shows the framework for receiving a government grant for land purchase in Nepal. It also shows the different stakeholders in the process of land purchase.



10 House design and construction technology

Resilient housing is the core of the ODHR approach. As a result, the strategies and actions involved in housing design and the technology required for reconstruction should conform to the principles of ODHR (refer to section 2). The housing reconstruction process (repair, retrofit and new construction) covers planning, design and implementation. This section provides necessary strategies and guidance on context-specific, affordable, high-quality, employment-generating and resilient solutions for housing reconstruction. All considerations and recommendations made here are equally relevant to urban and rural contexts.

10.1 Strategies

In ODHR, all information regarding designs and technologies that reaches beneficiaries should be single-sourced, consistent and accurate to avoid confusion and misinterpretations. It is very important to reach the people as early as possible to avoid self-built, non-compliant and unsafe construction. The following strategies have been laid down based on UNDP experience in post-disaster housing reconstruction in Nepal. The strategies may vary from place to place depending on the government system, geo-climate, hazard profile and social conditions.

Public information campaign: There must be a campaign to discourage people from doing anything to their damaged buildings until the technical and financial package has been declared and trained masons, supervisors and engineers have come to their doorsteps.

Adopt participatory design: Designs should not be supplied to the people affected. They should be developed through a participatory process by involving those affected, especially women, persons with disabilities and the vulnerable. The designs should be flexible enough to permit expansion in future.

Ensure safety and resilience: Adopt safe practices to ensure safety during the dismantling or restoration of damaged houses and the construction of new ones. The construction technologies adopted should be based on the principles of BBB, ensuring that all the resilience features figure in the reconstruction, in compliance with building safety codes.

Conserve culture: Reconstruction should preserve and revitalize traditional architecture for cultural continuity, economy and environmental friendliness. Balance should be maintained between traditional and modern construction materials and systems.

Cost-effective, environmentally friendly reconstruction: Reconstruction should emphasize the use of appropriate construction technologies based on locally available resources, recycling debris if possible and community consultation. The use of local materials will reduce both costs and the negative impact on the environment. To make housing reconstruction green, it is important to adopt green materials in reconstruction -- materials that have less embodied energy and lower CO_2 emission levels.

View reconstruction as an economic opportunity: Reconstruction may be viewed as an opportunity for enhancing livelihood and supporting the local economy, while ensuring that it is the least damaging to the environment and most sensitive to climate change. It is important that the technology solutions selected provide opportunities for entrepreneurship and for enhancing the skills of local artisans so as to increase local employment.

Promote repair and/or retrofitting: Advocacy is required to promote the concept that repair or retrofitting may be more economical and less time-consuming than reconstruction if the existing building is not severely damaged. Retrofitting provides an opportunity for design renewal as well as improving quality and raising the standard of living. Before deciding to construct a new building under a housing reconstruction programme, a comparative analysis of the strengths and weaknesses of reconstruction versus repair and retrofitting (Table 13, Annex B.6) should be carried out. With the help of technical facilitators, a house owner will be able to make a cost-effective and meaningful decision through this comparative analysis.

10.2 Guidance notes

This section provides guidance notes on the three pillars of post-disaster housing recovery: a) reconstruction of new buildings, b) repair and retrofitting, c) infrastructure and services.

10.2.1Construction of new buildings

Design: House design is a collective process involving the physical, emotional, social and financial aspects of a household. Because it also includes family needs, aspirations, social milieu and individual budgets, any housing design process must be participatory and involve the people affected, especially women, the elderly, persons with disabilities and the vulnerable in general.

Different regions of a country require context-specific designs based on their hazard risk as well as their sociocultural, economic and geo-climatic conditions. Designs should be prepared that require minimal socio-technical support. Through a participatory process, it is important to develop adequate building design options **(Box 28)** and explain their pros and cons so that people can make an informed decision. The designs should take into account the aspirations of house owners, affordability and the needs of women, children, senior citizens and persons with disabilities. All designs should be multi-hazard resilient (refer to Figure 25, Annex B.4). The designs developed should be based on the elements presented in the following figure.

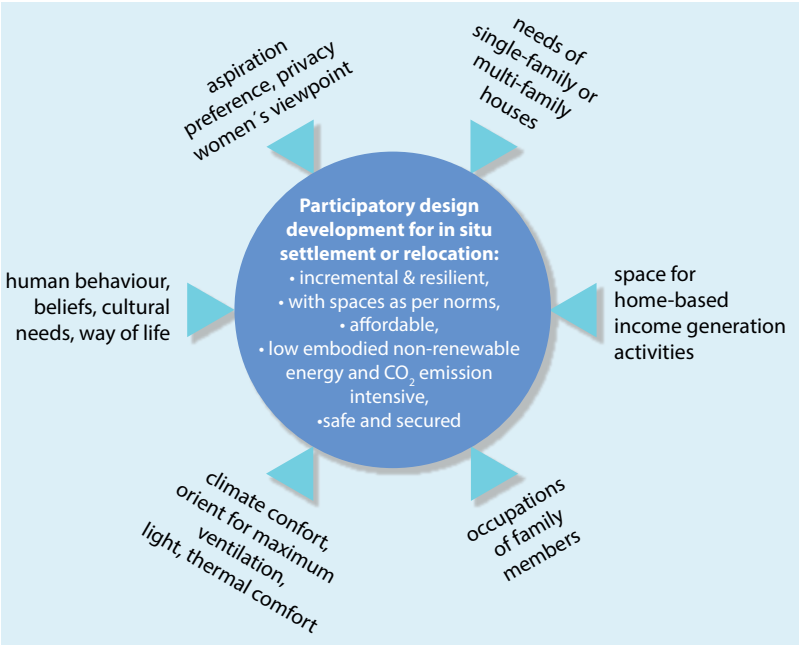


Figure 16. Principles of building design under housing reconstruction (Based on Nepal experience)

The proposed building designs, including construction technologies, should be simple so that local human resources can be easily trained to implement them. The designs and detailing should be flexible enough to expand to suit household-specific needs and to grow incrementally, allowing for extension or modification in the future without jeopardizing structural safety. A complete house should also have a toilet, a solid and liquid waste disposal system, drinking water and a power supply. The proposed designs should be seen over the entire lifespan of the building, from construction to eventual demolition or reuse, including maintenance requirements, and include the need for operating energy, maintenance, and potential costs.

Unlike rural houses (which have a more homogeneous design), structures in urban areas are heterogeneous in terms of their size and shape, construction materials and technologies. In urban areas, the size and shape of the parcel of land as well as local building and planning bylaws may also influence the shape of a building. High-density housing may be necessary in urban areas. All these may compel the formulation and use of tailor-made design solutions for reconstruction, repair and retrofitting[13].

13 Design studios were established in urban municipalities in Nepal after the 2015 earthquake to prepare tailor-made design solutions for reconstruction, repair, and retrofitting.

Box 28. Buildings based on modern and traditional materials, Nepal

To facilitate housing reconstruction after the 2015 Nepal earthquake, government authorities collaborated with partnering organizations and disaster-affected people to develop design catalogues[14] that included building proposals employing both traditional and modern materials. Beneficiaries were encouraged to choose a design that suited them from the catalogues.

A building in traditional and modern materials
Source: UNDP, Nepal

Reconstruction is an opportunity to preserve or revitalize traditional architecture for cultural continuity, economy and environmental friendliness[15]. When designing houses and adopting construction technologies in ODHR, it is important to study local traditional architecture which has evolved holistically over the centuries. Such buildings are climatically comfortable, safe and may be suitable even in today's context. The wisdom embedded in such buildings may be adopted in reconstruction and retrofitting after examining its suitability under current building codes. **Box 29** shows some examples of traditional construction based on regional variations in Nepal, its climatic conditions and locally available materials.

Box 29. Traditional constructions based on local materials and regional climate in Nepal

Region and Climate	Example of traditional construction
Hot and dry	Houses with small openings to control exposure to extreme heat and wind
Plains, tropical and humid	Traditional two-story bamboo or timber houses with living space on the first floor and storage and activities on the ground floor
Hilly region, subtropical and temperate	Clay-stone houses, wooden frames, thatched roofs with straw, slate or shingles and trap doors for vertical circulation
Mountainous and hilly terrain, continental with cold and snow	Stone walls, wood frames, small windows and wooden shutters. Large windows lead to heat loss.

Technologies (new buildings): Reconstruction should be based on technologies that enable fast construction of cost-effective, high-quality resilient buildings. It is important to identify the most appropriate technology for reconstruction, based on the surrounding environment and available resources **(Box 30)** through community-level consultations. As far as possible, reconstruction should be based on traditional construction materials, skills and techniques that are time-tested, cost-effective, labour-intensive and least damaging to the environment. It should be easy to monitor quality and to replicate with minimum possibility of construction error. When selecting, adapting and developing technologies for reconstruction, the use of recycled construction materials that will help reduce debris disposal and other negative environmental impacts should be maximized.

A number of factors should be considered when formulating technologies under the ODHR programme so as to make them cost-effective, income-generating, environmentally friendly and resilient. The technologies developed should be adaptable to the construction tools and skills

14 Design Catalogue Volume II, https://drive.google.com/file/d/1C0zp4Qmpz9BlWLHiyGN1hRNF9CMi1OKo/view?usp=sharing

15 It is very important to document the traditional buildings that withstood the disaster. Upgrading them under building safety codes would make them acceptable to local and international partners.

available. Before proposing that construction materials be brought in from outside sources, it is important to determine whether there will be any difficulties due to the inaccessibility of the sites from the nearest road, market, etc. Accessibility to infrastructures such as roads, communication, electricity, water supply, sewage systems and community services needs to be factored into planning. By mobilizing locally available resources such as community labour (barter system, exchange of labour) and local construction materials, the cost of reconstruction can be reduced. The technologies proposed should have a range of structural design options and general guidelines for hazard resistance. People can then choose a design and technology based on the site, their budget and their aspirations.

Box 30. Containment Reinforcement (CR) Technology

CR technology was developed to rebuild stone masonry houses after the 2015 Nepal earthquake in such a way as to maximize the use of local materials, reduce construction cost and simplify earthquake-resilient technology for masonry buildings[16]. The design followed the architectural form prevalent in the earthquake area so as to reflect local culture. It employed welded wire mesh and galvanized wires to reinforce walls and wires to tie building elements so as to improve the "box effect". The technology was easy to understand and implement, as well as being less sensitive to quality control. Any errors could be rectified easily.

Source: UNDP, Nepal

10.2.2 Repair and retrofitting existing buildings

Repair or retrofitting: To make retrofitting acceptable to the population, it is very important to formulate solutions that require a) minimum structural and architectural interventions, b) minimum cost and c) minimum downtime. During the restoration of the damaged portion, safety must be ensured. There is a need to develop simple, mason-friendly retrofitting technologies for introducing resilience features in an existing deficient or damaged building. **Box 31** and **Box 32** present a few tips for improving the seismic safety of buildings through simple retrofitting measures. Creating a cadre of specially trained construction workers and supervisors to implement the retrofitting of buildings based on modern as well as traditional technologies will greatly facilitate implementation.

The repair and retrofitting of partially damaged buildings may be a cost-effective option. Repair restores the strength of a building to pre-disaster conditions, while retrofitting entails some structural modifications to the existing building (Figure 26, Annex B.5) to enhance the building's resilience to hazards such as earthquakes, tropical cyclones, tornadoes and winds. Retrofitting generally includes adding new elements or features to the existing building structure while minimizing disturbance. Although seismic retrofitting is predominantly concerned with structural improvements, it is equally important to reduce hazards due to non-structural elements such as the toppling of parapet walls, shelves, a refrigerator or television, etc.

16 IEC materials prepared on GI-wire technology, https://drive.google.com/file/d/1uECf733YNDBOeMh5FbbdconPL1xkIHku/view?usp=sharing

Box 31. Improving the seismic safety of masonry buildings for earthquake resiliency

The following attributes should be added to the existing masonry building to make it earthquake-resilient. Attributes 1 to 5 are generic. Attribute 6 is specific to the 'splint and bandage' retrofitting method (see Footnote 17).

Attribute 1: Improving symmetry and uniformity. The building should be made symmetrical in plan and uniform in elevation as much as possible.

Attribute 2: Smaller opening. Reduce the size of openings, fill them out or strengthen abutting piers where required.

Attribute 3: Integrity. Tie building components together, so that the building acts as a "box".

Attribute 4: Clearly defined load paths. If "load paths" are not well defined, create new load paths.

Attribute 5: Redundancy. Provide new components where required, so that a backup system is readily available in case a component fails.

Attribute 6: Improve earthquake resiliency**.** Add seismic-resilient features such as bandages and splints. These tie walls together and provide the capacity for the building to deform and dissipate energy without severe damage to the building structure.

Promoting repair and retrofitting: Homeowners, builders, policymakers, engineers and architects are not generally thoroughly familiar with the process and benefits of repair and retrofitting. They lack confidence concerning the overall safety of a retrofitted house. Many affected households use their disaster grants to replace the existing buildings with new ones, assuming that only new buildings can provide safety. Sometimes, however, too much new construction may change the pre-disaster landscape of a place **(Box 33)**. House owners should be made aware that retrofitting can be incremental: in other words, a building can be retrofitted in phases as and when funds become available. Moreover, a building can be used during the retrofitting process.

There is generally a shortage of construction workers adequately trained to carry out retrofitting, which is one of the reasons why people are not encouraged to choose retrofitting, although it may be a more cost-effective alternative to reconstruction depending on the situation. Together with training construction workers in reconstruction techniques, capacity-building in retrofitting in both modern and traditional architecture should be undertaken. Because convincing the key stakeholder of the advantages of retrofitting may be very challenging, the following steps (Figure 17) have been proposed to make the repair and retrofitting of damaged buildings acceptable to the population, based on UNDP experience in retrofitting in Nepal.

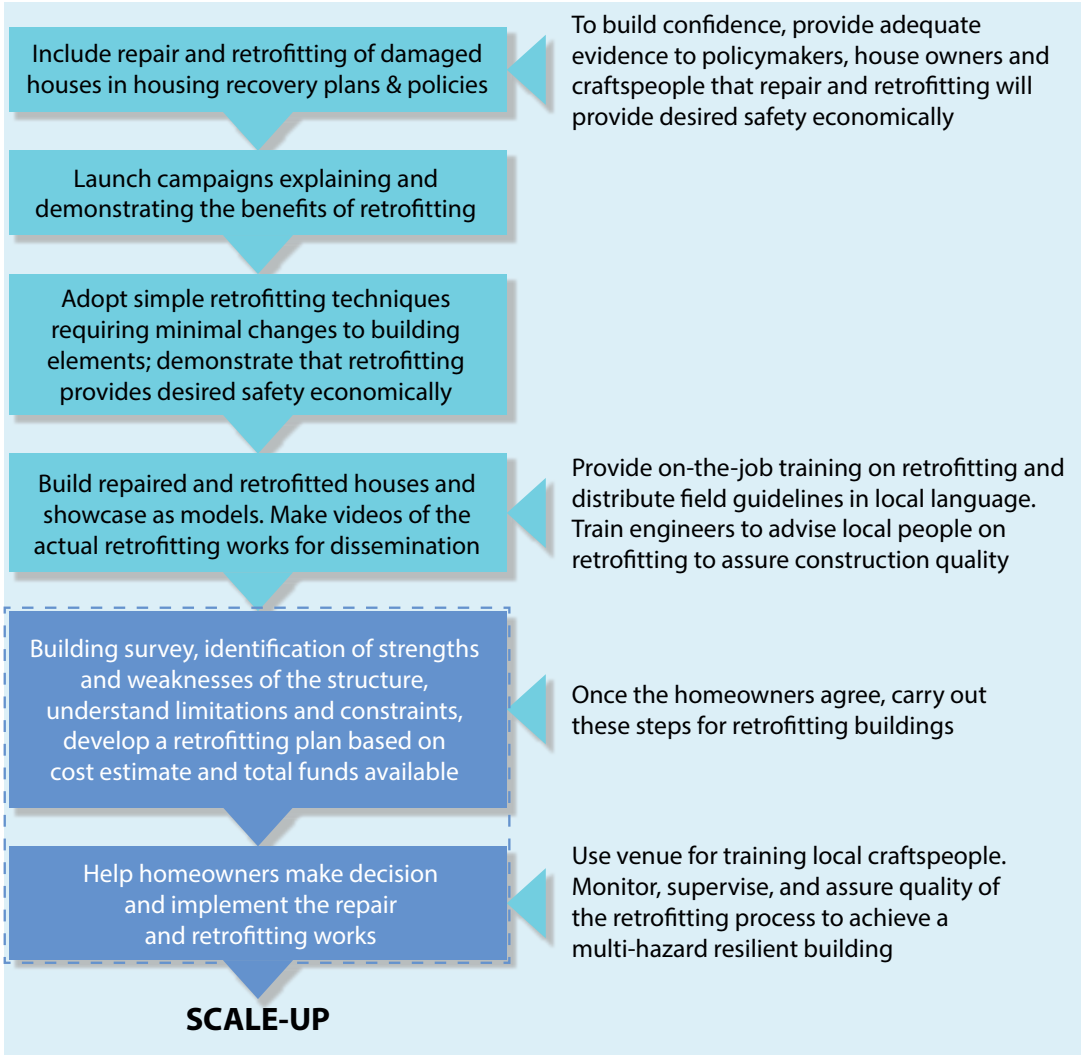
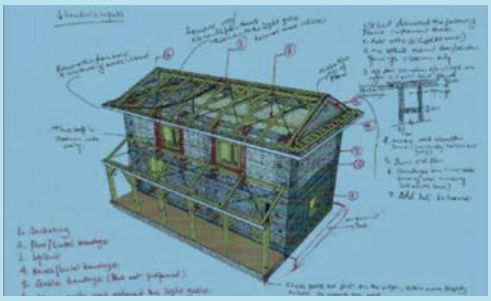


Figure 17. Steps for disseminating repair and retrofitting in housing reconstruction. (Based on Nepal experience)

Box 32. Retrofitting in Nepal: 38 buildings were retrofitted under ODHR through the training of more than 500 masons

It is crucial to develop affordable and sustainable retrofitting systems based on relevant codes and standards, existing construction guidelines and engineering judgment. Pictorial guidelines in the local language are necessary so as to disseminate and implement building retrofitting programmes.

Many damaged masonry buildings were repaired and retrofitted[17] using 'splint and bandage' and containment wires. The splint and bandage system ties the walls together. The containment wires are installed on both surfaces of the walls and connected with cross-links to hold the stone masonry.



A graphic from guidelines addressing the retrofitting of a local building type, Nepal
Source: UNDP, Nepal

17 Field Guide on Repair and Retrofitting
https://drive.google.com/file/d/1NImBv1rJ2PYrR0VDwDiizhCSde6BK7br/view?usp=sharing

Box 33. Reconstruction damaging the traditional built-up environment, Nepal

Too much focus on cement-based new building construction after the 2015 Nepal earthquake has changed the building typology and architectural setting of the earthquake-affected areas. After reconstruction, the number of cement-based houses increased by 57% in urban areas and 44% in rural areas. This has drastically changed the visual landscape of the earthquake-affected areas and left the people bereft of the rich cultural and traditional heritage they lived in. Exclusion of the earthquake-damaged buildings in the housing reconstruction policy left people no other option than constructing new buildings in order to receive the government financial grant. People kept the damaged buildings and lived in them. This led to increased vulnerability.

Building Typology	Prevalence % (Urban)		Prevalence % (Rural)	
	Pre-earthquake	Post-earthquake	Pre-earthquake	Post-earthquake
Masonry in mud or without mortar	76	76	95	41
Cement-based load bearing masonry	15	72	4	48
RC frame structure	9	17	1	11

After reconstruction, the number of cement-based houses increased by 72-15=57% and 48-4=44% in urban and rural areas respectively (earthquake-affected areas).
Source: Primary data collection by UNDP, Nepal

10.2.3 Infrastructure and services

For development to be holistic, community and other infrastructure and services should be planned together with the housing reconstruction programme. In situ infrastructure construction will be different from infrastructure construction on relocation sites. Moreover, it can be challenging in urban areas due to higher population density, multiple layers of both defunct and functional infrastructure, multiple service providers and multiple players. However, it is very important to ensure that essential services are provided to each household in the community to improve their quality of life. Community infrastructure and services may include:

1. Preschools, community centres, religious and social facilities, etc.;
2. Water supply, sanitation, and hygiene (WASH) facilities, including toilets and drainage. The toilets should have a septic tank or leach twin pit depending on local conditions;
3. A rainwater harvesting facility in each house;
4. Internal roads, footpaths, trails and connections to enable economic recovery;
5. Electricity, roads, bridges, communication systems, community infrastructure, etc. ensured by repairing the damaged infrastructures or laying out new infrastructure;
6. Innovative technologies such as smoke-free stoves, solar energy systems and solar photovoltaic systems for cooking for off-grid electricity communities.

To develop community infrastructure facilities coherently, coordination between the various line departments and other donor-funded reconstruction projects is required. The selection of projects should be based on community priorities. It is very important to ensure that existing infrastructure and services projects, programmes and schemes converge with ODHR.

11 Financial and socio-technical beneficiary facilitation

UNDP experience in post-disaster housing reconstruction in a number of countries suggests that merely building the awareness and capacities of the affected people will not always translate into hazard-resilient reconstruction in an ODHR approach because of the large number of houses built in a short time. To ensure cost-effective, high-quality, environmentally friendly and resilient reconstruction, repair and retrofitting, there is an additional need for active support in ODHR through providing the necessary financial and socio-technical facilitation at the doorstep of the affected people and communities. Facilitation may be challenging due to difficult terrain, poor phone connections and Internet networks, scattered and remote houses, etc. In ODHR, a community facilitation system should be established and implemented as soon as possible after the disaster.

11.1 Establishing a community facilitation system

Soon after a disaster, a facilitation system should be established because people in crisis and trauma need help urgently to rebuild, repair or retrofit their lost or damaged houses. Facilitation can be carried out at the level of the individual or the community, depending on the type and degree of assistance required. The main areas for facilitation are: a) providing access to information concerning the various types of financial and technical assistance available for reconstruction, repair and retrofitting and informing people as regards their entitlement, rights and responsibilities, b) bridging the gap between the disaster-affected, the authorities, banks and other financial institutions, c) supporting people undertaking housing reconstruction, d) supporting house owners so that they are able to meet compliance requirements, e) addressing grievances. This section provides the modalities and framework for delivering socio-technical and financial facilitation to the affected community (Figure 18)

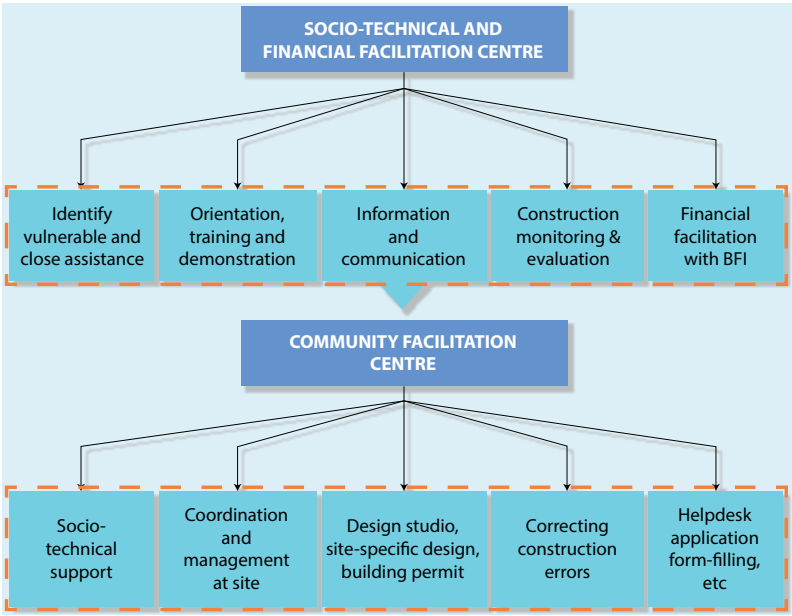


Figure 18. Components of a typical socio-technical and financial facilitation system.

When designing facilitation services, a number of factors should be considered, including the following: (For more details, see Figure 27, Annex B.6.)

1. Geographical scope of the disaster, the terrain, access roads and services including BFIs;
2. Number, location and profile of affected households, including vulnerable households -- education, income level, livelihood pattern, etc.;
3. Availability of materials and human resources (construction workers, engineers, subengineers, etc.);
4. Housing reconstruction standards and size of houses;
5. Availability of communication systems including traditional modes of communication;
6. Availability of field staff, preferably locals as they are aware of the local language, culture, context, etc.;
7. Training needs of the facilitation team on financial, social and technical aspects of the housing reconstruction programme, its procedures, guidelines and the roles of the various stakeholders;
8. Requirements for door-to-door facilitation, mobile clinics and free design campaigns;
9. Support for beneficiaries by preparing site-specific designs and arranging building permit documents in urban areas;
10. Resolving expected bottlenecks related to technical, social and administrative issues;
11. Special staff requirements, such as computer and software engineers;
12. Availability of office space and space to accommodate staff.

11.1.1 Facilitation centres

Facilitation centres for reconstruction should be planned and established after considering the administrative and logistic parameters, the distribution of communities and the inaccessibility of the area so as to be able to provide facilitation promptly. The team (engineers, architects, *Awas Nirman Sathis*, lead-masons, social facilitators, etc.) at facilitation centres can provide guidance to house owners about possible financial, social and technical solutions and liaise with the administration.

Facilitation centres may be combined with demonstration and exhibition centres as well as with local construction material retailers so that people can obtain advice on rebuilding their houses and purchase construction materials. Facilitation centres may also be used for delivering on-site training to construction workers.

11.1.2 Coordination with authorities, partners and BFI

Strong collaboration between local, national and international agencies, NGOs, development partners, the people affected and their communities is essential for a coordinated response. A well-designed coordination system with clearly defined job descriptions and a robust reporting structure avoids repetition, economizes scarce resources, reduces confusion and conflicts and enhances transparency, thus enabling housing reconstruction to be resilient, affordable and environmentally friendly. Regular discussion and collaboration with local government, district and central authorities, BFIs and partners are essential in order to accelerate reconstruction at different stages of the process.

Line ministries and local governments play very important roles in approving designs, easing the processing of land-related documents, strengthening material and human resource supply

chains, resolving land litigation, identifying the vulnerable and landless and formulating support mechanisms for them. Coordination between the technical support group and the people affected speeds up the on-site verification, inspection and certification of houses and the release of the tranche. Table 14, Annex B.7 (Areas of coordination in ODHR) outlines the basis for designing a robust facilitation mechanism to establish appropriate coordination between government authorities and other partners. The tasks identified may change depending on the local contexts.

11.1.3 Facilitating building permits

For reconstruction, repair and retrofitting, it is very important to obtain building permission from the appropriate authorities. A building permit facilitation team should be established to support building reconstruction in urban municipalities. The team may be composed of architects, structural and civil engineers and draftspersons. Services consist of a) preparation of structural and architectural drawings for submission, b) support for the affected family concerning the permit process, c) site visits and provision of drawings and advice for seismic retrofitting, modifications and extension of existing buildings. The building permit support team should provide such services free of charge or at a subsidized rate to prevent further economic hardship for the disaster-affected.

11.1.4 Communicating with communities: information and communications technology in facilitation

Successful facilitation depends on the ability of facilitators to communicate skilfully with the community. It is extremely important to select suitable facilitators and train them in the art of communicating, with the latest information and communication technology. An efficient communication system must be incorporated in the programme design so as to develop two-way communication between the programme facilitators and the beneficiaries, especially the vulnerable. The means and methods used in establishing and maintaining communication depend on factors such as the education level, sociocultural background, profession, and the urban or rural exposure of the disaster-affected people. Appropriate context-suitable tools can be used, such as satellite maps, tablets, mobile and web-based applications, photos and videos from cameras, mobile phones, or tablets, drones, etc. The use of walkie-talkies may be helpful where cellular phone services are not available. These materials can be reinforced with posters, flyers, brochures, handouts, street dramas, exhibitions, etc.

The communication system should be sensitive to people with disabilities, pregnant women, the elderly, etc. A good, socially appropriate communication system can reduce grievances and confusion.

11.2 Delivering facilitation at the household and community levels

Once the above four components that make up the basic structure of the facilitation system have been established, the focus should be on how to deliver facilitation services to the people affected. The following sections show how facilitation services can be delivered at a grassroots level. The three major components of facilitation delivery are: a) public information campaigns, b) financial, social and technical facilitation and c) construction management facilitation.

11.2.1 Public information campaign

Facilitation for reconstruction, repair and retrofitting under the housing recovery will be successful only if there is a demand for it, a demand that can be created by an extensive public information campaign right after the disaster. Use of information and communications technology would be highly beneficial in this regard. People need to be informed in simple language about the value added to their lives by taking advantage of facilitation. The campaign should focus on creating awareness of the advantages of BBB, their entitlement to a range of financial benefits as well as their responsibilities. This will help reduce trauma, fill in the information gap and assure the disaster-affected that they are being looked after. The information campaign will also help them prepare and plan for reconstruction. The campaign may include traditional means of mass communication systems or means such as street drama, radio, television and others.

UNDP carried out a public information campaign in the disaster-affected areas after the 2015 Nepal earthquake. Among the various means adopted for this purpose were billboards explaining the advantages of retrofitting over new construction.

11.2.2 Financial management facilitation

A lack of financial management at the household level can significantly impact the quality and progress of the reconstruction project. Many households may require assistance to access and manage the funds and cash-flow to increase their ability to pay their bills on time. The areas of assistance for financial management are as follows:

- House owners should be clearly informed that the government is providing financial assistance, not compensation, and what the consequences are of misuse of the financial grant.
- The release of tranches is linked to the progress of building construction.
- House owners should be linked with banking and other financial institutions and receive appropriate orientation on how processing and disbursement work.
- House owners will need facilitation on banking processes, including registration, access to loans, subsidies and grants. Coordinating with the assigned bank officials about the tranche status is crucial.

In a post-disaster situation, people without bankable assets, such as property connected by road and regular income to repay bank loans as required by financial regulations, are generally compelled to borrow money at higher interest rates from moneylenders if they cannot get funds from their friends and relatives. Timely access to government assistance would save such people from the poverty trap.

Households need assistance in accessing and managing their resources. For a timely release of the tranches, they should be assisted by verifying that the required documentation and administrative procedures have been properly completed. There is a need to raise householder awareness as regards available financial schemes from the government and other sources, access to vulnerability funds and revolving funds, any subsidized loan schemes, etc. It is very important to link house owners with local businesses so that construction materials can be procured on credit. In addition, help may be required so that they can find other means of paying the local business if tranches are delayed.

11.2.3 Social facilitation

In disaster-affected areas, especially in rural areas where the literacy level and exposure to the outside world are low, disaster-affected people often struggle with the complexities of simply submitting an application for assistance. The situation is worse for the poor and vulnerable. This may result in the exclusion of disaster-affected people from any assistance programmes. For this reason, facilitation should start very early on and can include the following components:

1. Providing necessary information concerning the rights and responsibilities of the affected populations, their entitlements and the process of submitting an application to access services;
2. Facilitating the acquisition by beneficiaries of lost certificates or new ones, including national identity cards, land registration certificates, utility bills and other documents required in order to apply for services;
3. Many disaster-affected people may not be aware of the process of submitting a formal application, and how to meet its requirements and other formalities, or they may be illiterate. They will need assistance for the application and follow-up process;
4. Facilitating the registration of beneficiaries with banks or other financial institutions;
5. Ensuring that any grant assistance for land is not used for any other purpose;
6. Facilitating land measurement, registration and communication with land registration authorities.

Social support: After a major disaster, people may need close assistance in order to complete reconstruction, repair and retrofitting work. They may need help organizing meetings to learn about their rights and responsibilities. Social support may be needed to organize construction materials and skills. The level of awareness and motivation for adopting appropriate designs and technologies may be enhanced by organizing exhibitions and demonstrations. Support may be needed for redressing grievances through participatory processes.

Facilitating vulnerable households: Identifying and verifying vulnerable households are the first steps towards inclusion and support so as to confirm that nobody will be left behind. The definition of vulnerable households varies from country to country. The requirements may be set by the government and identified through surveys and community consultations. Some of the possible attributes of the vulnerable may be based on: a) economic status, b) land tenure, c) ethnicity, d) gender, e) age and f) disabilities, chronic diseases, etc.

In housing reconstruction, vulnerable households require appropriate social support **(Box 34 and Box 35)**. This is an important issue in reconstruction and the implementation team needs to set up an appropriate mechanism for providing social support to the vulnerable population. The support mechanism may consist of:

1. Identifying their needs through separate meetings
2. Identifying their skills and resources and determining what additional support is required
3. Selecting their houses for technology demonstrations to reconstruct their homes early
4. Assisting the landless to access government support in acquiring land
5. Grouping the poor and vulnerable households to provide specific social, technical and financial facilitation
6. Ensuring facilitation is a collective effort of the local people, project teams, and voluntary contribution of construction materials, labour or cash
7. Advocating for and defending their rights related to land and housing
8. Accelerating inspection, certification and tranche release

Box 34. UNDP support to vulnerable households in Nepal.

Despite having appropriate criteria for the identification of vulnerable households after the 2015 Nepal earthquake, the disparities in terms of coverage and inclusion posed significant implementation challenges. The inclusion of local governments, community members and CBOs in the process helped to identify the vulnerable. UNDP helped over 2,500 vulnerable households through social mobilization and appropriate building technology to ensure that they would not be left behind

Box 35. Testimony, Nepal

Khil Bahadur, a visually-impaired, earthquake-affected person, was orphaned at an early age and did not have proof of his identity (a national identification card). The facilitation team helped Khil Bahadur to comply with all the formalities required for reconstructing his house. During the construction of his house, he said, "I cannot convey how eager I was, how happy those noises made me. Every day, it was like they were laying together my hopes, block by block, and I could not wait to see the final result."

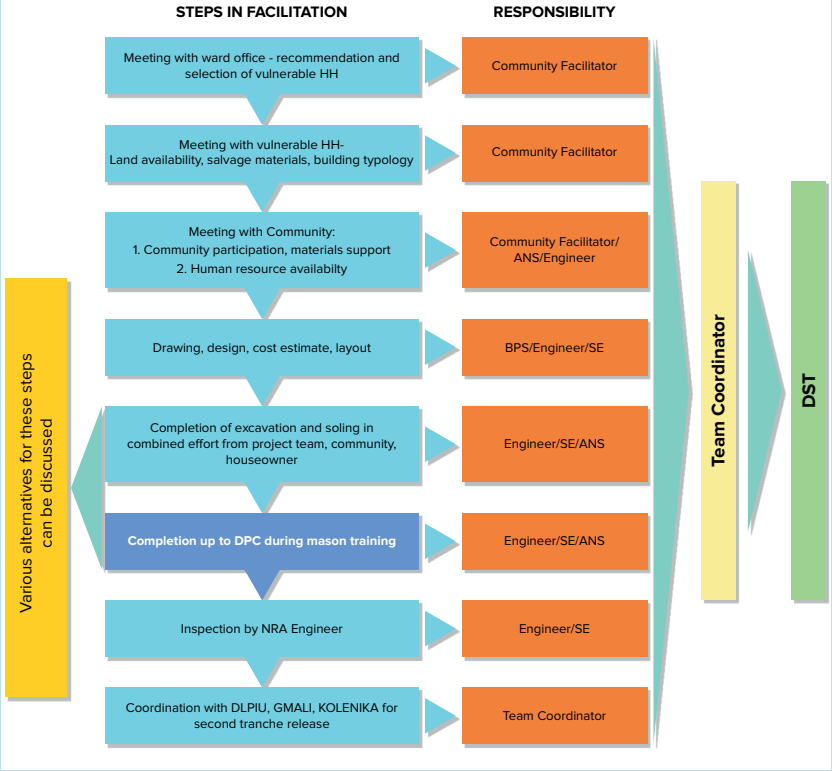
The house was a visually-impaired-friendly demonstration building. The required construction materials were managed through the local population and the UNDP district team's vigorous collective effort in calling on the community for voluntary contributions.

House of Khil Bahadur.
Source: UNDP, Nepal

Once the vulnerable households are identified, a support mechanism should start immediately to provide the necessary support, starting with damage assessment, memorandum of understanding signing and bank accounts right through to obtaining a certificate of completion. During the process, it is also necessary to provide them with the knowledge, skills and resources they need to reduce their vulnerabilities in the short and long terms. **Box 36** shows the framework for facilitating vulnerable beneficiaries in Nepal to carry out housing construction.

Box 36. Framework for facilitation to vulnerable beneficiaries for construction, Nepal

The chart lays out the facilitation framework for foundation construction and release of the second tranche to motivate vulnerable households.



For fast implementation of reconstruction and retrofitting, households need to coordinate with the municipality or authority engineers for timely inspections, certifications and tranche release, as well as for construction completion certificates (Figure 19)[18].

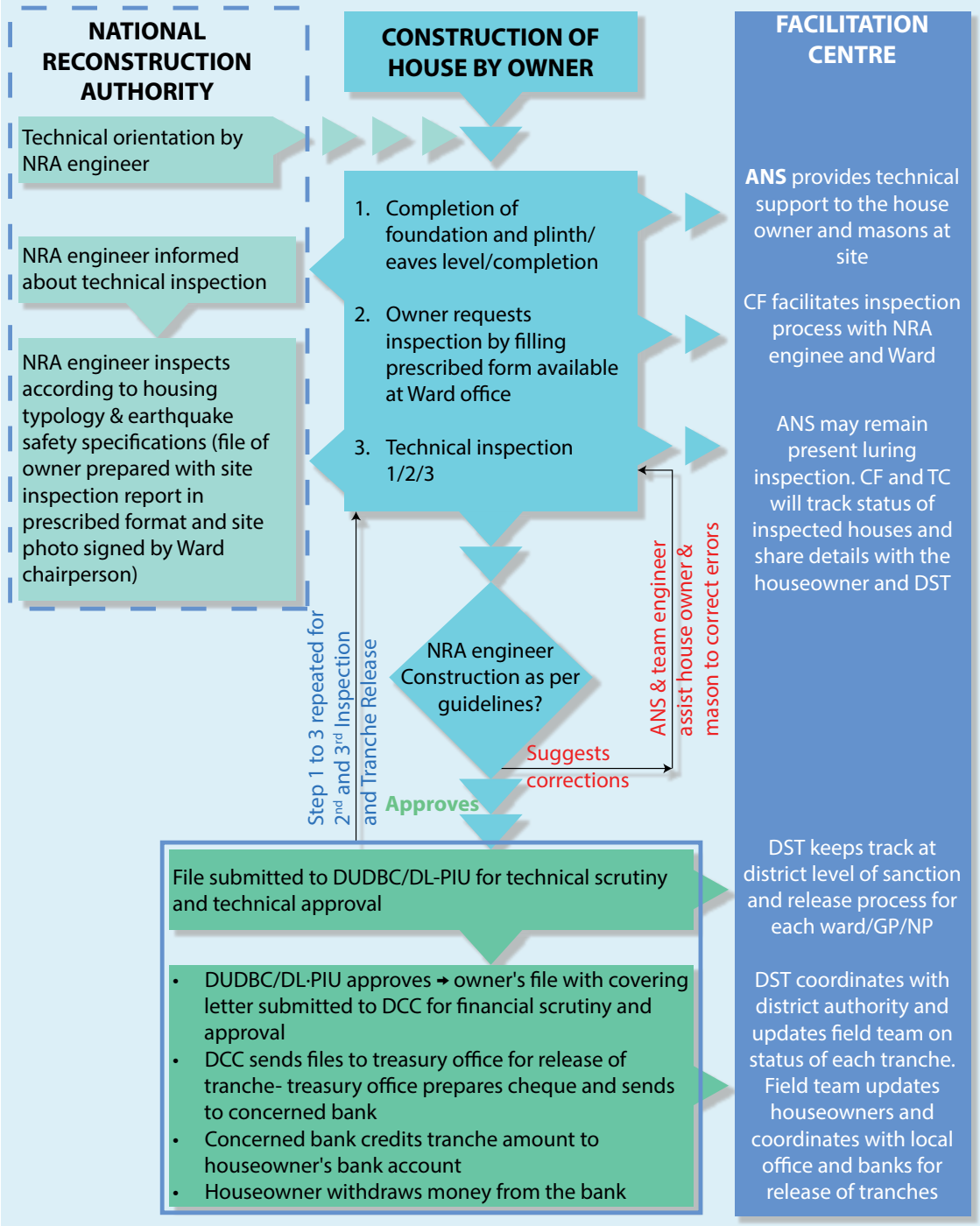
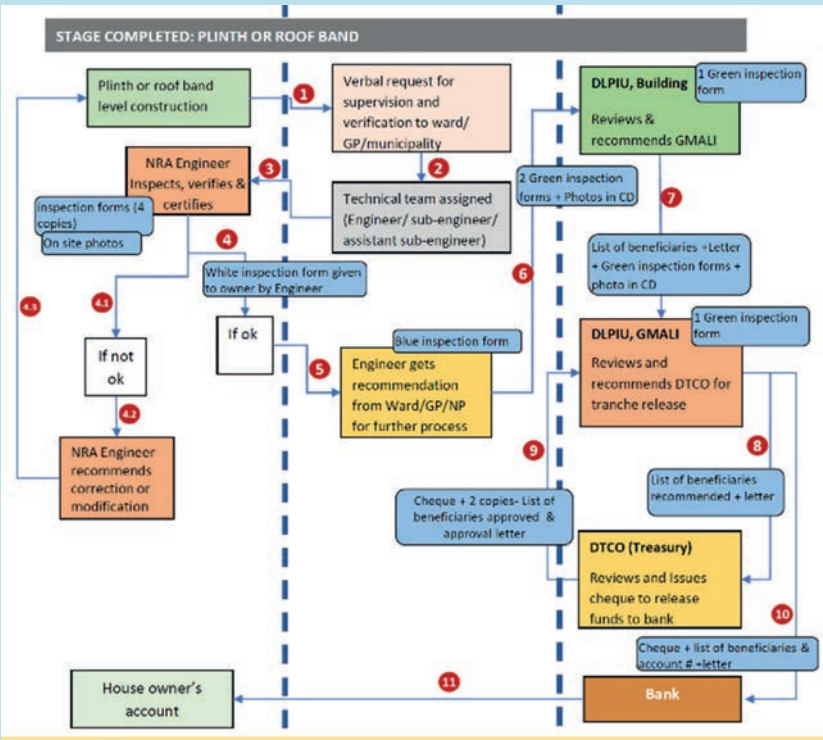


Figure 19. Process of inspection, authorization and release of tranches, a model followed by UNDP for housing reconstruction after the 2015 earthquake. See **Box 37** for the Government of Nepal's tranche release framework.

18 ANS: *Awas Nirman Sathi*, CF: Community Facilitator, TC: Team Coordinator, DST: District Support Team, NRA: National Reconstruction Authority, GP/NP: Rural and Urban municipalities, DUDBC: Department of Urban Development and Building Construction, DLPIU: District Level Project Implementation Unit, DCC: District Coordination Committee

Box 37. The Government of Nepal's tranche release framework

The United Nations Development Programme (UNDP) focused on providing necessary social and technical support in the areas indicated by numbered red circles.



11.2.4 Technical facilitation

Technical support to the population: Technical facilitation in post-disaster housing reconstruction is much more than mere technical support. It should be carried out in combination with social facilitation and facilitators must thus have both technical and social skills. Like social facilitation, technical facilitation also depends on the levels of education, literacy and awareness of the affected populations and the location of the affected area. Such facilitation should be provided by trained and skilled facilitation teams and trained construction workers. The capacity of the facilitation teams, support staff and craftspeople should be enhanced through orientation, skill refresher training and introduction to safer practices and construction methods (refer to Section 8: Training and capacity development). In a typical ODHR programme, the following support should be provided to house owners:

1. Make households aware of the technical norms, guidelines, safety features and different reconstruction schemes available and enable them to make decisions. Inform them regarding government norms and compliance requirements and liaise with the municipality for demolition, building permits, inspections and the construction completion certificate.
2. Advise the household in their selection of site, layout, design and affordable construction technologies by keeping them in the centre as the primary, well-informed decision makers in reconstruction or retrofitting. Explain disaster-resistant features and make it clear why they are an absolute must in reconstruction and/or retrofitting.
3. Provide them with information concerning the different options available for appropriate building solutions, such as new construction or repair and retrofitting, based on the extent of damage and the resources available. Help them in their selection of construction materials, including salvaging and recycling construction materials from damaged buildings and material procurement, construction monitoring and management. Prepare designs, drawings, bills of

quantities and building permit applications for submission and approval in urban municipal areas where building consent is required. Help to correct non-compliant construction. Special support to house owners is necessary in repair and retrofitting to ensure that BBB features are introduced in a cost-effective manner. Prior to the implementation of any retrofitting work, orient the house owners on repair and retrofitting **(Box 38)**.

Box 38. Orientation on repair and retrofitting of damaged buildings

Orientation of house owners on BBB and their buy-in are essential for improved building construction. The UNDP-facilitated programme on repair and retrofitting included the following discussion topics with house owners:

- Damage categorization
- The repair and retrofitting process and its implementation
- Socio-economic relevance of retrofitting traditional buildings

The discussions were followed by a demonstration of retrofitting damaged and non-compliant houses. The programme included the active participation of AWS, engineers, subengineers, the Community Facilitator and Team Coordinators.

Training and community meeting on retrofitting in Polungtar and Aarughat GP, Nepal
Source: Second annual report, UNDP Nepal, submitted to the Government of India

Correcting errors: In spite of the best efforts to build the capacities of construction workers, as well as monitoring and control during implementation, there may be occurrences of construction errors **(Box 39)**. Any building construction errors should be corrected to reduce the vulnerability of the building and improve its resilience, so that the building is compliant with the National Building Code. If any construction errors are identified during site inspection, the ANS and the team engineer should bring them to the notice of the house owner and help correct the errors. Corrections may also be communicated with the help of posters, pamphlets, etc.

Error correction is an expensive task and increases the cost of building. While it is desirable to correct all construction errors, it may not be feasible to do so for financial, social and technical reasons. The focus of correction should be on correcting critical errors that can significantly damage the structural performance of the building, and thus there is a need for a balance between what must be fixed and what can be accepted. The approach for correcting errors is as follows (Figure 20):

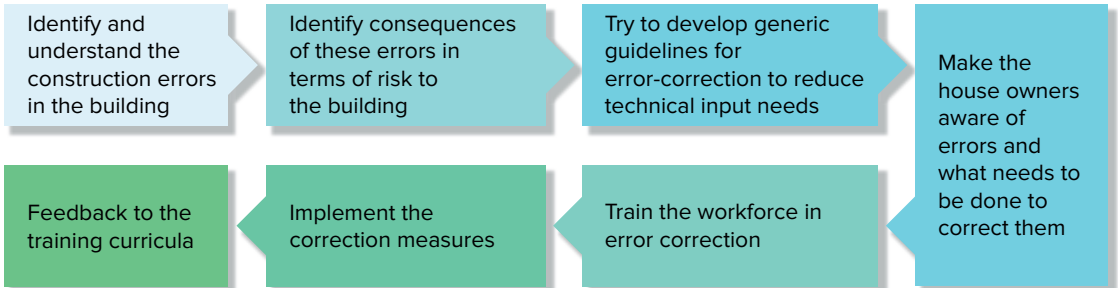


Figure 20. Construction error correction process.

Box 39. Addressing non-compliance issues, Nepal

Some of the common errors identified in masonry buildings during earthquake reconstruction in Nepal were:

1. Small spacing between openings or openings next to the room corner
2. Missing earthquake-resilient features
3. Vertical unbroken joints to masonry
4. Poorly constructed wall junctions
5. Discontinuity of bands (see photograph on the right)
6. Deficient connections between gable and eave band rebars
7. Poorly detailed rebars in the bands at junctions
8. Lack of sufficient splicing length of vertical rebars
9. Deficient cover to rebars.

A non-compliant building

An *Awas Nirman Sathi* (trained mobile mason) correcting a non-compliant building, earthquake reconstruction after the 2015 Nepal earthquake.
Source: UNDP, Nepal.

11.3 Construction management facilitation

Construction materials and the human resource supply chain: After a major disaster, the demand for construction materials increases significantly due to the large-scale housing reconstruction programme. As a result, the pre-disaster material supply chain cannot cope with the changed situation. This problem is further intensified by the demands on construction materials by other sectors, such as infrastructure, education, health, etc. Usually this results in price hikes, making reconstruction unaffordable. For this reason, there is a strong need for appropriate planning to organize construction materials at affordable prices. Sometimes it may be necessary to procure materials in bulk from nearby unaffected areas to reduce cost. Reconstruction can be supported by adopting local materials-based, cost-effective technologies. In some difficult terrains, it may be necessary to arrange for subsidized materials **(Box 40)**.

Box 40. Safer Construction Clinics-cum- Hardware Shops, Nepal

UNDP-facilitated Safer Construction Clinics-cum-Hardware Shops support the communities to build back better through the supply of subsidized construction materials and the promotion of cost-effective technology. The facility was run by a group of vulnerable community members identified through a consultative process. The facility also provided livelihood support to the vulnerable households who were trained to operate the clinics as small-scale enterprises.

Unfortunately, due to various conflicting issues, the facilities did not function. However, the experience provided an opportunity to further explore the feasibility of establishing centres for purchasing materials, obtaining expert advice and physical model demonstrations.

Source: UNDP, Nepal

The number of construction workers in a society depends on the rate of new housing construction and the repair of existing houses. The sudden change in demand patterns due to a disaster disrupts the supply chain of construction workers. Unlike construction materials, it is difficult to acquire adequately skilled workers at short notice. This issue can be addressed in part by conducting short, intensive training programmes for semi-skilled construction workers to enable them to become skilled masons. Similar training programmes may also be designed for social and financial facilitators and other field-level staff. Training is also required for engineers and technicians to orient them as regards the technologies proposed for housing reconstruction and meet reconstruction demands (refer to Section 8 for more details).

All stages in the supply chain, from the import and large or small scale manufacture of construction materials to their delivery at the site, need to be enhanced to cope with the increased demand for construction materials. Quantities will also depend on the need for specific construction materials (such as CGI sheets, bricks, steel, cement, timber, etc.) at different stages of construction and the potential schedule of tranche release. The following steps could be taken to enhance the efficiency of the construction materials supply chain (Figure 21):

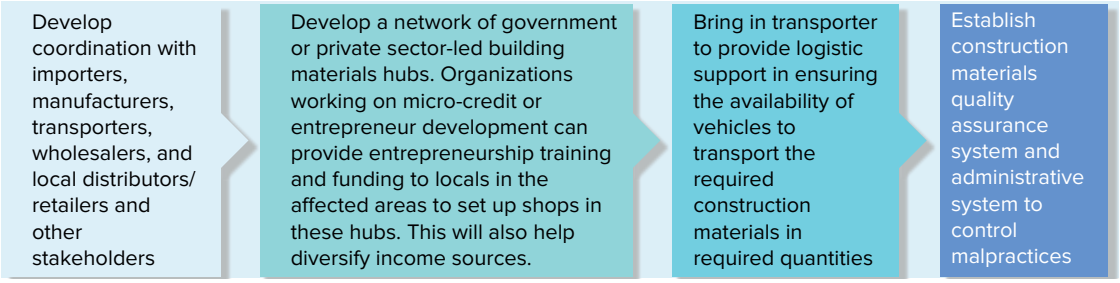


Figure 21. Process of enhancing the efficiency of the construction materials supply chain

Construction monitoring and evaluation: Periodic quality evaluation and monitoring of reconstruction work at different stages helps to ensure quality, identifying noncompliance issues and taking immediate and timely remedial measures for BBB. Some households may require frequent construction monitoring, evaluation and support to minimize construction errors. This process involves:

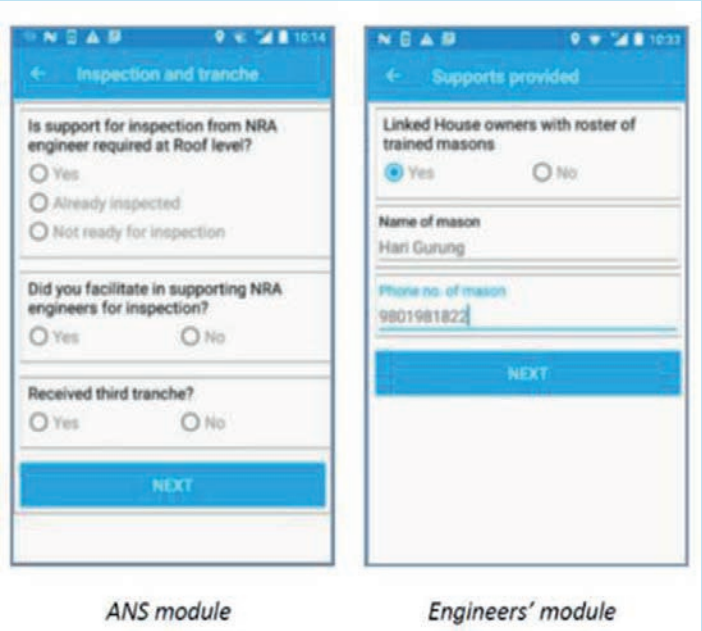
1. Tracking the reconstruction status and progress of each household through:
   a. Regular inspections focusing on the quality of workmanship and materials to ensure technical compliance
   b. Filling out inspection forms, checklists and photographic documentation
   c. Surveys and telephone interviews
   d. Consulting craftspeople and house owners regarding quality and progress
   e. Real-time web-based and mobile-based applications with pictures and geo-tagging system **(Box 41)**

2. Identifying stopped and non-started cases, material availability and associated issues
3. Identifying non-compliant construction and finding solutions
4. Making recommendations on achieving reconstruction quality based on observations
5. Establishing query and feedback mechanisms for house owners
6. Conducting satisfaction surveys and preparing testimonials
7. Assisting inspections and certification by authorities
8. Verifying reconstruction through third-party auditing

Box 41. Mobile-based application module of the Reconstruction Information Management System in Nepal

A mobile-based data-collection system was developed for the field-based staff to track housing reconstruction progress after the 2015 Nepal earthquake. It captured the socio-technical and other supports provided to the house owners in real time. The system was developed in both Nepali and English. The application was user-friendly and had the following features:

1. Real-time reporting by all field staff, with pictures and geo-tagging system
2. Paperless recording and reporting with a secure data backup system
3. Two-way communication mechanism, connecting the ground team with the remotely stationed experts
4. Automated data analytics to derive intelligent data
5. Ensuring compliance with provisions on different building typologies
6. Retrieval of the reconstruction information for individual beneficiaries and the support provided.



A snapshot of the mobile-based application module of the Reconstruction Information Management System (RIMS). Source: GOI NHRP second annual report.
UNDP used mobile-based Reconstruction Information Management System (RIMS) extensively to update reconstruction data and track real-time progress.

12 Complexities of urban housing

It has been recognized that due to increases in the extent of urban areas, people have become more exposed to the negative impacts of disasters. Housing reconstruction in those areas may be highly challenging after a disaster because of the high population density, varied building typologies **(Box 42, Photo-1)** and infrastructure built without resilience. Reconstruction will require coordination between the government, civil society, affected people, utility companies, NGOs and INGOs, multisectoral professional teams and extensive capital intervention to adopt and implement risk-informed development planning. Moreover, urban housing reconstruction is complex because of more extensive regulatory and planning requirements than in rural areas. Professional bodies, with their expertise in urban land-use planning, infrastructure, cultural heritage, communication, as well as commercial and civil society organizations can play vital roles in enabling housing reconstruction. This section is a brief reflection on the complexities of urban housing reconstruction after a disaster.

Box 42. Difference between rural and urban building typology

The term "urban areas" does not necessarily mean an area defined by the government as an "urban municipality area". Many of the settlements in urban municipalities may have a rural character from a building typology, size and functional perspective. However, in many countries, the fundamental difference between rural and urban housing is that urban municipalities require building consent for a) constructing a building, b) any significant change to an existing building, and c) change in the use of an existing building. **Generally, urban housing typologies vary widely, making post-disaster housing reconstruction complex.**

12.1 Complexities

As mentioned in Section 1.4, post-disaster reconstruction in large urban centres is outside the scope of this Handbook. ODHR may not be feasible for high-density and multi-household unit buildings such as apartment buildings. Table 15, Annex B.8 outlines the complexities of urban areas in the context of ODHR[19] **(Box 43)**. The following is a brief reflection on the different aspects of post-disaster housing reconstruction in urban areas.

The reconstruction of urban housing requires a comprehensive urban policy to tackle complexities that are very different from those encountered in rural areas. Resolving land tenure issues can be a lengthy legal process, which may be complicated further when the buildings are shared, owned or rented, formally or informally. Unsettled disputes between owners of multi-tenancy buildings may be difficult to resolve in a short time. Much of the slum housing in urban areas may be located in high-risk zones. Slum inhabitants may not have legal rights over the land they occupy.

Urban communities generally lack cohesion, owing to their diverse income levels and living standards. A heterogeneous group of people with complex social interrelationships is likely to give rise to conflicts. The buildings in urban areas are usually large and more elaborate, requiring extensive capital intervention. High costs may be a constraint, impeding the start or completion of reconstruction

19 Adapted from Stephenson (2020), Shrestha, et al. (2020), Davis (2015), Jha, et al. (2010), Sangachhe & Shrestha (2020).

In historic settlements, heritage and conservation rules may apply to reconstruction and these can be expensive to implement. Though urban centres may be accessible by motorable roads, narrow lanes make many parts of the centres difficult to access. After a disaster, debris from the collapsed or damaged buildings may block roads and make access to emergency services and transportation of construction materials difficult and expensive. One very crucial issue in urban areas is that post-disaster urban reconstruction is still the least studied and understood area of housing reconstruction.

Photo 1. A street in Kathmandu, Nepal, with mixed type buildings. Old urban centres are usually difficult to access and expensive to build in Source: UNDP.

Box 43. Complexity of urban housing reconstruction

Housing reconstruction in urban areas is usually complex and involving. Urban areas comprise complex building types and diverse socioeconomic and cultural situations. The situation in old urban centres may be further exacerbated by narrow lanes which are not accessible to motor vehicles. House owners may not be able to pool costs at the time of reconstruction and may have land issues that take time to resolve.

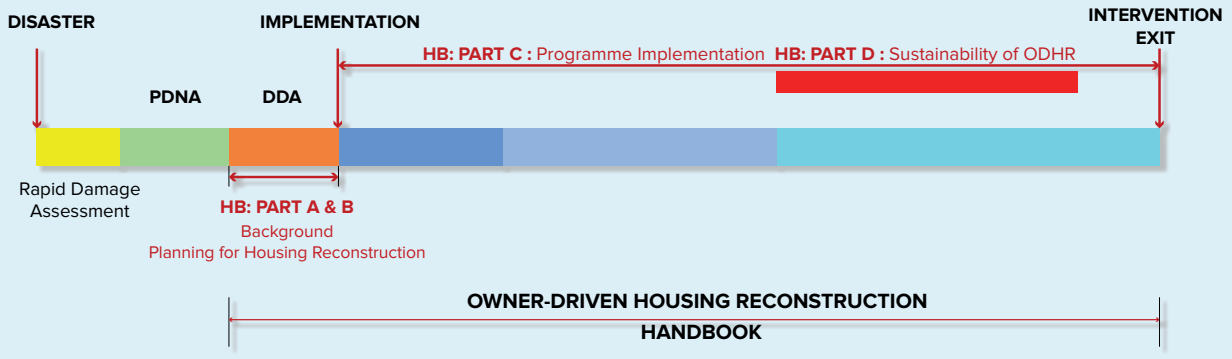
12.2 Finding solutions

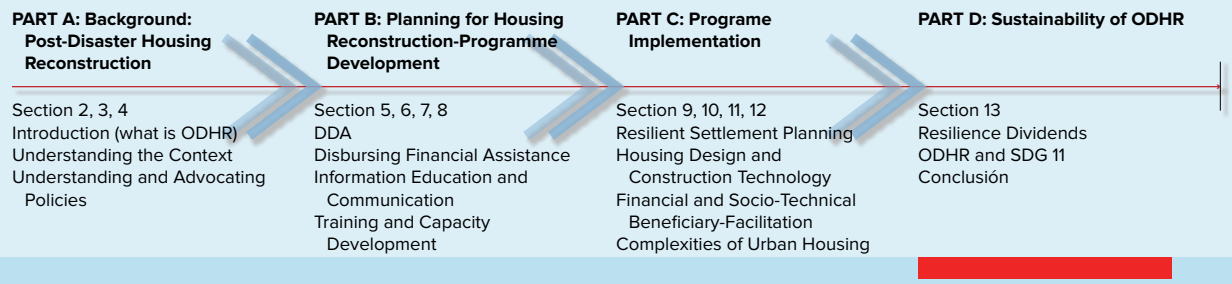
Specific strategies are needed to address the complexities involved in the reconstruction of urban housing. Some of the possible solutions to support urban housing reconstruction are outlined in Table 6: Urban issues and solutions. Each urban centre will require context-specific intervention in post-disaster housing reconstruction and involve multidisciplinary experts.

Table 6. Urban issues and solutions

Issue	Possible solution
Legislation and governance	● Legal instruments dedicated to urban reconstruction must be put in place as soon as possible after the disaster ● Clearly defined policies ● Faster building consent processing, including special discounts on building consent fees
Land	● Formation of a "Land Reconciliation Forum" for fast-tracked resolution of land issues
Coordination	● Coordinate regularly between the various stakeholders such as the disaster-affected population, building owners, utility companies, expert groups and special interest groups
Finance	● Provide loans from banks and other financial institutions at subsidized rates and with easy terms and conditions ● Provide special financial assistance packages for the urban poor
Expertise	● Pool local expertise supported by international experts
Conserve the architecture of old urban cores	● Provide specific schemes, such as reduced property taxes to motivate building to move to reconstruction
Time frame	● Provide a longer time frame for reconstruction, typically ten years

Part D. Sustainability of ODHR





13 Sustainability of ODHR

The post-disaster housing reconstruction process establishes a system with high-quality human resources, community partnership, empowerment, policy reforms or strengthening, innovations in technologies and design, in addition to many other components. At the end of the whole cycle of reconstruction, there is an opportunity to evaluate what worked and what did not, and learn lessons. The capacities developed in all aspects of the reconstruction process may be utilized for more effective and efficient reconstruction during any future disasters. Large-scale intervention over a sustained period also leads to inculcating and mainstreaming a culture of safety in the community and, ultimately, to sustainable DRR. The resilient housing developed and the creation of settlements with services may provide a wide range of designs and technologies that could save millions of lives. A good number of highly skilled human resources will continue to be available and will help to make the built environment resilient.

13.1 Resilience dividends

A resilience dividend may be defined as the net cost or benefit that accrues from investments aiming at increasing resilience in a given context, in the absence of a disaster on the planning horizon. In essence, it is the notion that investments in long-term resilience may yield short-term economic, social and cultural benefits as well. ODHR reconstruction should view resilience as a holistic approach towards facing all kinds of hazards in the future and recovering after any disaster in the shortest time possible. It is not just about creating safe buildings or habitats, it is about bringing about a change in the lifestyles of all of the stakeholders: the population, administrators, teachers, students, engineers, architects, masons, etc. Every conscious effort would then result holistically in a resilient built environment. One of the immediate benefits of investing in resilience in reconstruction is improved quality of life for a large number of people. For example, the UNDP-managed reconstruction investment in 0.124 million people (26,912 x 4.6/household[20]) in Nepal raised their standard of living above its pre-disaster level. The other short-term benefits for the whole population in the affected districts would be an aesthetically pleasing and efficient community infrastructure, ease of access and a reduction in vector-borne diseases.

Generally, the investment in awareness and capacity-building is very low compared to the cost of reconstruction. For example, the total cost of housing recovery after the flood-related disaster in Maharashtra (UNDP, India) was USD 237 million for repair or retrofitting and the rebuilding of 79,876 houses and cattle-sheds. To support reconstruction, 2,400 masons, carpenters, plumbers and electricians were trained in resilient construction and retrofitting. The cost of training was USD 4.4 million (3% of the cost of recovery[21]). The 2,400 trained workers, after completing housing reconstruction in the two affected districts of Maharashtra, will continue to construct hundreds of safe buildings in the future, well beyond the reconstruction programme. In addition, the 79,876 fully resilient and renewed buildings constructed under the reconstruction programme will stand as examples of what makes buildings resilient. These examples will encourage people to opt for such houses and habitats, thus increasing the demand-driven request for sustainable housing.

20 Annual Household Survey 2015_16_Major findings.pdf – p. 4

21 Vatsya, Das, Valvekar and Kumar, Maharashtra Floods Recovery Report, October 2019, UNDP Recovery Mission.

13.2 ODHR and Sustainable Development Goal 11

One very important issue in ODHR is how much return on investment it may have in terms of both monetized and non-monetized benefits to society. The above section on the resilience dividend indicates that ODHR is sustainable thanks to its post-intervention spin offs and its positive impacts for many years beyond the intervention period.

The UNDP-managed reconstruction of 26,912 houses in Nepal has generated useful experience, knowledge and tools to prepare reconstruction processes both in Nepal and in other countries. The advantage for socio-economically and culturally similar neighbouring countries is that they can use this experience with minor contextual modifications. The ODHR approach to post-disaster housing and settlement reconstruction in Nepal after the 2015 earthquake has contributed significantly to Sustainable Development Goal 11 as is evident in Table 7.

Table 7. Sustainability assessment of ODHR, based on selected SDG 11 goals

	SDG goal	How ODHR in Nepal contributed to SDG 11
11.1	By 2030, ensure access for all to adequate, safe and affordable housing and basic services, and upgrade slums	Resilient reconstruction, repair and retrofitting of 26,912 damaged or destroyed houses, now providing safe homes for earthquake-affected households in the Gorkha district, thus creating a favourable environment for housing for all in Nepal
11.3	By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	The entire ODHR approach was based on a participatory process for reconstruction, repair, retrofitting and settlement or resettlement planning in Nepal
11.4	Strengthen efforts to protect and safeguard the world's cultural and natural heritage	ODHR Nepal made the conservation of traditional construction practices, local culture, heritage and architecture a high priority
11.5	By 2030, significantly reduce the number of deaths and the number of people affected, and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations	The 26,912 resilient houses with services are now ready to face future hazards in Nepal and will ensure the safety of the occupants and prevent loss of life
11.6	By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	Use of environmentally friendly green technologies based on local materials in the construction or retrofitting of 26,912 houses has significantly reduced the carbon foot print and depletion of non-renewable resources
11.8	Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	ODHR in Nepal has set up a high-capacity institutional system comprising government, civil society and the population, creating an environment conducive to resilient development planning in the future

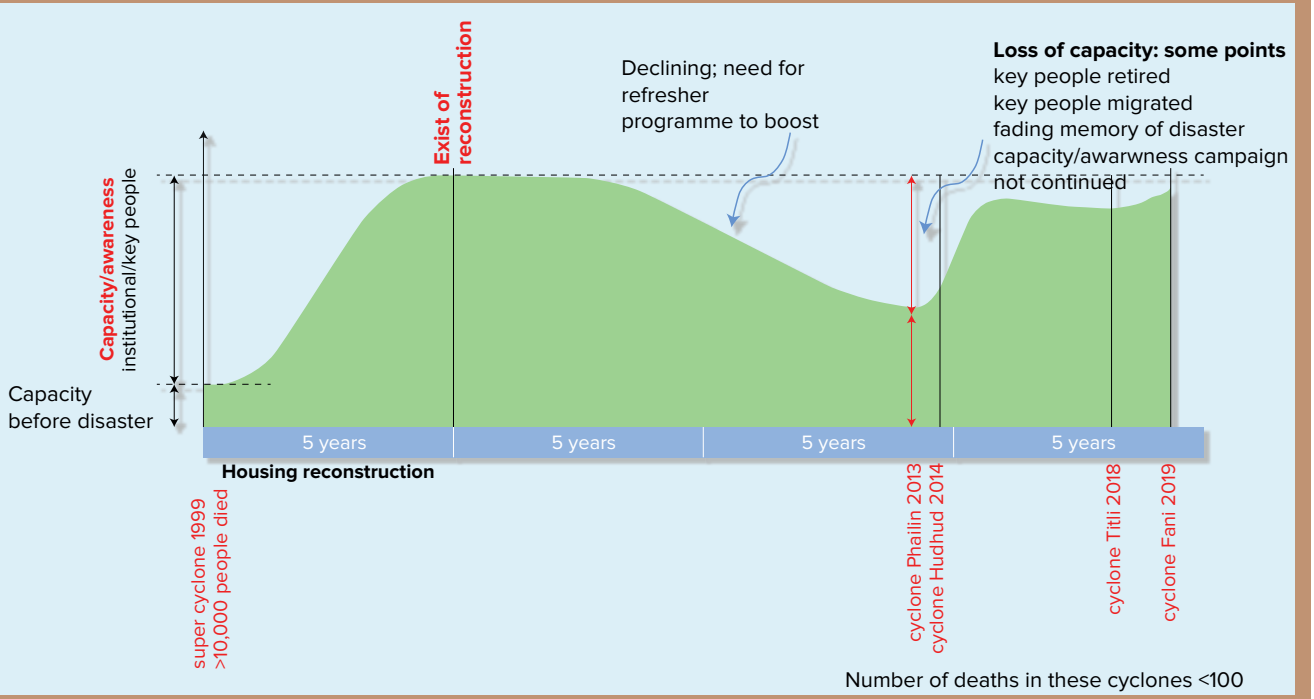
	SDG goal	How ODHR in Nepal contributed to SDG 11
11.9	By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels	The experience of housing and settlement reconstruction in Nepal will help the country to upscale the use of green materials and technologies, carry out appropriate settlement planning and mitigate detrimental impact on climate, leading to disaster risk reduction
11.10	Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials	A large body of highly skilled human resources has been developed in Nepal which could be a great resource for neighbouring countries. The programme has demonstrated the efficient use of local materials in resilient construction

13.3 Conclusion

The UNDP experience in facilitating the post-earthquake housing reconstruction programme suggests that the most valuable contribution by ODHR in Nepal has been the human resources developed in the programme. One of the prime indicators of the sustainability of reconstruction interventions will be how long the capacitated staff maintain their knowledge, memories and experiences over time **(Box 44)**. One of the issues encountered during efforts to sustain acquired knowledge is that after completing the reconstruction process, the trained human resources tend to disperse to various other fields in search of employment and a livelihood, which leads to the loss of the knowledge and expertise gained. When key people are unavailable, a considerable amount of data, learning and institutional memories is also lost. In addition, their potential to inform and influence change processes within organizations is also lost. It is thus essential to reinforce their collective experience and their professional and personal networks. This will impact their potential to play roles in the future and motivate them to sustain their interest in disaster risk reduction and management (Stephenson, 2020). In addition, developing a repository of human memory will ensure that it is available in the future. Some of the capacitated staff from the various sectors involved in reconstruction work could be deployed in the institutions associated with DRR and DRM. This would strengthen institutional memory. The benefits are numerous. For example, a policymaker with strong field experience gained during the previous disaster would be able to make informed decisions and deliver far more efficiently than a counterpart without such experience.

Box 44. Pattern of capacity and awareness over time: UNDP, Odisha

The following figure shows how the awareness and capacity developed during housing reconstruction after the 1999 super cyclone in Odisha (an Indian state) changed over a period of 20 years. It is based on UNDP experience supporting Odisha since the super cyclone in 1999, followed by Phailin (2013), Hudhud (2014), Titli (2018), Fani (2019) and Amphan (2020).



Pattern of awareness and capacity developed in post-disaster housing reconstruction over time. (Based on UNDP's active role in housing reconstruction, Odisha super cyclone, October 1999)

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Annex A. UNDP-facilitated ODHR, Nepal: Highlights

Women's empowerment, skill development and income generation, ODHR, Nepal

Recognizing the traditional ties, the project trained 1,600 masons employed by the owners on their own sites. With increasing number of men leaving villages in search of better opportunities, more women were trained as masons. Samjhana Sunar (photo-left), a trained mason was happy that more women were taking up masonry, a traditional domain of men. "Initially it was quite hard to grasp the technicalities of masonry, but slowly with practice, I learned new things through the training. The support of my family and my community has also encouraged me to continue this work," she said. Photo source: UNDP

Reaching the most vulnerable: The UNDP-facilitated ODHR in Nepal after the 2015 earthquake aimed to ensure that "no one is left out"

The project facilitated community consultations and surveys to identify those who needed special support like persons with disabilities, single mothers, elderly, or orphaned. These consultations led to communities supporting over 4,000 households to ensure that no one was left behind. Bishnu Maya Sarki, 70, said "I lived alone before the earthquake and when my house collapsed, I had no means of rebuilding it myself. The project mobilized support from my community who provided salvaged materials, labour contribution and oversaw reconstruction of my house. Photo source: UNDP

Owner-driven housing reconstruction: participatory, people-centric, high quality construction, economical and empowering

Owner-driven reconstruction approach places the responsibility of rebuilding on the homeowners and communities. It increases ownership, reduces cost and leads to high quality construction (with the help of the facilitators). Considering this, UNDP, with support from the Government of India, launched the Nepal Housing Reconstruction Project in March 2018 to help the house owners rebuild in Gorkha, the epicentre of the earthquake. Samjhana Sunar (photo-right) rebuilt her house and others in her community. Photo source: UNDP

Safety for all: Build Back Better and DRR were achieved with the help of financial, socio-technical facilitation support at the door steps of the beneficiaries

The National Reconstruction Authority deployed 27 additional engineers to the14 most-affected districts of Nepal to remove technical hurdles in the reconstruction. Addressing the engineers before their deployment, CEO Govind Raj Pokharel called on them to find innovative solutions in resolving technical issues that had delayed progress in housing reconstruction and subsequent disbursement of second and third instalments of the housing grants. "Within the parameters of the legal provision, I call you to provide innovative solutions," said Pokharel. This group of engineers was hired by the United Nations Development Programme (UNDP) for the NRA.

Source: Nepal's National Reconstruction Authority: http://nra.gov.np/news/details/236

Promotion and conservation: UNDP strongly promoted traditional construction based on local culture, local architecture, local materials and labour. The programme encouraged the use of affordable green design and technologies, which were cost-effective, income-generating, low embodied energy and CO2 emission intensive and above all, thermally comfortable.

Conservation: traditional construction that grew out of the local culture, materials, labour, etc were encouraged in the ODHR, Nepal. Because of the use of tradition-based time-tested designs with local materials and methods, the houses were thermally comfortable, affordable and led to enhanced income generation. It also made the reconstructed houses low embodied energy and low Carbon emission intensive. By adopting modern techniques, the houses were made more resilient than before.

"I did not want to drown myself in debt, so I decided to build with traditional technology using local and salvaged materials. You don't need to use new, more expensive technologies as you can find ways to make traditional methods safer. But to do this, you need the right guidance at the right time, which is why I am grateful for the support given by the mobile masons and engineers from the Nepal Housing Reconstruction Project," says Sukdev Sarki.

Communication: Reaching the affected people to involve them in the ODHR programme

Communication played a very important role to make the affected people aware of their rights and the responsibilities in ODHR, Nepal. Mobile vans, equipped with video and communication materials traversed to the remote areas to disseminate information to home owners on safer construction technologies and how to get government grants (photo-left: source UNDP). Street drama (photo-right, source: Jitendra K Bothara) was also found to be effective for communicating with the people about recovery under the post-earthquake housing recovery programme facilitated by UNDP.

Annex B. List of Tables and Figures: Handbook Parts A, B and C

Part A

The following Figures and Tables should be read in conjunction with their respective sections of Part A of the Handbook.

Table 8. Annex B.1 Principles of ODHR (Section 2.4)

Approach	Definition	Expected outputs
Adherence to core principles ● Humanitarianism– focus on the vulnerable ● Equity ● Neutrality and social justice	The ODRH process contributes to promoting human welfare, impartiality and justice in terms of the distribution of support, economic opportunities and privileges within a society.	It leads to impartiality and safety for all. Nobody is left behind in the housing reconstruction process. It reduces the frequency and magnitude of grievances and conflicts.
Participatory approach ● People-centricity ● Inclusiveness ● Equality[1] ● Cross-cutting issues[2] ● Empowerment ● Encouragement and support	The people and their communities should be at the centre of this process. House owners, their family members and the vulnerable community should be empowered to participate in the decision-making process.	Communities recognize the importance of safe construction practices, identify and prioritize their needs, make collaborative decisions and plan for the community's recovery. The needs of the vulnerable are prioritized.
Safety for all ● Build Back Better (BBB) ● DRR ● Sustainability ● Resilience ● Risk-informed planning ● Settlement and WASH	Disaster risk reduction measures should be an integral part of the process. The communities should be informed, trained and educated regarding multi-hazard resistance construction and settlement planning.	Both will reduce their vulnerability (settlement, habitat, economy, and livelihood) to the impacts of current and future disasters.
In situ reconstruction	Returning to the original place of residence is always desirable as the relocation site may lack economic opportunities and basic requirements. However, relocation in whole or in part may be unavoidable after a major disaster.	In situ reconstruction avoids both the ordeal of developing new sites for settlement and possible conflicts between the new arrivals and the existing communities.
Economic opportunities ● Employment ● Livelihood ● Entrepreneurship ● Technology	The process must develop an environment conducive to technological advancement and income-generating opportunities.	The socioeconomic and technological necessities of the community are secured.

Approach	Definition	Expected outputs
Promotion and conservation ● Traditional construction ● Local culture and tradition ● Local architecture ● Local materials and labour	Locally available resources often provide more sustainable, eco-friendly solutions. A balance between traditional and modern construction technologies should be sought to conserve the local culture and architecture.	The community recognizes their importance and undertakes construction employing locally available resources for long-term sustainability.
Advocacy ● Vulnerabilities ● Human dignity[3] ● Diversity[4] ● Special needs ● Equality[1] ● Building codes ● Land regulations ● Urban and rural issues	The process should advocate for reconstruction policies that address and prioritize the vulnerable, the elderly, orphan children, female-headed households, the landless and persons with disabilities. Moreover, advocacy should support policies that enhance household resilience and strengthen the community.	Advocacy should lead to the impartial and transparent selection of programme beneficiaries. It may also result in the revision and improvement of building codes, standards, land policies and regulations for rural and urban areas.
Sociotechnical-facilitated reconstruction ● Training and orientations ● Engineering solutions ● Building design ● Construction monitoring and inspection ● Guidelines	This process should prioritize ensuring that the house and infrastructure are of good quality and meet the established regulations. It must ensure frequent construction quality monitoring and inspection by qualified persons at all stages of reconstruction.	Communities will be equipped with the knowledge and skills needed to manage and carry out reconstruction effectively after future disasters.
Financial facilitation ● Grants ● Loans ● Affordability	The process must enable the most efficient means of disbursing financial assistance to be selected. It should also monitor and adjust to variations in the costs of materials and labour as well as transport availability and affordability.	This will prevent any undue scarcity of resources needed for timely reconstruction.

Notes:

1. Equality is based on race, colour, nationality, ideology, gender, ethnicity, age, language, religion, abilities and wealth.
2. Cross-cutting issues include livelihood, gender, environment, dignity, safety for all, and persons with disabilities.
3. Human dignity means that all humans deserve respect regardless of their race, gender, religion, wealth, abilities or additional factors other than merely being a human.
4. Diversity is the practice of including people from different races, colours, gender and social-cultural, economic and geographical backgrounds.

Table 9. Annex B.2 Attributes for understanding communities (Section 3.2)

Attributes	Significance
Native language and communication barriers	Language barriers may be a challenge for communication in localities where only native languages are spoken. In many native communities, male members may speak the national language while children and women may only speak their native language.
Socio-culture includes ethnicity, religion, caste, social cohesion, ethnic dynamics and social stratification.	In many communities, the intermixing of various ethnic groups or castes is still not practiced. It may cause problems in the neighbourhood and impede social interaction. Moreover, due to underlying prejudices between cultures, people are unlikely to work together. In many communities, professions may be based on caste or ethnicity.
A single culture or a mixture of cultures, homogeneous or heterogeneous neighbourhoods and their relationship, social interaction	
Economy, income level as related to expenses, house prices	The economic position of a household plays a crucial role in determining the affordability of a house. For this reason, it is important to know what the household income and savings are as a factor in the reconstruction cost of a building.
The power structure in communities and dominant classes or ethnic groups	The community power structure is the distribution or control of power or authority by a particular group or person. It may be based on caste, ethnicity, wealth, land ownership, the numerical strength of a specific ethnicity and positions occupied.
Community leadership structure and its potential role in the delivery of services and housing recovery	Community leaders are perceived to represent a community and act as a point of liaison between the community and outsiders. They do not necessarily possess legal or administrative power, although the community may have elected them following a traditional election system. In traditional societies, they can play a significant role in housing recovery.
Presence of a social transaction system and self-help schemes such as a barter system, "*arma-perma*"[22], "*pokma*"[23], "*guthi*"[24], or similar	Social transaction systems play a major role in the day-to-day functioning of a community without involving the use of cash. These systems may allow local people or groups to use their skills to help and support each other in the housing recovery process.
Support system in the community	It includes the assistance and services (work and income support, protection and advocacy, recreation, housing, mobility, and health care) provided by family members, friends, neighbours, ethnic groups, and other community organizations or clubs such as youth groups or clubs, mothers' club and *"guthi"*. This support system provides social cohesion.
Social cohesion	Social cohesion refers to characteristics (often, shared beliefs, social values, and norms) that bond a group or a community together and function as a unit. In societies with a high social cohesion level, people are likely to support each other for day-to-day activities.

22 means voluntary labour sharing in Nepali

23 *Pokma* has a meaning similar to *arma perma*.

24 *Guthi* is a traditional socio-cultural institution in Nepali society.

Attributes	Significance
Society's attitude towards vulnerable groups such as female-headed households, children, orphans, the landless, persons with disabilities, the youth and the elderly	Understanding this attribute is important for designing facilitation programme for the vulnerable.
The cycle of activities – farming seasons or migration seasons – that are essential for livelihood, etc.	In agrarian communities, farming seasons and seasonal migration play an important role in the workforce available for reconstruction.
The level of awareness of the disaster-affected people as regards their rights, entitlements and responsibilities	To design an effective facilitation programme, it is essential to understand the level of facilitation that will be required.
Enabling conditions for Community-Driven Housing Reconstruction (CDHR)	Usually, natives and indigenous groups have a much higher level of community affiliation and intercommunity support system. In such communities, CDHR would be feasible.

Table 10. Annex B.3. Understanding current settlement pattern (Section 3.4)

Attribute	Significance
The number of households to be affected.	Important for designing the size of the programme, budgeting and allocating of resources.
Current location and layout of the settlement, and reasons the settlement was laid out in its current form The layout of the circulation system, its streets and trails; the hierarchy of streets and their relationship to places of congregation; spaces and their underlying logic Land-use pattern	To understand the factors that underlay the choice of the particular location and layout of the original settlement and that will need to be taken into account if reclustering is necessary. Defining parameters for the location of the settlement, such as elevated sites to avoid the risk of flooding, sites that would escape hazards such as landslides, rockslides and liquefaction, and lands that are forbidden for housing, such as community forests. For social cohesion, congregating places are essential. These are places where people can meet and interact, children can play and the community can hold social or religious events.
Interrelationship of the settlement with sources of livelihood such as agriculture, animal husbandry, fruit farming, remittances or commerce	To be able to maintain the same relationship in future reclustering, and in planning infrastructure.
Trades and professions of people in the community and sources of livelihood	To understand the relation of the settlement to its economic and social development activities. Most settlements are multifunctional. The settlement location and clustering are influenced by its inhabitants' trades and professions, livelihoods, culture and religion.
Existing infrastructure and its interlinkage with a subregional and regional networks	• To decide how the existing infrastructure could best be utilized in the revised plan. • To create new opportunities through the development of linkages with regional and subregional infrastructure.
Places of religious and cultural significance include places of worship and veneration of ancestors, sacred places, graveyards and funerary rituals	Important for maintaining good relationships among the members of the re-clustered community and respecting their places of religious and cultural significance.

Attribute	Significance
Direction of wind and sun, shady areas, average and extreme temperatures	For thermal comfort and liveability.
Clustering of ethnic groups, kin and neighbourhood groups for social cohesion and harmony	Usually kin or members of the same ethnicity would prefer to stay together. In many communities, the intermixing of various ethnic groups or castes is still not practised. This may cause problems in the neighbourhood and in social interaction. Moreover, due to underlying prejudices between cultures, people are unlikely to work together. In many communities, trades and professions may be based on caste or ethnicity.
A single culture or a mixture of related cultures, homogeneous or heterogeneous neighbourhoods and their relationships	
Maintenance of infrastructure and services such as streets, footpaths, trails, water supply systems, etc.	Important for sustainable development.
Willingness of the community to plan resettlement or willingness of the community to relocate to the proposed new site	If a community is not interested in reclustering or relocating, it would be better to abandon the project.
Site-specific hazards such as landslides, rockslides, liquefaction, steep terrain, flooding, etc.	An investigation will help to understand if the current settlement is vulnerable to these hazards and how risk could be mitigated in the new settlement layout.
Legal and customary land management systems vary across different regions and countries. There may be a lack of clarity around land ownership leading to disagreements and disputes between households and within communities.	

Annex B: Part B

The following Figures and Tables are to be read in conjunction with their respective sections in Part B of the Handbook.

Table 11. Annex B.4. Detailed damage assessment – steps (Section 5.2)

Stage	Details
Before the field visit	The detailed damage assessment programme should be developed following the steps listed below: ● Review preliminary damage observations, secondary damage data and PDNA report. For planning DDA, a sample survey vetted against census data can also be used for projecting the number of safe houses, unsafe houses and houses requiring further assessment. Drones and helicopters can be used for aerial documentation and to identify at least the homes that have been destroyed ● Review census data and data on housing, including roof, wall type, if available ● Review geography, topography, accessibility and note if areas have any special needs ● Review available human resources for field visits and training of enumerators ● Plan logistics for field visits ● Prepare DDA questionnaires, guidelines and their testing ● Manage the quality control system ● Plan data recording and transfer mechanisms, including the use of real-time mobile and Internet applications
During the field visit	DDA team must carry a camera for photographic documentation of damage to individual households. The following attributes of the affected area should be recorded manually and photographically during the field visit: ● The types, geometry and layout of the buildings in the affected area. ● The construction materials and technologies typically used ● Building condition and maintenance level ● The type and degree of damage sustained by buildings ● Building damage should be categorized according to type and to the degree of damage to the building and its elements (using any established method) ● Characteristics of undamaged buildings ● Site and environmental conditions, such as soil failure, liquefaction, landslides, high water table, excessively steep slopes and seismic faults
Analysis and interpretation	The analysis phase should comprise the following activities: ● Development of a portfolio of damaged buildings, indicating the level of damage, occupancy, potential repair, retrofit and demolition and reconstruction needs ● Evaluation of the seismic resiliency and vulnerability of the building stock ● Identification of the large and complex buildings needing reassessments by experts
Decision-making	Conclusions and recommendations should be drawn as regards: ● Identifying beneficiaries, including the vulnerable, landless, lessees, and tenants ● Selecting the appropriate intervention type: demolition, reconstruction, repair or retrofitting ● Potential local materials, human resources and technology for reconstruction ● Economic and social feasibility of repair and retrofitting of buildings ● Listing and quantifying potential materials to be recycled and reused for reconstruction. ● The quantities of debris should be determined and an appropriate method for debris removal and deposition chosen ● Decide as to the partial or full relocation of the community based on the site condition, if the site is deemed unsafe.

Table 12. Annex B.5. Training audience and objectives (Section 8.1 and 8.2)

Target audience	Primary objectives	Tools and methods
Entire project team	● Developing a shared understanding of the ODHR programme ● Understanding housing reconstruction programme goals, government housing policies and programmes, deliverables and partners ● Clarifying roles, responsibilities and methods of coordination and communication	● Orientation ● Inductions, workshops ● Booklets and handbooks
House owners The vulnerable Communities	● Providing information and raising awareness on government housing policies and programmes ● Increasing awareness of their rights and responsibilities and expediting their participation in reconstruction ● Providing information on available construction materials and human resources ● Increasing social cohesion ● Enhancing livelihoods and skills for entrepreneurship	● Orientations, public campaigns ● Socio-technical facilitation, IEC materials, participation, redressal and feedback, focused assistance
Technical experts	● Updating on recent events, technological advances or any modifications made in the field	● Presentations ● Real-time data consultation, webinars
Engineers, architects and subengineers Monitoring, evaluating and correcting team	● Developing knowledge on available technical options ● Familiarizing with proposed reconstruction options ● Enabling to carry out technical facilitation, including monitoring and evaluation ● Familiarizing with the minimum requirements for technical compliance and common causes of non-compliance; local materials and resources ● Enabling them to suggest required corrective measures to householders, small contractors and masons in their respective project areas ● Addressing complex situations in house reconstruction ● Developing soft skills in negotiation and social mobilization	● Classroom and on-the-job training ● Demonstrations ● Exposure visits, field visits ● Print media: manuals, brochures, booklets ● Online media ● Videos
Lead trainers	● Acquiring the skills necessary to develop cascading training programmes	● Classroom and on-site training ● Training for trainers
Master craftspeople	● Enhancing capacity to supervise work and provide necessary regular advisory assistance to the craftspeople in the area	● Technical orientation ● Hands-on training

Target audience	Primary objectives	Tools and methods
Craftspeople (masons, carpenters, electricians, bar benders, welders, labourers): ● Upskilling existing craftspeople ● Training new craftspeople to meet increased demand	● Learning construction skills, including multi-hazard resilient construction ● Enhancing skills to mitigate errors during construction work ● Enhancing building service skills ● Developing quality assurance skills	● Classroom and on-the-job training ● Demonstration, site visits ● Issue-based training to resolve technical issues on common mistakes and incorrect practices
Community facilitators	● Developing skills for interfacing with house owners and communities ● Learning how to assist effectively ● Developing soft skills in negotiation and social mobilization	● Classroom and on-the-job training ● Role playing and rehearsals
Construction workforce (engineers, architects, AWS, craftspeople and social mobilizers)	● Upskilling, updating on new requirements and mitigating emerging issues	● Training ● Orientation
Communication and media, media personnel	● Familiarizing with the guidelines for communication and such technical aspects as documenting case studies and preparing audiovisual materials ● Gaining awareness regarding specificities of reporting during disasters and associated issues ● Code of conduct for media personnel	● Indoor orientation sessions ● Outdoor practical exercises
Authorities, Agencies, Banks	● Providing and updating information on administrative issues, government policies, cash management, tranche release	● Meetings ● Consultation ● Presentations ● Coordination
Construction material retailers, suppliers, manufacturers, importers	● Providing information concerning the increased need for construction materials ● Developing an improved material supply chain, including the supply of specific construction materials such as CGI sheets, bricks, steel, cement and lumber	● Orientation ● Meetings

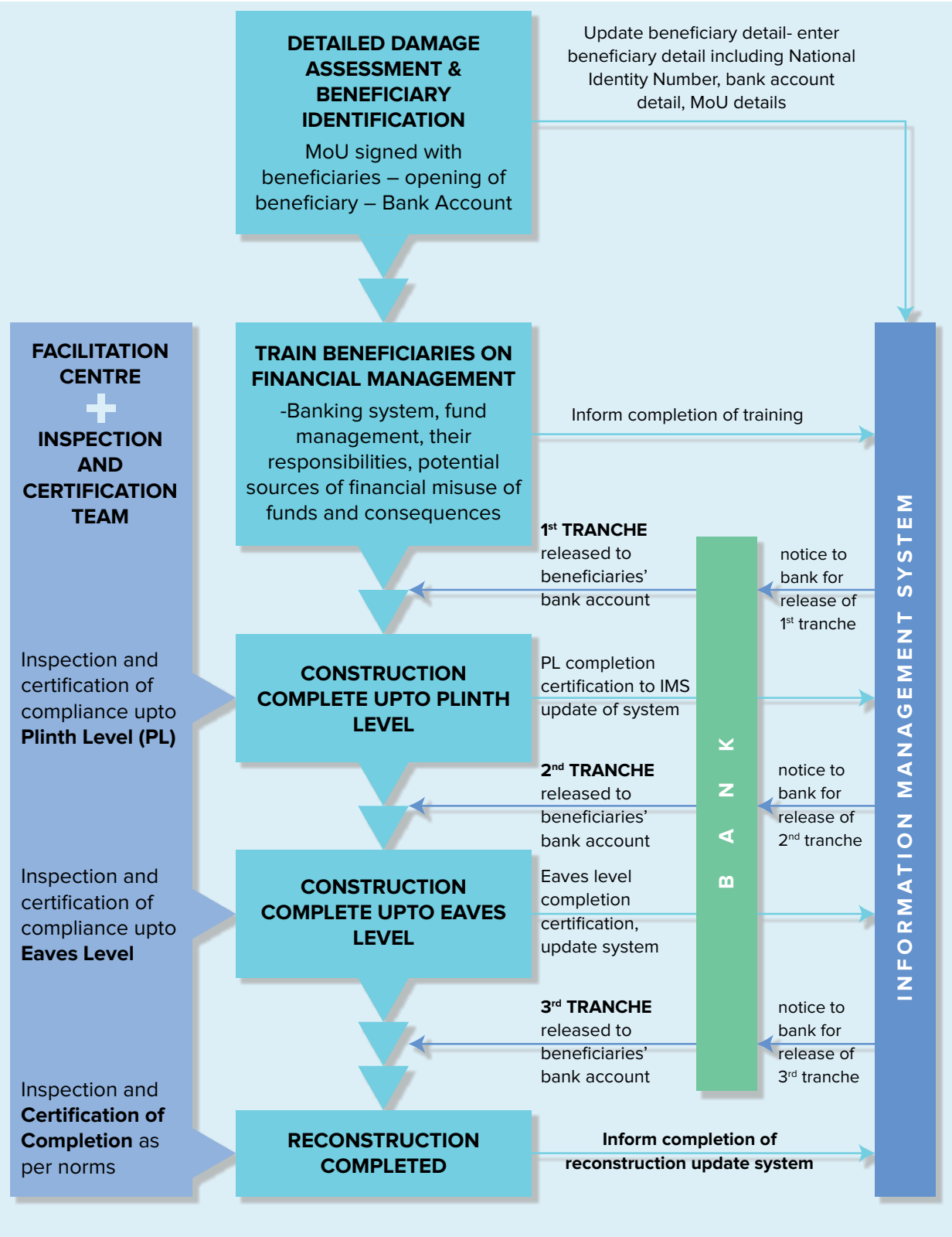


Figure 22. Annex B.1 Detail of tranche release (Section 6.3)

Annex B: Part C

The following Figures and Tables are to be read in conjunction with their respective sections in Part C of the Handbook.

Figure 23. Annex B.2 Methodology for settlement planning (Section 9.2)

Settlement planning can use multiple tools and techniques and incorporate new and innovative approaches. Some recommendations on organizing the settlement planning process are listed below (adapted from Jha, et al., 2010):

1. Focus on retention of the native population. If it is in situ planning, the original landowners should be provided land as close as possible to their original holdings.
2. The local government should take the lead in socio-technical dialogue with the local populations and in building consensus.
3. A resettlement task force composed of representatives of affected land or house owners, CBOs, elected representatives of the local government, relevant government line and administrative departments and experts should be created to assist directly in preparing the plan.
4. A community resettlement committee should be created to articulate the interests and needs of the affected population. It should facilitate communication between the community, the consultants and the resettlement task force.
5. Both land pooling and house pooling should be considered for urban planning. The planning process should go beyond traditional urban planning concepts of "land-use planning". It should study "space use planning", including mixed use of space, particularly in urban areas.
6. The development of a resettlement plan can take several months and should be overseen at the senior level by the reconstruction programme manager, with inputs from the resettlement task force.
7. Consultants with relevant expertise can be hired to help the task force conduct surveys and examine the complex social, environmental, economic and physical dimensions of resettlement. Consultants can provide objective input to a process that may become conflictual. The environmental impact of any planning should be considered carefully and mitigation options explored and implemented. Adopting a risk-sensitive development plan ensures flexibility, synergy in enforcement and regular updates based on risk information.

Figure 24. Annex B.3 Checklist for relocation (Section 9.3)

If relocation is being considered, the following should be taken into consideration (Jha, et al., 2010; Sphere, 2018):

1. Climate features such as wind, snow, average and extreme temperatures, and topographic suitability of the proposed relocation site for human settlement
2. Availability and sufficiency of land to meet the needs of the new settlement, such as arable land, space for livestock and grazing land

3. Geological stability and topography of the proposed area. The new area should have low susceptibility to natural hazards
4. Current use of the site proposed for relocation and potential future use of the original site
5. Availability and future expansion of facilities and services such as roads, electricity, drinking water, irrigation facilities, etc.
6. Proximity to the original settlement to ensure minimum disruption to life, livelihood, culture and use of the resources employed by the community at the original site for farming and other agricultural needs in an agrarian society
7. Besides providing a safer location and safer houses, relocation should also revive livelihoods, rebuild the community, reconstitute social capital, protect the environment and provide services
8. Protection of widows and female-headed households exposed to sexual and physical abuse
9. Environmental, social and economic risks of relocation and cost of risk mitigation strategies
10. Working relations between the communities near the proposed relocation site. The communities to be relocated should be involved in the relocation plan to avoid potential conflicts
11. The willingness of the community to move to the new site

Table 13. Annex B.6. Retrofitting versus new construction (Section 10.1)

Attribute	Repair and retrofitting	New construction
Change in plan layout and function	Total change in plan layout and function will require significant intervention. However, some vertical and horizontal additions to the building can be accommodated and retrofitted integrally with the existing house.	Can provide an opportunity to address new needs and requirements of the household.
Cost	Usually provides an economical solution. The typical cost may be less than 1/3 of the cost of reconstruction [25].	Costs incurred for both demolition and reconstruction, which could exceed 100% of the cost of reconstruction. Making arrangements for adequate funds may take a long time.
Downtime	A building can be made safe and habitable quickly, reducing downtime. The building may require vacating for a short period, or vacating may be avoided altogether by scheduling the intervention.	Demolition and reconstruction of a building require extended downtime. The homeowner will need a transitional shelter while the demolition and reconstruction of the building proceed. This may result in prolonged hardship and disruptions.
Local culture and architecture	Neighbourhood and building character, culture and architecture are preserved.	Neighbourhood and building character, culture and architecture may be disrupted or even entirely lost.
Services and amenities	Most of the facilities created in the house are saved.	Everything will be destroyed. In a reconstructed house, all the facilities will have to be recreated.

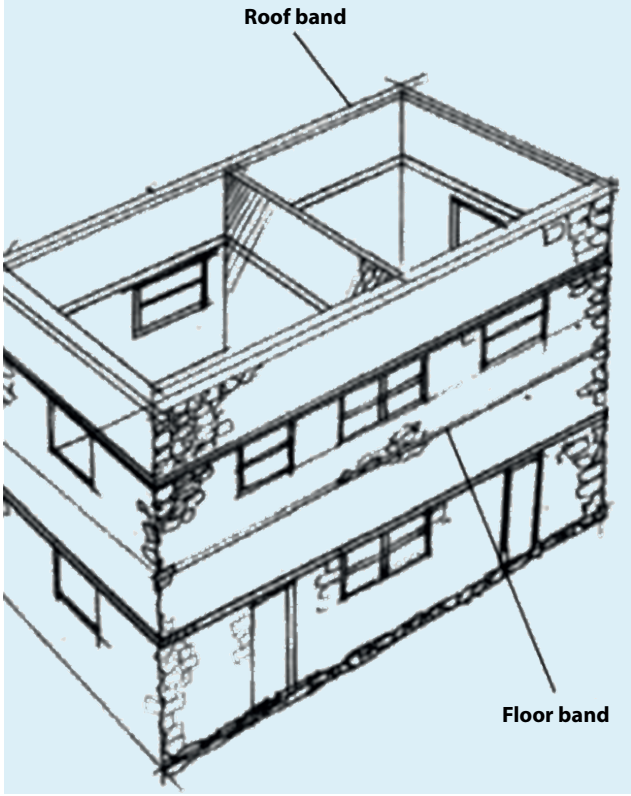
25 The actual cost of repair and retrofitting depends on the level of intervention required. A balance needs to be found so as to determine in what circumstances demolition and reconstruction may be considered as a more suitable option.

Attribute	Repair and retrofitting	New construction
Debris management	Debris management is not required in most instances, which helps to protect the environment and reduces carbon footprint.	Demolition and debris management may be a significant issue, triggering an environmental disaster leaving a large carbon footprint behind.
Design	Design, layout and construction require complex logistics because each house has to be investigated individually.	Design and construction can be standardized for a broad spectrum of houses.
Land	The issues related to land are quasi-absent and less challenging to address.	Can lead to land-related issues, which may be complex to resolve. For example, the consenting authorities may not grant building consent if the land is smaller than a specific size.
Resources required	Phasing or an incremental approach permits work with only a fraction of total resources required on hand and simultaneous use of the house.	Only a portion of the house may be built. However, it will cause much hardship over the long term.

Seismic design attributes – Masonry building

A masonry building should have the following attributes, so the building performs satisfactorily during an earthquake:

1. **Symmetry and uniformity.** Should be symmetrical in plan and uniform in elevation.
2. **Smaller opening.** Should have a small opening.
3. **Integrity.** All components of the building should be tied together, so it acts as a "box".
4. **Clearly defined load paths.** The building should have clearly defined "load paths" to transfer seismic forces from their origin to the ground.
5. **Redundancy.** The building should have enough structural components so that a backup system is readily available in case of a component fails.
6. **Earthquake-resilient features.** The building should have earthquake-resilient features such as bands, stitches and vertical reinforcements.
7. **Deformability and energy dissipation capacity.** The building should be able to deform and dissipate energy without severe damage to the building structure.



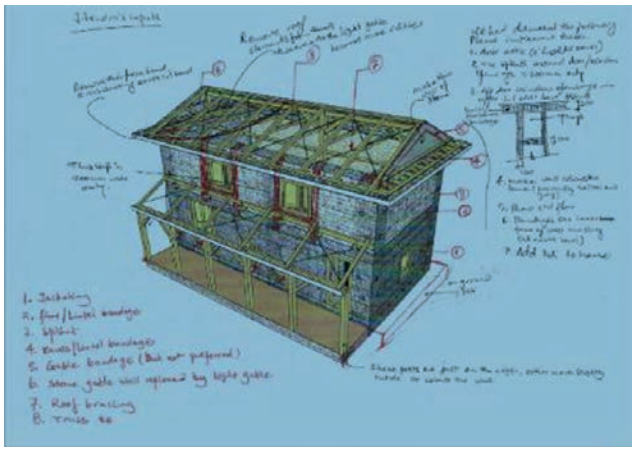
Features of an earthquake-resilient masonry building
Source: UNDP

Figure 25. Annex B.4 Attributes of seismic-resilient masonry building (Section 10.2.1)

Improving seismic safety of earthquake-risk masonry buildings

Add the following attributes to the existing masonry building to make it earthquake-resilient. Attributes 1 to 5 are generic. Attribute 6 is specific to the splint and bandage retrofitting method (footnote 17).

1. **Improving symmetry and uniformity.** The building should be made symmetrical in plan and uniform in elevation as much as possible.
2. **Smaller openings.** Reduce the size of openings, fill them out or strengthen abutting piers where required.
3. **Integrity.** Tie building components together, so the building acts as a "box".
4. **Clearly defined load paths.** If "load paths" are not well defined, create new load paths.
5. **Redundancy.** Provide new components where required, so the backup system is readily available in case a component fails.
6. **Improve earthquake resiliency.** Add seismic-resilient features such as bandages and splints, which tie walls together and provide the capacity for a building to deform and dissipate energy without severe damage to the building structure.



Features of an earthquake-resilient retrofitted masonry building
Source: UNDP

Figure 26. Annex B.5. Attributes of retrofitting masonry buildings (Section 10.2.2)

Figure 27. Annex B.6. Establishing a community facilitation system (Section 11.1)

Facilitation can be carried out with an individual or with a community, depending on the type and degree of assistance required. The following factors should be taken into account when designing facilitation services:

1. Geographical size of the area, terrain, including sites to visit based on priority
2. Proximity of motorable roads, markets and services, including BFIs
3. Number and location of households, including vulnerable households requiring facilitation, their physical accessibility and access to resources
4. Number of vulnerable households requiring facilitation and their physical accessibility
5. Profile of the household, including education and exposure level
6. Household income level and source of livelihood
7. Vulnerability of households through demographic analysis
8. Availability of materials and human resources
9. Stage of construction
10. Housing reconstruction strategy, proposed housing solutions, size of houses and their typologies (for example, brick or stone masonry in cement, RCC frames or timber)
11. Availability of communication systems (telephone, Internet, traditional communication)

12. Availability of local human resources (engineers, subengineers, community and financial facilitators, master masons and masons, etc.) who could play a key role in housing reconstruction, including local migration trends of the working-age population
13. Bring in field staff from outside if necessary; it is best if locals can be employed as they are aware of the local language, culture, context, families and their backgrounds
14. Level of understanding and skill of the socio-technical and financial facilitation team regarding the housing reconstruction programme, its procedures and guidelines, the role of different stakeholders and the local context, including time required for training
15. Extent and timing of facilitation, including door-to-door facilitation, mobile clinics and free design campaigns
16. Need for a design studio to prepare site-specific designs and draw up building consent documents in urban areas
17. Expected bottlenecks related to operational issues in the field and technical, social and administrative aspects
18. Special staff requirements such as computer and software engineers
19. Availability of office space and space to accommodate staff

Table 14. Annex B.7. Areas of coordination in ODHR (Section 11.1.2)

Institution	Possible support required
Central authorities	● Addressing policy issues ● Validating beneficiaries ● BFIs to create a positive and supportive environment and identify pragmatic solutions to prevalent issues
Line ministries, departments and approving agencies	● Easing procedures for documents related to land, building and citizenship to reduce the administrative burden ● Developing and distributing relevant brochures, booklets and handbooks ● Building infrastructure ● Land mapping and registration ● Approving design types, setting construction methodologies and minimum compliance requirements, resolving land litigations
Local government	● Resolving local issues ● Formulating community and/or ward level discussion groups to identify and resolve issues hindering housing reconstruction ● Establishing design and drawing studios to ease the building permit approval process ● Establishing building exhibition and design facilitation centres ● Developing financial support mechanisms such as revolving funds ● Developing material supply chains ● Identifying vulnerable and landless populations and formulating support mechanisms for them
Inspection agencies	● Coordinating with engineers to accelerate the on-site verification, inspection and certification of houses and release of the tranche ● Scheduling and facilitating meetings with officials and technical inspection teams
Local partners, NGOs, CBOs	● Reaching communities and identifying the vulnerable ● Delivering services
Others	● Facilitating exposure visits of experts and governmental personnel ● Coordination at a different level and stages of reconstruction, from the house owners to neighbourhood, ward and district level authorities to ensure timely provision of masons, materials, other human resources, inspection and error correction during housing construction

Table 15. Annex B.8. Complexities of urban areas (Section 12.1)

Area	Issues
Institutional arrangement and policy	● Requires a dedicated institutional structure with wide-ranging powers ● Requires a comprehensive urban policy to tackle complexities that are different from those that characterize rural areas ● Meets the requirements of prevailing urban planning laws and building consent
Land title and ownerships (Legislation)	● Undelineated land boundaries ● Undefined land ownership and land classification ● Small parcels of land that do not meet the minimum standard ● Resolving land tenure issues may be time-consuming and is further complicated when the buildings are shared, owned or rented, formally or informally
Inheritance	● In many countries and cultures, siblings have rights over the land and may be living in the same house, but as different households with unsettled inheritance disputes and land rights
Disputes	● Unsettled disputes between owners of multi-tenancy buildings ● Disputes between building owners and renters where renters have rights over the building space
Slums	● Informal housing, such as slums, many of which are located in high-risk areas ● Slum inhabitants may not have legal rights as regards the land they occupy
Renting	● Multi-family housing and a larger proportion of renters
Coherence	● Little coherence between public sector organizations, including those responsible for disaster management ● Lack of community cohesion
Diversity	● Diverse income levels and living standards of the affected population potentially requiring more generous assistance strategies ● Heterogeneous groups of people with complex social interrelationships that are likely to give rise to conflicts
Economy/Finance	● Higher land values and less undeveloped land ● Requires large investment for infrastructure development ● Economic and social interest groups not clearly defined ● Urban houses are usually large or elaborate, requiring high capital intervention, which may constrain starting or completing reconstruction
Expertise and coordination	● Need for multisectoral experts and coordination ● Limited understanding of multi-faceted urban reconstruction requires the involvement and coordination of multiple stakeholders ● Limited understanding of urban housing reconstruction
Historical and Environmental risks	● Unique and more challenging environmental risks ● In historic settlements, conservation rules may apply which are expensive to implement. In contrast, house owners may be interested in moving to modern construction, resulting in delayed decision-making
Time frame	● Post-disaster urban housing reconstruction may be an opportunity to improve infrastructure, replanning old cities or urban centres, which can be time-consuming
Accessibility	● Although an urban centre may be accessible by motorable roads, narrow lanes make many parts of the centres inaccessible to motor vehicles, causing difficulties in removing debris and transporting construction materials

Annex C. Policy Briefs

POLICY BRIEF

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C.1 Institutionalizing disaster preparedness: Localization of disaster and climate risk reduction and management

BACKGROUND

Nepal is exposed to more than 500 disastrous events every year. During the period between 1971 to 2015, over 40,000 people lost their lives, 75,000 were injured, and approximately 3 million people were affected due to these disasters. [1] Today, local governments have high stake in promoting development that is sustainable and resilient to the disasters and to the adverse effect of climate change. Disasters are created by development of land and settlement or construction of physical infrastructure that do not consider potential risks. The impact of disaster can be magnified when there is insufficient preparation and measure taken to respond to emergency or to get ready to cope with the changing climate. But risks can be reduced and mitigated as part of usual municipality planning and development processes.

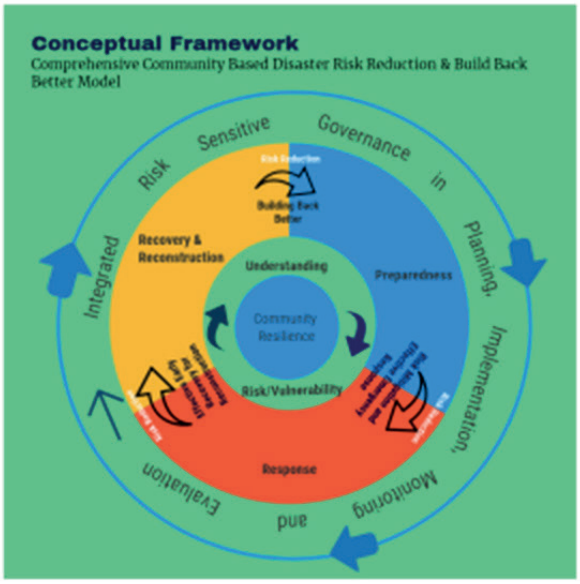
The Government of Nepal has put in place the legislations and policies to promote resilient and sustainable development. The Constitution of Nepal 2015, the Disaster Risk Reduction and Management Act 2017[2], and the Local Government Operation Act (LGOA) 2017[3] outline the responsibilities of the federal, provincial and local government in disaster risk reduction and management. National Policy and Strategic Action Plan for disaster risk reduction and management 2017–2030 is a guiding document that presents targets in line with the national development priorities and the country's commitment to the global agenda[4].

WE ARE ALWAYS IN THE CYCLE OF DISASTER RISK REDUCTION

2015 earthquake recovery continues in many part of the country, and much efforts have been made to build the communities back better for future disaster. In doing so, gradually, localities are slowly transitioning into the preparedness phase of the cycle of disaster risk reduction which comprises of preparedness phase, response phase and recovery phase (See the diagram next page).

[1] Ministry of Home Affairs

Beyond earthquake recovery, it is important that municipalities start systematically integrating risk reduction actions into their day-to-day business and long-term development programs. In any phase of risk reduction cycle, the context of underlying risks and vulnerability of the communities need to be understood first. A system and mechanism of risk reduction and management should be built as an integral part of local governance.



WHY INTEGRATION OF DISASTER RISK REDUCTION AND MANAGEMENT AT MUNICIPALITIES?

Some still think that natural disasters are acts of Gods. But the matter of fact is that disaster risk is often created in the process of development and its impact is magnified because we are not prepared to react. This is why it is essential to mainstream the issues of disaster risk management in every day decision making process such as development policy making, planning, budgeting, implementation, and monitoring and evaluation process. Wards and communities are always at the frontline of disaster response and first to experience the impact of disaster.

[5] "Reducing Risk through Community Resilience – best practices, lessons and success stories", Community-based Flood and Glacial Lake Outburst Risk Reduction Project, GON/GEF/UNDP, November 2017

It is imperative that the municipality promote Ward-level disaster risk management efforts by incorporating disaster and climate risk management actions in ward's annual plan during the 7-step development planning process. Municipalities that are able to address risks in development are the ones that will be more likely to be resilient, hence maximize the opportunity for prosperity.

At the time of 2017 flood in Terai, there were communities that lost many lives, and other communities managed to have zero-casualty and reduce loss of properties. The difference between the two was that the ones who had zero-casualty had prepared for floods by putting in place a flood early warning system; made communities aware of the risks of flood; and undertaken evacuation drills [5]

THINK ABOUT THE DEVELOPMENT PRIORITIES OF MUNICIPALITY – AND DECIDE WHERE TO INVEST IN RISK REDUCTION

It is important that municipalities have clear strategy or plan to address potential risks in different development sectors. Necessary technical capacities should be identified for specific sector contexts and sufficient amount of financial resource should be allocated as part of regular municipality budget.

a. PHYSICAL INFRASTRUCTURE may be one of the local development priorities. Demand for land development for residential and commercial purpose, and construction of road and bridges are very high. However, haphazard construction without any risk-sensitive planning leads to more damage and loss - as experienced at the time of the recent earthquakes. Large infrastructure development alters natural landscape (excavation of mountain, removal of forest resources or river courses), and this infers some level of risks such as soil instability leading to landslide, flush flood and others events. As large portion of capital expenditure go to physical infrastructure development, it is important to set aside resources for risk mitigation. Investments in pre-development scientific assessment of environmental and disaster risks, risk-sensitive land-use planning, strict enforcement of building codes, and strengthening of old building structures are critical at the level of municipalities.

b. In many municipalities, economic enhancement and wellbeing of citizens of a municipality depend on AGRICULTURE. Farmers can be extremely vulnerable to climate-related hazard such as excessive rain, flood, drought and emerging pest issue that directly impacts their productivity. Putting in place an extensive irrigation system; better climate/weather forecasting and early warning; and introduction of resilient seed varieties; promotion of agroforestry and sustainable crop land management are the areas where the local government can allocate more budget as a way to reduce and mitigate risks. Existing crop and livestock insurance (subsidized by the government) can be improved to cover wider population as a mechanism to transfer risks for rural population.

c. EDUCATION and HEALTH are often the top most priority social development sectors for many local governments. Schools are the best place to educate youth and community about disaster and climate risks. Curriculum and community activities held at the school facilities can integrate the contents on disaster and climate risk management, emergency drills and stockpiling of emergency relief items. Being major public space, the structure of the school and health facilities must be strong in compliance with the building codes. Hospitals and primary health care centers serve as the critical post-disaster emergency operation facilities. Strong preparedness and presence of standard operation procedure (SOP) will be the key areas of investment.

d. Is LOCAL GOVERNMENT ADMINISTRATION ready to promote disaster and climate risk management? Much of the expenditure of the local government is on the human resource, and it is the most important invest to ensure the quality public services – this entails promotion of risk reduction to protect the citizens. It is reasonable to say that municipalities set aside some budget to train their own staff to be acquainted to the know-how of disaster and climate risk management. Local administration must have their own emergency system to respond to sudden onset of disasters and emergency – SOPs for emergency operation, relief item stock-piling amongst others.

e. Last but not least, municipalities can consider risk reduction measures in as part of their PUBLIC SERVICELINES. Disaster risks are faced by individuals, families and communities. Those who are economically and socially vulnerable have letter way to cope with the consequence of disasters, or not to mention, to invest in risk reduction before disaster occurs.

It is important to empower the communities and citizens with knowledge and tools to manage risks by themselves. Municipalities can tailor risk management into their public programs or as part of social protection scheme. Public education and awareness raising program free for citizens can be part of regular activities designed and funded by the municipality. Existing social protection or subsidy program may introduce a contingency fund budgeted every year to supplement the potential payout at the time of emergency. Not to mention, emergency infrastructure such as open space, relief items and shelter, and health facilities are all critical service lines that require strengthening.

Identification of the priority sectors and public service lines should be undertaken as part of the annual and periodic planning cycle, and municipalities should allocate sufficient budget and monitor the level of execution.

WHERE TO START?

The 7-step development planning process is the best opportunities to take small steps to integrate disaster and climate risk management measures. Efforts of risk reduction is by no means a stand-alone planning approach. The very purpose of risk reduction is to protect the development gain of the localities and lives of people. Practical step-by-step guides are available in the existing "Local Disaster Risk Management Planning Guideline, 2068". Revised and updated guides will become available once Local Disaster and Climate Resilience Planning Guideline (Draft)- 2074 and Municipality Risk Reduction and Management Act (Draft)-2075 are formalized.

MUNICIPALITIES ALONE CANNOT ADDRESS RISK MANAGEMENT CHALLENGES

While municipalities are the driver of disaster and climate risk management actions, the impact of the actions are much bigger when collaborating with different stakeholders.

a. FEDERAL & PROVINCIAL GOVERNMENT can provide guidance and technical backup for many aspects of disaster risk reduction. The network of emergency operation center (EOC) coordinated under Ministry of Home Affairs and Ministry of Health; weather forecasting and flood early warning system under Department of Hydrology and Meteorology; and disaster loss and damage database system developed under Ministry of Home Affairs are some of the examples of vertically coordinated system that is critical and useful for the municipalities' efforts in risk reduction and management. In case municipalities require specialized technical capacity to undertake scientific hazard assessment from geology, hydrology, meteorology perspectives; or even application of remote sensing, collaboration should be sought with the Federal ministries and departments. Practical guidance on mainstreaming risk management and reduction into local planning can be accessed through Ministry of Federal Affairs and General Administration.

b. PRIVATE BUSINESSES are important part of the local economy. Promoting business continuity planning is a way to protect business gains and foster quick recovery of local economy at the time of disaster. Private sector can be encouraged to take part in community emergency preparedness in provision of relief items and shelters. Alternatively, municipalities can take a proactive role to promote commercial risk insurance scheme by making it more efficient and affordable for wider population.

c. NON-GOVRENMENT ORGANIZATIONS can add value to the municipalities efforts to promote disaster and climate risk management. Some development organizations including the UN organizations and international NGOs offer specific technical expertise in hazard and risk assessment, studying policy effectiveness, and designing sector specific policy tools and guidelines. Red Cross movement, local NGOs and civil society organizations are active in the communities and are critical players in post-disaster actions. Mechanism of coordinated response and post-disaster resource mobilization should be strengthened prior to disaster.

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POLICY BRIEF

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C.2 MICRO-INSURANCE - An alternative mechanism to protect low-income families from disaster damage and loss

BACKGROUND

The Gorkha earthquake in 2015 cost the country one third of its GDP [1] while the damage from the 2017 floods in Terai was almost 580 million US dollars [2]. Every year, different scales of disasters and climate events impact communities across the country: Households face damages of property and/or loss in crops and land productivity. This becomes a heavy financial burden especially for those who are economically and socially vulnerable. However, such negative consequences of disasters and vulnerability can be reduced through various risk reduction measures – such as micro-insurances which specifically cater to low-income households by transferring disaster risks to the insurance.

WHAT IS MICRO-INSURANCE?

Micro-insurance is an insurance form protecting low-income household against specific risks in life such as health, agriculture/livestock, properties and businesses. It is provided in exchange of regular premium payments proportionate to the likelihood and cost of the risk involved. It is also affordable for people who cannot afford other commercial insurances available on the market. It becomes part of their coping mechanism when absorbing shocks and loss caused by sudden onsets of events; such as diseases, weather-related agriculture impacts and other disasters such as earthquakes, fires and floods.

The operation of micro-insurance can be done either by a public or private entity. In the case of Nepal, basic policy and regulatory environment are in place. The Nepal Insurance Board (Beema Samiti)'s micro-insurance directives 2071 (2014) pre-approved seven standard micro-insurance products with prescribed maximum premium rates [3]. Those include micro household insurance, micro health insurance, micro accident insurance, micro livestock insurance, micro crop insurance, micro term life insurance, and micro endowment life insurance. Micro-insurance is considered as one of the products promoted in the financial inclusion initiatives, which aims at benefitting the poor - the vast majority of who are unable to avail themselves of the fundamental tools of economic self-determination including savings, credit, insurance, payments, money transfer and financial education. [4]

[1] Post Disaster Needs Assessment, Government of Nepal (2015)
[2] Post Flood Recovery Needs Assessment, Government of Nepal (2017)
[3]https://www.inclusiveinsuranceasia.com/docs/Translation%20%20Micro%20Insurance%20Directives.pdf
[4] McKinsey & Company, 2010

TYPES OF MICRO-INSURANCE FOR DISASTER

There are a few categories of micro-insurance in relation to disaster damage. One of the most common types is the micro-insurance that protects agriculture production and livestock assets from climate-induced disaster (floods, droughts, diseases and other weather-related events). Some insurances also compensate loss and damage in properties and assets (including land) from disasters such as earthquake, floods, fire and lightning.

WHY MICRO-INSURANCE ?

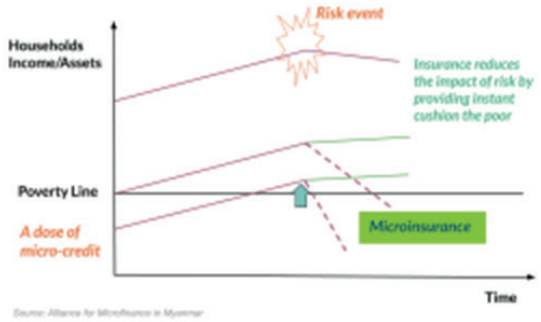
Post-disaster relief and compensation become a huge fiscal burden for the government, and it is not enough to cover all the loss [5]; thus, making it unsustainable. Low-income families and socially vulnerable people suffer the most from disaster events as there is almost no saving, other sources of income, investment, nor easy access to finances including insurance.

Disasters happen every year at different scales, and the efforts of local development can be disturbed if these populations remain financially vulnerable. Micro-insurance helps to transfer the impact of disasters by providing an instant bolster [6] to the low-income families; who usually not have the financial capacity to cope with such disasters. In other words, risk insurance can serve as safety net for low-income families when the product is designed well.

In general, the penetration of risk insurance is very low in the countries with a high proportion of the low-incomehouseholds. Today, only 10% of damages from disaster are covered by insurance in developing countries [7]. While there is no data found on the scale of insurance coverage in Nepal for disaster damage, some studies indicate that the country's insurance penetration stands at 1.5% (which represents the amount paid for premium as a percentage of GDP)[8].

The general practice in Nepal is that the government tries to provide the affected people with relief to survive in the immediate aftermath of disasters; and a grant to help the affected population to recover.

INSURANCE SUPPORT



Source: Alliance for Microfinance in Myanmar

While some level of government support is mandatory, the government's financial budget cannot withstand the kind of financial requirement for recovery of all the loss and damages for these households. Disaster risk reduction of the household effects should be primarily the responsibility of individual households. The government, especially municipalities, can facilitate the policy environment where even low-income households can benefit from insurance mechanisms to minimize fiscal burden and to foster resilience of households and communities at large.

Promotion of household risk insurance should be a public policy priority to protect the citizens and local development gains.

Studies and Research in multiple developing countries in regions like Asia, Latin America and Africa shows a relationship between an uptake of insurance and an increase of saving and ability to maintain food security during sub-optimal harvesting years [9]; as well as an economic behavior change of farmers (higher risk investment in agriculture for better output) which links to the enhancement of economic growth and investment decisions by individuals [10]. While researches argue that more empirical studies are needed to understand the disaster insurance's economic benefits and impact on the people's life, available lessons and experiences can guide Nepal to start exploring the potential of micro-insurance as one of the risk reduction measures.

[5] Risk Transfer through micro-insurance, UNISDR-GAR input paper, Batt and Pathak (2014)
[6] A study on micro insurance - Feasibility and the way forward for Alliance, UNCDF Myanmar (2016)
[7] Insuring disasters: survey of economics for disaster insurance, Noy et al. (2017)
[8] Overview of Nepal's Insurance Services in Nepal, Sharma, 2013; Swiss Re, 2015
[9] Impact evaluation of the R4 rural resilience initiative in Senegal, WFP and Oxfam, 2016
[10] Disaster risk insurance and the triple dividend of resilience (ODI Wroking paper 515), Weingartner et al, 2017

POLICY RECOMMENDATION

Municipalities can play a vital role to promote micro-insurance, which can be one way to broaden the coverage of social protection. Umbrella regulations for such financial products are already in place in Nepal, and there are public and private insurance mechanisms already established and functioning at smaller scales with some room to improve regarding service distribution efficiency.

Since Nepal has an extensive network of micro-finance institutions, the country has potential to broaden its client base for micro-insurances for disaster loss and damages – as long as local governments create conducive policy environments that respond to the needs of service providers and people. Following are four steps that municipalities can take toward improving the policy environment to promote micro-insurances for disaster.

1. LOOK INTO EXISTING INSURANCE OR FINANCIAL SERVICES AVAILABLE TO HOUSEHOLDS

In Nepal, Crop and Livestock insurance has been made available to the farmers since 2013 with subsides by the government (75% subsidies on premium by the government). Effectiveness of this insurance is yet to be maximized due to limitations faced in the system such as weak service distribution mechanism (slow claim settlements due to delay in damage assessment and bureaucracy to enable claim settlements); and low level of knowledge among clients on insurance policy terms and conditions including continued annual premium payment.

Financial inclusion has been Nepal's policy priority over the past years, and typically, four types of financial services have been promoted: savings, payment, credit and insurance services [11]. As of 2014, it was estimated that only 18 per cent of Nepal's adult population was financially excluded. 40% of the adult population had access to financial support through formal channels such as banks, 21 per cent had access to other formal financial channel, and 21% had informal financial services [12]. Savings and remittance payments attribute to most of this figure. **When it comes to insurance, 80% of highly vulnerable adult populations are excluded from insurance - making them even more vulnerable to disasters. [13]**

Nevertheless, some micro-finance institutions have slowly begun looking at insurance products for low-income families. Some of the active private sector players in micro-insurance are Chimek, Nirdhan Uttan Laghubitta Bittya Sanstha Ltd. and Shikhar Insurance Company Ltd, amongst others. Micro-insurance has good potential among private insurers and in rural areas. However, more efforts are required in promoting more private sector engagement as well as in strengthening public education on insurance.

2. EXPLORE POTENTIALS IN EARTHQUAKE INSURANCE

Japan, USA, New Zealand, and Turkey have a matured mechanism of earthquake insurance (against houses and land beneath) which has been effective in protecting house owners from massive financial losses and damages by major earthquakes. Lesser developed countries like Bhutan, Indonesia and some Caribbean countries also have embarked on introducing the insurance catered for seismic risks. In neighboring country Bhutan, the government provides large subsidies (20-60% of the premium) through the Rural House Insurance Scheme (RHIS). RHIS is the compulsory insurance for all the rural houses, and covers damage and loss occurred from fires, earthquakes, floods or landslides, storms and lightning, and what is called 'impact damage' (damage caused by animals, rock slides, falling trees, vehicles, and falling objects). The insurance is mandatory for rural houses and annual premium is collected by each household. In the case of Nepal, some of the existing insurance companies offer insurance policies for earthquakes, but the market for this is still very small.

The calculation of premium for earthquake insurance requires the technical capacity to evaluate the probability of event occurrences and the prediction of loss through analysis of structural characteristics, quality of rocks and soils linked to liquefaction patterns. The methodology of premium calculations varies from country to country and it continues to be updated and studied further in some countries.

[11] Financial Inclusion in Nepal: Policy Review and Prescriptions (NRB Working Paper Series), B. Pant, 2016
[12] Nepal – demand, supply, policy and regulation: Financial Inclusion Roadmap 2017-2022, Making Access Possible (MAP) Nepal, 2016
[13] FinScope, 2014

3. START FROM INITIATING A DIALOGUE WITH KEY STAKEHOLDERS

Dialogue and consultation with the service providers and potential beneficiaries/clients of micro-insurance is one of the first steps that municipalities can take. This will become an opportunity to understand the practices and constrains in the existing insurance mechanisms; public knowledge and perception towards risk transfer options; and potential policy requirements. The focus should be on building upon the existing services, networks of service providers and the learnt experiences in Nepal and other countries.

4. NOTE KEY LESSONS FROM COUNTRIES WITH AN EXPERIENCE OF EFFECTIVE MICRO-INSURANCE

Insurances for low-income families have been tested in many developing countries and their effectiveness and sustainability vary from country to country. It is imperative that key lessons and experiences are considered to promote similar initiatives in Nepal.

i. Micro-insurance for low-income families is **not the only solution** for disaster risk reduction, nor the quick solution for poverty reduction. Such product should be offered in conjunction with other protection measures (subsidies for elderlies, children and women or other social protection allowances) and risk mitigation measures (promotion of saving and accessibility to finances). Successes have been observed when the insurance initiative is embedded in a broader climate and a disaster risk management program [14].

ii. Lengthy claim settlement procedures and timing of pay-outs to the clients remain challenging. Reliable and efficient service distribution becomes the key to gain confidence and trust of insurance policy holders and to further expand the coverage.

iii. Much efforts are required in educating and building awareness of clients on the concept and mechanism of micro-insurance, and in harnessing the trust in the system of micro-insurance by making the system effectively function (strong service distribution, smooth insurance claim processing, fast disbursement of claim).

iv. Maximize partnerships with established or existing service providers for insurance or other financial products such as micro-finance institutions rather than introducing something new [15]. In the case of rural municipalities, utilizing both, the availability and the potential network of service distributors, is recommended. The service distributors include micro-finance institutions, farmer groups/cooperatives, mother's group, government offices for agriculture and livestock, and where appropriate, non-government entities. Even mobile phone network operators can be part of the effective distribution mechanism of micro-insurance in rural areas [16].

v. Research has shown that women are more financially responsible or willing to gain financial literacy and achieved the largest gains as a result of providing hand-holding support in micro-insurance uptake [17]. Further, targeting female micro-insurance policy holders brought about financial as well as social empowerment. It improved their self-esteem and respect in their communities, decreased domestic violence, and increased the nutritional and educational opportunities for children [18].

vi. Micro-insurance initiatives are iterative processes where policies and service improve over many phases of intervention. Leadership of the government - in-house capacity to apply improved scientific method in risk and premium calculation -and steady improvement of service efficiency will contribute to increased trust and demand from the people in the micro-insurance scheme. Municipalities should consider micro-insurance as long-term policy initiatives while continuing to invest in the system.

[14] Scaling up index-insurance for smallholder farmers: Recent evidence and insights, G. Greatrex et al., CGIAR Research Program, 2015
[15] Brief paper 7: Microfinance for Risk Mitigation and Crisis Recovery, Banking with the Poor Network, year not known
[16] Microinsurance for disaster recovery: Business venture or humanitarian intervention? An analysis of potential success and failure factors of microinsurance case studies, R. Yore and J. F. Walker, 2018
[17] Impact evaluation of the R4 rural resilience initiative in Senegal, WFP and Oxfam, 2016
[18] Risk Transfer through micro-insurance, UNISDR-GAR input paper, Batt and Pathak, 2014

Funded by European Union Civil Protection and Humanitarian Aid

POLICY BRIEF

C.3 Unlocking the challenge of access to finance for housing reconstruction after the 2015 earthquake: Relevance of housing reconstruction revolving fund for the most vulnerable households

BACKGROUND

Nearly four years after the 2015 earthquake there are still many people who have yet to rebuild their homes. So far, 738,523 home owners [1] have signed agreements with the Government for housing reconstruction grants [2]; however, reconstruction of more than 400,000 houses is yet be completed. With a bare minimum amount of government subsidies home owners are required to invest additional financial resources to fund reconstruction by tapping into their savings, existing assets and loans.

Amongst those who have not yet completed reconstruction of their homes are those who are socially vulnerable. They had no choice but to use the first tranche of Government grants (Rs. 50,000) on existing loan payments, food and medical expenses. They could not take advantage of the 2% interest bank loans due to the complicated procedure [1] and had to choose between foregoing the loan or opting for high-interest informal loans from local lenders. Selling the little available land that is their sole source of income is not a feasible option for them. Insurance to cover the loss is also not an affordable option.

There are many people who have taken the first government tranche but failed to secure a second or third tranche. Some used a portion on reconstruction, but the remainder would not have met their other needs. For others, it took too long to start because they were either alone, helpless, old or disabled. **Chances are high that these people will not be able to start or complete if no further support is provided.**

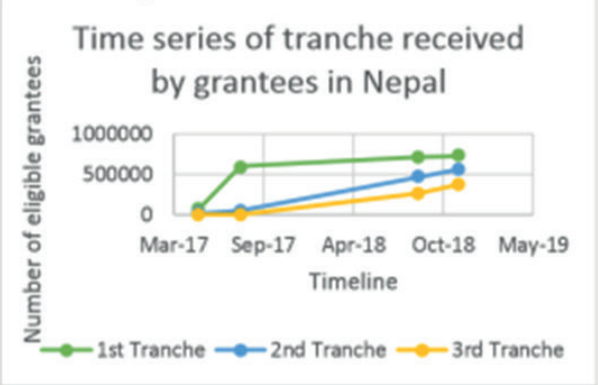
Signing an agreement for a housing grant alone doesn't guarantee the complete reconstruction of houses. The reconstruction process is leaving these vulnerable households behind and challenging the timely completion of the post-earthquake rebuilding. This is largely due to the **challenge of access to financial resources** by the most vulnerable households (intertwined with the inherent social vulnerability). Addressing this challenge is critical to ensure poor and vulnerable citizens have access to decent and resilient houses and to achieve completion of housing reconstruction on time.

HOUSING RECONSTRUCTION REVOLVING FUND

It is an innovative way to support families who are willing to start/complete reconstruction of their houses but having difficulty arranging additional self-funding to achieve this. The fund gives them the opportunity to access financial support without any interest on the principle amount and to reach the three key milestones of the housing reconstruction set by the government.

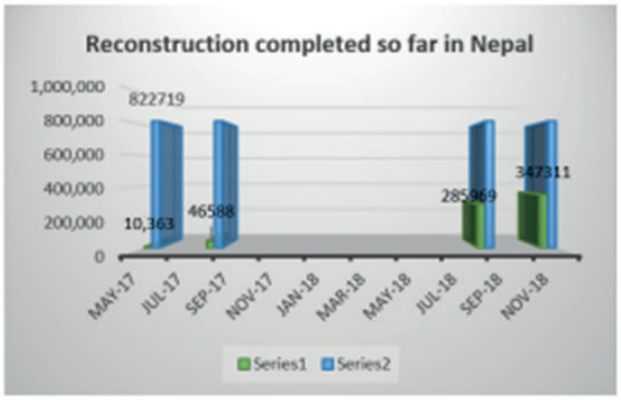
Local governments are the owners of the revolving fund and they decide the amount of seed fund required to benefit a certain number of target beneficiaries. Beneficiaries are those who have no savings or are unable access financial support from either formal or informal channels. The grantees of the revolving fund secure the immediate fund required to complete a certain level of housing reconstruction before the next tranche of the government housing grant is disbursed. Upon receiving the new government tranche, the borrowed amount will be paid back into the revolving fund. The fund gets redistributed among other grantees once its purpose is fulfilled by the earlier recipient.

The government housing grant is distributed in three installments: first Rs. 50,000 at foundation level, second Rs. 150,000 at plinth-level, and finally Rs. 100,000 at roof level. Constructing plinth, which is the government requirement to access the second installment, is the most expensive part of the construction process. With only Rs.50,000 in hand and without savings or additional financial support, it's simply not possible for the extreme poor to start up the construction process.



The NRA data shows a large gap between the ones who have taken their first tranche and those who have taken their second and/or third tranche. There are a significant number of households remaining who need to take their second and third tranche as the NRA data suggests. Of the total 822,719 agreements signed only 347,311 are reported to have reached the third tranche as of November 2018 (NRA website). The idea of a revolving fund is to fill the void created in between the first, second and third tranche of grants provided by the government.

Originally, the concept of a revolving fund was envisioned by Mr. Govinda Porkhel, former NRA CEO. Some municipalities have adopted this concept and rolled out utilizing the local government budget. Their experiences demonstrate the potential of a housing reconstruction revolving fund being implemented by other municipalities.



EXPERIENCE OF MUNICIPALITIES IN HOUSING RECONSTRUCTION REVOLVING FUND

In Gorkha, at least four municipalities have initiated housing reconstruction revolving funds - Palungtar municipality, Sahid Lakhan municipality, Gandaki municipality and Arughat Rural municipality. Most of their budget allocation was proclaimed through a council. In Arughat alone more than 27 grantees have benefited from the service. In Gandaki, 9 individuals were supported. The remaining two have been allocated the funds and will start the roll out soon. They have already selected beneficiaries that would have otherwise never completed reconstructing their homes.

For instance, the executive officer of Arughat Rural Municipality claims that "the effort has helped speeding up the reconstruction process." According to him they have nearly completed private home reconstruction in this rural municipality. The mechanism has come in handy to support those who have been left out so far. The chairperson of Sahid Lakhan, Mr. Ramesh Thapa said that "the process helps those vulnerable groups that have failed to start reconstruction even after taking the first tranche amount." He states that "having that amount is immensely useful for instant or immediate use, which can be paid back later, after the second tranche is received."

The ward chairperson from Gandakai, Mr. Deu Bahadur Gurung asserts that reimbursement to the revolving fund from beneficiaries is not difficult as they coordinate with banks to ensure it is received. Local authorities are excited that they have this provision to help marginalized and vulnerable people.

In many cases, a small gathering was held to evaluate the necessity of such a mechanism. Once it was identified as essential, municipalities requested to make such funds available to locals. Except for Gandaki Rural Municipality all other municipalities passed the allocated budget through their councils. In Gandaki Rural Municipality the mechanism is rolled out at ward level which is temporarily using the development budget to reallocate funds once the purpose is fulfilled. At the municipality level, the chairperson or the mayor himself, aiong with support from the ward chairperson, is heading the operation of the fund. Likewise, the ward chairperson is heading the operation at ward level.

TOWARDS OPERATIONALIZATION OF REVOLVING FUND IN YOUR MUNICIPALITY

The conclusion of those municipalities and wards is that the revolving fund is a practical solution for access to finance for housing reconstruction and, more importantly, it works when the local government takes a strong lead.

Municipalities or wards can allocate funds, most preferably through their councils, or use development funds to help people that are yet to complete or start reconstruction.

Alternatively, any organization or agency can establish such funds to support vulnerable and marginalized groups to access financial resources. The operation of the revolving fund can be managed by forming committees or sub-committees with the authority to roll out funds and select beneficiaries based on recommendations from ward secretaries.

One important aspect of the revolving fund is the recovery of the funds lent out. The funds should be recovered from the borrowers once they receive their 2nd or 3rd government housing grant tranche. The local authorities play a critical role in making this happen and coordination with banks and ward secretaries is required.

If deemed appropriate, paying back the fund can be tied to access to certain local government services (however, this should not further constrain the already poor and marginalized people who need support through the revolving fund). Once the borrower pays back the principle amount it should be rotated to help others until the last homeowner completes reconstruction work.

FACES OF THE REVOLVING FUND BENEFICIARIES

Mr. Julfe Kami is about 90 years old and lives in Arupokhari Rural Municipality, Ward no. 8, Gorkha. He lost his home in the 2015 earthquake and lived in a small shed for almost 3 years. He had partially spent the first tranche of the government housing grant for Dashain expenses and the remaining amount was insufficient to start up the construction required to fetch the second installment. The ward chairperson recommended his name for accessing revolving fund support after which he was able to access the second tranche, pay back the amount taken from the revolving fund, and construct the new house.

Ms. Khing Maya Gurung is 82 years old and lives alone. She was approached by the local Ward Chairperson with the offer of support to construct a new house replacing the 25 square foot shed in which she spent 3 winters. She was among those people who felt helpless and was reluctant to approach government by going through all the procedures. She was listed in the NRA as an eligible grantee but due to some technical problem she had not yet received any tranche. Her ward will provide the revolving fund to start up the construction process immediately, process her files for correction, and apply for her share of tranche. "I can live in a proper house to survive through winters in the future.", says Ms. Gurung.

Funded by European Union Civil Protection and Humanitarian Aid

Annex D. Abbreviations

ADB	Asian Development Bank
AWS	*Awas Nirman Sathi* ("house construction friend"), master mason and facilitator
BBB	Building Back Better
BFI	Bank and other financial institutions
CBO	Community-based Organizations
CDHR	Community-Driven Housing Reconstruction
CR	Containment Reinforcement
DDA	Detailed Damage Assessment
DFID	Department for International Development
DRM	Disaster Risk Mitigation
DRR	Disaster Risk Reduction
DRU	District Reconstruction Units
ERRA	Earthquake Reconstruction and Rehabilitation Authority
GOI	Government of India
HRRP	Housing Recovery and Reconstruction Platform
ICT	Information and Communications Technologies
IDP	Internally Displaced People
IEC	Information, Education, and Communication
IHF	Islamic Revolution Housing Foundation
INGO	International Non-Government Organization
JICA	Japan International Cooperation Agency
M & E	Monitoring and Evaluation
MoU	Memorandum of Understanding
MTC	Mobile Van Technology Clinic
NDMA	National Disaster Management Authority, Delhi, India
NGO	Non-Governmental Organization
NHRP	Nepal Housing Reconstruction Project
NRA	National Reconstruction Authority
ODHR	Owner-Driven Housing Reconstruction
PDNA	Post-Disaster Needs Assessment
PDRF	Post-Disaster Recovery Framework
RIMS	Reconstruction Information Management System
SDG	Sustainable Development Goals
SE	Senior Engineer
SERRA	State Earthquake Reconstruction and Rehabilitation Authority
SoW	Scope of Work
ToR	Terms of Reference
UNDP	United Nations Development Programme
UN-Habitat	United Nations Human Settlements Programme
WB	World Bank

Annex E. Definitions

Special note: unless otherwise mentioned, all definitions are based on United Nations Office for Disaster Risk Reduction terminology. (UNDRR, https://www.undrr.org/terminology)

'Build Back Better': The use of the recovery, rehabilitation and reconstruction phases after a disaster to increase the resilience of nations and communities through integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems, and into the revitalization of livelihoods, economies and the environment.

Building Code: A set of ordinances or regulations and associated standards intended to control aspects of the design, constructions, materials, alteration and occupancy of structures that are necessary to ensure human safety and welfare, including resistance to collapse and damage.

Capacity development is the process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals. It is a concept that extends the term of capacity-building to encompass all aspects of creating and sustaining capacity growth over time. It involves learning and various types of training, but also continuous efforts to develop institutions, political awareness, financial resources, technology systems and the wider enabling environment.

Cash transfer: Cash transfer is an alternative way of conveying aid to populations affected by disasters such as earthquakes, floods, droughts, as well as temporary or chronic food insecurity due to prolonged conflict and/or poverty. It broadly implies giving money rather than assistance in-kind such as food, shelter, livelihoods, medicine.
https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/guidelines_cash_transfers_in_emergencies_helpage.pdf

Community: The people living in one particular area or people who are considered as a unit because of their common interests, social group, or nationality. A community often has a common cultural and historical heritage. (Based on https://dictionary.cambridge.org/).

Disaster: A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts.

Disaster risk: The potential loss of life, injury or destroyed or damaged assets which may occur in a system, society or a community in a specific period of time, determined in terms of probabilities as a function of hazard, exposure, vulnerability and capacity.

Disaster Risk Management (DRM): Disaster risk management is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses.

Disaster Risk Reduction (DRR): Disaster risk reduction aims to reduce existing disaster risk, prevent new risk and manage residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development.

Downtime: The time required for repairing and retrofitting the building. During this period, the house may not be suitable to occupy (UNDP, CO, Nepal).

Global Facility for Disaster Reduction and Recovery (GFDRR): A global partnership that helps developing countries better understand and reduce their vulnerability to natural hazards and climate change. GFDRR is a grant-funding mechanism, managed by the World Bank, that supports disaster risk management projects worldwide (www.gfdrr.org).

Governance: Governance refers to the exercise of political and administrative authority at all levels to manage a country's affairs. It comprises the mechanisms, processes and institutions, through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences[26].

Hazard: A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.

Local materials: Material which may be locally extracted, processed and procured and which are close enough to building sites, such as stones, soil, timber in the hills and mountains. Local materials may be area-specific.

Locally available materials: Materials which may be locally procured and easily transported to the site. These include local materials as well as materials imported from outside, such as cement, steel, sand, etc.

Non-structural elements: These can be listed under three categories: (a) Contents of buildings: furniture, storage shelves, refrigerators, washing machines, gas cylinders, TVs, false ceilings, generators and motors, door and window panels and frames, large-panel glass panes with frames, etc.; (b) Appendages to buildings: chimneys projecting out from buildings, glass or stone cladding, parapets, advertisement hoardings, antennae, etc.; and (c) Services and utilities: plumbing lines, gas pipelines, sewage pipelines, air-conditioning ducts, elevators, fire hydrant systems, etc. (Adapted from GSDMA, non-structural components gsdma.pdf).

Reconstruction: The medium- and long-term rebuilding and sustainable restoration of resilient critical infrastructures, services, housing, facilities and livelihoods required for the full functioning of a community or a society affected by a disaster, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risk (UNDRR).

Recovery: The restoring or improving of the livelihoods and health, as well as the economic, physical, social, cultural and environmental assets, systems and activities, of a disaster-affected community or society, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risk (UNDRR).

Relocation: Process whereby a community's housing assets and public infrastructure are rebuilt in another location (UNDP, CO, Nepal).

Resilience: The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.

Retrofitting: Reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards. It is carried out by modifying existing components or installing new components to the building that correct any identified deficiencies which might jeopardize the safety of the building during a hazard event. (Adapted from UNDRR).

Risk: The combination of the probability of an event and its negative consequences. Risk depends on hazard, vulnerability and coping mechanisms (Adapted from UNISDR) https://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf)

Vulnerability: The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

26 https://www.un.org/millenniumgoals/pdf/Think%20Pieces/7_governance.pdf

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