



Housing Recovery and
Reconstruction Platform



Urban Housing Reconstruction Status Paper

September 2018



About HRRP

The Housing Recovery and Reconstruction Platform (HRRP) was established in December 2015 to take over supporting coordination of the post-earthquake housing reconstruction from the Nepal Shelter Cluster, as it returned to the pre-earthquake format as a standing cluster. The platform provides coordination support services for the National Reconstruction Authority (NRA), Building and Grant Management and Local Infrastructure (GMALI) Central Level Programme Implementation Units (CLPIUs), other relevant government authorities, and Partner Organisations (POs). Phase 3 of the HRRP was approved by the Government of Nepal (GoN) at the beginning of March 2017 and will run until the end of February 2019. HRRP3 is primarily funded by DFID Nepal and CRS Nepal. Other financial contributors and implementing partners include Oxfam, Caritas Nepal, Plan International, National Society for Earthquake Technology-Nepal (NSET), and Habitat for Humanity.

The HRRP has 12 District Coordination Teams (DCTs) primarily focused on the 14 districts most affected by the 2015 Gorkha earthquake (1 team covers the three districts in the Kathmandu Valley) and providing support to the 18 moderately affected districts where feasible. The DCTs are made up of a Coordinator, a Technical Coordinator, and an Information Management Officer. The DCTs are supported by a District Management Team (DMT) made up of a Coordinator, Technical Coordinator, and Information Manager. The DMT provides day to day guidance and support to the DCTs as well as targeted capacity building and has a roving presence across all districts. The national team includes general coordination, technical coordination, and information management expertise and supports the link between national and district level.

Areas of Focus

The HRRP has four main areas of focus:

- Monitoring and documenting the housing reconstruction process
- Improving coverage and quality of socio-technical assistance
- Addressing gaps and duplications
- Advocacy and Communications

Get Involved!

Visit the HRRP website

hrrpnepal.org

Subscribe to the HRRP mailing list

hrrpnepal.org/subscribe

Follow the HRRP Flickr page (and share photos!)

 [@hrrp_im](https://www.flickr.com/photos/hrrp_im/)

Like our Facebook page

 [@HRRPNepal](https://www.facebook.com/HRRPNepal)

Follow us on Twitter

 [@hrrp_nepal](https://twitter.com/hrrp_nepal)

Primary Funding:



Contents

1.0 Introduction	4
2.0 Background	5
2.1 Urban Context in Nepal	5
2.2 Post-Earthquake Urban Reconstruction – Other Contexts	8
2.3 Gorkha Earthquake 2015	11
2.4 Housing Typologies	12
3.0 Post Disaster Recovery Framework and Urban Housing Reconstruction	19
4.0 Challenges in Urban Reconstruction	22
4.1 Land	22
4.2 Cost	24
4.3 Materials & Technology	26
4.4 Human Resources	29
4.5 Construction Process and Systems	29
5.0 Opportunities & Successes in Urban Reconstruction	32
5.1 Land	32
5.2 Cost	34
5.3 Materials & Technology	34
5.4 Human Resources	39
5.5 Construction Process and Systems	39
6.0 Next Steps	42

I.0 Introduction

This status paper has been prepared by HRRP with the objective of providing a snapshot of progress in urban reconstruction to date, the challenges and opportunities in urban reconstruction, and some suggestions for next steps.

The document introduces the context, provides photographs of common housing typologies found in urban areas, shares examples of reconstruction issues in urban parts of earthquake affected districts, and provides information about initiatives to address some of these issues.

One area that this paper does not cover is renters in urban sectors due to a lack of information on this topic.

This is clearly an important factor in urban housing reconstruction and it is recommended that research and documentation on this topic be carried out.

This paper was reviewed by the Technical Advisor on Urban Reconstruction in the Government of Nepal's (GoN) National Reconstruction Authority (NRA). This is 'version 0' of the paper and it is hoped that it will be a living document that can be updated and improved as and when required.

2.0 Background

2.1 Urban Context in Nepal

Nepal remains a largely rural country, with just under 20% of the population living in urban areas as of 2017. However, the country is urbanising rapidly. The population of the Kathmandu Valley is growing at 4% per year and is one of the fastest-growing metropolitan areas in South Asia. Pokhara, the largest medium-size city, is also expanding rapidly, with an annual population growth rate of 5%. Urban areas are also developing and expanding along the border with India and along the main highways with population increasing by 5-7% every year in the fastest-growing settlements¹.

Communities in urban areas are diverse and mobile and face many challenges specific to the urban context. In particular, haphazard and uncontrolled growth of built-up areas is leading to rapid and uncontrolled sprawl, irregular, substandard, and inaccessible housing development, loss of open space, decreased livability, and increased vulnerability to disasters². In this context, using a geographical definition for urban communities is not applicable in the same way as it is for urban. The British Red Cross 'Strengthening Urban Resilience & Engagement (SURE) Programme' defines 6 types of urban communities³:



The municipal structure in Nepal has changed many times in the past decades but municipality has not always meant urban – the indicator used to define a municipality has been population and as a result many municipalities remain partially, or even fully, rural in character.

In 1959, Nepal had just 10 municipalities. By 1992, this had increased to 36 municipalities and then further increased to 58 municipalities by 1996. In May 2014 72 municipalities were established, in December 2014 61 municipalities were established, in September 2015

26 municipalities were established, and in March 2017 46 municipalities were established. This brought the total to 263 in March 2017. Under the new Federal Administration restructuring in Nepal the number of municipalities again changed on September 2017. At this point, 6 metropolitan cities, 11 sub-metropolitan cities, 276 municipalities, and 460 rural municipalities were declared. These changes in administrative structures are presented in the maps below:

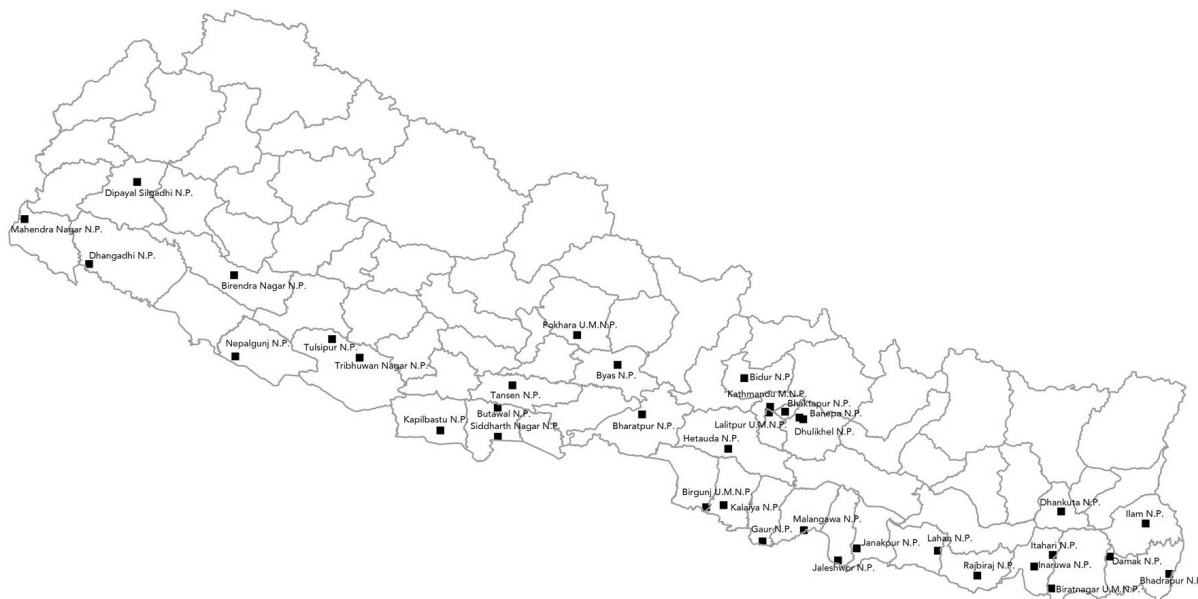
¹ *Managing Nepal's Urban Transition, World Bank, April 2013*

² *Managing Nepal's Urban Transition, World Bank, April 2013*

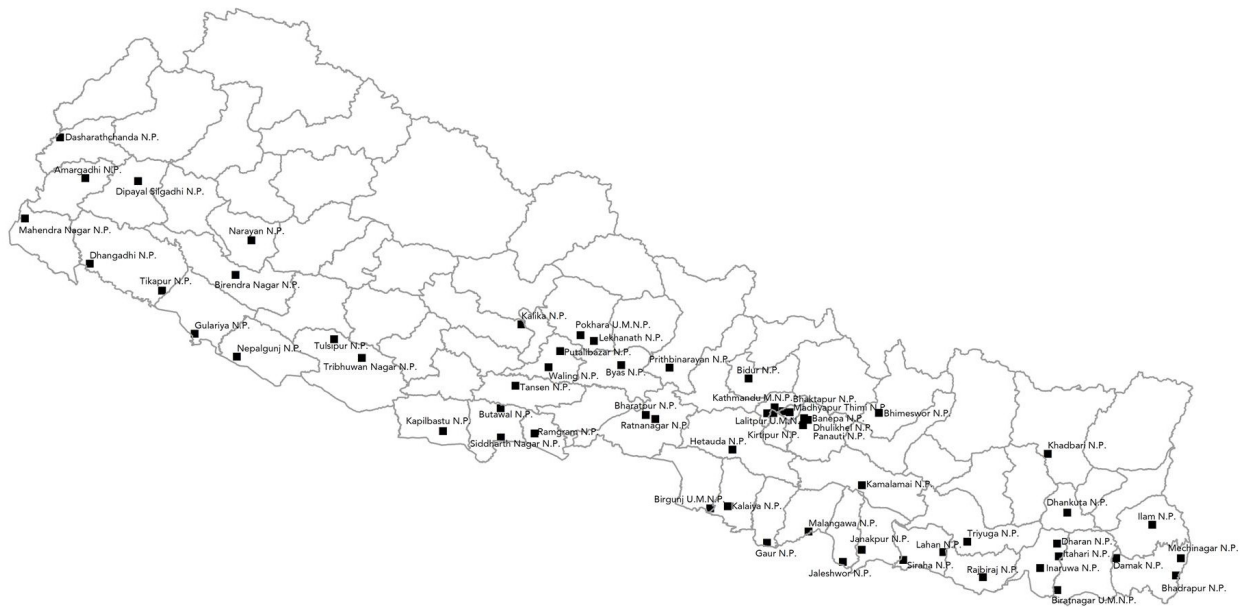
³ *Urban Assessment (VCA) Guidelines, Strengthening Urban Resilience & Engagement (SURE) Programme, British Red Cross, May 2017*



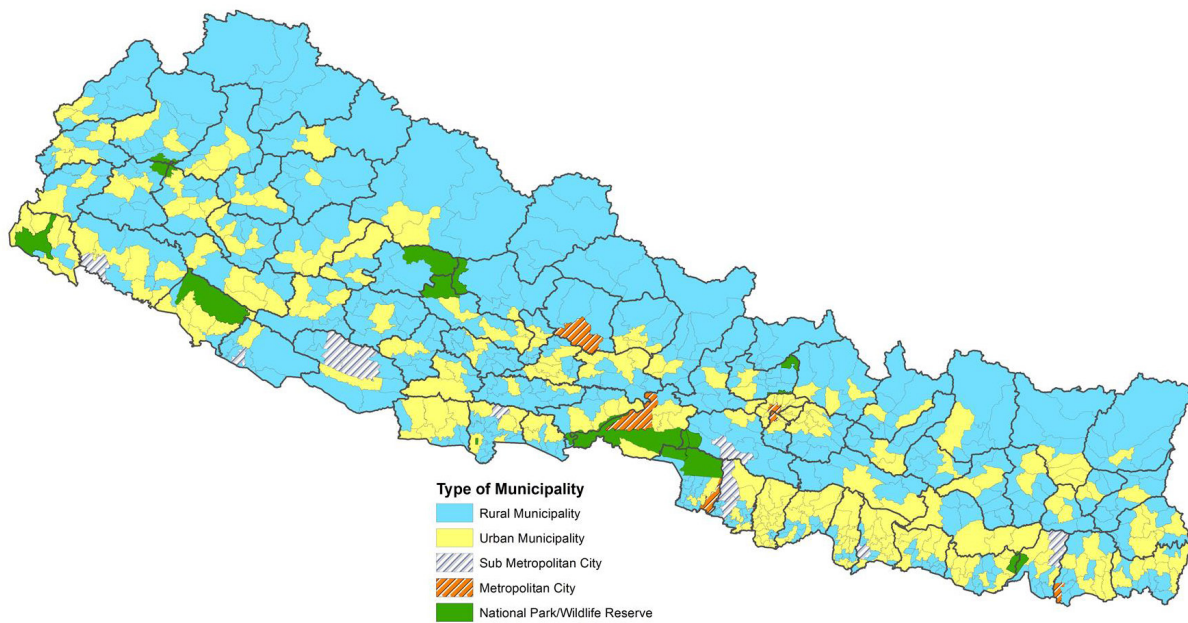
Municipalities in Nepal in 1959.



Municipalities in Nepal in 1992.



Municipalities in Nepal in 1996



New local administrative structure established in September 2017.

The Government of Nepal's (GoN) National Urban Development Strategy⁴, published in 2017, has five underlying and interconnected guiding principles; sustainability, inclusivity, resilience, green, and efficient. The strategy outlines "Vision 2031: Balanced and Prosperous National Urban System" – a singular, consolidated milestone for the urban development sector. The strategy sets out three major milestones for achieving this vision:

- 5 year milestone: "policies, plans, guidelines and regulations in place for improved investment and systemic planning for urban development".
- 10 year milestone: "plans, projects and programs operationalized with increased investment in urban development with strengthened interurban and urban rural linkages".
- 15 year milestone: "urban centers with improved infrastructure, healthy environment, efficient management and vibrant economy".

The strategy also sets out indicators for a 'Balanced and Prosperous Urban System':

- a. national and sub-national (provincial and regional) urban primacy index (two City and four city index)
- b. provincial and regional level of urbanization
- c. number of settlements of each hierarchy
- d. population and area served by each settlement
- e. inter- and intra-provincial and regional urban migration
- f. GDP of provincial and regional urban centers
- g. growth rate of small, medium and large urban areas
- h. number and growth of higher and specialized social and economic functions in large urban areas

- i. number and growth of large, small and medium enterprise (output, employment)
- j. number, mileage and standard of intra-provincial and regional highways and roads
- k. number, mileage and standard of inter-provincial and regional highways and roads
- l. volume of the flow of intra-provincial/regional and interprovincial/regional trade and services
- m. citizen report card for cities

Making the vision in the National Urban Development Strategy (NUDS) a reality requires investment, coordination, and collaboration across a wide range of actors. The urban reconstruction and recovery following the 2015 Gorkha Earthquake offers a huge opportunity to contribute to the realisation of the NUDS. The implementation of the NUDS will require coordination and collaboration between multiple government ministries, especially the Ministry of Urban Development (MoUD) and the Ministry of Federal Affairs and General Administration (MoFAGA). MoUD have the technical lead on NUDS, but implementation at municipal level comes under the jurisdiction of local government.

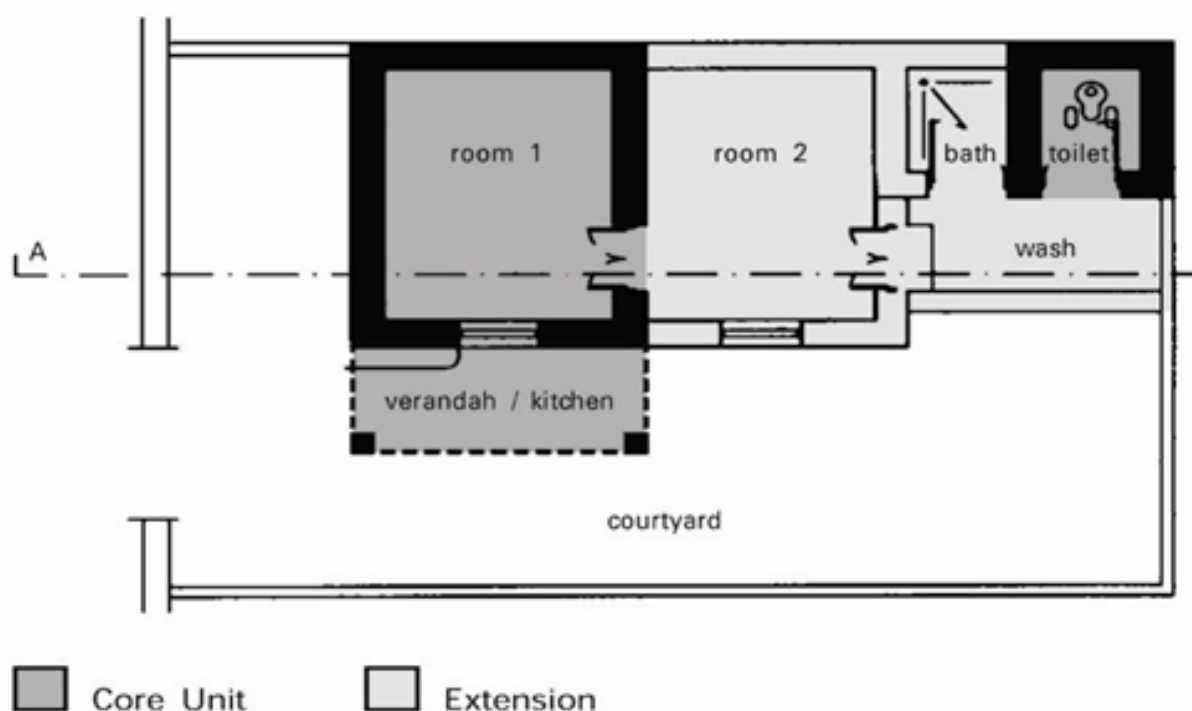
2.2 Post-Earthquake Urban Reconstruction – Other Contexts

Gujarat Earthquake, 2001

The Gujarat earthquake response focused on providing a financial grant to cover costs of a core shelter, that could later be expanded, so that "every affected and eligible family would receive at least a minimum safe shelter, even if their home had greater square metres prior to the earthquake"⁵.

⁴ National Urban Development Strategy, Government of Nepal, January 2017

⁵ EAP DRM Knowledge Notes, Working Paper Series No. 9, Housing reconstruction in urban and rural areas



Room 1, the verandah / kitchen, and the toilet were covered by the financial grant – shaded in darker grey in the diagram.

However, the financial grant did acknowledge the difference between reconstruction in rural and urban areas and this was reflected in the amounts distributed. In rural areas, government assistance was limited to the maximum grant amount of RS 90,000 (USD 2,117) required to construct a safe core housing unit of 45 square meters but in urban areas, the core unit was estimated to cost RS 175,000 (USD 4,117) for up to 50 square meters⁶.

In Nepal, there is also a significant difference between the cost of construction in rural and urban areas, as discussed later in the report. Increase in the housing reconstruction and retrofit grants for urban areas could be a potential option for urban housing recovery in Nepal also.

Kashmir Earthquake, 2005

One of the keynote speakers during the 'Risk2Resilience' conference (organised by the Ministry of Home Affairs (MOHA), the National Reconstruction Authority (NRA), the Nepal Academy of Science and Technology (NAST), and the National Society for Earthquake Technology - Nepal (NSET)) in Kathmandu in June 2018 shared lessons

learned from urban reconstruction in Pakistan as follows:

- 90% of temporary shelters still used 13 years after earthquake
- Rental and interim costs have slowed housing reconstruction
- Joint family property ownership makes decision making complex and takes time
- Funding larger building reconstruction takes time
- Urban land values, new buildings are bigger
- No strengthening of municipal regulatory capacity
- Urban housing reconstruction is underway in 2018 with no technical guidance

Many of these issues are seen in the urban housing reconstruction in Nepal and are discussed later in this document. What is critical to learn from the Pakistan experience is that planning technical assistance for urban housing reconstruction cannot be tied to the same timeframe and approach as rural housing reconstruction.

⁶ EAP DRM Knowledge Notes, Working Paper Series No. 9, Housing reconstruction in urban and rural areas



L: earthquake damage in urban areas in 2005 following the Kashmir earthquake. Centre: temporary shelter still in use, and occupying plot, in 2010. Right: urban housing reconstruction underway in 2018 with no technical assistance. All photos taken from keynote speech, 'What went well? What could have gone better? Learning from recovery experience in Nepal and Pakistan', from June 2018 Risk2Resilience conference.

Haiti Earthquake, 2010

This was an urban disaster, heavily affecting the capital Port-au-Prince as well as a number of secondary cities and towns. A report produced by GFDRR, WB, UN Habitat, Habitat for Humanity, and the International Federation of the Red Cross and Red Crescent Societies⁷, found that "Government and development partners were unprepared for the spatial, physical, and institutional challenges associated with recovery from such a large-scale urban disaster".

The report also states that "what was more critical in the first two years, which was never put in place, was an urban planning framework that could have increased the coherence of recovery projects at the local level and guided newly urbanizing areas, in order to maximize the contribution of these initiatives to strategic urban development goals".

One of the 'newly urbanising areas' is Canaan, on the outskirts of the city and surrounding two planned

settlements implemented by the Government of Haiti and international partners. Before the earthquake, the Canaan area was an environmental protection zone, with nobody living there. In the space of just three years after the earthquake it became a large, busy settlement with approximately 20,000 families living there and with roads, schools, churches, and businesses all established by these families⁸. A GIF of an aerial view of the growing Canaan community from January 12, 2010 through April 2013 is available here.

The experience in Haiti highlights the importance of urban planning, both for reconstruction as well as for longer term urban resilience – a lesson that is important to incorporate into urban housing reconstruction efforts in Nepal. It is also clear that globally there are many local and national governments, NGOs, academics, etc. that are trying to develop ways to address post-disaster recovery in an urban context. There is an opportunity for work in this area in Nepal to contribute greatly towards this global effort.

⁷ *What did we learn? The Shelter Response and Housing Recovery in the First Two Years after the 2010 Haiti Earthquake*, GFDRR / World Bank, 2016

⁸ *Promised Lands: 5 Examples of Housing Developments in Haiti (part 2 of 2)*, UrbDeZine Chicago, April 2013



An aerial view of earthquake damage to housing in Port-au-Prince.

2.3 Gorkha Earthquake 2015

The Gorkha Earthquake, which struck Nepal on 25 April 2015, caused widespread damage and loss of life across almost 50% of the country. The Post Disaster Needs Assessment (PDNA) identified 32 districts as earthquake affected, across five different categories of impact:

- Severely Hit: Gorkha, Dhading, Rasuwa, Nuwakot, Sindhupalchok, Dolakha, and Ramechhap
- Crisis Hit: Kathmandu, Bhaktapur, Lalitpur, Kavre, Okhaldunga, Sindhuli, and Makwanpur
- Hit with Heavy Losses: Lamjung, Tanahun, Chitwan, Solukhumbhu, and Khotang
- Hit: Kaski, Parbat, Syangja, Palpa, Gulmi, and Baglung
- Slightly Affected: Myagdi, Arghakhanchi, Nawalpur, Parasi, Bhojpur, Dhankhuta, and Sankhuwasabha

There are urban areas across all these districts, and in total there are 589 urban wards, across 94 municipalities. The map below illustrates the spread of urban wards, as well as the scale of housing reconstruction across each. Ward level data is not available for the total number of

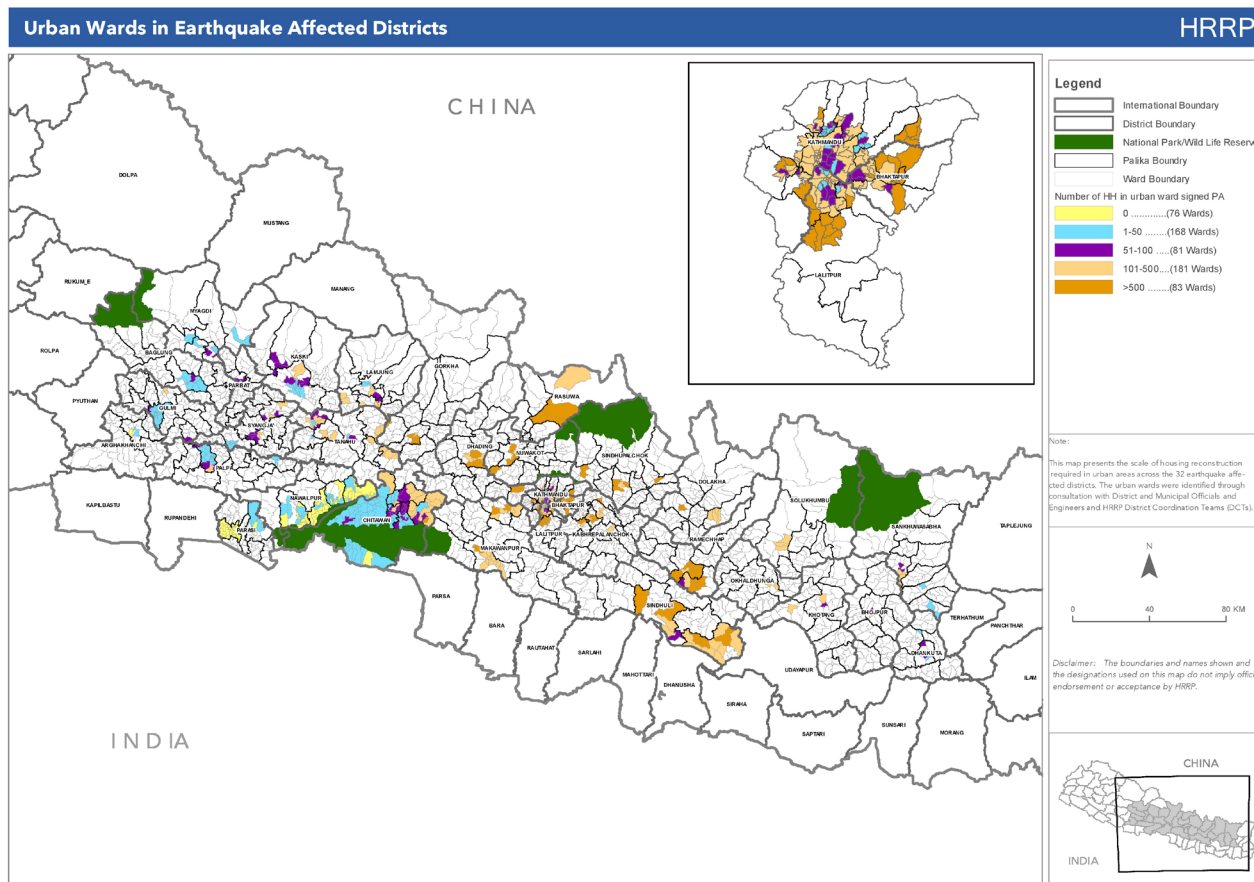
households eligible for the housing reconstruction or retrofit grant, but the data for the number of households that have signed the Partnership Agreement (PA) with the GoN is available at ward level. Based on this there are 76 wards where no households have signed a PA, 168 wards where 1-50 households have signed a PA, 81 wards where 51-100 households have signed a PA, 181 wards where 101-500 households have signed a PA, and 83 wards where more than 500 households have signed a PA. Across all urban wards there are more than 120,000 households that have signed a PA.

As per the GoN's National Urban Development Strategy⁹ defining urban areas is a challenge and "the criteria taken for urban or municipal designation do not take into account the more relevant functional characteristics such as density, contiguity, occupational structure". This challenge has also impacted the reconstruction as there has not been a common understanding of which areas in earthquake affected districts are urban. HRRP, through consultation with GMALI DLPIU offices, municipal and ward officials, NRA, Building DLPIU technical staff, and the HRRP District Coordination Teams (DCTs), identified the urban wards

⁹ National Urban Development Strategy, Government of Nepal, January 2017

across the 32 earthquake districts. The 589 wards identified are spread across 10 Rural Municipalities, 79

Urban Municipalities, 1 Sub-Metropolitan City, and 4 Metropolitan Cities.



Map of urban wards in earthquake affected districts.

2.4 Housing Typologies

The spread of urban wards across earthquake affected districts covers a wide range of areas and contexts and the diversity of housing typologies reflects this. Some of the major housing typologies found in urban areas are:

- Reinforced Cement Concrete (RCC) Framed Building: this is a frame structure consisting of cast in situ RCC beams and columns. Floors and roofs are constructed from cast-in-situ concrete slabs. These buildings usually have brick masonry infill in the walls. RCC buildings fall in to two major categories; non-engineered and engineered.
- Brick and Cement Mortar Masonry: the structural walls in these buildings are one brick thick (230mm) and the mortar used is 1:6 cement sand mortar. These buildings are normally two or three storeys but can be even higher in some areas. The floors are using either reinforced concrete, reinforced brick, or reinforced brick concrete slabs. The roof is generally built in a similar way

but in some cases a sloped roof is built using RC slabs. Usually the slabs rest directly on walls without beams. A peripheral beam cast with the floor slab can be found in some buildings.

- Hollow Concrete Block and Cement Mortar Masonry: in these types of structures hollow concrete blocks are used as the wall materials. Concrete blocks with a core void area larger than 25% of the gross area are considered hollow concrete blocks. Under Nepal Standards NS 119/2042, hollow concrete blocks are required to have a minimum compressive strength of 51 kg/cm².
- Stone and Cement Mortar Masonry: in these buildings, cement mortar is used to bind the stones together. The wall thickness is reduced compared to stone and mud mortar masonry buildings and is usually 350-450mm. These houses are normally 2 or 3 storeys. The floors are constructed of either reinforced concrete, reinforced brick slabs, or timber. The roof is

generally constructed in a similar way but in some cases sloped roofs may be built from RC slabs. Usually the slabs rest directly on walls without beams. A peripheral beam at plinth and roof can be found in some buildings.

- Stone and Mud Mortar Masonry: in these buildings, mud mortar is used to bind the stones together. The structural walls are the main load bearing components of the building and are normally 450-650 mm thick. These thick walls are generally constructed in multiple wythes, with smaller pieces of stone used as filler material between them. The flooring is normally bamboo or timber joists with mud plaster. Roofs are

normally constructed using timber rafters with CGI sheets or tiles

- Hybrid Structures: these structures bring together a combination of building typologies or systems in one structure. There are generally two types of hybrid structures; combined load resisting systems, e.g. RCC at ground floor and masonry structure for upper storey(s), and combination of materials in the structural system, e.g. brick masonry load bearing wall at ground floor and adobe for upper storey(s).

The table below presents some housing typologies from across earthquake affected urban areas.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)

Location: Kavrepalanchok, Panauti Municipality, Ward No. 11

An example of good construction practice for an RCC house. The columns are 12"x 12" and lintel and sill bands have been provided.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)

Location: Bhaktapur, Madhyapur Thimi Municipality, Ward No. 5

Three storey house with single bay at one side which is non-redundant. As the plot of land is small, the house is slender and tall with an eccentric footing – one of the most common issues in urban core areas.

Housing Recovery and Reconstruction Platform



Housing Typology: Hollow Concrete Block and Cement Mortar Masonry

Location: Dolakha, Jiri Municipality, Ward No. 6

The house owner has received the first tranche of the GoN housing reconstruction grant.



Housing Typology: Stone and Cement Mortar Masonry

Location: Dolakha, Bhimeshwor Municipality

Stone and cement mortar masonry house with RCC bands.



Housing Typology: Hybrid Structure

Location: Kavrepalanchok, Namobuddha Municipality, Ward No. 4

Hybrid structure with stone and cement mortar masonry ground floor and steel frame first floor.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)

Location: Okhaldhunga, Siddhicharan Municipality, Ward No. 9



Housing Typology: Stone and Mud Mortar Masonry
Location: Ramechhap, Ramechhap Municipality, Ward No. 9
RC bands have been used and a light gable has been constructed from CGI.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)
Location: Ramechhap, Manthali Municipality, Ward No. 1
Irregular shaped RCC house with columns that are 9"x 12".



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)
Location: Sindhupalchowk, Chautara Municipality
The house owner has received the second tranche of the GoN housing reconstruction grant.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)
Location: Sindhupalchowk, Chautara Municipality
The house owner has received the second tranche of the GoN housing reconstruction grant.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)

Location: Bhaktapur, Bhaktapur Municipality, Ward No. 3
An RCC structure with traditional architectural cladding on the front of the building.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)

Location: Kathmandu, Kathmandu Metropolitan City, Ward No. 12, Teku

Four storey house with single bay at one side which is non-redundant. As the plot of land is small, the house is slender and tall with an eccentric footing – one of the most common issues in urban core areas.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)

Location: Gorkha, Gorkha Municipality, Ward No. 8

An RCC house with 12" x 12" columns.



Housing Typology: Load Bearing Brick and Cement Mortar Masonry

Location: Lalitpur, Godawari Municipality, Ward No. 10

One room, load bearing structure with flexible roof. The house has been built with support from Lumanti and belongs to an elderly couple.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)

Location: Tanahun, Bhanu Municipality, Ward No. 2

This RCC house has not been completed due to road right of way conflict and the building requirements of the newly formed municipality. Instead of constructing a rigid floor as planned, the home owner has put a temporary CGI roof over one section of the house.



Housing Typology: Load Bearing Brick and Cement Mortar Masonry

Location: Tanahun, Bhanu Municipality, Ward No. 2

The home owner has received the first tranche of the GoN housing reconstruction grant but does not know anything about the process to receive the second tranche. They have already reconstructed this one room house with a steel frame and flexible roof structure and the house has not yet been inspected by the government engineers.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)

Location: Sankhuwasabha, Khandbari Municipality, Ward No. 8

RCC frame structure with 998 sq. ft. plinth area, and 16 no. 12"x12" Columns. The house has 3 storeys and an underground. The NRA, Building DLPIU engineers are not sure if this house can be approved for the GoN housing reconstruction grant but it has been approved by the municipality.



Housing Typology: Load Bearing Hollow Concrete Block and Cement Mortar Masonry

Location: Kaski, Lekhnath Municipality, Pokhara

More than 600 houses have been constructed using hollow concrete blocks in Kaski. Households regularly ask the GoN engineers for designs and they have been providing the designs from the DUDBC Design Catalogue Volume 2, but households are not building according to these designs. There is a lot of hollow concrete block production in Kaski, with many of the biggest and oldest producers in the district. Blocks from Kaski are sent to Tanahun, Lamjung, Gorkha, and Pabot.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)

Location: Chitwan

An RCC frame structure with 12" x 12" columns. A major issue with this house is that the lap length in the steel reinforcement in the columns is insufficient for the next storey.



Housing Typology: Reinforced Cement Concrete Framed Building (RCC)

Location: Chitwan, Khairahani Municipality, Ward no.2, Ladari

This two storey RCC frame structure, with 12"X12" columns, has been approved for all three tranches of the GoN housing reconstruction grant.

3.0 Post Disaster Recovery Framework and Urban Housing Reconstruction

The Post Disaster Recovery Framework (PDRF), published by the Government of Nepal (GoN) in May 2016, is intended to “provide a systematic, structured, and prioritized framework for implementing recovery and reconstruction” for “all of government, as well as national and international partners and other recovery stakeholders, including the affected population”.

The PDRF defines five strategic recovery objectives, the first of which is to “restore and improve disaster resilient housing, government buildings and cultural heritage, in rural areas and cities”. Under this strategic objective the PDRF outlines plans for restoring urban heritage settlements, unsafe neighbourhoods, and affected market towns, including:

- Improving access to planning and building skills
- Engaging small and medium sized businesses and cooperatives to increase investment in revival of urban areas
- Strengthening effectiveness of municipalities and other stakeholders to plan and enforce safe and resilient rebuilding and expansion of settlements
- Advocating for comprehensive risk reduction and enforcing the safeguarding of public and open spaces for evacuation

The PDRF sector plan for urban housing reconstruction outlines recovery and reconstruction priorities, together with estimated financial requirements:

Year	2016	2017	2018	2019	2020	Total	On-budget sources	Off-budget sources	Un-known
Budget in Million NPR	19,814	19,475	17,694	17,569	15,507	90,059	20,000		70,059
Program									
Regeneration of 63 (52 in Kathmandu valley) heritage settlements	4,000	4,000	4,000	4,000	4,000	20,000			20,000
Housing Reconstruction	4,000	4,000	4,000	4,000	4,000	20,000	20,000		
Funding support for financing housing credit	4,159	4,159	4,159	4,159	4,157	20,793			
Vulnerable top up subsidy	600	600	600	600	600	3,000			
Repair and retrofit subsidy	1,000	1,000	500	500		3,000			
Material supply, enterprise, livelihood	2,000	1,500	500	500	500	5,000			
Sustainable housing services	200	200	200	200	200	1,000			
Emergency shelter and camps	500	200	100	100	100	1,000			

Housing Recovery and Reconstruction Platform

Year	2016	2017	2018	2019	2020	Total	On-budget sources	Off-budget sources	Un-known
Community grants for local infrastructure	1,500	1,500	1,500	1,500	300	6,300			
Safe demolition	75	25				100			
Communication campaigns	250	250	250	125	125	1,000			
Risk sensitive land use plan preparation and implementation for 31 settlements with adequate provision for open spaces	310	310	310	310	310	1,550			1,550
Rental housing for urban poor	50	50	50	50	50	250			250
Integrated reculstering of urban settlements		250	250	250	250	1,000			
Preparation of Guidelines, planning norms, standards, bye-laws for safer housing and settlement reconstruction	60	25				85			85
Construction of 1 model houses in each of the 30 urban settlements	30	15				45			45
Institutional development and capacity enhancement for building back better	250	250	250	250	200	1,200			1,200
Review national plans, strategies and building codes	10	6				16			16
Preparation of housing technology and design options	10	10				20			20
Implementation of national plan of action for safer building construction	10	25	25	25	15	100			100
Setting up resource and training centers	100	100				200			200
Technical assistance for revitalization of traditional settlements of Kathmandu valley	500	500	500	500	200	2,200			2,200
Revitalization of 44 informal settlements of Kathmandu valley	200	500	500	500	500	2,200			2,200

The sector plans are intended to be living documents, which should be updated periodically, and against which results can be measured on an ongoing basis.

There are elements in the PDRF sector plan that have not yet taken off but that could have a big impact on the urban housing reconstruction. This includes:

- Regeneration of heritage settlements (including 52 in the KTM valley) – recovery in heritage settlements needs specific support and cannot take an approach focused on individual houses. Settlement planning is required accompanied by technical support for reconstruction that protects / promotes heritage building styles.
- Community grants for local infrastructure – housing recovery is not just about the houses. Settlement planning and recovery are equally

important and providing community grants for local infrastructure could contribute hugely to this. There have been some examples where community groups in old core settlements have come together to reconstruct a 'paati' (resting place).

- Rental housing for urban poor – poor households in urban areas have lost their rented accommodation and are often struggling to find new rented accommodation in the same area at an accessible price. They are generally not able to access any reconstruction support as they do not own a home - most reconstruction support to date has been directed to home owners. Municipalities, 79 Urban Municipalities, 1 Sub-Metropolitan City, and 4 Metropolitan Cities.



Gita Maya Raut, originally from Okhaldhunga, was living in a rented room in Kathmandu since before the earthquake. After the earthquake, Gita and her family of six, moved to the Chuchepati camp near Bouddhanath. They rented a tiny room where they could store their belongings but it was not big enough for them to live in so they moved to the camp. Gita's eldest son has work but does not earn enough to support the family. When the Chuchepati camp was demolished in March 2017, Gita and her family had no other option but to move into the small rented room where they had been storing their belongings.

Photo Credit: Sajana Shreshta, People in Need.

4.0 Challenges in Urban Reconstruction

The information presented below has been collected by HRRP District Coordination Teams (DCTs) through district and municipal level coordination meetings, technical meetings, orientations, and trainings, and field visits. The HRRP National Team also collected information through a technical session as well as consultations with Partner Organisations (POs) working in urban areas.

4.1 Land

Right of Way and Road Expansion

The Nepal Rural Road Standards (NRRS) specifies that “right of way depends on the importance of the road and possible future development. Recommended total Right of Way (Row) and building line for different types of road are” as follows:

Road Type	Total RoW (m)	Setback distance from road land boundary / RoW to building line on either side (m)	Comment
District Road Core Network (DRCN)	20	6	10m RoW on either side from road centre line
Village Road	15	3	7.5m RoW on either side from road centre line

In any case where the existing Right of Way is more than the above defined value, the existing available width shall be adopted as a right of way. Right of Way is generally not applied in traditional or old settlements as they were built before these standards were endorsed. But if these buildings are demolished for any reason and a new structure is rebuilt in its place then RoW must be followed, resulting in smaller plot sizes.

There are many areas where households are reluctant to start building, or have started building and had to stop, as a result of issues with Right of Way and road expansion. In Dolakha, the width of Jiri road was initially set at 15m by the Department of Roads (DoR) but after the earthquake it was revised to 21m which has left many households with insufficient land to build on. In the Kathmandu Valley, where there is a lot of road widening work taking place, many home owners face losing their land, or significant portions of their land, as a result of the road widening.



Rambika Thapa Magar stands outside her one room home on the edge of Kathmandu's ring road. The expanded road is due to cut through the middle of the house. “We have been told to evacuate. The demolition could started at any time, maybe while we are sleeping. We have nowhere else to go,” said Rambika¹⁰.

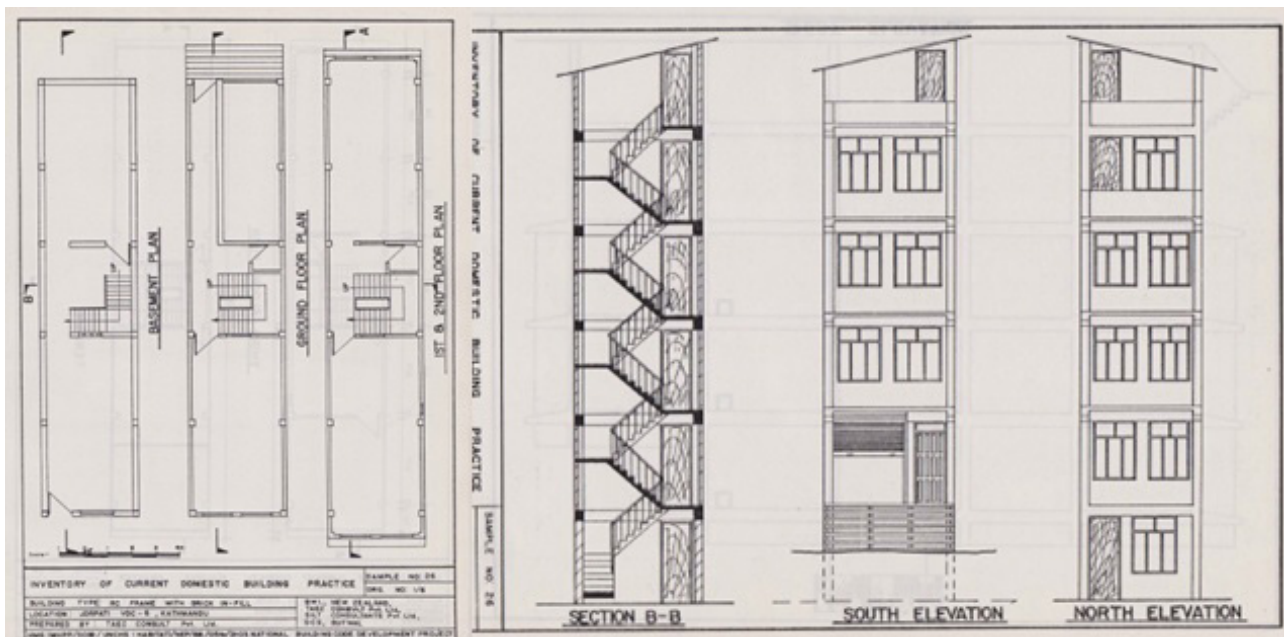
¹⁰ Heat and dust: Kathmandu's commuter hell – in pictures, The Guardian, 20 June 2018

Small Land Plots and Vertical Sub-Division

In many urban areas in the Kathmandu Valley the plot size is so small that it does not meet the minimum requirements of the building permit process and home owners are essentially stuck. The small plots are often due to the practice of vertical sub-division, where when the home is inherited by the younger generation it is divided vertically leading to increasingly smaller plot sizes over time. In some cases, the plot size may be small due to a portion of the land being sold off (land prices in the Kathmandu Valley are high and continue to increase). Where families do build on these small plots, many build with eccentric footings which are not compliant with the building code. In addition to having small plots, the houses that were or are on these plots are adjoining making the construction process even more challenging. This also increases risk during earthquakes as the buildings are not designed as adjoining and therefore may have a negative impact on neighbouring structures.



An extremely narrow house in Sankhu, Shankharapur Municipality, Kathmandu in June 2018.



In 1993 and 1994, as part of the development of the building code, an inventory of common building typologies was prepared¹¹. This structure was chosen as representative of the “buildings which are part of the ribbon development along road sides in urban and semi-urban areas of the Kathmandu Valley”. The structure is RC frame with brick infill walls and was built in 1991 in Jorpati Bazaar, Jorpati VDC, Kathmandu.

¹¹ The Development of Alternative Building Materials and Technologies for Nepal, GoN, December 1993 and August 1994

Land Owned by Trusts (Guthi land), Public or Government Lands

Trust, or 'guthi', land is land that is held under a trust that is endowed by any philanthropist through relinquishment of their title to an immovable property fund to a trust for the operation of any social or religious cause. Government land is public space such as roads, land around government buildings or offices, land around monasteries and temples, forests, river beds, and uncultivated lands, which are owned by the Nepal government or are declared as public lands and published in the 'Nepal Rajpatra'.

People residing on 'guthi' or government land do not have a land ownership certificate ('lal purja') and cannot

construct on the land as it does not belong to them. People that have been residing on these types of land for decades found themselves displaced after the 2015 Gorkha Earthquake as a result of these issues with land ownership rights.

Buying and Selling of Land During Reconstruction

In Madhyapur-Thimi Municipality, Bhaktapur, there have been cases of land being sold by the home owner while the house is under reconstruction. The buying and selling of the land is not an issue in itself but once the house has been sold, the owner will no longer be eligible for the GoN housing reconstruction grant and the grant amount will not be transferred to the person who brought the land.

Sumitra Byanju, Bhaktapur Municipality, Bhaktapur

Sumitra is 35 and lived with her husband, mother in law, and two children in their home in the Bhaktapur Durbar square. Their home was completely destroyed by the 2015 Gorkha earthquake. Immediately after the earthquake, Sumitra and her family spent several nights staying in the open part of the Durbar Square. After this initial period, her family received a tent but it was difficult to live in as the weather conditions were not good. When the family received material support from IOM, the Red Cross, and other humanitarian organisations her husband built a temporary shelter in the open space of a school nearby their old house.

Sumitra previously ran a small shop in her house but she lost this, and all the stock, during the earthquake. After the earthquake, her husband became the only one person in the family earning and the loss of her earnings from the shop made things very difficult for the family.

The family is eligible for the Government of Nepal (GoN) housing reconstruction grant and they have already received the first tranche (50,000

NPRs). However, they have not been able to start reconstruction due to land issues. When they started planning their reconstruction they found out that the land they were residing on was not separated among the brothers of her father in law and they weren't the sole owner of that property. Their cousin is claiming half of the property which does not leave them with sufficient land on which to construct. A court case on the separation of the land is pending in the courts.

As a result of these issues, they have decided not to reconstruct their home. They have rented 2 small rooms in Bhaktapur bazaar where her children and mother in law are staying. She and her husband also stay in the rented house during the day, and only use the temporary shelter for sleeping.

Sumitra does not feel that her family will be able to build a house for themselves because they do not have any other land. She is hoping that soon the court case regarding the land will be resolved and her family will get her share of the property so that they can sell it and use the funds for the education of their children and business.

4.2 Cost

In October 2017 HRRP conducted research on the cost of housing construction and financing for construction costs¹². The survey was conducted with 570 respondents from across the 14 most affected districts and respondents were asked to answer three questions:

- How much did your house cost / do you estimate it will cost?

- What building materials did you use / are you planning to use and have you salvaged materials?
- Do you plan to / have you already taken a loan and if so for how much, from what type of financial institution, and at what interest rate?

Cost of Construction

The report found that Bhaktapur, Kathmandu, and Lalitpur – where there is the highest concentration of

¹² Cost of Construction, HRRP, October 2017

urban areas – have the highest median construction costs at 2,500,000 NPRs, 2,250,000 NPRs, and 1,200,000 NPRs respectively. The most expensive houses were RC frame structures in Kathmandu and Nuwakot that cost 6,500,000 NPRs.

The median cost of construction for the 14 districts is 675,000 NPRs. In this case the GoN housing reconstruction grant of 300,000 NPRs represents almost 50% of the total cost of construction and is a significant contribution and incentive. However, for urban areas the grant may represent as little as 0.05% of the total cost of construction which greatly reduces the significance and impact of the grant.

The cost of constructing traditional houses is also reportedly higher than other structures. An assessment of the 'Impact of the 2015 Earthquake on Housing and Livelihoods in Urban Areas in Nepal'¹³, completed in June 2016, conducted Focus Group Discussions (FGDs) with communities to collect their interest in rebuilding their houses in traditional style. Whilst the FGD participants recognised the advantages of preserving the vernacular architecture styles the majority were planning to rebuild an RC frame structure as they felt it was too expensive to rebuild in the traditional style. They suggested that the government should provide financial incentives or other support to promote traditional architecture. One house owner shared that they are reconstructing their house in the traditional Newari style and have already spent 1.6 lakhs NPRs to repair the eight timber columns on the ground floor.

Increased Cost of Construction Materials

The Nepal Urban Housing Sector Profile, produced by UN Habitat in 2010, reported that the “real estate boom” in Nepal was driving up the cost of land and construction materials and that the Nepal Rashtra Bank (NRC) “directed all commercial banks to bring down the share of housing and real estate loans to 15% and 10% respectively as per the monetary policy of NRB (July 2010)”. This was a decrease of 10% from

the 2009 average. The Nepal Urban Housing Sector Profile shared that these efforts had slowed the growth in the real estate market “but the underlying market forces have not changed and will therefore to continue to exert an upward pressure on prices”. With the additional demand created by the earthquake on the construction sector, it is not surprising that the cost of construction has continued to increase.

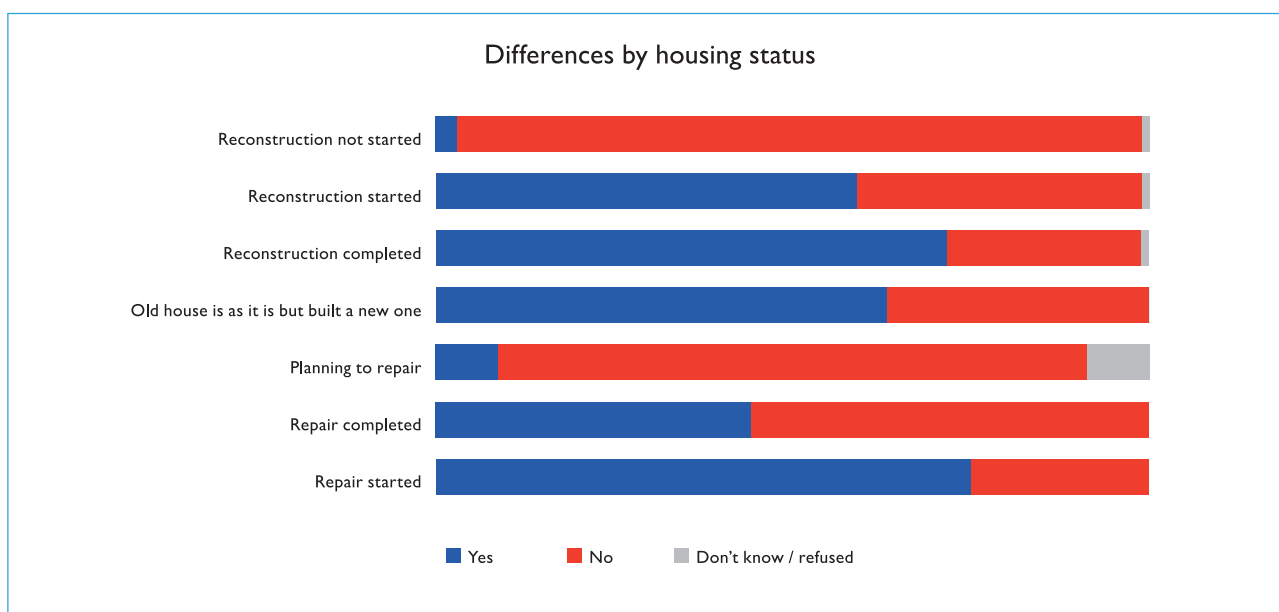
Access to Finance

The HRRP research from October 2017 found that 56% of respondents (321 households) have taken, or are planning to take, a loan to finance the reconstruction of their home. The average interest rate is 23% (annual), ranging from 0% (three respondents had taken interest free loans from neighbors / relatives) to 43% (from friends / relatives, and one cooperative). On average, the loan amount represents 50% of the total construction costs, ranging from 15% to 125% of the total cost. 57% of loans were taken from friends / relatives / neighbors. Two respondents, both in Kathmandu, reported that they had received the GoN subsidised loan, of up to 25 lakhs NPRs inside the Kathmandu Valley and up to 15 lakhs NPRs outside the Kathmandu Valley, with annual interest rate of 2%. It is reported that as of August 2018, more than 1,000 households have received these subsidised loans. However, in most cases the banks are only agreeing to the subsidised interest rate of 2% for the first two years, and after this time the interest rate returns to the market norm (generally somewhere between 12 and 16% for commercial banks).

In May 2018, the CFP community perception survey¹⁴ asked respondents 'have you taken a loan to finance your reconstruction?'. 55% of respondents reported that they have taken a loan and the average interest rate was found to be 24% per annum (almost exactly the same as the HRRP data from October 2017). The difference by housing status was very interesting, with respondents that have not yet started reconstruction much less likely to have taken a loan.

¹³ *The Impact of the 2015 Earthquake on Housing and Livelihoods in Urban Areas in Nepal, June 2016, HRRP / Innovative Solutions*

¹⁴ *Community Perception Report, Common Feedback Project, May 2018*



The Nepal Urban Housing Sector Profile, produced by UN Habitat in 2010, provides a comprehensive summary of financing options for urban housing but highlights that “the existing housing finance system has not been able to address and solve the housing finance problem of poor and low income

families with high interest rates and unfavourable lending conditions for lower income groups, for whom at times collateral in the form of land and house makes access to finance unattainable”. Understanding and learning from experience in housing finance pre-earthquake is critical if appropriate finance options are to be made available to home owners trying to reconstruct in urban areas.

4.3 Materials & Technology

Demolition of Vulnerable Houses & Debris Clearance

In many urban areas, particularly in the Kathmandu Valley, demolition of vulnerable houses and debris clearance has yet to be carried out. Damaged houses remain standing with support from props posing a potential threat to public safety. Narrow roads in these areas increase the difficulty of demolition and debris clearance. There are also cases where earthquake affected households believe that the longer they wait to reconstruct, the more likely it is that the government will rebuild their houses.



Thimi, February 2017: on the left a new RC frame structure is being constructed while on either side traditional houses have timber props providing support from the street.

In ward no. 7, Panauti Municipality, Kavre, just 3 households, out of 438 eligible for the GoN housing reconstruction grant, have received the third tranche. This is mainly due to the lengthy approval process with the municipality for demolition of earthquake

damaged houses. After municipal approval and consent from neighbours, regular presence of Army/Police is required throughout the demolition process. Debris clearance is difficult due to the narrow width of traditional alleyways.

An assessment of the 'Impact of the 2015 Earthquake on Housing and Livelihoods in Urban Areas in Nepal'¹⁵, completed in June 2016, also identified this as a major issue for urban reconstruction. The assessment reported that the main access routes had been cleared soon after the earthquake and additional routes had been subsequently cleared for festival routes. However, many damaged houses, particularly along pedestrian routes and in inner courtyards, have not been dismantled and remained a risk and a block to reconstruction. These damaged houses

were both traditional brick masonry houses as well as RCC structures. The report highlighted that the main challenges with dismantling these structures are potential impact on adjacent attached structures, lack of equipment and technologies, and narrow access routes.

The report also states that "in some cases the Government used bulldozer to remove the debris, such initiatives were detrimental particularly to the settlements where they have heritage valued possibilities of salvaged arts and artifacts".



Demolition being carried out by the Nepal Army in Sankhu, Shankharapur Municipality, Kathmandu on 20 May 2015.

Conservation of Vernacular Architecture

In the historical core areas of the Kathmandu Valley, and in other areas such as Bhimweshwor Municipality in Dolakha, there is a risk that vernacular architecture may be lost during the housing reconstruction. The main types of architecture found in these areas are Malla and Newar, with newer styles including Rana and Hindu Islamic found in 19th century structures¹⁶. The architectural features that are commonly found in historical core areas include intricately carved wooden windows and doors, brick

masonry with timber banding (often the timber banding is also carved), houses organised around courtyards, and sloped, tiled roofs. The earthquake resistant elements present at various levels in these buildings indicates that people were aware of safer construction practices.

The 2015 Gorkha Earthquake caused significant damage to traditional houses in these areas and reconstruction has been challenging as the National Building Code, existing building by-laws, and planning regulations do not adequately reflect conservation aspects of traditional

¹⁵ *The Impact of the 2015 Earthquake on Housing and Livelihoods in Urban Areas in Nepal, June 2016, HRRP / Innovative Solutions*

¹⁶ *Traditional Materials and Construction Technologies used in the Kathmandu Valley, UNESCO, November 2003*

buildings. A particular issue is that all of these are more focused on individual buildings instead of on settlements as a whole. The administrative restructuring in Nepal has also impacted the pace of reconstruction as the changes fail to understand and incorporate issues of traditional settlements and decisions that had been made by the former local authorities have been overturned by the newly established authorities. The NRA and the Department of Urban Development and Building Construction (DUDBC), with support from UN Habitat, initiated formulation of an amendment to the Settlement Development, Urban Planning and Building Construction By-laws 2072 (September 2015) to better reflect the needs of heritage settlements.

This amendment to the by-laws was introduced by MoUD in April 2017. The amendment covers different options that municipalities can choose for conservation of historical areas including house pooling, land pooling, and integrated settlement development. The amendment also details the process to have a settlement listed as a heritage settlement and provides guidelines for the conservation of vernacular architecture including materials and construction technologies that should be used.

Another challenge is that there are not enough construction workers (carpenters, masons, etc.) available who are skilled in the techniques used in vernacular architecture.

Common Non-Compliances

In urban areas the most common non-compliances are¹⁷:

- Steel frame houses with infill walls
- One storey houses with 9"x9" columns and flexible roofs
- Absence of vertical reinforcement at doors and windows
- Eccentric foundations
- Adjoining houses (where not designed to be adjoining)
- Distance between the corner of the walls and openings of less than 2ft
- Absence of c-hooks in sills and lintels
- Practice of placing the stirrups at random distances, usually @1' c/c in load bearing.
- Placement of vertical rebars from DPC only
- 2 or more storey load bearing structure with wall thickness of only 9"

- Stone masonry houses without gable bands
- Use of different materials (both stone and brick) at same level
- Houses with 9"x12" or 9"x9" columns that cannot be passed by the municipality – some of these issues were addressed in 2017 when district engineers collected information on such non-compliances and it was passed to central level for review and development of solutions. This resulted in publication of approved structural and architectural drawings for RCC structures.
- RCC house with stone masonry as infill wall
- Use of interlocking bricks
- Hollow concrete block houses – HRRP has produced a report on research conducted on production and use of hollow concrete blocks in earthquake affected districts¹⁸. During the research testing of blocks from across the districts was carried out and 78% of blocks failed to meet the compressive strength standards set out in Nepal Standards NS 119/2042. This indicates that in addition to addressing the non-compliant construction, effort is required to address issues with material quality.
- Large openings on ground floor for shutters – this is very common in urban areas where ground floor space is often used for commercial purposes. In some urban areas in the 18 moderately affected districts home owners are waiting for development and approval of an RC frame house design where they can use shutters on the ground floor so that they can have space for commercial purposes¹⁹.
- Houses built using prefabricated structures
- Hybrid structures – in September 2017 the NRA published the Hybrid Structure Manual which outlines the standards and specifications, as well as the minimum intervention works to construct hybrid structures. The manual applies only to buildings that are constructed using load bearing masonry structures for the ground floor and frame structure with light weight walls for the first floor.

Many of the NRA, Building DLPIU technical staff have not received any training on the Corrections and Exceptions Manual and therefore are not able to provide guidance to home owners and masons on application of corrections to address these non-compliances. A recent survey conducted with NRA, Building DLPIU technical staff

¹⁷ From NRA, Building DLPIU technical staff's presentations on reconstruction progress, June 2018

¹⁸ Hollow Concrete Block Production and Use in Earthquake Affected Districts, HRRP, May 2018

¹⁹ 18 Moderately Affected Districts Updated Overview, HRRP, July 2018

found that 19% of respondents received training on the Corrections and Exceptions Manual before deployment and a further 21% received training on the Corrections and Exceptions Manual after deployment²⁰. This means that 60% of NRA, Building DLPIU staff have not received training on the Corrections and Exceptions Manual despite being required to provide support to households on application of corrections.

Retrofitting

In September 2017 the NRA published the Repair and Retrofitting Manuals for masonry and RCC structures. These manuals set out the technical guidelines and the process for disbursement of GoN housing retrofit grant. The grant is 100,000 NPRs disbursed in two tranches; the first of 50,000 NPRs on signing the partnership agreement with the government and the second of 50,000 NPRs on completion of the retrofit as per the standards.

One of the major challenges faced is that there are many households that would like to switch from the 300,000 NPRs housing reconstruction grant to the retrofit grant but the process for making the switch is unclear. In Gokarneshwor Municipality, Kathmandu, more than 30% of households in ward no. 3, more than 25% in ward no. 4, and more than 20% in each of wards 5-9, would like to change their agreement from the housing reconstruction grant to the housing retrofit grant but have been unable to do so. This is due to a lack of information with district and local officials, as well as with NRA, Building DLPIU technical staff on the procedure for changing grant. A similar situation is reported in several other urban areas.

A survey conducted with the NRA, Building DLPIU technical staff in July 2018 found that just 15% of the technical staff had received training on the repair and retrofit manual before deployment and a further 12% had received training on the repair and retrofit manual after deployment. This means that 73% of the technical staff have not received any training on the repair and retrofit manual. Without this training the technical staff are not able to implement the housing retrofit grant. In some areas, technical staff also report that they do not have access to the list of households eligible for the retrofit grant.

4.4 Human Resources

Many urban areas (but not all) benefit from having had technical personnel in the municipality pre-earthquake and having to implement the building code process. Since the earthquake, the technical capacity in municipalities

has been boosted by the addition of the NRA, Building DLPIU technical staff (engineers, sub-engineers, and assistant sub-engineers). However, there are some challenges arising:

- NRA, Building DLPIU technical staff are fully focused on the inspection process for the housing reconstruction grant and do not have experience or training on building code implementation and municipal by-laws
- There is misunderstanding and miscommunication at local level regarding reconstruction policies and procedures. For example, many NRA, Building DLPIU technical staff (and other technical assistance staff from POs) have been informing households that they must use one of the designs from the DUDBC design catalogue volume 1 to be eligible for the housing reconstruction grant.
- The relationship between the NRA, Building DLPIU technical staff and the local officials can be strained as a result of attempts by officials to influence the inspection process. A survey that HRRP is currently conducting with NRA, Building DLPIU technical staff found that 30% of respondents reported facing pressure or threats from ward / municipal officials to pass certain houses.

The NRA, Building DLPIU technical staff face significant challenges in their work with 85% reporting in a recent survey that their primary mode of transport is walking and 45% facing pressure or threats from households to pass their house and 29% facing pressure or threats from ward / municipal officials to pass certain houses²¹.

4.5 Construction Process and Systems

Building Permit Process

The Building Act (1998) and National Building Code (NBC, 1994) introduced provisions for building permits to be issued by Municipalities and Village Development Committees (VDCs)²². In practice though it was only municipalities that issued building permits. Since the introduction of the new administrative structure in late 2017, all local bodies are now required to issue building permits.

The building permit process involves the following steps²³:

- Build Company submits the drawings to the municipality along with a copy of the title certificate.

²⁰ NRA, Building DLPIU Technical Staff Survey Report, Version 0, HRRP, August 2018

²¹ NRA, Building DLPIU Technical Staff Survey Report, Version 0, HRRP, August 2018

²² Nepal Urban Housing Sector Profile, UN Habitat, 2010

²³ Electronic Building Permit System Website, Building Permit Process

Housing Recovery and Reconstruction Platform

- The applicant must submit the following along with the building permit application:
 - Identity document of the owner (or Company Registration Certificate)
 - Certification by a registered architect or engineer
 - Cadastral extract
 - Proof of land ownership/lease
 - Building Plans
 - Lot plan
 - Proof of tax payment
 - Structural plans (not required for buildings with ground coverage area of less than 1,000 sq. ft. and less than 3 stories)
- The municipality forwards the file to the municipality ward office where the land is located.
- The ward office checks the field and sends a notice to the site's neighbours.
- Start of the maturation of notice period.
- Start of the local inquiry done by the ward office.
- The ward office sends the file back to the municipality.
- The municipality starts the process of issuing a temporary approval of the drawings. At least one of the neighbours must give their consent in order for the project to be approved. Otherwise, the builder can submit a "commitment letter" certifying that he is responsible for any potential disputes in the future. This step can delay the approval process to around 2 months.
- The building permit fee is calculated as follows:
 - Built-up area up to 3,000 sq. ft.: NPR 10.00 per sq. ft.
 - Built-up area between 3,001 and 5,000 sq. ft.: NPR 15.00 per sq. ft.
 - Built-up area 5,001 sq. ft. and above: NPR 20.00 per sq. ft.
 - For apartment housing and group housing, the application fee is a flat NPR 25.00 per sq. ft.
 - In addition to the building permit fee, the Urban Development Department also charges a Designer Fee of NPR 2,000.00. The project designer must be licensed by the Department. The license is called Certificate of Designer and is renewed every year at the Municipality. The annual fee is NPR 3,000.00. The Municipality

charges an additional NPR 2,000.00 for each building design.

In Lalitpur Metropolitan City, it takes an average of five months to secure a building permit. As of July 2018, less than 8% of households in Lalitpur Metropolitan City that are eligible for the housing reconstruction grant have started to reconstruct their homes. It is thought that the time required to secure a building permit, and the steps in the process that may be difficult for some home owners, may be one of the reasons for the low reconstruction rate.

In some areas the requirement to prepare a building design can be a challenge, both in terms of finding appropriate technical support and the associated cost. The August 2018 Common Feedback Project community perception survey²⁴ collected some concerning reports from Dakshinkali, Kathmandu of municipal engineers charging as much as 36,000 NPRs to develop house designs. Partner Organisations are requested to provide support for preparation of house designs in this area as a way to help households reduce their reconstruction costs. Reconstruction costs in Kathmandu are generally much higher than in other districts and the GoN reconstruction grant is therefore less of an incentive and support for safer construction. If households must spend more than half the first tranche on preparing their house design, their reconstruction process will potentially struggle to get off the ground.

In many core settlement areas, the process for getting the building permit is effectively impossible because the land parcels are smaller than the minimum requirements. This relates to the vertical sub-division practice discussed in section 3.2 above.

In Madhyaur-Thimi and Bhaktapur Municipalities there has been an increase in the number of homeowners adding illegal storeys beyond the number approved in their building permit. The additional storeys were mostly found in houses with 9"x9" and 9"x12" columns, as well as in houses that had not been constructed under the building permit system and were considered unsafe based on structural analysis. In response to this issue, Madhyapur Thimi Municipality has been fining home owners that have built such additional storeys. The fine is normally 1,000 NPRs per storey, but the municipalities are flexible in the case of earthquake reconstruction and will work with the household to prepare revised building drawings. However, a full structural analysis is required to confirm the safety of the structure.

Coverage of Socio-Technical Assistance

The Government of Nepal's Strategic Recovery Objective 1, under the Post Disaster Recovery

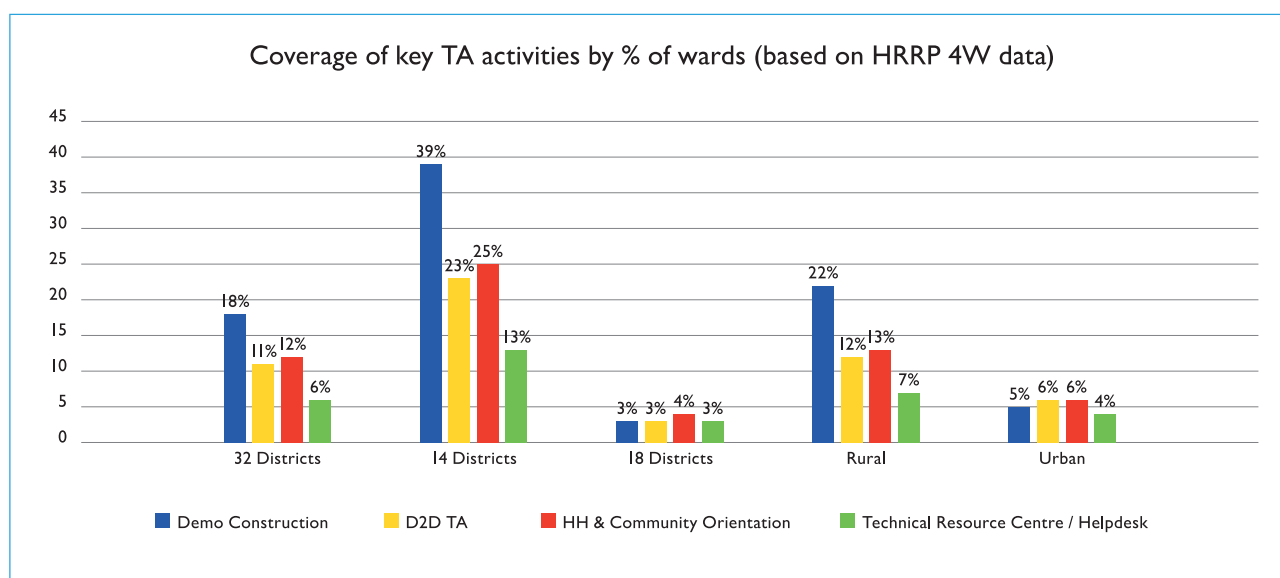
²⁴ Common Feedback Project, Community Perception Survey, August 2018

Framework (PDRF)²⁵, is to 'restore and improve disaster resilient housing, government buildings and cultural heritage, in rural areas and cities'. The PDRF further states that to achieve this, the following is required:

Owners will be provided financial assistance in tranches, supported by timely provision of technical assistance, training and facilitation, so that people can rebuild as soon

as possible. It is critical that there is a uniform approach to support and implementation for universal coverage in the 32 earthquake affected districts, including the 14 most-affected districts, irrespective of funding sources.

To date, coverage of socio-technical assistance has been low, especially in urban areas:



The number of Partner Organisations (POs) providing socio-technical assistance is much lower in urban areas compared to rural areas; there are 14 POs with ongoing reconstruction support in urban areas and 46 in rural areas (as per the HRRP 4W data from 25 June 2018, does not include planned or completed activities) and in Bhaktapur all support from POs ended in August 2016.

The poor coverage of socio-technical assistance in urban areas leaves households who are facing a complex and challenging reconstruction, with likely a very large investment required from their side, without access to the information, guidance, and support they require.

Tranche Disbursement Deadlines

In late July 2017, the NRA announced deadlines for the disbursement of the housing reconstruction and retrofit grants as follows²⁶:

- Grant agreement signed with local bodies within November 16
- First tranche must be disbursed by January 13, 2018
- Second tranche must be disbursed by April 13, 2018
- Third tranche must be disbursed by July 15, 2018

On 3 April 2018, the NRA Steering Committee agreed to extend the deadline for the disbursement of the second tranche to 16 July 2018. The NRA Steering Committee extended the deadlines during a meeting on 6 September (the committee did not meet prior to this due to the change in the NRA CEO) and the new deadline for second tranche disbursement is 15 January 2019 and the new deadline for third tranche disbursement is 14 May 2019. The deadlines do not apply for households identified as eligible for the reconstruction / retrofit grant by re-survey/ verification, households in traditional settlements, and households that need to relocate.

Despite the extension, the deadlines continue to represent an unrealistic timeframe for reconstruction for many households, and the HRRP advocates for the deadlines to be extended for at least the next two building seasons to allow a realistic period for households to complete their reconstruction.

In urban areas, the deadlines should be removed, or extended for at least the next four building seasons. Urban reconstruction will take time as it is complex, involves very high levels of investment, and requires a more comprehensive process of collective planning.

²⁵ Post Disaster Recovery Framework, May 2016, Government of Nepal

²⁶ HRRP Bulletin, 24 July 2017

5.0 Opportunities & Successes in Urban Reconstruction

The information presented below has been collected by HRRP District Coordination Teams (DCTs) through district and municipal level coordination meetings, technical meetings, orientations, and trainings, and field visits. The HRRP National Team also collected information through a technical session as well as consultations with Partner Organisations (POs) working in urban areas.

5.1 Land

House Pooling Concept, Dumbo Chowk, Ward No. 18, KMC

Dumbo Chowk is the historic city core in Ward No. 18 of Kathmandu Metropolitan City (KMC). It is a mixed zone composed of residential and commercial use. It is densely populated urban core with well decorated by temples, chibas, and courtyards (chowks). It also represents vernacular architecture. Forty-four residential buildings out of fifty-four, suffered major damage in the 2015 Gorkha Earthquake and are waiting for reconstruction.

In Dumbo Chowk (DC), 54 families have agreed to move forward with reconstructing their homes using a 'house pooling' concept. House pooling can be defined as a tool for restoring vernacular architectural form by consolidating the individual houses constructed in smaller plots to provide functional, safe and spacious, well planned environment friendly living space. Hence it is a tool for integrated settlement redevelopment in the historic city core and traditional old settlements. Under this concept, houses are horizontally divided with each family owning a floor of the house (as opposed to the traditional system of vertical division).

The initial planning process of integrated settlement development through house pooling for urban regeneration was carried out in collaboration of Kathmandu Metropolitan City (KMC), National Society for Earthquake Technology (NSET), and the residents of DC.

Later, National Reconstruction Authority (NRA) agreed to support this initiative. NRA's National Steering Committee meeting held on 6 September 2018 has made

certain decisions in this regard. A draft of Memorandum of Understanding (MoU) has been prepared and is being signed between KMC, NRA and the residents of DC.

In the MOU, each stakeholder has their own set of responsibilities.

- NRA is to provide the collective earthquake relief fund through KMC, facilitate bank loans through a simplified process, initiate to give additional grants, encourage the use of reusable construction materials obtained from the demolition of the buildings and monitor and evaluate the compliance of the construction work.
- KMC to establish a planning and implementation team office and develop an action plan for 2 years, develop house plans, provide detail estimate of conservation of heritages and execution of infrastructure services, provide monthly rent for 2 years for those who have no other places of living during the construction period, to provide cost of demolition of houses and protection of reusable construction materials, issue building permit approval certificate with nominal fee or free, ensure technical support from NSET and agree on the Terms of Reference (ToR) of NSET.
- House Owners to build the consensus of all the households, formulate user's committee and to identify the problems and needs of the household regarding house pooling, take the responsibility of construction, accumulate the cost of construction
- NSET will provide technical assistance to KMC in preparing maps, plans, and facilitating technical supervision of construction works

The Disaster Management Unit under KMC has supported the households to form a user's committee. The committee has submitted a preliminary letter of interest to KMC. Following a series of meetings between KMC and the user's committee, the letter of interest was submitted to NRA at central level. NRA is supportive of the 'house pooling' concept, and has proposed it for additional urban areas including Khokana, Bungamati, and Kirtipur. Following submission of the letter of interest, NRA met with KMC on this topic and it was expected

that the approval letter would be issued. However, this has not happened yet due to the change in NRA CEO. The proposal agreed by KMC and the user's committee includes the following points:

- The 54 houses which fall under this scheme will be demolished, for which KMC will provide incentives to the user's committee. The incentives have yet to be agreed.
 - KMC will also provide incentives for the reconstruction of the houses, and the home owners will also invest in the construction.
 - KMC will deploy technical personnel to assure that proper technical requirements are followed for design and construction.
- KMC will waive the costs on services such as building permit, housing tax, revenue service etc. for the 54 households as a motivational package of support
 - KMC will make plans for public infrastructure construction such as drainage systems, water systems, walking paths / alleys, etc. as a contribution to the 'house pooling' initiative
 - KMC will facilitate provision of subsidised 2% loan for the 54 households from interested financial institutions

Once NRA provides formal approval there will be a tripartite agreement between NRA, KMC, and the user's committee and there after KMC will take forward the 'house pooling' works in Dumbo Chowk area.



Part of the area in Dambochowk where house pooling will be implemented by a group of 54 households.

Land Owned by Trusts (Guthi land)

In Kageshwori-Manahara Municipality, Kathmandu, the local leaders and the Municipality convinced the Pashupati Development Trust to allow earthquake affected households to reconstruct on the land once they had paid the land revenue. People residing on 'guthi' (trust) land must pay land revenue tax annually at a rate fixed by the government. There are 1,120 households in ward no. 1 of the municipality that are on trust land and are eligible for the GoN housing reconstruction grant. Since people have not paid this tax for years, the amount to be paid is quite large, more than 600,000 NPRs (approx. USD 5,400). Hence a mutual agreement has been signed specifying that by initially paying a minimum of 5,000 NPRs (approx. USD 45) households can proceed with the reconstruction process and apply for the GoN housing reconstruction grant. The remainder of the land revenue can be paid off in instalments over time.

5.2 Cost

Cost of Materials

Addressing the rising costs of construction materials is challenging but considering options such as cutting all tax on cement and steel for 1 year could be useful.

Construction material vendors and producers also represent fixed points of reference for households and communities, where they can access information and guidance regarding materials and their use for construction. Vendors and producers can be mobilised

as partners in the promotion of awareness of the importance of quality assurance in safer construction. Additional support in terms of employment and skills development opportunities, use of debris, use of vacant sites, acquisition of machinery, business training, etc. may also be useful for vendors and producers.

5.3 Materials & Technology

Conservation of Vernacular Architecture

There are opportunities to establish policies and incentives to support conservation of vernacular architecture in historic, core areas that were affected by the earthquake. If these are implemented, the conservation of vernacular architecture may also open up other opportunities, for example around tourism, or preservation of wider settlements beyond individual houses. There are several examples of municipalities that are implementing efforts to promote and protect vernacular architecture, including:

- Shankharapur Municipality has given a motivation grant of 100,000 NPRs to 5 home owners from Sankhu Core area (wards no. 6 and 7) who have followed traditional reconstruction practices such as cladding the front face of the structure, and use of carved wooden windows and doors. As the carved doors and windows have to be imported from Bhaktapur or Lalitpur, this can be very expensive. The grant is paid at the end of the construction and is funded through the municipal budget.



Sankhu, Shankharapur Municipality, Kathmandu: the picture on the left was taken on 20 May 2015 (photo credit: Surya Shrestha, NSET). The photo on the right was taken in the same spot but on 22 June 2018.

- In Bhimeswhor Municipality, Dolakha, the municipal executive has decided that all houses in the historic core area must have uniform cladding instead of plaster. For this, home owners should bring stone or brick from Bhaktapur to use for the cladding. Due to the additional cost, the

plan has met with resistance from home owners but the municipal office has offered to provide a nominal subsidy to cover transportation costs for the cladding material or to provide the building permit and drawings for free.



View of the old core, urban area in Bhimeswhor Municipality, Dolakha. Photo Credit: NSET.



Buildings in the old core, urban area in Bhimeswhor Municipality, Dolakha. Photo Credit: NSET.



A building in the old core, urban area in Bhimeswhor Municipality, Dolakha.

- Bhaktapur Municipality has been promoting heritage conservation for decades. The Bhaktapur Development Project, 1974 – 1985, supported by GTZ took an integrated development approach to preserving and restoring the town with the objective to improve the living conditions of the people and promote heritage conservation. Preservation and conservation of Bhaktapur's architectural and urban heritage encompassed the cultural and environmental dimensions along with obvious economic implications. Other activities such as drinking water, sanitation, street and public square pavement, school assistance and economic promotion contributed to achieve the above objective.
- Bungmati Area Reconstruction and Development Council (BARDeC) was established with support from UN Habitat along with neighbourhood (Tole) committees. Designs have been prepared for the buildings surrounding important places in the town, reflecting traditional architectural characteristics and using traditional building materials and construction technologies. The proposed houses are three and half stories with brick facades, timber balconies facing public spaces, and sloped roofs. This proposal is not limited to the reconstruction of private houses, but also includes infrastructural improvements, such as street paving and pond revitalisation.
- Khokana Reconstruction and Rehabilitation Committee (KRRC) was established after the 2015 Gorkha Earthquake to advocate for the reconstruction of Khokana to preserve the Newari architecture which is traditional to the area. KRRC includes members of civil society organisations, CBOs, NGOs, and social institutions (Guthis and Manka Khala), as well as representatives from political parties. The KRRC has developed a reconstruction plan for Khokhana and organised research on conservation in the area which was carried out by the Tokyo National Research Institute for Cultural Properties (TNRICP), Japan. The proposed reconstruction plan aims to ensure environmental sustainability through adoption of environmental considerations during reconstruction and use of energy efficiency building materials.
- Pilachhen Reconstruction and Tourism Project: Pilachhen is a Newari (Jyapu) neighbourhood in Ward No. 7 of Lalitpur Metropolitan City. During the 2015 Gorkha Earthquake, 82 houses in Pilachhen were completely destroyed. After the earthquake, the community, with support from the Maya Foundation, launched the Pilachhen Reconstruction and Tourism Project with the objective of reconstructing houses on the existing footprint using vernacular architecture and rehabilitating existing courtyards, alleys, and temples. The Tilganga Foundation donated 40 million NPRs to the project. The project plans to



Earthquake damage in Bungamati in June 2015. Photo credit: Jake Zarins / Habitat for Humanity.

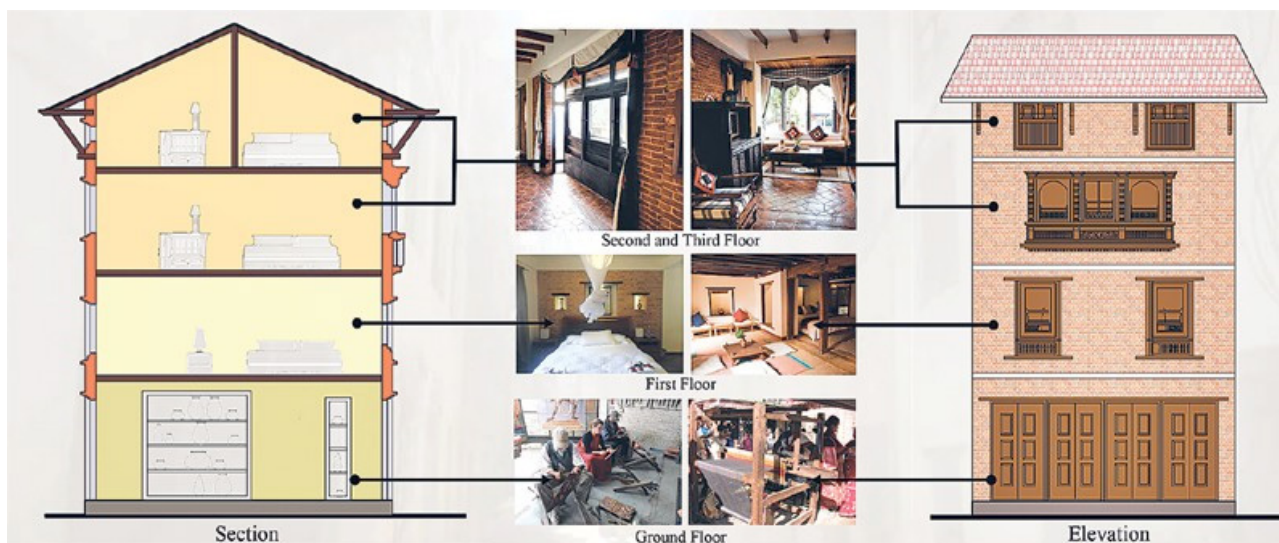


Newly constructed house under Pilachhen Reconstruction and Tourism Project.

Housing Recovery and Reconstruction Platform

provide financial support to households for up to 25% of the total cost of construction. To date 22 houses have been completed and are in the process of applying for the tranches of the government

housing reconstruction grant. The project facilitated preparation and approval of the drawings for the 82 houses and also facilitated the building permit process with the Metropolitan City.



Design of houses used for the Pilachhen Reconstruction and Tourism Project²⁷.

- Ward No. 7, Panauti Municipality, Kavre is a traditional settlement of more than 500 houses. This settlement has applied to be listed as a World Heritage Site but as 78 houses do not meet heritage standards the application has not progressed. Most families in this settlement are living in their earthquake damaged house to which they have made minor repairs. 6.8% of home owners have applied for the second tranche of the GoN housing reconstruction grant and 2.8% have applied for the third tranche. There are strict by-laws under Panauti Municipality

that govern construction in this settlement. Houses constructed should reflect the traditional architecture with brick façade, tiled and sloped roofs, carved wooden windows and doors, etc. For the reconstruction, the municipality are providing building permits in cases where households are reusing the previous foundation. A grant of 75,000 NPRs is also available to support traditional construction but to date nobody has applied for this. Households who are interested to receive the grant must be recommended by their ward representative.



Ward No. 7, Panauti Municipality, Kavre.

²⁷ 'It takes a village', Kathmandu Post, 30 January 2016

- Karyabinayak Municipality (now Lalitpur Metropolitan City (LMC)) has collaborated with UNESCO and UN Habitat after the earthquake to train municipal architects and engineers in the construction of traditional houses. The LMC reconstruction unit has been working on motivating and supporting home owners to build their houses based on the government grant procedures as well as incorporating traditional construction techniques and materials. For non-compliant houses, constructed before the publication of the procedures, LMC has ensured that the home owners are supported with information on the relevant corrections to be applied based on the NRA's Corrections and Exceptions Manual.

Addressing Non-Compliances

The Corrections and Exceptions Manual, developed by the NRA, sets out the ways in which households can address non-compliances, as well as providing guidance for when exceptions are applicable. To date, more than 14,500 non-compliances have been addressed (more than 80% of the total) across the 14 most affected districts. There is a need to provide an increased level of training for the NRA, Building technical staff so that they can better support households with application of corrections. There may also be a need to continue developing additional measures to carry out corrections for common non-compliances in urban areas.

Retrofitting

With 73% of the NRA, Building DLPIU technical staff not trained on the repair and retrofit manual, there is clearly an opportunity to scale up this training and increase their capacity to implement the retrofit grant.

There is also an opportunity to support households who are interested to switch to the retrofit grant to do so, if applicable. This will require information and guidance on the process to be provided to technical staff, local officials, and home owners. It is a worthwhile investment though representing an opportunity to reduce recovery costs and potential to reduce the need for demolition and to preserve vernacular architecture in some cases.

Research and Development

Some of the technical issues arising during the inspection process may also require further research and development of new options for corrections, e.g. for hollow concrete block houses and retrofitting.

5.4 Human Resources

There are examples of NRA, Building DLPIU technical staff positively influencing the building permit process in the municipality they are based in. For example, in Pokhara Lekhnath Metropolitan City, Kaski, where NRA, Building DLPIU engineers have influenced the Metropolitan engineers to endorse the minimum requirements and building code fully which means that the previous practice of approving RCC houses with no banding has now stopped. In Byas Municipality, Tanahun, the Building Code Implementation Project Nepal (BCIPN) led by NSET were building up capacity by conducting trainings to engineers and municipality staff before the 2015 Gorkha earthquake. Following the earthquake an exchange visit was conducted with engineers and local authority representatives from Gorkha to Byas Municipality to discuss building code implementation and to learn from RCC demonstration model that was constructed in municipality boundary²⁸.

Developing and supporting technical capacity at municipal level (both in municipalities and the NRA, Building DLPIU technical staff) is critical for the reconstruction but also for longer term resilience in Nepal. It also represents an important opportunity to build on experience to date on building code implementation and to roll out and expand this experience across all municipalities, both urban and rural.

5.5 Construction Process and Systems

Scale Up of Socio-Technical Assistance

The approach to providing socio-technical assistance in urban areas has to be quite different to rural areas. In urban areas it is not possible to provide technical assistance using a blanket approach as the areas are so large and densely populated, and earthquake affected households are generally scattered across the area. In some cases, such as Bungamati and Khokana, a settlement approach has been taken focused on developing and implementing a plan for the core, historical area, and this is to be encouraged. However, even in these areas, the need for socio-technical assistance goes beyond the core, historical area and a mobile and targeted approach is required. Some examples of socio-technical assistance activities implemented by POs in urban areas are:

- In wards 1-5 of Shankharpur Municipality, Kathmandu, Lumanti Support Group for Shelter have deployed an engineer to prepare building designs for home owners free of charge. This has

²⁸ 18 Moderately Affected Districts Updated Overview, HRRP, July 2018

been found to boost the reconstruction rate in these areas.

- Lumanti also run information / resource centres from their district offices.
- In Karibinayak Municipality, Kathmandu, the Baliyo Ghar programme (under the National Society for Earthquake Technology (NSET)) work through the municipality office, using this as the starting point for continuous technical assistance throughout the construction process.
- OXFAM had operated helpdesk desk for providing technical assistance in Shankharapur Municipality. Similarly, a team of engineers and social mobilizer were deployed to provide the door to door technical assistance to the beneficiaries. In total 911 household were provided with the technical assistance under the program.

Electronic – Building Permit System (e-BPS)

The UNDP Nepal Comprehensive Disaster Risk Management Programme (CDRMP) has supported in development of the electronic – Building Permit System (e-BPS). e-BPS has been designed to implement the National Building Code (NBC) and Building Bye-Laws (BBL) to promote safe building construction practices and planned urban development.

e-BPS is a web-based application software suite which has been developed to assist municipalities to improve their current building permit process and to maintain building records. This is an effective, transparent and efficient automated system for verification and checking of proposed building, that further helps to monitor and evaluate the current state of building constructions in a municipal area. e-BPS is a distributed system and can be accessed from both municipal head offices as well as their respective ward offices. Some salient features of eBPS are:

- Online Registration: An applicant can register and submit a building permit application through the municipality's web portal.
- Compliance Checking: Automated feature for checking against BBL and NBC compliance verifies the data and information provided by the building designer against the system standards defined by the municipality.
- Tracking Permit Status: The system updates the permit status of each application. Applicants can track their building permit status by logging onto their municipality's website through their web portal.
- Management of Building Permit Application: The system manages building permit applications which includes (but not limited to) the important

documents required in the permit process.

- Archiving Building Permit Data: This system enables municipalities to archive submitted building drawings/plans and related documents. The system enables storing, retrieving and managing AutoCAD and/or other image/PDF file formats of building drawings.
- GIS/Addressing Support: e-BPS enables municipalities to integrate building data with a GIS based building database.

The e-BPS website provides access to application forms and other required documents for the building permit process, contact details of registered designers and trained masons, and a set of FAQs on the building permit process.

The e-BPS system was piloted in Kathmandu Metropolitan City, and has been adopted in Lalitpur Metropolitan City and Kirtipur Municipality. CDRMP supported in digitisation and archiving of 15,000 plans and drawings of existing building stock in Kathmandu and Lalitpur Metropolitan City areas. Also, Butwal Sub-Metropolitan City, Dharan Sub-Metropolitan City and Madhyapur Thimi Municipality have initiated implementation of eBPS.

Support for Building Design

In wards 1-5 of Shankharapur Municipality, Kathmandu, Lumanti Support Group for Shelter have deployed an engineer to prepare building designs for home owners free of charge. This has been found to boost the reconstruction rate in these areas. In Karibinayak Municipality, Kathmandu, the Baliyo Ghar programme (under the National Society for Earthquake Technology (NSET)) also provides support for building design. They work through the municipality offices, using this as the starting point for continuous technical assistance throughout the construction process.

Building Code Implementation Programme, NSET

Under the overall guidance of the Department of Urban Development and Building Construction (DUDBC), and led by the municipalities involved, the National Society for Earthquake Technology-Nepal (NSET) implemented the Building Code Implementation Program in Municipalities of Nepal (BCIPN) in 30 municipalities between 2012 and 2017.

The program provided technical support on sensitisation, capacity enhancement, and institutionalisation for the effective implementation of the building code in the municipalities. The program helped to develop trust and collaboration between the municipalities, construction technicians, and house owners. The program made a significant impact on building code compliance; in 2012 15% of buildings were compliant and this jumped to 79% by 2016. BCIPN was

successful in developing and piloting methodologies for building code compliance in municipalities and urbanising settlements of Nepal.

Building Standards for Protected Sub-Areas and Historic Settlements, Kathmandu Metropolitan City

The Kathmandu Metropolitan City recently issued the 'Building Standards 2075' which allow for the height and the Floor Area Ratio (FAR) of a house to be up to a maximum of 65 feet (7 storeys) in the new protected sub-areas, and up to a maximum of 75 feet (8 storeys) in historic settlements. The new standards have been introduced following complaints from residents in these areas regarding the previous standard of up to a maximum of 45 feet (5 storeys). There will be extra

taxes applied for the construction of houses that are taller than 45 feet.

The building standards also allow for construction of basements which was not allowed under the previous standards. In historic settlement areas basements are limited to one storey but in other areas basements can be up to two storeys. A set-back of a minimum of three metres should be left when constructing a two storey basement. Basements will be approved for use for personal parking and storage spaces. Where basements are planned, they must be approved by the technical committee to ensure that construction is earthquake resilient and that it doesn't negatively impact neighbouring houses, monuments, or sources of water in the area.

6.0 Next Steps

Based on the urban reconstruction status and suggestions collected during the recent technical session on urban reconstruction, the next steps are proposed as follows:

- Remove the tranche disbursement deadlines, or extend them for at least the next four building seasons for urban areas
- Consider options to increase the housing reconstruction grant amount in urban areas
- Work with financial institutions to facilitate increased roll out of the 2% subsidised loan of up to 25 lakhs NPRs in the Kathmandu Valley and up to 15 lakhs NPRs outside of the Kathmandu Valley
- Policy review – are there additional policies that could address urban reconstruction? Are there opportunities to review / update existing policies to better address urban housing reconstruction?
- Work with municipalities to build their capacity on urban reconstruction issues and urban planning, as well as encouraging development of by-laws that support and promote urban housing reconstruction
- Scale up appropriate technical assistance in urban areas
- Increase coverage of standardised support to inspection engineers, and to local and ward officials in urban areas
- Conduct further research on retrofitting options for urban housing and scale up coverage of retrofitting training to engineers and masons
- Conduct research on the rental market and the experience of urban renters that were affected by the earthquake
- Exchange visits between urban areas to facilitate experience sharing and interaction between home owners, local representatives, and partner organisations across urban areas
- Form a working group to address and promote urban reconstruction – if you / your organisation are interested to take part, please contact Bhubaneswari Parajuli, HRRP National Technical Coordinator, techcord.national@hrrpnepal.org



Jwagal, Kupondole, Lalitpur, Nepal

+977-1-5544149

info@hrrpnepal.org

[f /HRRPNepal](https://www.facebook.com/HRRPNepal) [• HRRP](https://www.instagram.com/HRRP) [t @HRRP_Nepal](https://twitter.com/HRRP_Nepal)

www.hrrpnepal.org