NATIONAL RECONSTRUCTION AUTHORITY
FEDERAL DEMOCRATIC REPUBLIC OF NEPAL

TRANSITIONAL PROJECT IMPLEMENTATION SUPPORT FOR EMERGENCY RECONSTRUCTION PROJECTS

FINAL REPORT

FEBRUARY 2019

JAPAN INTERNATIONAL COOPERATION AGENCY

ORIENTAL CONSULTANTS GLOBAL CO., LTD.
MOHRI, ARCHITECT & ASSOCIATES, INC.
INTERNATIONAL DEVELOPMENT CENTER OF JAPAN

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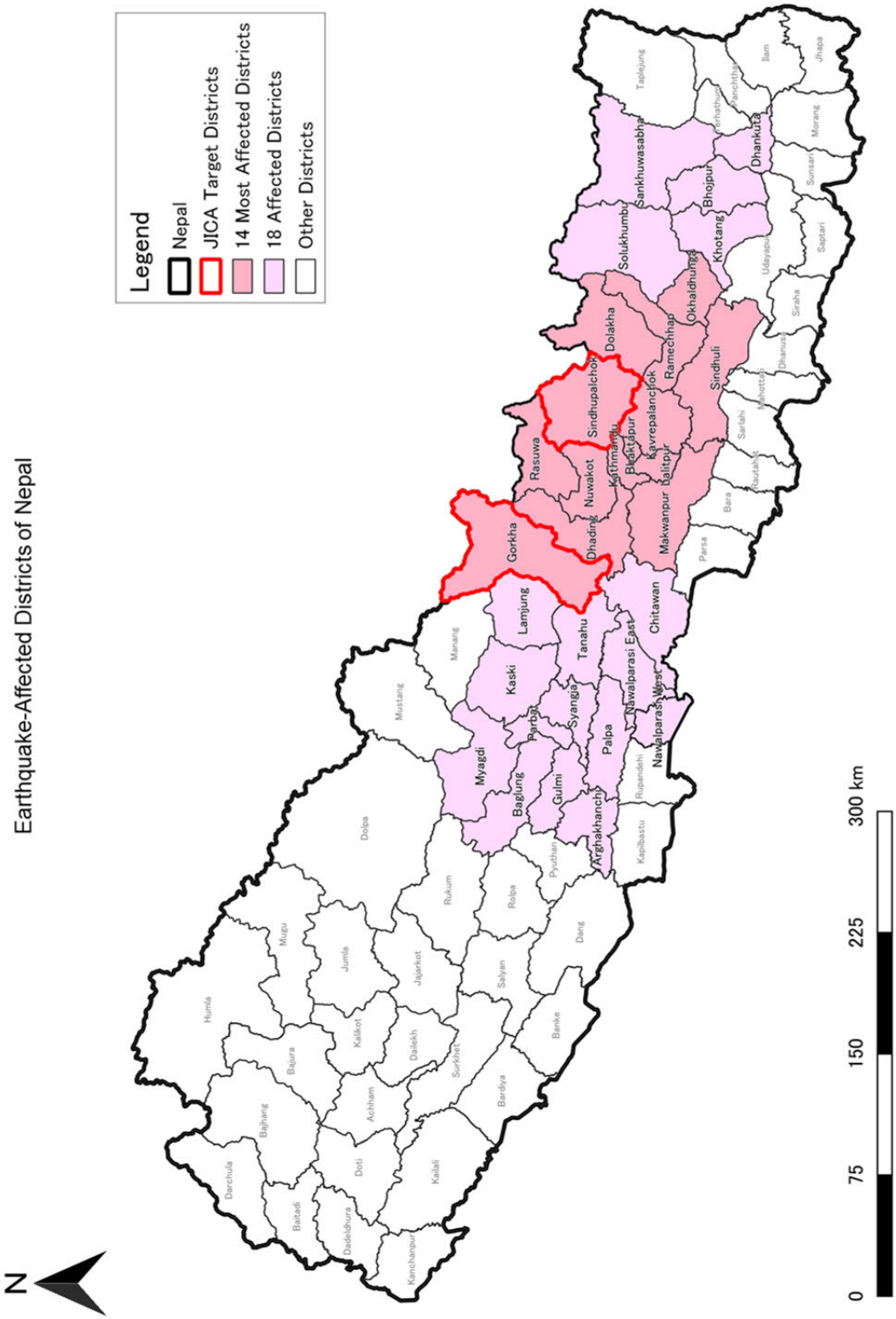
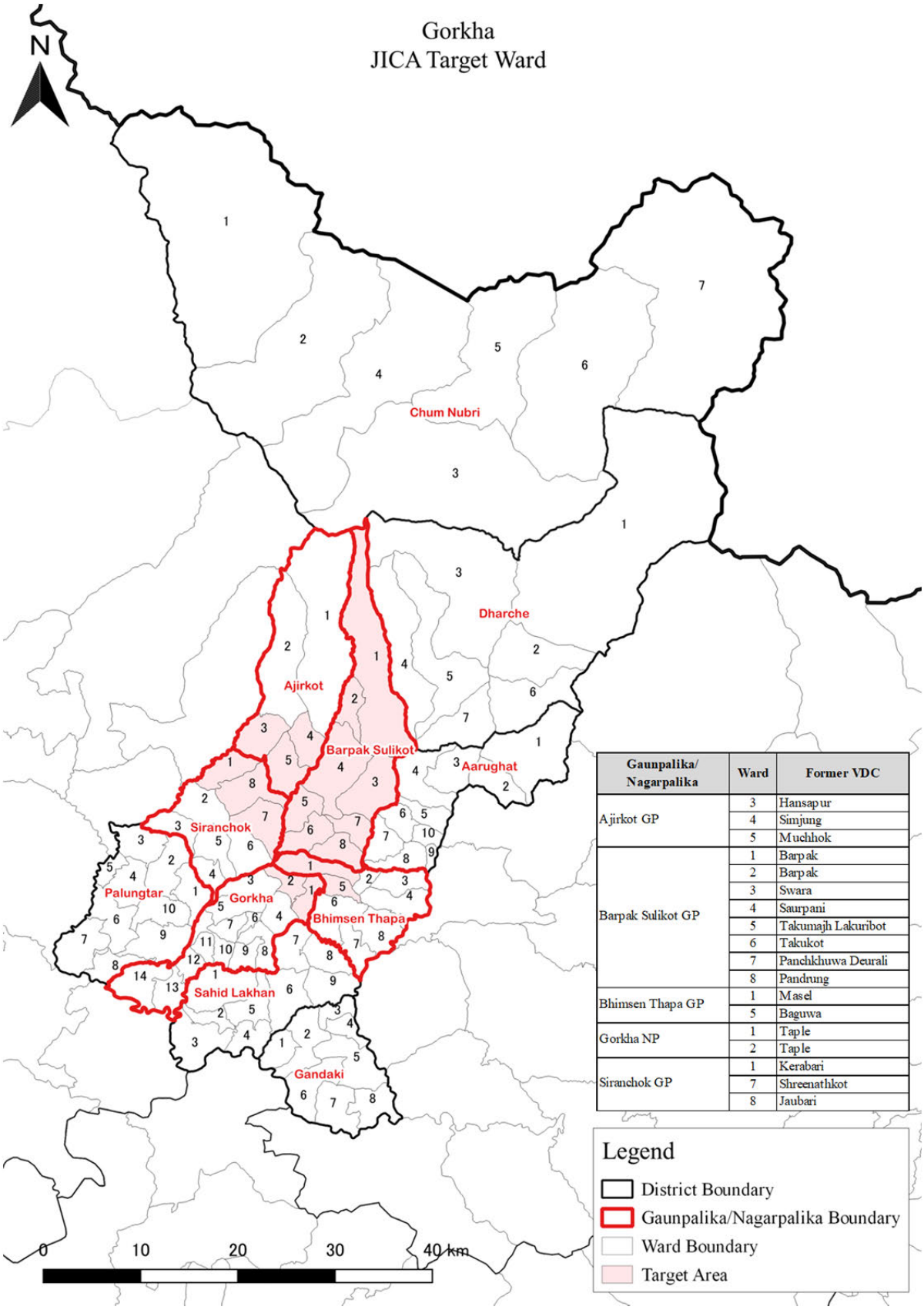
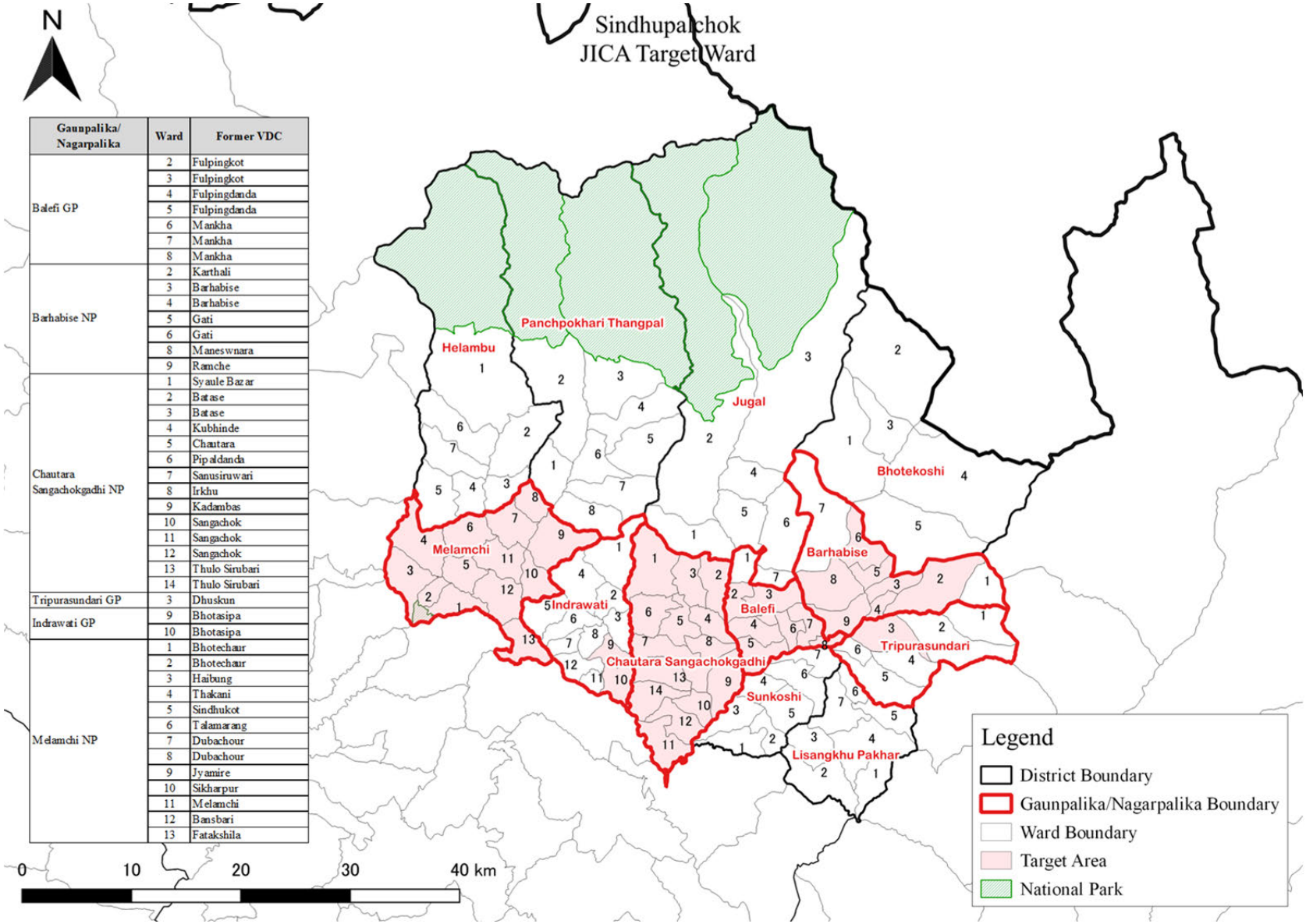


Project Target Area



Gaunpalika/ Nagarpalika	Ward	Former VDC
Ajirkot GP	3	Hansapur
	4	Simjung
	5	Muchhok
Barpak Sulikot GP	1	Barpak
	2	Barpak
	3	Swara
	4	Saurpani
	5	Takumajh Lakuribot
	6	Takukot
	7	Panchkhuwa Deurali
	8	Pandrung
Bhimsen Thapa GP	1	Masel
	5	Baguwa
Gorkha NP	1	Taple
	2	Taple
Siranchok GP	1	Kerabari
	7	Shreenathkot
	8	Jaubari

Project Target Area: Gorkha



Gaunpalika/ Nagarpalika	Ward	Former VDC
Balefi GP	2	Fulpingkot
	3	Fulpingkot
	4	Fulpingdanda
	5	Fulpingdanda
	6	Mankha
	7	Mankha
	8	Mankha
Barhabise NP	2	Karthali
	3	Barhabise
	4	Barhabise
	5	Gati
	6	Gati
	8	Maneswnara
	9	Ramche
Chautara Sangachokgadhi NP	1	Syaule Bazar
	2	Batase
	3	Batase
	4	Kubhinde
	5	Chautara
	6	Pipaldanda
	7	Sanusiruwari
	8	Irkhu
	9	Kadambas
	10	Sangachok
	11	Sangachok
	12	Sangachok
	13	Thulo Sirubari
	14	Thulo Sirubari
Tripurasundari GP	3	Dhuskun
Indrawati GP	9	Bhotasipa
	10	Bhotasipa
Melamchi NP	1	Bhotechaur
	2	Bhotechaur
	3	Haibung
	4	Thakani
	5	Sindhukot
	6	Talamarang
	7	Dubachour
	8	Dubachour
	9	Jyamire
	10	Sikharpur
	11	Melamchi
	12	Bansbari
	13	Fatakshila

Project Target Area: Sindhupalchok

	
Mason Training	Mason Training
	
Theatrical Performance at HO Training	Public Awareness Campaign, in Gorkha
	
PA Signing, in Hansapur, Ajirkot GP	Enrolment Camp

Photographs of Project Activities

	
TOT DLPIU Engineers	CBRC Orientation, in Irkhu, Chautara Sangachokgadhi NP
	
Community Meeting	Community Meeting, in Sinhadevi CBRC Kadambas
	
Mobile Mason Orientation	Technical Support by Mobile Masons

Photographs of Project Activities

	
Training on Correction Work	Completed House of SMM, in Gorkha
	
Completed House of SMM, in Sindhupalchok	Completed House of SMC, in Gorkha
	
Completed House of BMC, in Gorkha	Completed House of RCC, in Gorkha

Photographs of Project Activities

Executive Summary

1. Background and Purpose

1.1. Background of the Project

On 25th April 2015, an earthquake of magnitude 7.6[1] occurred with epicentre about 80 km northwest of the capital city of Kathmandu followed by aftershocks. Approximately 8,790 people lost their lives and more than 22,300 people were injured to date. Furthermore, at least 498,852 houses were destroyed and 256,697 houses were partially damaged[2]. The Government of Nepal (GON) prepared the Post Disaster Needs Assessment (PDNA) with support of international community such as the World Bank, United Nations Development Programme (UNDP) and Japan International Cooperation Agency (JICA). In May 2016, the Post Disaster Recovery Framework (PDRF) was completed in which the total financing requirement was estimated at USD 8,377 million. The requirements for urban and rural housing sector were estimated at USD 901 million and USD 2,861 million, respectively. The disaster effects on housing and human settlements and recovery needs for housing were the highest among other sectors. The Earthquake Household Damages and Characteristics Survey conducted from January to May 2016 by the Central Bureau of Statistics (CBS) classified damages on housing into five grades and according to said survey, a total of 563,696 houses are categorised as Grade 3 (Substantial to Heavy Damage), Grade 4 (Very Heavy Damage) and Grade 5 (Destructed). Of this figure, 83,408 houses (14.8%) were located in Sindhupalchok District; 71,307 houses (12.6%) in Nuwakot District; 71,146 houses (12.6%) in Kavrepalanchok District; 65,881 houses (11.7%) in Dhading District; and 63,775 houses (11.3%) in Gorkha District, indicating that the damages on housing spread largely in rural areas. Stone and brick masonry with mud mortar was commonly used for housing construction in rural areas which did not take into account the seismic resistance capacity. Hence, 95% of the damaged houses were built by this construction method and urgent action for their reconstruction was required.

In the education sector, approximately 26,000 classrooms were completely destroyed and also 26,000 classrooms were severely damaged nationwide. PDNA estimated the disaster effects on education sector to be the second largest after the housing sector. Schools with seismic resistance capacity were expected to be reconstructed to ensure students' safety.

[1] Ministry of Industry, Department of Mines and Geology, National Seismological Centre
http://www.seismonepal.gov.np/index.php?action=earthquakes&show=recent&page=5
[2] Nepal Earthquake 2015 Post Disaster Recovery Framework 2016-2020

Under these circumstances, GON convened the International Conference on Nepal's Reconstruction on 25th June 2015 and made a statement calling for support from international community for recovery and reconstruction from the earthquake. International community, including Japan, responded with pledge of more than USD 4.1 billion in total. Japan committed JPY 32 billion of support that includes the Emergency Housing Reconstruction Project (EHRP) (JPY 12 billion) and Emergency School Reconstruction Project (ESRP) (JPY 14 billon) as Japanese ODA LOAN project.

1.2. Emergency Housing Reconstruction Project (EHRP)

The objective of the Project is to restore and improve the living condition of the victims of the Nepal earthquake, by reconstructing the destroyed and damaged houses with adequate seismic standard in the districts severely affected by the Nepal earthquake, thereby contributing to sustainable socioeconomic development in the region and Build Back Better (BBB).

The Minimum Requirements was adopted as an adequate seismic standard which was prepared based on the National Building Code 105 (Seismic Design of Buildings in Nepal).

EHRP provides technical assistance for more than 56,000 house owners in the target areas of Gorkha and Sindhupalchok among which EHRP provides financial assistance for about 30,000 house owners who successfully reconstructed their houses in accordance with the standard.

1.3. Emergency School Reconstruction Project (ESRP)

The objective of the Project is to rebuild and retrofit schools in the districts severely affected by the Nepal earthquake by financing the necessary expense for reconstruction of schools and related facilities, thereby contributing to the improvement of education service and earthquake resilience for sustainable socio-economic growth.

1.4. Outline of the Project

The Transitional Project Implementation Support for Emergency Reconstruction Project (TPIS-ERP) is a grant technical assistance designed to provide transitional support for EHRP and ESRP until consultants are hired by GON under Japanese ODA LOAN. However, GON and JICA decided to continue TPIS-ERP up to March 2019 even after April 2017 when EHRP consultants were employed because continuation of the Community Mobilization Program (CMP) and support in the preparation of the Minimum Requirements and guidelines were crucial but were not included in the scope of EHRP consultants.

For the Emergency Housing Reconstruction Project (EHRP)

- Confirmation of Project Implementation Manuals of Japanese ODA LOAN Project
- Selection of housing grant beneficiaries in the target area

- Preparation of criteria for housing grant
- Preparation and implementation of trainings
- Confirmation of fund flow
- Study on retroactive loan financing and support in loan disbursement
- Implementation of procurement trainings including anti-corruption measures
- Development of monitoring, inspection and reporting system
- Study on the Environmental and Social Management System (ESMS)
- Coordination with World Bank for housing reconstruction

For the Emergency School Reconstruction Project (ESRP)

- Preparation of school selection criteria and procedure
- School selection
- Preparation of school reconstruction plan for each school
- Preparation of school operation and maintenance manual
- Confirmation of local contractors' capacity and recommendations of appropriate contract packaging
- Implementation of training on Japanese ODA LOAN procedures and various guidelines (procurement, ESMS, safety measures, etc.)
- Development of monitoring, inspection and reporting system
- Study on retroactive loan financing and support in loan disbursement
- Study on ESMS

2. Emergency Housing Reconstruction Project

2.1 EHRP Status as of December 2018

(1) Total Identified Beneficiaries

Total identified beneficiaries as of December 2018 were 56,532 households (HH) (Gorkha: 15,187 HH; Sindhupalchok: 41,345 HH)

(2) Participation Agreement (PA) Signing Rate

Out of the total identified beneficiaries, 55,699 (98.5%) beneficiaries have signed the Participation Agreement (PA).

(3) Reconstruction and Inspection Status as of December 2018

- Completed up to plinth : 52,794 (93.4%) beneficiaries have already reached to the plinth level and they are ready for 1st inspection.

- 1st Inspection : 1st inspection has been conducted already for 52,334 (92.6%) beneficiaries which shows that 460 (0.8%) beneficiaries are still awaiting 1st inspection.
- Completed up to roof band : 46,496 (82.2%) beneficiaries have already reached roof band level and they are ready for 2nd inspection.
- 2nd Inspection : 2nd inspection has been conducted already for 44,090 (78.0%) beneficiaries which shows that 2,406 (4.3%) beneficiaries are still awaiting 2nd inspection.
- Completed up to roof : 43,854 (77.6%) beneficiaries have already completed the construction up to roof and they are ready for final inspection.
- Final Inspection : Final inspection has been conducted already for 6,712 (11.9%) beneficiaries which shows that 37,142 (65.7%) beneficiaries are still awaiting final inspection.
- Completion Certificate : Completion certificates have been distributed to 2,436 (4.3%) beneficiaries in JICA target areas.

(4) Housing Grant Distribution Rate

- First tranche : The first tranche was received by 55,570 (98.3%) beneficiaries consisting of 54,052 (95.6%) beneficiaries supported by Government and 1,518 (2.7%) beneficiaries supported by I/NGOs.
- Second tranche : The second tranche was received by 50,499 (89.3%) beneficiaries consisting of 49,079 (86.8%) beneficiaries supported by Government and 1,420 (2.5%) beneficiaries supported by I/NGOs.
- Third tranche : The third tranche was received by 40,355 (71.4%) beneficiaries consisting of 39,128 (69.2%) beneficiaries supported by Government and 1,227 (2.2%) beneficiaries supported by I/NGOs.

2.2 TPIS-ERP Technical Assistance Outputs

2.2.1 Contractual Scope of Work

The following table shows the scope of work stipulated in TPIS-ERP Consultants Agreement ([Scope of Work for Housing Reconstruction] of (2) Field Work, 7. Scope of Work, Particular Specification) and its status as of December 2018.

Table 1 Status of Contractual Scope of Work as of December 2018

Scope of Work	Status	Accomplishment
1) Confirmation of Japanese ODA LOAN Project Implementation Manual	Consultants have monitored the modification of the Program Operations Manual (POM) by NRA.	100%
2) Selection of housing reconstruction grant beneficiaries in the target area	NRA selected beneficiaries for housing reconstruction/retrofitting grant based on the results of damage survey. Consultants have monitored the selection of additional beneficiaries through the grievance redressal.	100%
3) Preparation of priority criteria for housing reconstruction grant distribution	Criteria were not prepared since every beneficiary was able to receive the grant without any prioritisation	Not applicable
4) Preparation and implementation of trainings	Consultants have conducted the following trainings: • House owner training • Mason training • DLPIU Engineer training • Mobile Mason training on correction work • Community Mobilization Program	100%
5) Confirmation of fund flow	Consultants have confirmed and monitored the fund flow at both central and district levels specially money transfer from the assigned Participating Financial Institutions to beneficiary.	100%
6) Consideration of retroactive financing and support for disbursement	Retroactive financing has not taken place.	Not applicable
7) Procurement Seminar including anti-corruption measure	Consultants have conducted a seminar on advance procedure fund flow and management of evidencing documents for loan disbursement. Anti-corruption measure was introduced as part of DLPIU Engineer training.	100%
8) Development of monitoring, inspection and reporting system	Consultants have developed the system by the following guidelines: • Minimum Requirements • Inspection Guidelines	100%
9) Environmental and Social Monitoring System		
a) Baseline survey on environmental and social considerations	Consultants have collected the baseline information.	100%
b) Confirmation of government legislation and organisation in the matter of environmental and social considerations	Consultants have confirmed government legislation and organisation in the matter of environmental and social considerations.	100%
c) Confirmation of selection criteria and procedure for environmental and social subprojects	Consultants have confirmed subproject through ESMS Checklist and excluded subproject under category A in principle.	100%
d) Confirmation of government ESMS capacity and preparation of proposal for improvement and monitoring (in case of deficiency in capacity)	Consultants have prepared and conducted the monitoring plan on ESMS implementation as a trial.	100%
e) Preparation of ESMS Checklist	Consultants have prepared the checklist which JICA and the government approved.	100%
f) Confirmation of World Bank policy on environmental and social considerations	Consultants have collected and shared information with World Bank periodically.	100%
g) Support for environmental and social subprojects, if needed	Consultants have provided assistance for integrated settlement.	100%
h) Preparation of Indigenous Peoples Plan Framework (IPPF), if needed	No Issue related to indigenous people was reported.	Not applicable
10) Coordination with Earthquake Housing Reconstruction Project implemented by World Bank	Consultants have coordinated not only with World Bank but also with other donors and I/NGOs.	100%

Source: This Study 2018

2.2.2 Standard and Manuals

At the central level, TPIS-ERP formulated the technical guidelines and manuals that include the following:

- Design Catalogue for the Reconstruction of Earthquake Resistant Houses, Vol.1 (RRNE, see 1.2.3 (2) for detail)
- Minimum Requirements for Masonry Structure for housing reconstruction programme (RRNE)
- Correction/Exception Manual for Masonry Structure for housing reconstruction programme
- Hybrid Structure Manual for housing reconstruction programme
- Light Timber/Steel Frame Structure Manual for housing reconstruction programme
- Compliance Catalogue for housing reconstruction programme

Aside from these, the curriculum and teaching materials of the trainings for DLPIU engineers, masonries and house owners were produced by the technical support of TPIS-ERP.

2.2.3 Training

In order to promote housing reconstruction with higher quality than before the earthquake, the dissemination of suitable construction skills and communication on the Housing Reconstruction Program procedure were necessary. In response to the request of National Reconstruction Authority (NRA), TPIS-ERP had implemented trainings for house owners and masons. In addition, TPIS-ERP assisted NRA in the management of enrolment camp for the housing reconstruction and conducted the Community Mobilization Program as part of the training.

The following table shows the trainings implemented by TPIS-ERP through subcontractors.

Table 2 List of Trainings

Sub-contract Package	Contents	Participant	Contract Period / Situation	Subcon tractor
Training (Package 1)	Mason Training on earthquake resilient housing reconstruction skill (lectures and practices, 6/7 days): 9 times	282 masons (280 male and 2 female masons)	Oct 2015 – Jun 2016	TCN
	House Owner Training on earthquake-resilient housing reconstruction concept (lectures, site tours, theatrical performance, 1 day): 17 times	711 house owners (350 male and 361 female house owners)		
	Enrolment camp management, including confirmation of required documents and communication about earthquake-resilient housing, etc.	944 applicants of housing reconstruction		
Training (Package 2)	Mason Training on earthquake-resilient housing reconstruction skill (lectures and practices, 7 days): 7 times	218 masons (218 male masons)	Feb 2016 – May 2016	TCN
	House Owner Training on earthquake resilient housing reconstruction concept (lectures, site tours, theatre appreciation, 1 day): 14 times	512 house owners (375 male and 137 female house owners)		

Sub-contract Package	Contents	Participant	Contract Period / Situation	Subcon tractor
	Enrolment camp management, including confirmation of required documents and communication about earthquake-resilient housing, etc.	About 2,000 applicants of housing reconstruction		
Training (Package 3)	Mason Training on earthquake-resilient housing reconstruction skill (lectures and practices, 7 days): 31 times	918 masons (914 male and 4 female masons)	May 2016 – Dec 2016	ERTech
	House Owner Training on earthquake-resilient housing reconstruction concept (lectures, site tours, theatre appreciation, 1 day): 62 times	2,454 house owners (1,674 male and 780 female house owners)		
Training (Package 4)	Mason Training on earthquake-resilient housing reconstruction skill (lectures and practices, 7 days): 25 times	739 masons (726 male and 13 female masons)	Nov 2016 – Mar 2017	TCN
	House Owner Training on earthquake-resilient housing reconstruction concept (lectures, site tours, theatre appreciation, 1 day): 50 times	2,841 house owners (1,310 male and 1,531 female house owners)		
	Refresher Course on earthquake-resilient housing reconstruction skill (lectures, 1 day) 49 times	1,404 already trained masons (1,384 male and 20 female masons)		
Training (Package 5)	Community Mobilization Program including CBRC support and dispatch of Mobile Mason	House owners in the target 4 VDCs	Apr 2017 – Mar 2018	TCN
	Refresher Course on earthquake resilient housing reconstruction skill (lectures, 2-day): 6 times	191 already trained masons (156 male and 35 female masons)		
	Mobile Mason Training: 4 times	95 masons (89 male and 6 female masons)		
Training (Package 6)	Community Mobilization Program including CBRC support and dispatch of Mobile Mason	House owners in the target 21 VDCs	Sep 2017 – Mar 2018	SSE
	Mobile Mason Training: 21 times	561 masons (553 male and 8 female masons)		
Training (Package 7)	Community Mobilization Program including CBRC support and dispatch of Mobile Mason	House owners in the target area of Sindhupalchok	Feb 2018 – Jan 2019	SSE
Training (Package 8)	Community Mobilization Program including CBRC support and dispatch of Mobile Mason	House owners in the target area of Gorkha	Feb 2018 – Jan 2019	TCN

Source: This Study 2018

(1) House Owner Trainings

It was necessary for house owners to comprehend why earthquake-resilient houses are important, and to understand the principle and procedure of GON Housing Reconstruction Program. Every training accommodated 60 participants, including leaders of the community, female house owners and economically vulnerable house owners selected by the Ward Citizen Forum. The house owners were given theoretical session along with the demonstration of the models prepared during mason training. The main attraction of the house owners training was theatrical performance which had a message on the importance of earthquake-resilient construction. A total of 6,518 house owners were trained, of which 2,809 were female participants.

(2) Mason Trainings

Based on the need of the beneficiaries and masons working in the field, different types of mason trainings were conducted in the target areas.

1) Mason Training (6 or 7 days[3])

Mason training started in JICA target area in December 2015. The training was intended for the existing masons with more than 1-year working experience who had not received trainings from other donors and provided them knowledge on earthquake-resilient constructions. About 30 masons, nominated by Village Development Committee (VDC) and screened through interviews and practical examination, were trained and provided with allowances and meals. Theoretical knowledge on earthquake-resilient construction followed by practical sessions was the main content of the training. TPIS-ERP conducted 72 trainings and trained a total of 2,157 masons from the target areas, of which 19 were female masons.

2) Refresher Course (1 or 2 days)

To brush up the technique on earthquake-resilient construction of the masons that were already trained by TPIS-ERP or other donors, and to equip them with new technologies and revised guidelines, a 2-day refresher training was conducted with model-based training approach. The participants were taken for site visits to make them understand the real complications regarding non-compliance issues of the on-going constructions. A total of 1,595 masons were trained during the refresher course of the project, of which 55 were female masons.

3) Mobile Mason Training (6 days)

TPIS-ERP conducted training for the masons who were already trained by TPIS-ERP to be Mobile Masons under the CMP. The training provided them more detailed practical training and the opportunity to find out the best masons in the community who would be appropriate to work as Mobile Mason in the field. This would also create a roster of trained masons and so if any mason would leave the job, the next trained mason could be selected without undergoing any other training. A total of 656 masons were trained, of which 14 were female masons.

(3) Enrolment Camp

Enrolment Camp was the place for selected beneficiaries to make the participation agreement (PA) and enrol in the GON Housing Reconstruction Program. NRA conducted the first enrolment camp in Dolakha in March 2016 and planned to expand to other districts. However, the District Coordination Committee was not so familiar with the procedure on how to start the enrolment camp and its contents.

[3] 1st training in Package 1 was a 6-day training. However, it was learned that 6 days were not enough for the contents, and so the training period was changed to 7 days.

TPIS-ERP learned lessons from the Enrolment Camp in Dolakha and improved the procedure and contents.

(4) Government Engineer Trainings

CLPIU (Building)[4] conducted the Training of Trainers (TOT) for DLPIU engineers on earthquake resilient building in July 2016. After completion of the Inspection Guidelines and the Inspection Manuals for Housing Reconstruction Program in December 2016, CLPIU (Building) implemented the Master Training of Trainers (MTOT) for selected DLPIU engineers on the guidelines so that they would be able to conduct the Inspection Training for other DLPIU engineers in their districts. JICA conducted 19 TOT and trained 493 DLPIU engineers.

2.2.4 Community Mobilization Program (CMP)

Reconstruction start rate was as low as 21.3% in March 2017, according to the complete survey in 10 VDCs conducted by TPIS-ERP even though the Minimum Requirements were set in place, house owners and mason trainings were conducted, and DLPIU engineers were trained as inspectors. TPIS-ERP assumed that this reconstruction rate lower than expected could be attributed to lack of mutual support in the community. Therefore, CMP was planned to accelerate the housing reconstruction by promoting mutual support and ownership of reconstruction work.

First, the Technical Assistance Team (TA Team) facilitated the formation of Community-Based Reconstruction Committee (CBRC) which was directed by the Community-Based Reconstruction Committee Guideline 2017 published by NRA. CBRC was the committee composed of one president, five members (including three females) and one secretary selected from the community to increase the participation and ownership of reconstruction work through mutual support and coordination with VDC. However, there was no guidance and budget from NRA so CBRC did not know how to accelerate housing reconstruction. Hence, TPIS-ERP started the orientation training to CBRC on how to address issues related to housing reconstruction such as shortage of masons, procurement and transportation of construction materials, and noncompliance to the Minimum Requirements.

Once CBRC became acquainted with its responsibilities, TPIS-ERP supported it in facilitating community meetings where all house owners in the community gathered and discussed issues related to housing reconstruction.

TPIS-ERP also dispatched the Mobile Masons to communities who would work as working masons at the site free of charge as well as train other mason and unskilled labour on earthquake resilient technology. Maximum number of Mobile Mason was 548 of which 10 were female Mobile Masons.

[4] The then MOUD CLPIU conducted the training which was changed to CLPIU (Building) later.

The project started CMP by doing the CBRC orientation (workshop) with the Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis, community follow-up meetings and dispatch of the Mobile Masons for each CBRC with activities listed below:

(1) CMP Phase 1 (May 2017 – April 2018)

- Orientation to CBRC
- Community Meeting for all the house owners
- Selection and dispatch of Mobile Masons (Technical Assistance by Mobile Masons)

(2) CMP Phase 2 (May 2018 – January 2019)

- Ward Level Coordination Meeting
- Issue Specific Community Meeting
- Technical Assistance by Mobile Mason
- Correction work through Mobile Mason OJT (On-the-Job Training)

2.2.5 Monitoring and Reporting

TPIS-ERP central staff monitored housing reconstruction status and technical assistance activity by periodic reports prepared by the district staff. Reporting system had been modified and improved depending on the housing reconstruction situation. All information reported from the field were incorporated in the central database with which technical and financial analyses were generated.

Table 3 Reporting System

Period	Report	Contents
Mar 2017 – Jul 2017	Monthly Report	Reconstruction Progress by VDC
Aug 2017 – Feb 2018	Bi-weekly Report	Reconstruction Progress by VDC Training Status Community Mobilization Program Status
Mar 2018 – Jul 2018	Weekly Report	Reconstruction Progress by VDC Issues
Aug 2018 – Oct 2018	Weekly Report	Reconstruction Progress by VDC
	Bi-weekly Report	Reconstruction Progress Graph Issues Actions
Nov 2018 – Jan 2019	Bi-weekly Report	Reconstruction Progress by Ward Reconstruction Progress Graph Reconstruction Stage (detailed progress) Reconstruction Status (detailed issues)

Source: This Study 2018

Current biweekly monitoring system classifies all 56,532 beneficiaries into 13 stages and 146 status based on which TA Teams and Mobile Masons are able to take actions appropriate to each specific issue hindering house owners from housing reconstruction. EHRP Consultants will take over this monitoring system. The following table is the bi-weekly report as of 26th December 2018 which shows that there are 3,611 beneficiaries who have not started reconstruction (stage A+B+C) and only 2,431 beneficiaries have received the completion certificate.

Table 4 Biweekly Monitoring Report (as of 26th December 2018)

Category of Issue		No. of Beneficiaries			
		Previous Period	This Period		
			Unsolved	New	Total
A	~PA Not Signed	819	662	140	810
B	PA Signed~1st Tranche not deposited	353	171	38	209
C	1st Tranche deposited~ Not Started	3,010	2,223	369	2,592
D	Started~Plinth Not Completed	277	128	150	278
E	Plinth completed ~ 1st Inspection not conducted	404	183	180	363
F	1st Inspection conducted~2nd Tranche not deposited	1,211	694	711	1,405
G	2nd Tranche deposited~Roof Band not completed	5,542	4,179	831	5,010
H	Roof Band Completed~2nd Inspection not conducted	2,010	1,269	710	1,979
I	2nd Inspection conducted ~3rd Tranche not deposited	3,148	2,281	1,171	3,452
J	3rd Tranche deposited~Roof not completed	1,408	1,009	156	1,165
K	Roof Completed~Final Inspection not conducted	32,426	26,591	6,123	32,714
L	Final Inspection completed~Completion certificate not distributed	3,601	3,025	1,099	4,124
M	Completion Certificate distributed	2,187	2,185	246	2,431
Total		**56,396**	**44,600**	**11,924**	**56,532**

Source: This Study 2018

2.2.6 Financial Seminar

Seminar on Financial Management for Housing Reconstruction (Advance Procedure) was conducted on 4 June 2017, while the training for countermeasures for corruption has been included in the Inspection Training for DLPIU Engineers.

Seminar on financial management for housing reconstruction (advance procedure) was organised by CLPIU (GMaLI) and co-supported by TPIS-ERP and EHRP Consultants who prepared presentation materials for project profile, Japanese ODA LOAN and the advance procedure. The seminar provided information on the challenges faced at district level and samples of necessary documents to be submitted by the District Coordinating Committee (DCC), the District Treasury Comptroller Office (DTCO) and PFIs.

The objectives of the seminar were as follows:

- Understand and review the overall project implementation, progress, project issues and solutions.
- Identify target areas of JICA to support and finance.
- Explain Japanese ODA LOAN as well as how to deal with advance procedure.
- Obtain feedbacks, difficulties and different opinions from the participants to correct financial flows and necessary evidences to be submitted.
- Request headquarters of Participating Financial Institutions (PFI) to inform their district managers (Gorkha and Sindhupalchok) to submit summary of payment records to beneficiaries.

3. Environmental and Social Management System (ESMS)

3.1 Brief Summary of District-wide Environmental and Social Baseline Condition

3.1.1 Gorkha District

Gorkha District lies in Gandaki zone and has 60 VDCs and 2 Municipalities[5]. The climatic condition in Gorkha also changes with altitude and comprises of all the climatic zones from Upper Tropical in the south to Nival in the north. The temperature ranges from maximum of over 35 °C in upper tropical region to minimum of around -10 °C in Nival zone with the average maximum of 20 °C and average minimum of about 4 °C. The total average annual rainfall in Gorkha is 1,400 mm with about 80% of the annual precipitation occurring during the monsoon season.

Geologically speaking, Gorkha District falls both in the Lesser Himalaya and the Higher Himalaya. The Lesser Himalaya is made up of sedimentary, metamorphic and igneous rocks, which are highly folded, jointed and faulted and have developed complicated geological structures. The Higher Himalaya rocks are fresh and hard, and exhibit high mountain ranges with steep to very steep slopes. The epicentre of the 2015 Gorkha Earthquake was located at the northern edge of the Lesser Himalaya. Because of the climate, topography, accessibility and presence of fertile soil, most of the people live in the Lesser Himalayan zone.

Landslides are common phenomena in this district, especially during monsoon rain season. In addition, the 2015 Gorkha Earthquake triggered widespread landslides in more than three-fourths part of Gorkha in the north, and the damage, destruction and casualties related to them during and after the earthquake were highest among the affected districts.

3.1.2 Sindhupalchok District

The soil of this district is alluvial along the river valleys with boulder, gravel, sand, silt and clay in different proportions. Mountain soils are residual and colluvial. The places up to 1,000 meter above sea level is very hot in summer showing maximum temperature of 33° C which drops to the lowest of 5° C in winter (i.e., the tropical zone). The subtropical zone, which starts at 1,000 meters and goes up to 2,000 meters, is warm and with humid climate that is good for forestation. The mid-hill area is generally a complex physiographic condition with stepwise rise in altitudes from south to the north, providing the formation of deep river valleys.

The total average annual rainfall is 1,615 mm and most of local run-off waters are drained by large number of rivers and their tributaries and sub-tributaries. Most of this district is located under the Lesser and Higher Himalayas. The Lesser Himalayas in this district consists of low grade

[5] In line with the transformation to federal system, VDC was changed to Nagarpalika (NP, Municipality) and Gaunpalika (GP, Rural Municipality). Gorkha district is now composed of 2 NP and 9 GP

meta-sedimentary rocks, such as slate, phyllite and schist of different names and ages, with some carbonate rocks (limestone and dolomite) at places. Except for the carbonates, the rocks are mostly soft and moderately to highly weathered and develop low topographic reliefs of the midland zone.

3.2 ESMS Checklist

ESMS Checklist was developed in order to make the proposed housing sector reconstruction project environmentally and socially sound. The development of this ESMS checklist was initiated in August 2015 and completed in November 2015 through a series of discussion among JICA and DOLIDAR. Relevant ESMS implementation - related capacity development (CD) programmes, to be described later, are developed based on this ESMS checklist as well as engineering results of the proposed housing-sector reconstruction project.

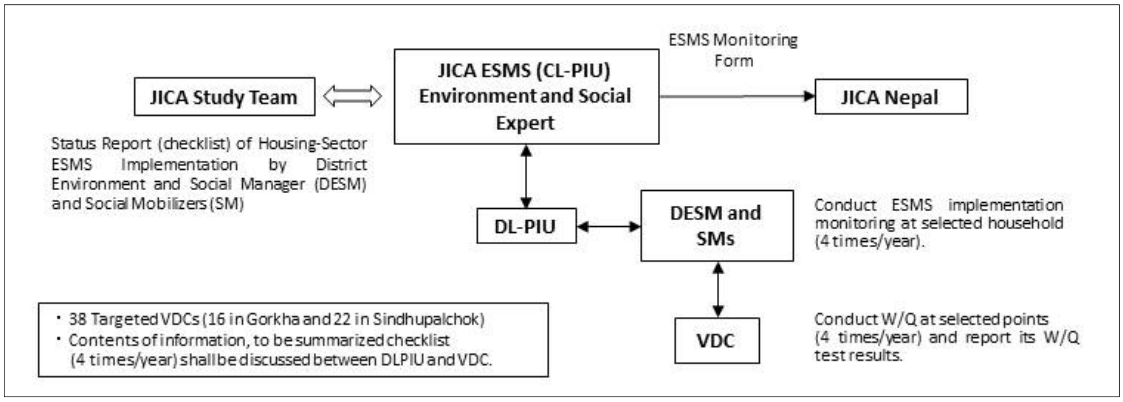
3.3 Implementation Framework

The implementation of JICA-ESMS and its relevant examinations are to be conducted for selected household at VDC-level (i.e., 25 to 40 households ESMS monitoring activity per one VDC). Within this housing-sector reconstruction project, three ESMS staff are to be assigned (2 months/year each, in total 4 months/year, one person working with CL-PIU, one working at Gorkha District, and the remaining one working at Sindhupalchok District) within the Japanese ODA LOAN project.

Upon considering the accessibility from Kathmandu to each reconstruction site of two districts, as mentioned above, ESMS reporting schedule (4 times per year) and assignment schedule of three ESMS staff to be assigned for the Japanese ODA LOAN project, it would be quite difficult to conduct meaningful ESMS-related monitoring works at all reconstruction sites and reporting to JICA by JICA-ESMS staff within 4 months every year.

As mentioned earlier, to increase the transparency and guarantee the accountability of this ESMS implementation, each social mobilizer is to have explanation meeting with beneficiaries to discuss contents of draft ESMS monitoring sheet before starting ESMS-related information collection. After this ESMS-related data collection in each household, those data are to be compiled by each VDC for the VDC-wide preliminary environmental evaluation. Then, those compiled data and environmental evaluation results are to be submitted from each DESM to CLPIU while liaising with each DLPIU. After CLPIU examines those ESMS monitoring results, to be submitted by DESM, then periodic reporting of ESMS-related monitoring progress to JICA from CLPIU (GMaLI) is to be conducted. It is noted that the ESMS-related monitoring survey sheet is prepared by the JICA Study Team based on JICA Guidelines, EPA96, EPR97 and others. This reporting is planned to be conducted quarterly (4 times per year during implementation of the entire reconstruction project). Figure 1 shows the entire framework of the housing sector ESMS implementation.

In addition, ESMS-related water quality tests at nearby tributaries and/or water bodies such as springs, located at both upstream and downstream sides of the reconstruction site, are to be conducted using water analysis kits by DESM.



Source: This Study 2018

Figure 1 JICA-ESMS Implementation Framework (Housing Sector)

Since no environmental staff exists at both Districts and/or VDCs, it is strongly recommended to implement capacity development (CD) regarding the JICA-ESMS-based environmental clearance for selected housing reconstruction projects while raising strong environmental awareness within Districts, VDCs and/or house owners in order to improve environmental governance therein. More detailed descriptions of this CD program are to be summarised in the following section.

3.4 ESMS Implementation - Related Capacity Development (CD) Program

This ESMS-related CD program was conducted between January 2017 and June 2017 at Gorkha and Sindhupalchok Districts as well as Kathmandu as a kick-off meeting for relevant central government organisations. It is noted that relevant community-level workshops were held at 16 VDCs in Gorkha and 22 VDCs/Municipalities in Sindhupalchok District.

Table 5 Schedule of ESMS Capacity Development Workshop (Housing Sector)

Activities	01, 2017	02, 2017	03, 2017	04, 2017	05, 2017	06, 2017
Preparation						
Kick-off Workshop (Central)						
CD at DLPIU						
CD at community						
Theatre Preparation						
Theatre Performance						
Post Training Data Processing						
Preparation of deliverables						
Deliverable Inspections						
Submission of Final Report						

Source: This Study 2018

4. Lessons Learnt and Way Forward

4.1 Technical Standard

(1) Prototype design / Fix design from the Design Catalogue

The main purpose of the Design Catalogue was to introduce prototypes of seismic-resistant design by using many images and to facilitate easy understanding by house owners. Also, the Design Catalogue aimed to simplify/accelerate the process of obtaining a building permit. Ideally, all house owners should prepare architectural drawings for the house reconstruction, but considering the ground reality in rural areas where there are no architect or engineer, it is generally difficult for them to prepare complete drawings by themselves. Therefore, development of simplified drawings such as the ones introduced in the Design Catalogue is necessary.

(2) Minimum Requirements/Inspection Sheets

The Minimum Requirements is a unified standard for seismic resistant design, and aims at popularising the National Building Code (NBC) among local population. The inspection sheets were developed as practical tools to check whether each item meets the Minimum Requirements. However, some items such as strength of concrete, steel and brick, and depth of foundation are difficult to inspect after the construction. Also, items like site selection, shape and size of building and material preparation which is supposed to be checked during design phase and permit process, are only inspected during construction.

(3) Retrofitting

As of 21st January 2019, NRA has identified 61,591 eligible households who can apply for retrofitting grant, out of which 15,462 households have enrolled in the programme, while 14,148 households have received the first tranche after first inspection, and only 20 households have received the final tranche. The primary reason behind the low number of households to receive retrofitting grant is lack of trained inspectors.

4.2 Implementation

(1) Owner-driven Approach

CMP is a community-driven participatory approach that empowers beneficiaries and communities to organise themselves and to develop strategies and plans that support reconstruction by mutual work. Owner-driven approach supplemented by community-driven approach with support of local masons was identified as a major supportive key for accelerating housing reconstruction.

(2) Housing Grant Amount

The average construction cost is NPR 633,330 which is twice as much as the housing grant provided by the government, and beneficiaries who are financially incapable take loans at interest rate of

21.7% on the average to complete the construction of their house. The government should focus not only on the housing grant distribution but consider other indirect supports like subsidized loans, construction materials and manpower in an organized way to reduce the economic burden of the beneficiaries.

(3) Delay in Preparation of Legal Framework

Many houses constructed before the Inspection Guidelines was set in place in November 2016 were found non-compliant with the Minimum Requirements. Timely formulation of standards and guidelines plays a crucial role to the momentum of owner-driven reconstruction.

(4) Effectiveness of Inspector

Delays in employment, high turnover rate and absence in the field of DLPIU engineers affected timely monitoring and inspection that increased non-compliance rate in housing reconstruction. The TA Team supported DLPIU engineers to expedite their duty. At the same time, TPIS-ERP had provided training to 493 DLPIU engineers in cooperation with CLPIU. Close monitoring of activity and timely provision of payment and other logistic support will increase effectiveness of the inspectors.

(5) Noncompliance

Houses noncompliant with the Minimum Requirements in the project target area were found to be 1.46% of the corresponding total targeted 56,532 beneficiaries as of December 2018. NRA Technical Working Group developed different guidelines which proved to be very useful tools for the technical assistance on house reconstructions which are yet to meet the Minimum Requirements. There were about 740 houses corrected by Mobile Mason until December 2018.

(6) Condition for 3rd Tranche and Completion Certificate

NRA considered the terms of payment into three tranches. The concept of third tranche to be distributed after roof band construction is to encourage beneficiaries to construct roof along with toilet or renewable energy technology. However, as there is no financial benefit after roof band completion, people are not motivated somehow to construct earthquake-resilient structure above roof band. To avoid this situation, EHRP consultant will continue to encourage beneficiaries to construct compliant house up to roof and receive the completion certificate.

(7) Sustainability of Community Approach

Considering the time constraint and urgency of housing reconstruction, TPIS-ERP had focused on time-limited community approach only for the housing reconstruction but not its sustainability. In fact, during project implementation CBRCs were formed in communities and they were carrying out their responsibilities successfully and expected to continue their efforts for other activities as well.

It is suggested that these kind of community groups must be institutionalised by the government to be prepared for future disasters for sustainability.

(8) Project Implementation by the Two Ministries

NRA was structured to work for housing reconstruction in coordination with two different ministries. For housing reconstruction, Ministry of Federal Affairs and Local Development (MOFALD which was changed to MOFAGA) and Ministry of Urban Development (MOUD) were provided the main responsibility to implement the program. CLPIUs were formed under two ministries to execute the works in coordination with NRA. MOFALD CLPIU was responsible for administrative and financial part whereas MOUD CLPIU was responsible for technical part.

For the efficient process of tranche payment to the beneficiaries, well-coordinated system between MOFALD and MOUD was expected.

In April 2018, NRA restructured its organisational structure to make the effective reconstruction implementation with operative chain of command. This restructuring brought CLPIUs under the NRA. NRA has also been trying to handover the responsibilities to the local governments to make the process faster.

(9) One Room House

At the end of 2017, NRA Technical Standardization Committee recommended 120 square feet as a minimum size of the room for the houses to be reconstructed. However, that recommendation was not officially disseminated and NRA could not finally decide the size of the room since many houses smaller than 120 square feet were already constructed before that. Still there is no clear guideline about the size and number of rooms.

As NRA could not clearly stipulate one-room house standard, DLPIU (building) and some ward chairpersons made their own opinion regarding inspection of one room house. Because of this non-uniformed judgment, the number of one-room house varies in different district.

Since most of the local mason and beneficiaries have got well familiar with the earthquake resilient standard for housing reconstruction, beneficiaries can expand their house compliant with standard in the future.

(10) Enrolment Camp

Even after one year since the earthquake, there was no institutional setup to support the reconstruction beneficiaries in the local level. Huge number of the beneficiaries were waiting for the government support to start the reconstruction. The first enrolment camp was conducted in March 2016 in Singati, Dolakha. Enrolment camp required organized and effective communication in advance to invite people in the program. It also required a huge setup to process the whole program smoothly in an organized way. In such scenario, whole TPIS-ERP team

concentrated to support the government and beneficiaries for enrolment camp including logistics support with the help of Ward Citizen Forum (WCF).

Even though the weak government institutional set up, enrolment camp became the opportunity to conduct mass participation agreement signing and to make the people aware of whole housing reconstruction program process and earthquake resilient technology.

(11) Deadline for Housing Grant

One of the reason why beneficiary had not started reconstruction was assumed that there was no clear housing reconstruction timeline directed by NRA. Therefore, NRA announced the deadline of housing grant distribution in July 2017 which resulted that 169,269 (25.4%) beneficiaries started reconstruction in November 2017.

In a way, the deadline for housing reconstruction was effective to accelerate the housing reconstruction. However, it also led beneficiaries to reconstruct houses which did not satisfy their needs solely in order to receive the housing grant. Those beneficiaries continued to utilize their old houses to supplement new houses, planned to construct another house or expand new houses later.

Even after the deadline was set many beneficiary was not likely to meet it so that NRA extended the deadline time and again. Eventually, some of beneficiaries began not to take the deadline seriously and would not start the reconstruction.

4.3 Environmental and Social Concerns

(1) No Significant Environmental Adverse Impact

The housing reconstruction was found to be of small scale, largely labour-based, and took place in situ or at alternative nearby locations, hence having no significant impacts on the environment. Results of water quality test also show no significant impacts of reconstruction on water resources and the least possibility of having negative impacts on water resources.

(2) Grievance

Grievance redressing mechanism is slow because of limited human resources and still there are many grievances to be addressed after 3 years since the earthquake. Grievance registration and management process is continuous in in order to include all earthquake victims into the housing reconstruction program. Through grievance redress, 4,843 households were identified as new beneficiaries in targeted area in different phases until December 2018.

(3) Resettlement

The earthquake resulted in population displacement as habitable lands were damaged due to cracks/fissures, making them inappropriate for house reconstruction. Central level office of NRA has small unit of geological section consisting of 3 government officers to look after 32

earthquake-affected districts and there are 2 person each at Gorkha and Sindhupalchok which slows the resettlement process specially the phases of assessment and identification of resettlement beneficiaries, land purchase and land transfer to the beneficiaries.

(4) Retention of trained Masons

Due to limited employment opportunities in villages, masons are likely to migrate to bigger cities or outside Nepal which created shortage of local manpower for reconstruction works. For retention of trained masons, it was necessary to involve them from the beginning of the programme, like joining some activities as Mobile Masons.

(5) Women's Participation in reconstruction

Out of total target beneficiaries of 56,532, there were 12,419 (22.0%) female-headed households. Notably, most of male family members of male-headed households were out of the village for employment and the decision-making responsibility was temporarily passed to the female members. However, there was no special attention from government to increase female participation in housing reconstruction.

During the implementation of different activities in the field such as public awareness campaign, enrolment camp, house owner training, CBRC orientation and community meetings, the active participation of female was highly observed. Though government did not have any policy in ground, the voluntary participation of female in reconstruction has resulted in good reconstruction rate in target area.

(6) Safety issues

Most of the beneficiaries have been residing temporary shelters until the reconstruction of their permanent houses is completed. These temporary shelters do not meet adequate safety standards and consequently pose safety issues in terms of location and structural design. Also, houses that were not completely damaged by earthquake are being used as storage or for other purposes. It is advised that beneficiaries who own the old houses that are not in inhabitable conditions should be prohibited from utilising these even at the beginning of the process.

4.4 Financial Mechanism

(1) Verification of housing grant distribution

Verification between the Payment Order (PO) issued by DCC and the check list of the housing grant issued by DTCO, and furthermore confirmation of the issued checks by DTCO with the expenditure on the Line Ministry Budget Information System (LMBIS) under the Ministry of Finance have been carried out. Uploading to MIS is obliged by each financial institution that provides housing grant payment, but since the upload deadline is not specified, it is firster to confirm with DCC, DTCO and LMBIS for the latest situation of housing grant distribution.

In any case, because it is possible to occur any mistakes in settlement and evidencing documents at DCC and DTCO (mistakes in entry, duplication of beneficiaries, omission of information, etc.) in the future, the verification works by the EHRP consultant will be continued.

(2) Uploading housing grant distribution status to MIS and its verification

Management Information System (MIS) operating under NRA, manages information and status on housing grant distribution for beneficiaries, which started up the system since the beginning of the Project. In the past, the operability of the MIS upload of the second and third tranches were inferior, and it was very difficult to operate, but due to the improvement in the system and calls on NRA, many additional PFIs uploaded the payment status of housing grants. In the future, it is necessary to increase the MIS upload for status of the third tranche, which is an important parameter for JICA for the verification on project completion, and the EHRP consultants will continue to support.

(3) Operational challenges of Participating Financial Institutions (PFI)

As the project progressed, PO and checks were issued by DCC/DTCO and even though payment to PFI was completed, there were still some feedbacks from beneficiaries that housing grants were not received and delayed to be credited in their bank accounts. It is necessary to discuss measures on accelerating housing grant payments between bank associations that have signed agreements with NRA.

(4) Financial linkage

In general, formal financial services were not available to people in remote areas because of the complicated application procedure, and long admissions process. Most of the beneficiaries did not have bank account to do the formal transaction of their financial activities.

The Housing Reconstruction Program facilitated the opening of bank accounts in the name of the beneficiaries to formalise the tranche distribution free of cost. The importance of financial access, which entails not only obtaining credit but also making deposits and money transactions and finally supporting them to overcome poverty in long term.

(5) Fund Management in Community Level

There are communities in the target areas who were able to collect funds in the same basket and started reconstruction of the houses with mutual support. Collective fund management at the community level was effective, and this had been done through the initiative of active leaders in the community and continuous technical support from the project's TA Team.

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Abbreviations

Abbreviation	Name
ADB	Asian Development Bank
ADBL	Agricultural Development Bank Limited
BBB	Build Back Better
BLB	Branchless Banking
BMC	Brick Masonry with Cement Mortar
BMM	Brick Masonry with Mud Mortar
CBRC	Community Based Reconstruction Committee
CBS	Central Bureau of Statistics
CGI	Corrugated Galvanised Iron
CLPIU	Central Level Project Implementation Unit
CMP	Community Mobilization Program
CPO	Certified Payment Order
D/A	Designated Account
DCC	District Coordination Committee
DDC	District Development Committee
DDF	District Development Fund
DFID	Department for International Development
DG	Damage Grade
DLPIU	District Level Project Implementation Unit
DOE	Department of Education
DOLIDAR	Department of Local Development and Agricultural Roads
DTCO	District Treasury Comptroller Office
DUDBC	Department of Urban Development and Building Construction
E/A	Executing Agency
EC	Enrolment Camp
EHRP	Emergency Housing Reconstruction Project
EIA	Environmental Impact Assessment
ESMF	Environmental and Social Management Framework
ESMS	Environmental and Social Management System
ESRP	Emergency School Reconstruction Project
FCGO	Financial Comptroller General Office
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GON	Government of Nepal

Abbreviation	Name
GP	Gaupalika (Rural Municipality)
HH	Households
HRRP	Housing Reconstruction and Recovery Platform
IEE	Initial Environmental Examination
JICA	Japan International Cooperation Agency
LA	Loan Agreement
LC	Local Currency
LMBIS	Line Ministry Budget Information System
MIS	Management Information System
MOFALD	Ministry of Federal Affairs and Local Development
MOSTE	Ministry of Science, Technology and Environment
MOUD	Ministry of Urban Development
MTOT	Master Training of Trainer
MR	Minimum Requirements
NBC	National Building Code
NBL	Nepal Bank Limited
NGO	Non-governmental Organization
NP	Nagarpalika (Municipality)
NPC	National Planning Commission
NPR	Nepalese Rupee
NRA	National Reconstruction Authority
NSET	National Society for Earthquake Technology
OAG	Office of Auditors General
OJT	On the Job Training
PA	Participation Agreement
PDNA	Post Disaster Needs Assessment
PDRF	Post Disaster Recovery Framework
PFI	Participating Financial Institution
PO	Payment Order
POM	Program Operations Manual
PP	Political Party
PR	Payment Record
RBB	Rastriya Banjiya Bank
RCC	Reinforced Cement Concrete
RPF	Resettlement Policy Framework

Abbreviation	Name
RRNE	Project on Rehabilitation and Recovery from Nepal Earthquake
SDC	Swiss Agency for Development and Cooperation
SMC	Stone Masonry with Cement Mortar
SMM	Stone Masonry with Mud Mortar
TCN	Training Centre Nepal
TOT	Training of Trainers
TPIS-ERP	Transitional Project Implementation Support for Emergency Reconstruction Projects
TWG	Technical Working Group
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
VCDF	Vulnerable Community Development Framework
VDC	Village Development Committee
WB	World Bank
WCF	Ward Citizen Forum

Chapter 1 Introduction

1.1 Background of the Project

1.1.1 Background

On 25th April 2015, an earthquake of magnitude 7.6[6] occurred with epicentre about 80 km northwest of the capital city of Kathmandu followed by the aftershocks. Approximately 8,790 people lost their lives and more than 22,300 people were injured to date. Furthermore, at least 498,852 houses were destroyed and 256,697 houses were partially damaged[7]. The Government of Nepal (GON) prepared the Post Disaster Needs Assessment (PDNA) with support of international community such as the World Bank, United Nations Development Programme (UNDP) and Japan International Cooperation Agency (JICA). The PDNA estimated the total disaster effects at USD 7,065 million and the total recovery needs at USD 6,695 million. The disaster effects on housing and human settlements, and recovery needs for the housing sector are estimated at USD 4,086 million and USD 3,278 million, respectively, which are highest among other sectors. In May 2016, the Post Disaster Recovery Framework (PDRF) was prepared in which the total financing requirements was reviewed and estimated at USD 8,377 million. The requirements for urban and rural housing sector were estimated at USD 901 million and USD 2,861 million, respectively. The Earthquake Household Damages and Characteristics Survey conducted from January to May 2016 by the Central Bureau of Statistics (CBS) classified housing damages into five grades and according to said survey, a total of 563,696 houses were categorised as Grade 3 (Substantial to Heavy Damage), Grade 4 (Very Heavy Damage) and Grade 5 (Destructed). Of these, a total of 83,408 houses (14.8%) were located in Sindhupalchok District; 71,307 houses (12.6%) in Nuwakot District; 71,146 houses (12.6%) in Kavrepalanchok District; 65,881 houses (11.7%) in Dhading District; and 63,775 houses (11.3%) in Gorkha District, indicating that the damage to housing spread largely in rural areas. Stone and brick masonry with mud mortar was commonly used for housing construction in rural areas which did not take into account the seismic resistance capacity. Hence, 95% of the damaged houses were built by this construction method and urgent action for their reconstruction was required.

[6] Ministry of Industry, Department of Mines and Geology, National Seismological Centre
http://www.seismonepal.gov.np/index.php?action=earthquakes&show=recent&page=5
[7] Nepal Earthquake 2015 Post Disaster Recovery Framework 2016-2020

In the education sector, approximately 26,000 classrooms were completely destroyed and also 26,000 classrooms were severely damaged nationwide. PDNA estimated the disaster effects on education sector at USD 397 million, the second largest after housing sector among others. Afterwards, PDRF reviewed it drastically and estimated damages to education sector at USD 1,806 million. Schools with seismic resistance capacity were expected to be reconstructed to ensure the students' safety.

Under these circumstances, GON convened the International Conference on Nepal's Reconstruction on 25th June 2015 and made a statement calling for support from international community for recovery and reconstruction from the earthquake. International community, including Japan, responded with pledge of more than USD 4.1 billion in total. Japan committed JPY 32 billion of support that includes the Emergency Housing Reconstruction Project (EHRP) (JPY 12 billion) and Emergency School Reconstruction Project (ESRP) (JPY 14 billon) as Japanese ODA LOAN project.

1.1.2 Emergency Housing Reconstruction Project (EHRP)

The objective of the Project is to restore and improve the living condition of the victims of the Nepal earthquake, by reconstructing the destroyed and damaged houses with an adequate seismic standard in the districts severely affected by the Nepal earthquake, thereby contributing to sustainable socioeconomic development in the region and Build Back Better (BBB).

The Minimum Requirements was adopted as an adequate seismic standard which was prepared based on the National Building Code 105 (Seismic Design of Buildings in Nepal).

EHRP provides technical assistance for more than 56,000 house owners in the target areas of Gorkha and Sindhupalchok among which EHRP provides financial assistance for about 30,000 house owners who successfully reconstructed their houses in accordance with the standard.

1.1.3 Emergency School Reconstruction Project (ESRP)

The objective of the Project is to rebuild and retrofit schools in the districts severely affected by the Nepal earthquake by financing the necessary expense for reconstruction of schools and related facilities, thereby contributing to the improvement of education service and earthquake resilience for sustainable socio-economic growth.

1.2 Transitional Project Implementation Support for Emergency Reconstruction Projects (TPIS-ERP)

1.2.1 Scope of Work

The Transitional Project Implementation Support for Emergency Reconstruction Project

(TPIS-ERP) is a grant technical assistance designed to provide transitional support for EHRP and ESRP until consultants are hired by GON under Japanese ODA LOAN.

(1) For the Emergency Housing Reconstruction Project (EHRP)

The scope of TPIS-ERP stipulated in the consultancy services agreement is as follows:

- Confirmation of Project Implementation Manuals of Japanese ODA LOAN Project
- Selection of housing grant beneficiaries in the target area
- Preparation of criteria for housing grants
- Preparation and implementation of trainings
- Confirmation of fund flow
- Study on retroactive loan financing and support in loan disbursement
- Implementation of procurement trainings including anti-corruption measures
- Development of monitoring, inspection and reporting system
- Study on the Environmental and Social Management System (ESMS)
- Coordination with World Bank for housing reconstruction

(2) For the Emergency School Reconstruction Project (ESRP)

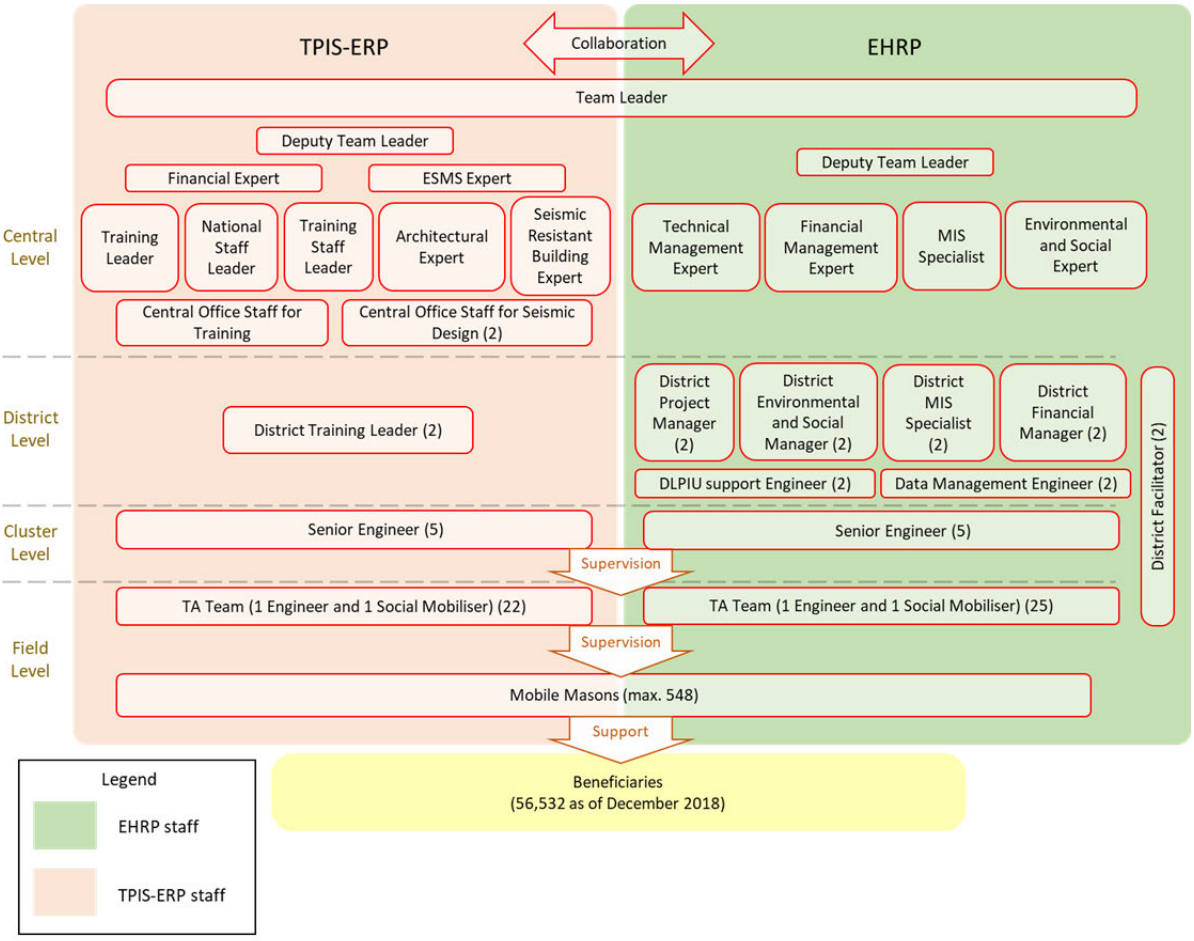
The scope of ESRP is as follows:

- Preparation of school selection criteria and procedure
- School selection
- Preparation of school reconstruction plan for each school
- Preparation of school operation and maintenance manual
- Confirmation of local contractors' capacity and recommendations of appropriate contract packaging
- Implementation of training on Japanese ODA LOAN procedures and various guidelines (procurement, ESMS, safety measures, etc.)
- Development of monitoring, inspection and reporting system
- Study on retroactive loan financing and support in loan disbursement
- Study on ESMS

1.2.2 TPIS-ERP Consultants

Since TPIS-ERP is a transitional support for EHRP and ESRP until the consultants for both are employed by GON, the support for ESRP was terminated in March 2017 when ESRP consultants were employed.

However, GON and JICA decided to continue TPIS-ERP for EHRP up to March 2019 even after April 2017 when EHRP consultants were employed because continuation of Community Mobilization Program (CMP) and support in the preparation of the Minimum Requirements and guidelines were crucial which were not included in the scope of EHRP consultants.



Source: This Study 2018

Figure 1-1 Correlation between TPIS-ERP and EHRP Consultants

1.2.3 TPIS-ERP and Other JICA Projects

TPIS-ERP is closely related to other on-going JICA's technical assistance projects of the Project for Assessment of Earthquake Disaster Risk for Kathmandu Valley (ERAKV) and the Project on Rehabilitation and Recovery from Nepal Earthquake (RRNE) which are implemented by one consulting firm, Oriental Consultants Global.

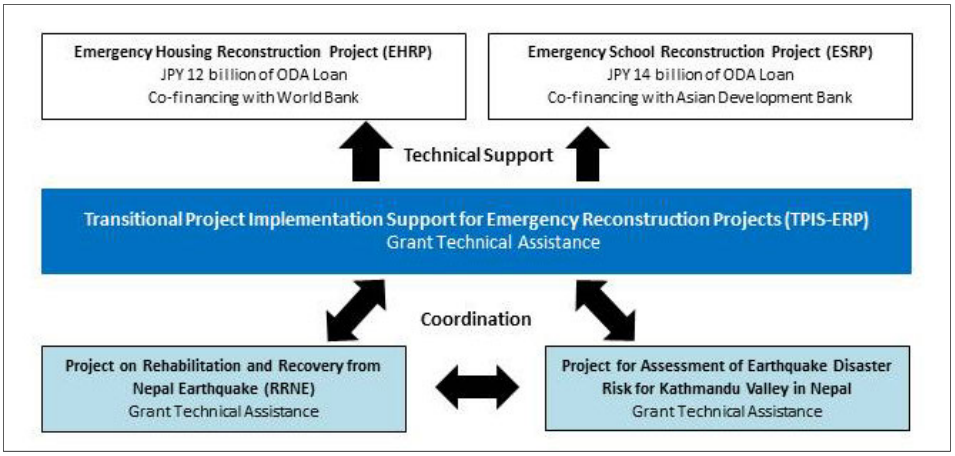
(1) Project for Assessment of Earthquake Disaster Risk for Kathmandu Valley (ERAKV)

In 2002, JICA conducted a study on Earthquake Disaster Mitigation in the Kathmandu Valley which aimed to mitigate the disaster caused by the earthquake in Kathmandu Valley. This survey was followed by ERAKV which was formulated to assess the earthquake risk of Kathmandu Valley.

However, the Nepal Earthquake occurred right after the project was designed and some of the project component were modified accordingly. ERAKV looked into the vulnerability of houses and other infrastructures during earthquake. The assessment analysed the possibility of improving the seismic performance of the structures for future earthquake occurrence, based on the current scenario of Nepal. The results of ERAKV indicate the possibility of earthquake stronger than the one assumed in the National Building Code (NBC) in Kathmandu Valley, implying a new seismic coefficient. However, through discussions of the National Reconstruction Authority (NRA) Technical Working Group, it seems that the new coefficient, no matter how much it is, may not have impact on seismic demand calculation in case of low raised masonry structures calculated based on current NBC and Indian Standard.

(2) Project on Rehabilitation and Recovery from Nepal Earthquake (RRNE)

The purpose of RRNE is to comprehensively support the process of early rehabilitation and reconstruction of the affected areas and the formulation of a disaster resilient nation and society by referring to the experience and lessons learned from the disasters and reconstruction in Japan. RRNE also took initiatives to support GON in preparation of seismic resilient standards like the Minimum Requirements and Design Catalogue for the Reconstruction of Earthquake Resistant Houses Vol.1. RRNE carried out structural analysis of non-engineered masonry structure comparing NBC and Indian Standard.



Source: This Study 2018

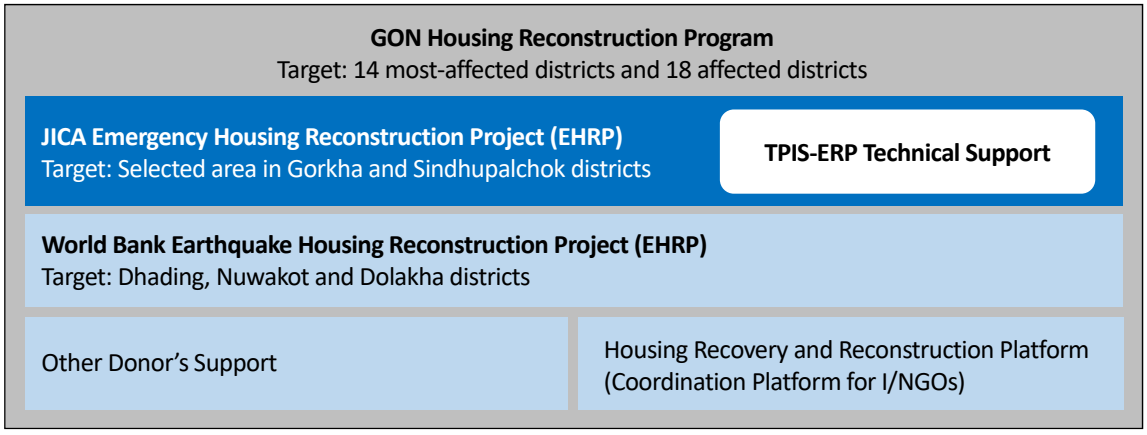
Figure 1-2 Correlation of TPIS-ERP and Other Projects

Chapter 2 GON Housing Reconstruction Program

2.1 Outline of the Program

GON established the NRA in December 2015 and authorised it to be responsible for reconstruction activities of all sectors damaged by the earthquake, including the Housing Reconstruction Program. The objective of the Program is to restore earthquake-affected houses through an owner-driven approach by providing housing reconstruction grant of NPR 300,000[8] in three tranches (NPR 50,000 upon signing of a Participation Agreement (PA); NPR 150,000 upon completion of the foundation; and NPR 100,000 upon completion of roof band) to eligible house owners[9] who reconstruct their houses in accordance with the Minimum Requirements. A housing retrofitting grant of NPR 100,000 is also available for the house owners with partially damaged houses. The Program covers the 14 most-affected districts and 18 affected districts.

GON Housing Reconstruction Program is financed by GON as well as international community, including Japanese ODA LOAN of JPY 12 billion, and consists of several projects implemented by multilateral donors, bilateral donors and I/NGOs. EHRP financed by JICA is a part of GON Housing Reconstruction Program.



Source: This Study 2018

Figure 2-1 GON Housing Reconstruction Program

[8] At the beginning of the program, NRA planned to provide a housing reconstruction grant of NPR 200,000. Afterwards, NRA Steering Committee decided to increase it to NPR 300,000 on 26 September 2016.

[9] Eligible house owner is someone whose house was categorised as damaged to grade 3, 4 or 5 through the Earthquake Household Damages and Characteristics Survey by the Central Bureau of Statistics.

2.1.1 Principles

GON Housing Reconstruction Program is being implemented in accordance with the following key operating principles derived from international experience and best practices of housing reconstruction.

(1) Housing Grant

GON has decided to provide housing reconstruction grant of NPR 300,000 to eligible beneficiaries in three tranches, and the first tranche of NPR 50,000 is provided once the house owner has signed the PA with the local government. The second tranche of NPR 150,000 is provided after inspection and approval of construction of the foundation (i.e., plinth level), and the third tranche of NPR 100,000 is provided after inspection and approval of wall construction (i.e., roof band). On the other hand, the grant of NPR 100,000 is provided to beneficiaries for retrofitting of their damaged houses in two tranches. The first tranche of NPR 50,000 is provided once the first inspection has been conducted, and the second tranche of NPR 50,000 is provided after the retrofitted house has been certified by the technician that the retrofitting has been done using earthquake-resistant technology. Both types of grants are disbursed to the bank account of eligible beneficiaries.

However, NPR 300,000 is not sufficient to reconstruct even a stone masonry house with single story and two rooms which cost about NPR 700,000. Therefore, house owners are required to shoulder the rest of the cost by themselves.

NRA has developed the Grant Disbursement Procedures for Private Houses Damaged by the Earthquake 2016 which stipulates all procedures of housing reconstruction.

(2) Owner Driven

The owner-driven reconstruction is a participatory model which places house owners at the centre of reconstruction and let them take decision on design and site selection for their housing reconstruction. It is believed that this approach helps the house owner to adopt their traditional and cultural identities in the construction. The owner-driven reconstruction is a fundamental principle of GON Housing Reconstruction Program, where construction is carried out by the owners themselves with sociotechnical and financial assistance.

(3) Build Back Better (BBB)

The objective of GON Housing Reconstruction Program is to restore and improve the living condition of the earthquake victims, by reconstructing the destroyed and damaged houses into structures with adequate seismic standard in the districts severely affected by the earthquake, thereby contributing to sustainable socioeconomic development in the region and applying the concept of Build Back Better (BBB). NRA is coordinating and facilitating national effort to BBB – that underpins the reconstruction and rehabilitation policy.

(4) Uniformed Platform

The Reconstruction and Rehabilitation Policy brings together all the important actors – government, I/NGOs, International Agencies, Private Sectors, Communities and Volunteers – to plan and implement GON Housing Reconstruction Program.

The Program Operations Manual (POM) was developed to describe the standard mechanisms for components and activities in GON Housing Reconstruction Program, and to provide implementation guidelines to relevant authorities and project implementing agencies. As the POM has been prepared in consultation with all the stakeholders, the manual applies to all activities in GON Housing Reconstruction Program financed by GON budget as well as by the World Bank, JICA, United States Agency for International Development (USAID), the World Bank managed Multi-Donor Trust Fund (MDTF) and other donors.

Similarly, the Housing Recovery and Reconstruction Platform (HRRP) has been established to provide coordinating support services for NRA, CLPIUs, other relevant government authorities and Partner Organisations (POs).

The policy, guideline, manual and platform have established a uniform housing reconstruction approach to all concerned parties irrespective of the funding sources so that all beneficiaries will receive equal housing grant amount to reconstruct their houses.

(5) Third Party Monitoring

Third party monitoring checks the overall quality of housing reconstruction and it also monitors the technical assistance and inspection. It provides independent feedback on the compliance status of the reconstructed houses to ensure that the Minimum Requirements are met. The goal is to bring an independent perspective on project performance by third parties who are neither direct beneficiaries nor part of the project's management structures. This monitoring provides recommendations to NRA and donor organisations on improvement or modifications to reconstruction works.

The Technical Inspection Guideline for Housing Reconstruction directs that NRA will manage the monitoring of at least 5% of reconstructed/ retrofitted/ repaired houses by forming third party technical monitoring team. In which 1% of the houses will be checked from foundation to completion, while 4% will be monitored through random sampling.

(6) Effective Communication

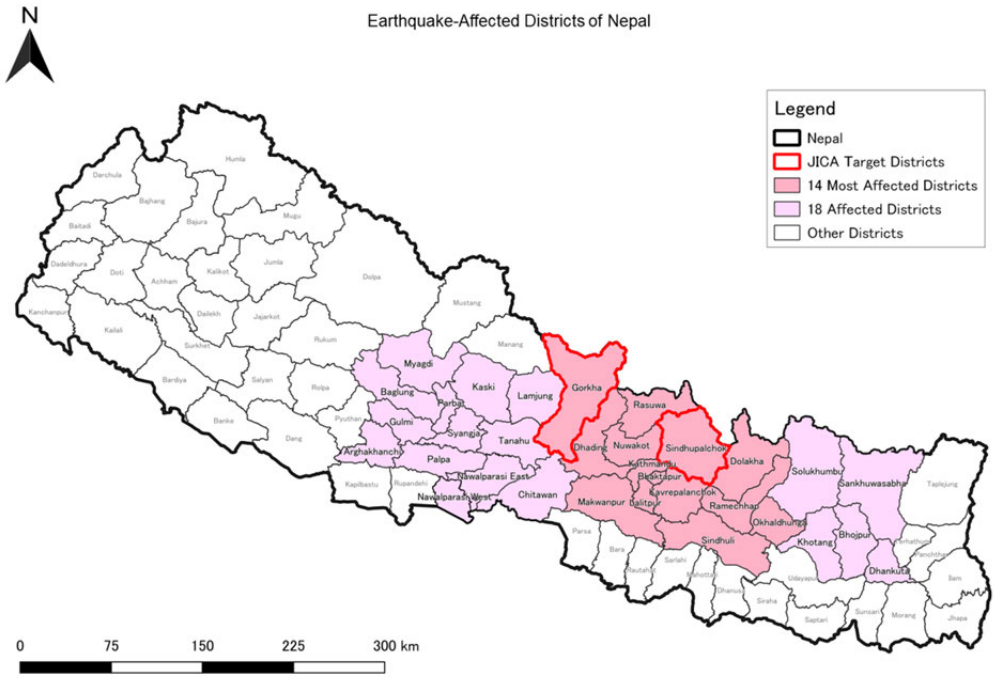
The Reconstruction and Rehabilitation Policy provides guidance on the coordination, communication and monitoring system of NRA. Appropriate, timely and effective communication interventions are inevitable to achieve the objectives of reconstruction and NRA has established a section for information and communication management. The principle objective of effective

communication is to inform the earthquake-affected communities and households of appropriate, timely and relevant information about the means to access services and support provided by the government and development partners on the process of reconstruction

A reconstruction communication working group was formed to develop a communication strategy and deal with all communications matters, such as preparation of key massages, capacity building and documentation of works. The working group has prepared unified Information, Education and Communication (IEC) materials such as posters, notices, bulletins and newsletters; TV and radio programmes. The group also provided toll free telephone services for the earthquake victims so that they can inquire NRA of any concerns.

2.1.2 Target Districts

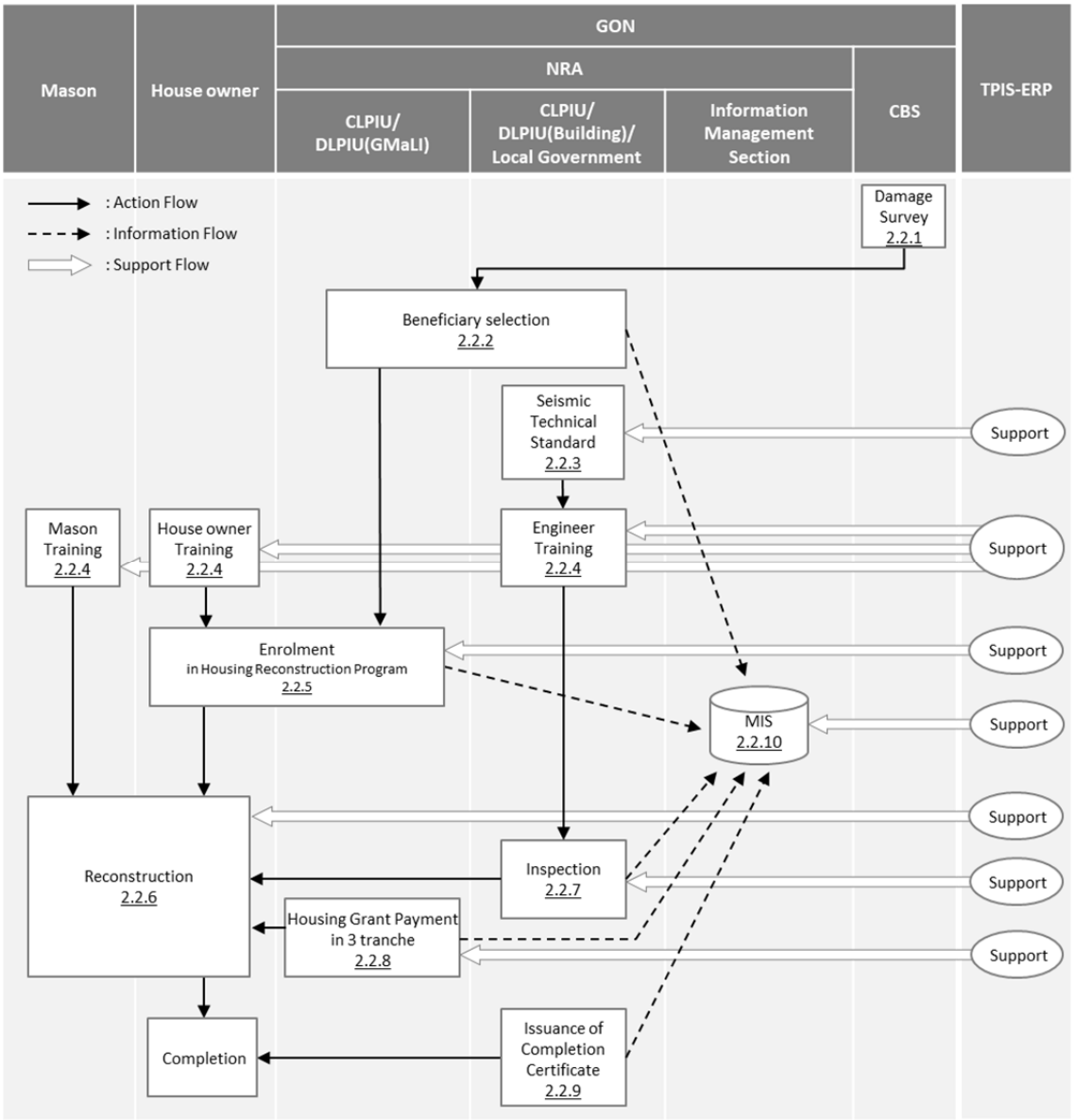
The target area of GON Housing Reconstruction Program comprises of 32 districts affected by the earthquake out of the total 77 districts. Out of the 32 districts, 14 were declared "crisis-hit" and another 18 neighbouring districts were declared partially affected. Sindhupalchok and Gorkha districts are being supported by the JICA under EHRP. Dhading, Nuwakot and Dolakha districts are being supported by the World Bank (Earthquake Housing Reconstruction Project) and USAID (Baliyo Ghar). Additionally, more than 400 I/NGOs are providing assistance to affected households across 32 districts.



Source: This Study 2018

Figure 2-2 Target Area

2.2 Reconstruction Process



Source: This Study 2018

Figure 2-3 Housing Reconstruction Program Flow

2.2.1 Damage Survey

As per CBS Survey Report in June 2017, the Earthquake Housing Damage and Characteristics Survey was conducted in three phases– Phase I: 11 Most Affected Districts of Dolakha, Ramechhap, Okhaldhunga, Sindhupalchok, Kavrepalanchok, Sindhuli, Makawanpur, Dhading, Nuwakot, Rasuwa and Gorkha; Phase II: 3 Most Affected Districts of Kathmandu, Lalitpur and Bhaktapur; Phase III: 17 Affected Districts[10] of Solukhumbu, Sankhuwasabha, Bhojpur, Dhankuta, Khotang,

[10] Nawalparasi was not divided into Nawalparasi East and Nawalparasi West at that time so that the total number of affected districts was 17 and the total number of target districts was 31.

Chitwan, Nawalparasi, Arghakhanchi, Palpa, Gulmi, Syangja, Parbat, Baglung, Myagdi, Kaski, Tanahun, and Lamjung. Total number of houses surveyed in 31 earthquake-affected districts was 1,052,930 according to MIS (Management Information System). Conditions of houses at the time of survey were as follows:

- Completely collapsed : 333,298 (31.7%)
- Damaged but standing : 648,063 (61.5%)
- Not Damaged : 71,587 (6.8%)

Houses were also categorised from Damage Grade 1 to 5 (DG 1 to 5) and technical solutions were determined accordingly as 1 (nothing to be done), 2 (Minor Repair), 3 (Major Repair) and 4 and 5 (Reconstruction). The tabulated number of houses by Damage Grade in 31 districts is as follows:

Table 2-1 Numbers of housed by Damage Grade

Damage Grade	Extent of Damage	No. of HHs
DG 1	Negligible-slight damage (No structural, slight non-structural damage. Hairline cracks in very few walls, falling of small pieces of plaster only, fall of loose stone from upper part of building in rare cases.)	101,821
DG 2	Moderate damage (Slight structural, moderate non-structural damage. Thin cracks in many walls, fall of fairly large pieces of plaster, damage to non-structural parts like chimney and projecting cornices. The load carrying capacity is not reduced appreciably.)	141,987
DG 3	Substantial to heavy damage (Moderate structural, heavy non-structural damage. Large and extensive cracks in most walls, roof tiles detached, tilting or falling of chimneys, failure of individual non-structural elements such as partition/ gable walls. Load carrying capacity of structure is partially reduced.)	204,178
DG 4	Very heavy damage (Heavy structural, very heavy non- structural damage. Gaps occur in walls, walls collapse, partial structural failure of floor/ roof, Building takes a dangerous state.)	253,123
DG 5	Destruction (Very heavy structural damage. Total or near total collapse.)	351,821

Source: This Study 2018

2.2.2 Beneficiary Selection

Houses which fall under any of the damage grade DG3, DG4 or DG5 and requires technical solutions of 3 (Major Repair) or 4 (reconstructions) shall be eligible to receive NPR 300,000 for reconstruction. On the other hand, those houses with damage grade DG3 together with technical solution required as 2 (Minor Repair) or those houses with damage grade DG2 together with technical solution required as 3 (Major Repair) shall be eligible to receive NPR 100,000 for retrofitting/repair.

As per the data of December 2018, total number of households identified as eligible beneficiaries was 726,754 from 32 earthquake-affected districts. The eligibility list was published before the enrolment camp and housing grant were provided to the house owners under following conditions:

- A house separated from the other house legally before 25th April 2015 will be entitled to receive housing grant as a different house.
- In case a house is in the name of the person who is abroad, those who lives in the house can get the housing grant only if the relationship with the owner is verified.
- In case the land owner is dead and the transfer of the land is not done, the heir shall apply with the death certificate and the grant can be provided in the name of one person among many heirs by consensus.
- For those who have already reconstructed houses and listed in the damage survey data, the record of those houses shall be kept differently and the housing grant shall be provided if the technical persons verify that the house is earthquake resilient.
- In case a land is not surveyed yet, the land needs to be surveyed and the land owner's certificate needs to be issued in the name of the person who owns it. Only after that, the household is eligible to receive the grant.
- House owner who wants to build a house in the site of previous house or any other area in the same district then he/she will be eligible to receive the grant.

2.2.3 Seismic Technical Standard

Under GON Housing Reconstruction Program, a housing reconstruction grant is disbursed based on construction compliance with the Minimum Requirements as per the NBC and the inspection checklists.

The Department of Urban Development and Building Construction (DUDBC) of the Ministry of Urban Development (MOUD), including RRNE Technical Standard Team, have been working since 2015 mainly to improve earthquake safety on masonry structures such as stone and brick with cement and mud mortar, which is considered the most common construction typology in earthquake-affected area. First of all, Design Catalogue Volume 1 and the Minimum Requirements for flexible design of masonry structures were prepared.

Afterward, NRA Technical Working Group was established in February 2016 under NRA Technical Standardization Committee. This group consists of architects and structural engineers from NRA, JICA, HRRP, National Society for Earthquake Technology (NSET) and other partner organisations. TPIS-ERP Technical Standard Team has been working in the Technical Working Group (TWG) as a main resource organisation.

NRA Technical Working Group had developed the following standards and manuals:

- Inspection Standard Operation Procedure, including the Minimum Requirements (2016)
- Inspection Manual (2016)
- Correction/Exception Manual (2017)
- Inspection Sheet of Confined Masonry (2017)

- Retrofitting Manual (2017)
- Hybrid Structure Manual (2017)
- Light Timber/Steel Frame Structure Manual (2018)
- Compliance Catalogue (2018)
- Hollow Concrete Block Manual (2018)

2.2.4 Trainings

GON with support from international development partners has committed to provide financial and technical assistance to facilitate and access material and skilled labour, enabling home owners to reconstruct their houses. The necessity of the housing reconstruction training for technical and skilled labours were identified and NRA developed the Training Strategy for Disaster Resistant Housing Reconstruction (Earthquake Recovery and Reconstruction Program) in November 2016.

The primary objective of this strategy was to ensure that there were adequate human resources available for reconstruction after the Nepal earthquake in 2015. It was estimated that 65,000 trained artisans (masons and carpenters) on earthquake-resistant construction would be required for the reconstruction to fill the gaps in human resources.

The Council for Technical Education and Vocational Training (CTEVT) and MOUD DUDBC with support from organisations such as JICA, Helvetas, NSET, UNDP, UN Habitat, Swiss Agency for Development and Cooperation (SDC), Department for International Development (DFID) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) have provided the trainings.

As per Training Strategy for Disaster Resistant Housing Reconstruction, the following is the list of different trainings that have been conducted by CLPIU as of December 2018.

Table 2-2 List of Different Trainings by CLPIU as of December 2018

	Name of Training	Participants	Remarks
1	Master Training of Trainers on Building Inspection Training in Kathmandu	130 engineers	Conducted by CLPIU
2	Building Inspection Training in Kathmandu	434 engineers	For Kathmandu, Lalitpur, Bhaktapur and Kavre
3	Building Inspection Training in 10 Districts	1,720 engineers	Conducted by CLPIU
4	7-day mason Training conducted in 14 districts	2,334 masons	Conducted by DLPIU
5	Master Training of Trainers on Retrofitting and Correction /Exception Manual	113 engineers	Conducted by CLPIU in Kathmandu
6	Training on Retrofitting and Correction /Exception Manual	1,862 engineers	Conducted by TCN in districts still 10 groups are remaining for new Engineers
7	OJT in Gorkha, Makwanpur and Rasuwa in 41 VDCs and Municipalities.	3,530 masons	Completed
8	7-day Mason Training in 17 Moderately hit Districts	1,350 masons	Completed
9	7day Mason Training in 17 Moderately hit Districts	3,840 masons	On-going

Source: This Study 2018

The main objectives of all trainings were to enhance knowledge and skills of masons, construction workers, and technical assistant team in earthquake-affected areas on earthquake-resistant construction; and to develop new masons with knowledge on earthquake-resistant technology.

2.2.5 Enrolment

This process is to undertake the PA between GON and beneficiaries to make the beneficiaries responsible for earthquake-resilient house construction. Requirements to enrol in the program are citizenship card, land certificate and bank account. To enrol beneficiaries in GON Housing Reconstruction Program, NRA announced enrolment camps in all affected districts and the first enrolment camp took place in Dolakha district as a pilot program in March 2016. Then the camps were expanded to other districts by June 2016. Before the enrolment, necessary information were provided to the beneficiaries along with some theatrical performances and technical awareness campaign. During enrolment, a technical support desk was being set up as part of enrolment camp where the beneficiaries were informed and given suggestions about type designs and the Minimum Requirements. Grievance registration desk was also established and grievances related to the survey were registered. By the end of December 2018, there were 650,411 households enrolled in the program in 14 affected districts and 743,768 households in 31 affected districts.

2.2.6 Reconstruction

GON Housing Reconstruction Program is an owner-driven program with cash-based assistance along with technical support, training and community mobilisation. Eligible house owners received the first tranche of housing grant of NPR 50,000 upon signing of PA with which they were able to start housing reconstruction. Basically, the house owner was the one who managed construction material and labours.

2.2.7 Inspection

Based on the Technical Inspection Guidelines for Housing Reconstruction, inspection and subsequent tranche distributions are carried out in the following major phases. Engineers dispatched from DLPIU (Building) to local government conducts inspection.

(1) After completion of the foundation (i.e., plinth band)

The first inspection of the reconstructed house will be conducted after the completion of the foundation or plinth band. Inspection forms are filled up by the technical inspection team and the structure should comply with the Minimum Requirements for the beneficiary to receive the second tranche.

(2) After completion of wall (i.e., roof band)

Similar to the first inspection, the second inspection will be carried out after the completion of the wall up to roof band. If the structure is found to be compliant with the Minimum Requirements, then the beneficiary will receive the third tranche.

(3) After completion of the roof

To receive the housing completion certificate, the inspection will be carried out after the complete construction of the house up to the roof. However, the house should comply with all the Minimum Requirements to be fully certified.

At any stage, if the construction is found to be technically noncompliant, the inspection team or inspection supervision team can suggest corrections to the house owner. The house owner must make corrections as suggested and can take the help of technical teams. The house owner can reapply for inspection after the corrections are completed. The inspections are carried out by District Level Project Implementation Unit (DLPIU) engineers who have been deployed by NRA.

2.2.8 Housing Grant Payment

Based on the Grant Distribution Guidelines, GON made a decision to distribute housing grants in three tranches. The initial decision was made to distribute NPR 200,000 in three tranches where NPR 50,000 would be received in the first tranche; NPR 100,000 in the second tranche and NPR 50,000 in the third tranche. GON increased the grant amount in December 2016 to NPR 300,000 where the NPR 50,000 would be provided as the first tranche; NPR 150,000 as the second tranche; and NPR 100,000 as the third tranche.

The second and third tranches are linked to inspection by the DLPIU (Building) engineer and verified by DLPIU (Building) office. After it is technically verified from DLPIU (Building), the file is sent to DLPIU (GMaLI) and the District Treasury Comptroller Office (DTCO), verified in Line Ministry Budget Information System (LMBIS) and the payment is made.

The program has brought thousands of Nepalese into the formal banking system. Before these agreements, only about 20% of the population had bank accounts in the 11 districts where the housing survey was completed. Through GON Housing Reconstruction Program, beneficiaries now have a secure, transparent means of receiving their grant payments along with all the other benefits of electronic banking.

2.2.9 Completion certificate distribution

Completion certificate is provided upon final inspection to certify that the reconstructed house meets the required earthquake resilient standard. Engineer dispatched from DLPIU (Building) to local government conducts final inspection and local government issues completion certificate.

First inspection at the plinth level and second inspection at roof band level are related to the release of the second tranche and third tranche of housing grant, respectively. However, the final inspection and completion certificate are not related to the release of housing grant.

2.2.10 Management Information System (MIS)

With the concept of information management and monitoring on physical and financial progress of reconstruction, MIS unit was established by NRA. MIS monitors physical and financial progress, transparency and accountability. It has facilitated setting of targets, enrolment, inspection, and disbursements. Photographs and data collected from the beneficiary survey are easy to store, view, and search. MIS has been used to derive and cross-check the list of eligible beneficiaries. It will be used to collect data during inspection, facilitating quick and effective monitoring activities. MIS is also linked to the LMBIS, hosted by the Ministry of Finance. MIS is key to retaining and expanding confidence in the housing program, particularly among donors. The total data of housing reconstruction collected by the survey were stored in Government Integrated Data Centre (GIDC). CBS supported in cleaning of the data and MIS team analysed the data and derived the beneficiaries based on these. Every authorised stakeholder can directly go to the EHRP MIS website and get the updated detailed information and summary reports. With entire updated information in the system, MIS helps to ensure transparency and accountability on all the processes for all concerned stakeholders.

2.3 Guidelines

GON and NRA have developed various guidelines to facilitate the housing reconstruction process.

(1) Program Operation Manual (POM)

The POM was developed by NRA in 2016 and amended afterward to describe the standard mechanisms for components and activities in GON Housing Reconstruction Program. It intends to provide implementation guidelines to relevant authorities and departments in a uniformed way. The provisions outlined in this manual apply to all projects on rural housing reconstruction irrespective of the funding sources. Therefore, POM applies all activities financed by GON budget as well as the proceeds from JICA.

(2) Grant Distribution Guidelines

The “Grant Distribution Guideline for Private House Destroyed by Earthquake” was developed by GON in May 2016 and amended in May 2017 to simplify and manage the release of housing reconstruction and retrofitting grants for private houses damaged by the Nepal earthquake. The guideline also contains requirements for the selection of beneficiaries and format for a PA letter.

(3) Inspection Guidelines

The "Technical Inspection Guideline for Housing Reconstruction" was developed by GON on November 2016 to establish a uniform practice by engineers for the inspection of technical design, quality of construction and construction material of private houses which are being reconstructed, retrofitted or repaired to ensure that the structure is earthquake resistant.

(4) NGO Mobilisation Guidelines

NRA developed "Procedure Relating to Mobilization of NGO for Reconstruction and Rehabilitation'' in order to mobilise the assistance through NGOs/INGOs for the reconstruction of structures damaged by the Nepal earthquake in a simple, easy, transparent and integrated manner and make the coordination of such organisations effective. The guideline was developed initially in March 2016 and twice revised, with the latest revision in April 2017.

(5) Grievances Procedure

The "Working Procedure for Handling of Grievance Related to Reconstruction" was developed by NRA in August 2016 to address grievances of the public about private housing reconstruction, infrastructure reconstruction and economic and social rehabilitation after the Nepal earthquake through simple and effective management.

(6) Interest Free Loan Procedure

The "Working Procedure to Provide Interest Free Loan for Earthquake Victims on Community Guarantee" was developed by GON on June 2017 to provide additional amount up to NRs 300,000 as interest free loan.

(7) Requirement to Purchase Habitable Land

The "Requirement to Purchase Habitable Land for Earthquake Victims" was developed by GON on June, 2017. It provides all the requirements and format of application for the land purchase.

(8) Relocation Procedure

The "Working Procedure for Relocation and Rehabilitation of Hazard-Prone Settlements" was developed by GON in 2017 to manage relocation and rehabilitation of settlements which were identified to be at risk by geological survey by NRA.

(9) Support Procedure for Vulnerable Beneficiaries

The "Working Procedure Related to Identification of Earthquake Affected Vulnerable Beneficiaries" was developed by NRA in 2018 to provide special system for vulnerable beneficiaries to accelerate their housing reconstruction. Households headed by single women with age above 65 years, male above 70 years, children below 16 years and persons who have been certified as physically

challenged by GON are classified as Vulnerable but their respective households should not have any other physically abled member between 16 to 70 years old.

(10) Interest Subsidy Procedure

The "Integrated Working Procedure to Provide Interest Subsidy on Soft Loan" was developed by GON in 2018. This procedure provides interest subsidy on soft loan up to three lakhs for earthquake-affected persons who have signed PA and but cannot continue the construction due to poor economic condition. The maximum interest rate is 2%.

(11) Resurvey Working Procedure

The "Resurvey Working Procedure" was developed by NRA in 2018 to resurvey and collect information about the households affected by the Nepal earthquake who were either not surveyed before or who filed grievance as they were not listed as beneficiaries although they were surveyed. The resurvey is conducted by the engineers at local level.

2.4 Relevant Ministries and Organisations

The following are the relevant government authorities and organisations.

- National Reconstruction Authority (NRA)
- Ministry of Federal Affairs and General Administration (MOFAGA)[11]
  - Department of Local Infrastructure Development and Agricultural Roads (DOLIDAR)
- Ministry of Urban Development (MOUD)
  - Department of Urban Development and Building Construction (DUDBC)
- Ministry of Education (MOE)
- Department of Education (DOE)
- Ministry of Finance (MOF)

(1) National Reconstruction Authority (NRA)

NRA was formed in August 2015 by the GON. However, it was dissolved due to the government's failure to present a replacement bill. NRA was then established again on 25th December 2015, exactly eight months after the Nepal earthquake. Mr. Sushil Gyawali is the current CEO of NRA.

NRA is a coordinating and facilitating body formed by GON to manage, oversee and coordinate the reconstruction work. By law, its functions include damage assessment caused by the earthquake and its aftershocks, determination of reconstruction priorities, preparing policies, plans and

[11] MOFALD was changed to MOFAGA in June 2018.

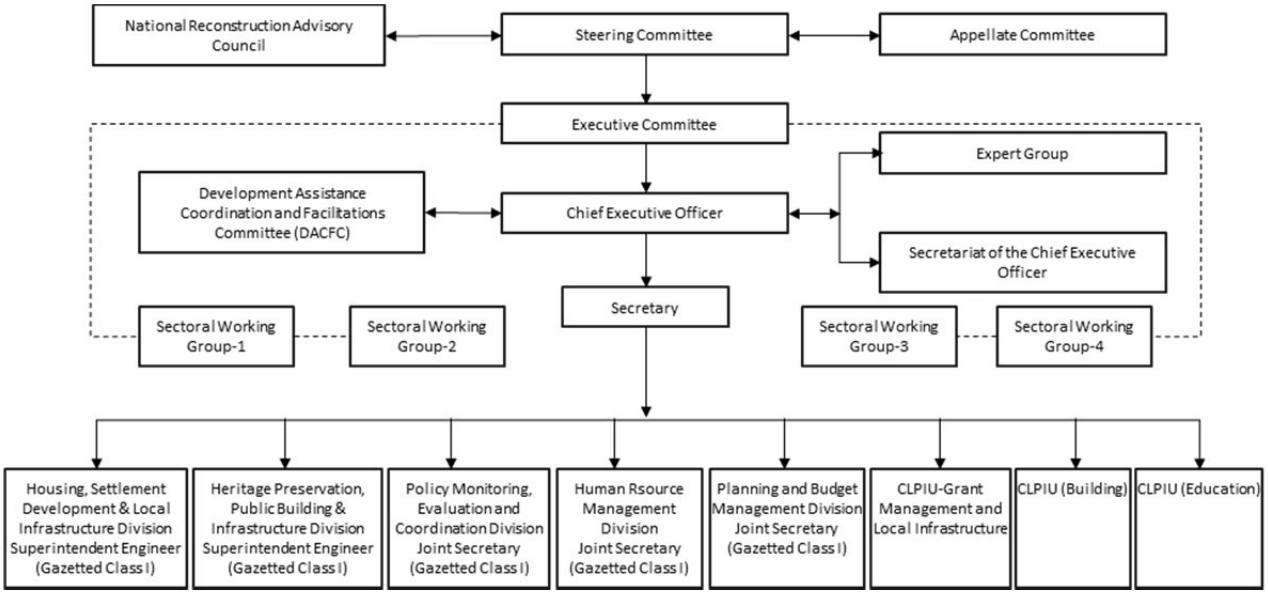
programmes, and implementation facilitation. NRA is also responsible for coordination and collaboration with I/NGOs, private sectors and communities as they relate to reconstruction. It is also empowered to raise financial resources for reconstruction and to make arrangements for effective use.

NRA consists of the Advisory Council, Steering Committee and Executive Committee. The Advisory Council, chaired by the Prime Minister, advises the Steering Committee on the formulation of reconstruction policies and plans. It is composed of members from the political party, Legislature-Parliament (representing earthquake-affected districts), ministries, military and civil society.

The Steering Committee approves the NRA's organisational structure, budget, policies and plans prepared by the Executive Committee and gives direction to improve the effectiveness of reconstruction. It is composed of members from opposition party, two ministries, the National Planning Commission (NPC) Vice-Chairperson, as well as three technical experts nominated by the government, the Chief Executive Officer (CEO), Chief Secretary and NRA Secretary.

The Executive Committee is chaired by the CEO and composed of one representative of the government, four technical experts nominated by the government and the Member Secretary.

NRA has a foreign aid coordination and facilitation committee to make fund allocation to reconstruction-related programmes effective and transparent.



Source: This Study 2018

Figure 2-4 NRA Organisational Structure

(2) Project Implementation Unit (PIU)

Project Implementation Unit (PIU) was established to look after the reconstruction of residential and public buildings along with reconstruction of urban infrastructure and community development affected by the earthquakes. Different PIUs like Central Level Project Implementation Unit (CLPIU) and District Level Project Implementation Unit (DLPIU) have been established to look after the various reconstruction activities under the National Reconstruction and Rehabilitation Act 2072.

For housing reconstruction, two CLPIUs are involved. CLPIU Grant Management and Local Infrastructure (GMaLI) is responsible for the approval and disbursement of tranches, monitoring and evaluation of cash transfer system, addressing the social and environmental issues, development and implementation of ESMS along with other administrative tasks. CLPIU (Building) is responsible for all technical aspects. District Coordination Committee (DCC) houses the DLPIU (GMaLI) and DLPIU (Building) and coordinates with the local governments of Nagarpalika (NP, Municipality) and Gaunpalika (GP, Rural Municipality). There are 14 Secretariats of DCC in 14 highly affected districts and 8 Secretariats of DCC in remaining 18 moderately affected districts.

(3) Housing Reconstruction and Recovery Platform (HRRP)

The 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 standard cluster. HRRP provides coordination support services for the NRA, CLPIUs, other relevant government authorities, and Partner Organisations (POs). HRRP is primarily funded by DFID Nepal and CRS Nepal. Other financial contributors and implementing partners include Oxfam, Caritas Nepal, Plan International, and NSET which leads on technical coordination.

Chapter 3 Emergency Housing Reconstruction Project

3.1 Emergency Housing Reconstruction Project (EHRP)

EHRP, a part of GON Housing Reconstruction Program, is Japanese ODA Loan project of JPY 12 billion and aimed to reconstruct the houses damaged by the Nepal earthquake by providing the housing reconstruction grants in the target area of Gorkha and Sindhupalchok districts.

As explained in Chapter 1, TPIS-ERP was designed to provide a transitional support for EHRP until consultants would be hired by GON under Japanese ODA LOAN. However, GON and JICA decided to continue TPIS-ERP up to March 2019 even after April 2017 when EHRP consultants were employed because continuation of CMP and support in the preparation of the Minimum Requirements and guidelines were crucial which were not included in the scope of EHRP consultants.

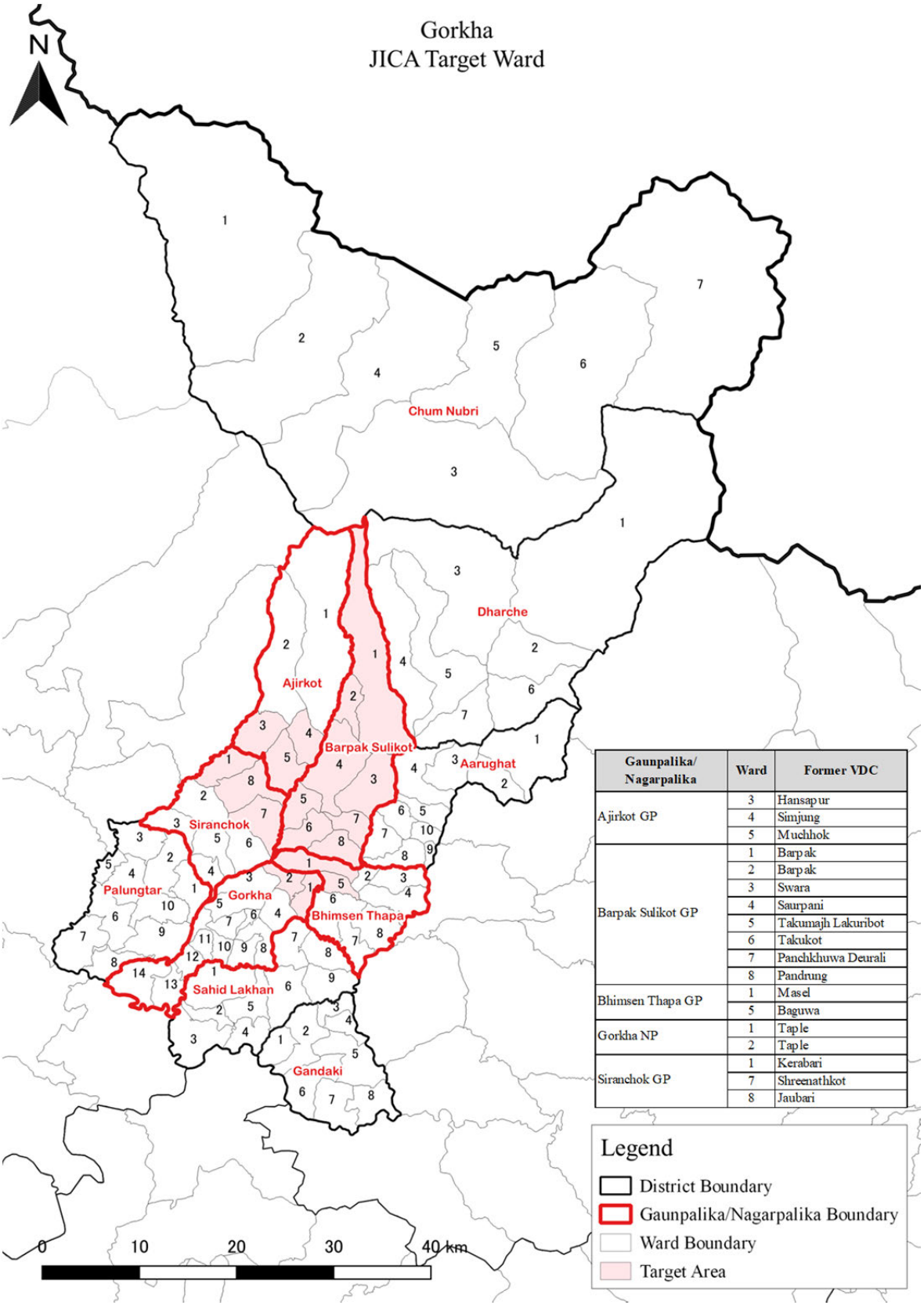
3.1.1 Target Area

The target areas were 47 Village Development Committees (VDCs) at the beginning of the project.

- 16 VDCs in Gorkha district:
  G1) Barpak, G2) Hansapur, G3) Jaubari, G4) Kerabari, G5) Muchhok, G6) Saurpani, G7) Shreenathkot, G8) Simjung, G9) Baguwa, G10) Masel, G11) Panchkhuwa Deurali, G12) Pandrung, G13) Swara, G14) Takukot, G15) Takumajh Lakuribot and G16)
- 31 VDCs in Sindhupalchok district:
  S1) Barhabise, S2) Dhuskun, S3) Fulpingdanda, S4) Fulpingkot, S5) Gati, S6) Karthali, S7) Maneswnara, S8) Mankha, S9) Ramche, S10) Batase, S11) Bhotasipa, S12-1) Chautara, S12-2) Kubhinde, S12-3) Pipaldanda, S12-4) Sanusiruwari, S13) Irkhu, S14) Kadambas, S15) Sangachok, S16) Syaule Bazar, S17) Thulo Sirubari, S18) Bhotechaur, S19) Dubachour, S20) Haibung, S21-1) Bansbari, S21-2) Fatakshila, S21-3) Jyamire, S21-4) Melamchi, S21-5) Sikhapur, S21-6) Sindhukot, S21-7) Talamarang and S22) Thakani

In March 2017, VDC was restructured and transformed as ward of NP and GP in line with the transformation to federal system. Therefore, the target 47 VDCs changed to 62 wards across 11 Municipalities of Gorkha and Sindhupalchok districts.

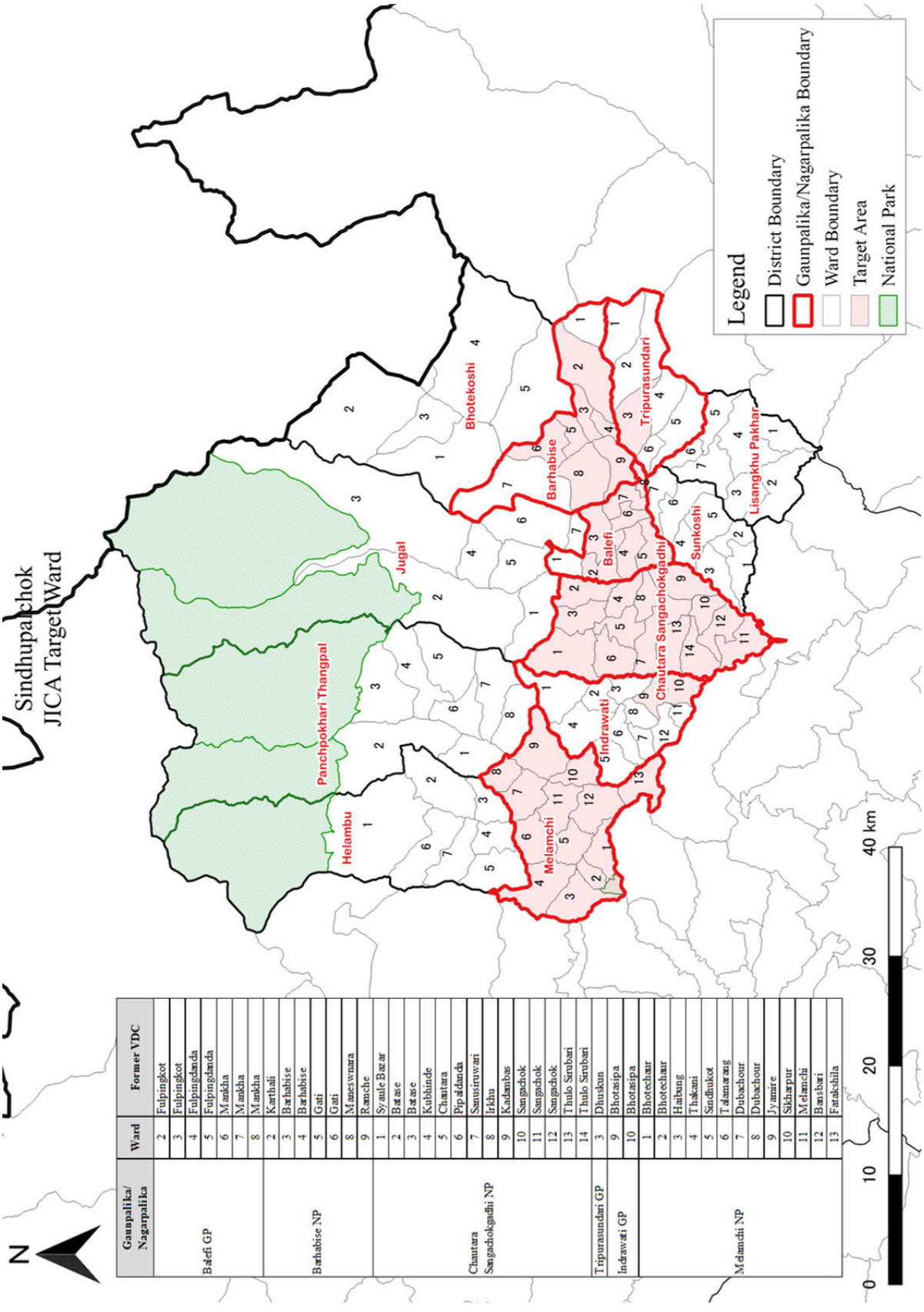
- 18 wards of 5 NP/GP in Gorkha district:
  Ajirkot GP, Bhimsenthapa GP, Gorkha NP, Siranchok GP and Barpak Sulikot GP
- 44 wards of 6 NP/GP in Sindhupalchok:
  Balefi GP, Barhabise NP, Chautara NP, Indrawati GP, Melamchi NP and TripuraSundari GP



Gaunpalika/ Nagarpalika	Ward	Former VDC
Ajirkot GP	3	Hansapur
	4	Simjung
	5	Muchhok
Barpak Sulikot GP	1	Barpak
	2	Barpak
	3	Swara
	4	Saurpani
	5	Takumajh Lakuribot
	6	Takukot
	7	Panchkhuwa Deurali
	8	Pandrung
Bhimsen Thapa GP	1	Masel
	5	Baguwa
Gorkha NP	1	Taple
	2	Taple
Siranchok GP	1	Kerabari
	7	Shreenathkot
	8	Jaubari

Source: This Study 2018

Figure 3-1 Target Area: Gorkha



Gaunpalika/ Nagarpalika	Ward	Former VDC
Balefi GP	2	Fulpingkot
	3	Fulpingkot
	4	Fulpingdanda
	5	Fulpingdanda
	6	Mankha
	7	Mankha
	8	Mankha
Barhabise NP	2	Karthali
	3	Barhabise
	4	Barhabise
	5	Gati
	6	Gati
	8	Maneswnara
	9	Ramche
Chautara Sangachokgadhi NP	1	Syaule Bazar
	2	Batase
	3	Batase
	4	Kubhinde
	5	Chautara
	6	Pipaldanda
	7	Sanusiruwari
	8	Irkhu
	9	Kadambas
	10	Sangachok
	11	Sangachok
	12	Sangachok
	13	Thulo Sirubari
	14	Thulo Sirubari
Tripurasundari GP	3	Dhuskun
Indrawati GP	9	Bhotasipa
	10	Bhotasipa
Melamchi NP	1	Bhotechaur
	2	Bhotechaur
	3	Haibung
	4	Thakani
	5	Sindhukot
	6	Talamarang
	7	Dubachour
	8	Dubachour
	9	Jyamire
	10	Sikharpur
	11	Melamchi
	12	Bausbari
	13	Fatakshila

Source: This Study 2018

Figure 3-2 Target Area: Sindhupalchok

3.1.2 Technical Assistance

(1) Institutional Arrangement

TPIS-ERP, in coordination with the World Bank and other donors, supported NRA in preparation for the practical system of GON Housing Reconstruction Program as follows:

- Development and review of Program Operation Manual
- Quality management system of reconstructed houses to be earthquake resilient
  - Development of training system for house owners, masons and government engineers
  - Development of inspection system
  - Development of housing grant distribution system
- Communication management
- Administration of enrolment camp
- Grievance redressal system
- Environmental and Social Management System (ESMS)
- Management Information System (MIS)

(2) Technical Assistance at the Central Level

NRA established the Technical Working Group to prepare necessary standards, guidelines and manuals for the smooth implementation of GON Housing Reconstruction Program, and TPIS-ERP provided technical assistance to NRA as a member of the Technical Working Group.

The following are technical documents prepared by the Technical Working Group:

- Design Catalogue for the Reconstruction of Earthquake Resistant Houses,Vol.1 (RRNE)
- Minimum Requirements for Masonry Structure (RRNE)
- Correction/Exception Manual for Masonry Structure
- Hybrid Structure Manual
- Light Timber/Steel Frame Structure Manual
- Inspection Guidelines
- Inspection Manual

The following are technical tools prepared by TPIS-ERP:

- Handbook of housing reconstruction for masonry
- Handbook of housing reconstruction for house owner
- Handbook of Minimum Requirements
- Poster of GON Housing Reconstruction Program procedure
- Poster of safety management at construction site
- Posters of Minimum Requirements, including points of Correction/Exception manual
- Curriculum and materials for mason training

- Curriculum and materials for house owner training
- Curriculum and materials for DLPIU engineer training
- Curriculum and materials for CMP

(3) Technical Assistance at the Field Level

Technical Assistance Team (TA Team) comprising of an engineer and a social mobiliser along with Mobile Masons provide assistance to the beneficiaries at field level. One TA Team provides assistance to the beneficiaries in one or two wards while one Mobile Mason assists around 100 beneficiaries. The Engineer assists the beneficiaries in technical matters such as on the type of houses, layout, cost and the Minimum Requirements while the social mobiliser assists in social and environmental matters and communication. The role of Mobile Mason is not only to train unskilled labour in the community, but to work as mason actually reconstructing houses at the site. Mobile Mason has been selected from the masons who received the mason training by TPIS-ERP in the community so that he/she has a thorough knowledge of the Minimum Requirements and, at the same time, familiar with the situation of the community.

(4) Monitoring and Reporting

TPIS-ERP central staff has monitored housing reconstruction status and technical assistance activity by periodic reports prepared by the district staff. The reporting system has been modified and improved, depending on the housing reconstruction situation. All information reported from the field are incorporated in the central database with which technical and financial analyses are generated.

Table 3-1 Reporting System

Period	Report	Contents
Mar 2017 – Jul 2017	Monthly Report	Reconstruction Progress by VDC
Aug 2017 – Feb 2018	Biweekly Report	Reconstruction Progress by VDC Training Status Community Mobilization Program Status
Mar 2018 – Jul 2018	Weekly Report	Reconstruction Progress by VDC Issues
Aug 2018 – Oct 2018	Weekly Report	Reconstruction Progress by VDC
	Biweekly Report	Reconstruction Progress Graph Issues Actions
Nov 2018 – Jan 2019	Biweekly Report	Reconstruction Progress by Ward Reconstruction Progress Graph Reconstruction Stage (detailed progress) Reconstruction Status (detailed issues)

Source: This Study 2018

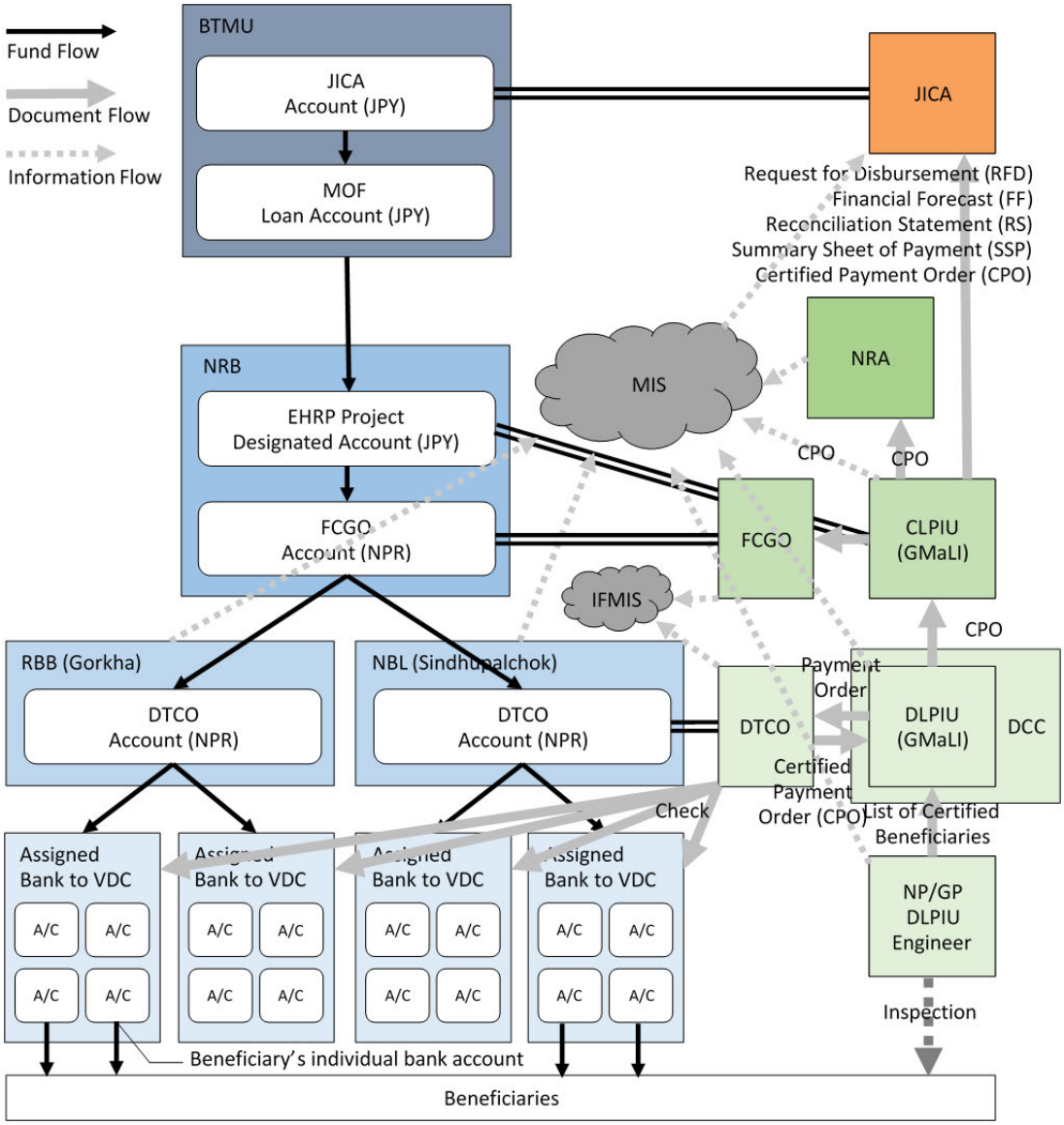
Currently, TPIS-ERP adopted the biweekly reporting system in which the beneficiaries are classified into 13 stages and 146 statuses as per reconstruction progress and issues. Mobile Mason grasps

and updates these information, TA Team reports to the Senior Engineer, and the Senior Engineer organises the information by ward and reports to the central team every other week. The central team analyses the report, verifies the actions to be taken by the field staff and visits critical sites to address issues.

3.1.3 Financial Mechanism

(1) Fund Flow

The following figure shows the disbursement flow from JICA and the fund flow of housing grants to beneficiaries.



Source: This Study 2018

Figure 3-3 Financial Mechanism

1) Flow of first tranche payment

a) Requirements for receiving housing grant

Eligible households (showing proof of their damaged houses with the damage survey rated and accompanied by the presentation of evidencing documents that are the prerequisites for signing of PA) and the Secretary of VDC[12] need to sign the PA at the enrolment camp for beneficiaries of housing reconstruction.

b) Flow of documents and funds

Eligible households conclude two copies of original PA with VDC Secretary, one signed PA to be stored in the VDC office[13] and the remaining one to be kept by beneficiaries.

The VDC Secretary submits the list of beneficiaries who concluded PA (name of beneficiary, PA number, unique ID, beneficiary's father's name, citizen number, etc.) to DCC and DLPIU (GMaLI).

DCC verifies the above list against the list of eligible households, and after the confirmation, DCC issues a Payment Order (PO) together with the beneficiary list to DTCO.

DTCO verifies the data on the beneficiary list received from DCC with the data on the Nepalese Government's own electronic system (Integrated Financial Management Information System or IFMIS) managed by the Financial Comptroller General Office (FCGO), checking for any duplication of PA numbers submitted in the past. Then DTCO approves PO (Certified Payment Order: CPO) and issues payment checks addressed to each Participating Financial Institution (PFI).

In principle, funds for rural development are usually to be released by the District Development Fund (DDF). In this project, however, it was released under the authority of DTCO due to the status of this project regarded as a national project. Therefore, DTCO, which is responsible for the payment by the government established in each district, is responsible for issuing bulk checks (large checks for beneficiaries at designated bank in each VDC) from District Development Committee (DDC) accounts in Rastriya Banjiya Bank (RBB) in Gorkha District and in Nepal Bank Limited (NBL) in Sindhupalchok District.

Upon receipt of these checks and the beneficiary list with the PA numbers, the banks sort a predetermined amount and deposit it to each beneficiary account. These banks accept the withdrawal of housing grants by beneficiaries who brought the necessary documents (i.e., photographs confirming their identity, Citizenship Certificate, signed PA). They make copy and file these evidences. Some households, specifically those who could not prepare the necessary documents in advance in remote areas of Gorkha District where access had been difficult and

[12] After transformation from VDC to NP and GP, Ward Chairperson is the signer of PA.
[13] The document is kept at Ward office after transformation.

information are not well received, were not able to withdraw the housing grant even if they went to their bank after traveling for several hours on foot and had to travel back on foot again.

In order to avoid such situations, the VDC Secretary decided to issue an Authorisation Letter to DCC, covering the elderly householders and heads of households who are abroad, etc. DCC coordinates with the banks, and thus representatives of households with authorisation letters are able to withdraw the housing grant.

However, some households could not withdraw their housing grants in a timely manner even if they tried to withdraw from Cosmos Development Bank, Gorkha's designated bank, because the bank has been short of cash due to its financial problem. To resolve the matter, Sangrila Development Bank provided support to Cosmos Development Bank.

2) Flow of second and third tranches

In the case of the first tranche, DLPIU (GMaLI) performs the payment procedure of housing grant based on the PA signed by VDC Secretary, whereas in the case of second and third tranches, engineers from DLPIU (Building) inspect the reconstructed houses and issue inspection certificates. This inspection certificate proves that the reconstructed house complied with the Minimum Requirements for earthquake resistance and this served as the evidence material for grant payment. Therefore, the verification of each agency after the second tranche is carried out based on the inspection certificate issued by DLPIU (Building) Engineers (Inspectors).

(2) Disbursement Procedure

Regarding the financial mechanism concerning the JICA disbursement procedure, JICA was originally working with the World Bank to create a mechanism of distributing directly to the designated banks in districts from the Central Bank without going through DCC, which is conflicting with the government-recommended method of distributing funds to households through DCC.

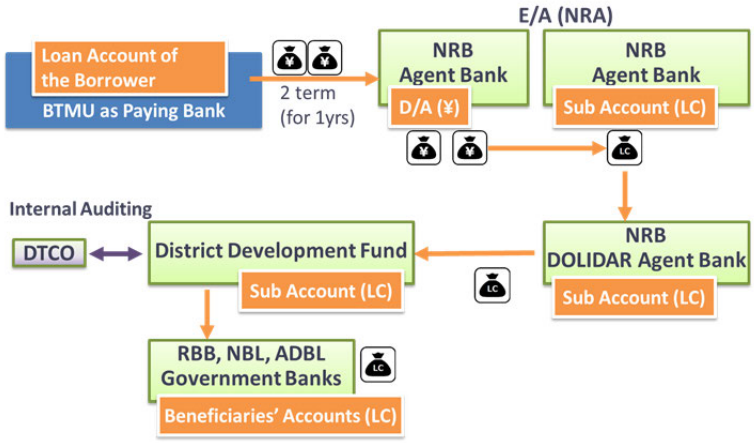
However, as housing reconstruction involves remote areas with few banks, there is a need to place housing grant distribution under the control of DLPIU (GMaLI), so that the grant payment to beneficiaries is disbursed through the DDF while receiving audits by DTCO. In the case of this project, unlike regional development, the Project has been regarded as a national project, DTCO certification is mandatory.

Regarding payments at district level, it was decided that the beneficiaries transact with the following three national banks whose authority was delegated by the Nepal Government.

- Rastriya Banijya Bank (RBB)
- Nepal Bank Limited (NBL)
- Agricultural Development Bank Limited (ADBL)

Regarding the arrangement at private banks, transactions are made through the above three national banks. However, not all private banks are permitted to transact.

Based on the above scenario, the financial mechanism of JICA's disbursement had been planned as shown in the following figure:

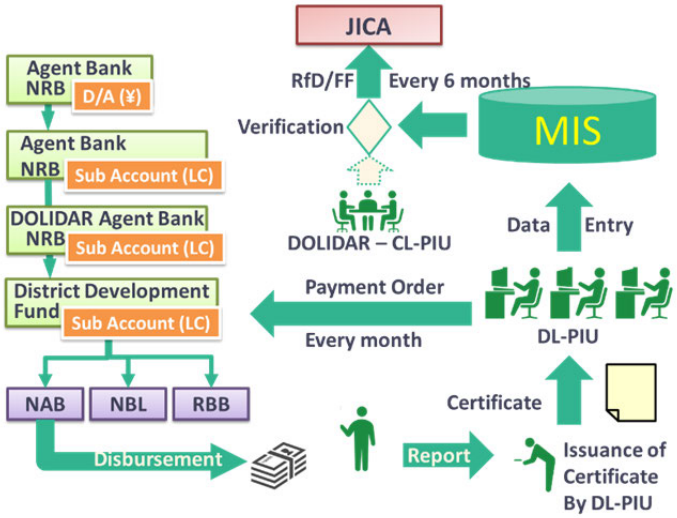


Abbreviation: D/A (Designated Account), LC (Local Currency)

Source: This Study 2018

Figure 3-4 Financial mechanism on housing grant distribution (through national banks)

In the VDC where branches of the three government banks exist, it is possible for households to be paid through their accounts in these branches. Below is a diagram of payment flow to beneficiaries as originally planned.



Source: This Study 2018

Figure 3-5 Payment flow through inspection

In the MIS, detailed data of the households receiving financial support have been registered already, including the results of household/house damage survey. All households receiving the first tranche have been registered also. Electronic data (e.g., scanned copy of PA) of households who signed

PA at the enrolment camp for housing reconstruction grant have been uploaded also to MIS in Sindhupalchok and Gorkha Districts successively.

Meanwhile, with regard to the inspection, which is closely related to the payment of housing grant, the initial aim was to establish a mechanism to input the survey results to tablets and instantly upload them to the MIS for data verification. However, this did not progress since there were insufficient tablets to distribute to DLPIU Engineers, and Internet access is poor in rural areas. Therefore, it was decided to adopt handwritten information on a paper check sheet, image data by photograph of that sheet is collected in Gorkha District, and a printed copy of the image is collected in Sindhupalchok District.

According to DCC and DTCO, the information of households that passed the first inspection have been uploaded already to MIS. However, due to omission of the account number of household heads and the land registration number of the target houses on the inspection sheets, the EHRP Consultant has to spend more time than necessary in making scanned copy of the inspection sheets and in collecting proper photos for certified reconstructed houses.

The EHRP Financial Team continues to conduct cross-checks on payment information of DCC Payment Order to target households, and the payment information from DTCO to PFI for target households. After receiving payment from DTCO (specifically after receiving the check), each PFI needs to deposit to the beneficiaries' respective accounts and upload the payment information to the MIS of NRA. According to the agreement documents of NRA and Bankers Association, PFI can receive fee by uploading payment information of first tranche to MIS. However, uploading of the second and third tranches has been delayed, the reasons being the lack of payment fees for uploading these, complication of the MIS system, etc. However, with the support of MIS Expert from EHRP, NRA improved the MIS to a more user-friendly system that make it easier to input information, encouraging urgent uploading to each PFI. The situation greatly improved, thus PFI uploaded additional payment information for the second and third tranches.

Meanwhile, CLPIU (Building) has already established the MIS dedicated to MOUD with respect to technical data different from CLPIU (GMaLI), and MOF and DTCO utilise LMBIS, each department is analysing and registering data for its own use. For this reason, the MIS related to housing reconstruction established by CLPIU (GMaLI) has to be shared by related ministries and agencies. And in order to demonstrate comprehensive cross-checking function, not only data digitisation and uploading but also sharing operation and adjustment are necessary.

For the sake of those beneficiaries who could not establish bank accounts or VDC where the bank does not exist, NRA reviewed the adoption of mobile banking system and Branchless Banking (BLB) system initiated by DFID. However, due to problem on budgetary measures concerning banking commission, this was not implemented. Hence, not only government bank but also bank

responsible for each VDC, including the banks of classes A to C, are certified to operate for distribution of housing grants.

(3) Banks dealing with housing grant distribution in target VDC

On 27th May 2016, NRA and the Bankers Association (Bankers' Association: Development Bankers Association, Nepal Financial Institution Association), 59 financial institutions (Class A, B, C banks) signed an agreement to approve operations in target VDC.

According to press notes of MOFAGA (then MOFALD) on 24th June 2016, these approved financial institutions would provide services in clustered form to the affected 187 VDCs.

The lists of banks providing services for 38 target VDCs in Sindhupalchok and Gorkha Districts covered by JICA are given below.

The banking situation in Sindhupalchok District is shown in the following table.

Table 3-2 List of Banks in VDC (Sindhupalchok District)

District	Cluster	VDC		Supporting Banks
Sindhupalchok	Barhabise	S1	Barhabise VDC	Himalayan Bank+Nepal Credit and Commerce Bank
		S2	Dhuskun VDC	Civil Bank+Himalayan Bank
		S3	Fulpingdanda VDC	Sindhu Bikas Bank
		S4	Fulpingkot VDC	Prabhu Bank+sindhu Bikas
		S5	Gati VDC	Himalayan Bank+Nepal Credit and Commerce Bank
		S6	Karthali VDC	Nepal Credit and Commerce Bank+Prabhu Bank
		S7	Maneswnara VDC	Civil Bank
		S8	Mankha VDC	Sindhu Bikas Bank
		S9	Ramche VDC	Global IME Bank
	Chautara	S10	Batase VDC	Agriculture Bikas Bank
		S11	Bhotasipa VDC	Sindhu Bikas Bank
		S12	Chautara Municipality	
		S12-1	Chautara	International Development Bank
		S12-2	Kubinde	Janta Bikas Bank
		S12-3	Pipaldanda	Megha Bank
		S12-4	Sanu Sirubari	Nepal Bank+Professional Diyalo Bank
		S13	Irkhu VDC	Janta Bikas Bank
		S14	Kadambas VDC	International Development Bank+Janata Bank
		S15	Sangachok VDC	International Development Bank
		S16	Syaule Bazar VDC	Professional Diyalo Bank
		S17	Thulo Sirubari VDC	Agriculture Bikas Bank
	Melamchi	S18	Bhotechaur VDC	Civil Bank
		S19	Dubachour VDC	Civil Bank+Deva Bikash Bank
		S20	Haibung VDC	Global IME Bank
		S21	Melamchi Municipality	
		S21-1	Bansbari	Nepal Bank
		S21-2	Fatakshila	Nepal Bank
		S21-3	Jyamire	Nepal Bank
		S21-4	Melamchi	Deva Bikas Bank
		S21-5	Sikharpur	Nepal Bank
		S21-6	Sindhukot	Civil Bank
		S21-7	Talamarang	Agriculture Bikas Bank
		S22	Thakani VDC	Not finalized

Source: This Study 2018

The target VDCs and the deployment status of financial institutions in the Sindhupalchok District are as follows:

Table 3-3 List of Target VDCs by financial institutions (Sindhupalchok District)

S.N.	Banks	VDC
1	Himalayan Bank	Barhabise, Dhuskun, Gati
2	Nepal Credit & Commerce Bank	Barhabise, Gati, Karthali
3	Civil Bank	Dhuskun, Maneswnara, Bhotechaur, Dubachour, Sindhukot
4	Prabhu Bank	Fulpingkot, Karthali
5	Sindhu Bikas Bank	Mankha, Fulpingdanda, Fulpingkot, Bhotasipa
6	Global IME Bank	Ramche, Haibung
7	Agriculture Bikas Bank	Batase, Thulo Sirubari, Talamarang
8	International Development Bank	Chautara Municipality (3,4,7), Kadambas, Sangachok,
9	Nepal Bank	Sanusiruwari (8,9), Jyamire, Sikharpur, Phatakshila, Bansbari, Thakani
10	Professional Diyalo Bank	Sanusiruwari (8,9), Syaule Bazar
11	Megha Bank	Pipaldanda (1,2)
12	Janta Bikas Bank	Kubhinde (5,6), Irkhu, Kadambas
13	Deva Bikash Bank	Dubachour, Melamchi, Jyamire

Source: MOFAGA (then MOFALD)

Source: HRRP

Figure 3-6 Development situation of financial institutions in Sindhupalchok District

On the other hand, the situation in Gorkha District is as follows:

Table 3-4 List of Banks in VDC (Gorkha District)

District	Cluster	VDC	Supporting Banks
Gorkha	Barpak	Barpak VDC	Manasal Development Bank, Gorkha
		Hansapur VDC	RBB, Vachhek
		Jaubari VDC	RBB, Vachhek
		Kerabari VDC	RBB, Vachhek
		Muchhok VDC	RBB, Vachhek
		Saurpani VDC	NMB Bank, Prabhu Bank
		Shreen athkot VDC	Prime Bank, Prabhu Bank, Rbb
		Simjung VDC	RBB, Vachhek
		Takumajh Lakuribot VDC	Cosmos Development Bank, Ghyampesal
	Bungkot	Baguwa VDC	Cosmos Development Bank, Ghyampesal
		Masel VDC	Cosmos Development Bank, Ghyampesal
		Panchkhuwa Deurali VDC	Cosmos Development Bank, Ghyampesal
		Pandrung VDC	Cosmos Development Bank, Ghyampesal
		Swara VDC	Manasalu Development Bank, Gorkha
		Taple VDC	Prime Bank, Gorkha
		Takukot VDC	Cosmos Development Bank, Ghyampesal

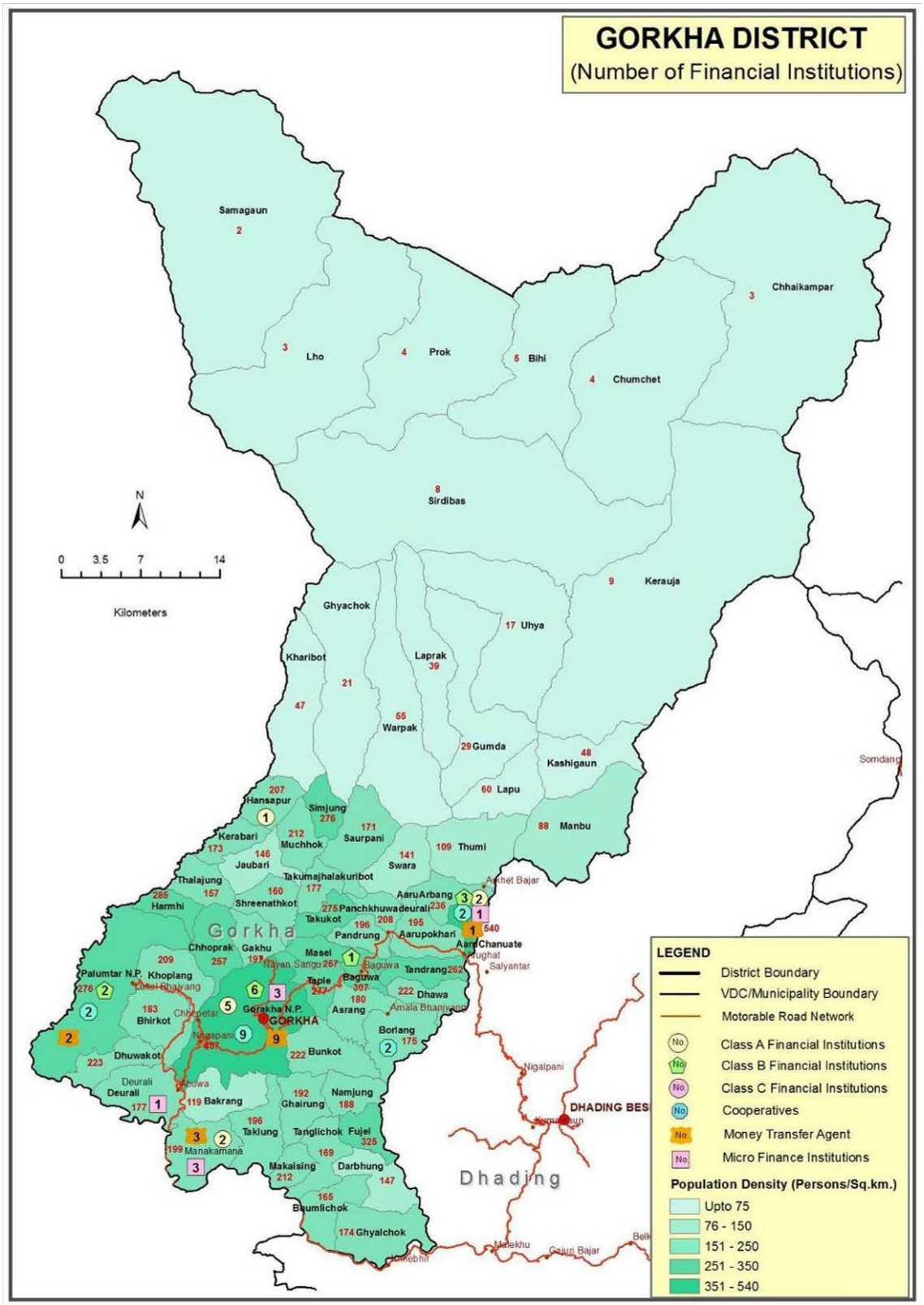
Source: MOFAGA (then MOFALD)

The target VDCs and the deployment status of financial institutions in the Gorkha District are as follows:

Table 3-5 List of Target VDCs by Financial Institutions (Gorkha District)

S.N	Banks	VDC
1	Manasalu Development Bank	Barpak, Swara
2	Rastriya Banijya Bank (RBB)	Hansapur, Jaubari, Kerabari, Muchhok, Shreenathkot, Simjung
3	NMB Bank	Saurpani
4	Prabhu Bank	Saurpani, Shreenathkot
5	Prime Bank	Shreenathkot, Taple
6	Cosmos Development Bank	Baguwa, Masel, Panchkhuwa Deurali, Pandrung, Takukot, Takumajh Lakuribot

Source: MOFAGA (then MOFALD)



Source: HRRP

Figure 3-7 Development situation of financial institutions in Sindhupalchok District

(4) Auditing

The audit of this project in Nepal is implemented as follows:

1) Internal Audit

Internal audits are conducted by DTCO on a quarterly basis.

2) External Audit

The external audit is conducted annually by the Office of Auditors General (OAG) around August to September, after the end of fiscal year (July). Usually, external audit reports are submitted from October to November under the regular cycle. This Project is necessary to conduct audit of all target areas at the same time, and since its scale is large, an external audit report can still be completed around March to April in the following year.

JICA requested NRA to submit external audit report only for JICA target areas, and NRA accepted this method. After completing the external audit report of all target areas, the EHRP Consultant extracts only those for JICA target areas and submits report to JICA around June 2018.

3.2 EHRP Status (as of December 2018)

3.2.1 Housing Reconstruction

(1) Overall Status

1) Total Identified Beneficiaries

Total identified beneficiaries as of December 2018 were 56,532 HH (Gorkha: 15,187 HH Sindhupalchok: 41,345 HH). The additional identified beneficiaries through grievance redress are the following:

- 2,754 HH (Gorkha: 565 HH, Sindhupalchok: 2,189 HH) in December 2017
- 626 HH (Gorkha: 171 HH, Sindhupalchok: 455 HH) in May 2018
- 1,018 HH (Gorkha: 233 HH, Sindhupalchok: 785 HH) in June 2018
- 429 HH (Gorkha: 429 HH) in July 2018
- 7 HH (Gorkha: 7HH) in October 2018
- 9 HH (Sindhupalchok: 9 HH) in December 2018

2) PA signing rate

Out of the total identified beneficiaries, 55,699 (98.5%) beneficiaries have signed the PA.

3) Reconstruction and Inspection Status

- Completed up to plinth : 52,794 (93.4%) beneficiaries have already reached to the plinth level and they are ready for 1st inspection.
- 1st Inspection : 1st inspection has been conducted already for 52,334 (92.6%) beneficiaries which shows that 460 (0.8%) beneficiaries are still awaiting 1st inspection.
- Completed up to roof band : 46,496 (82.2%) beneficiaries have already reached to the roof band level and they are ready for 2nd inspection.
- 2nd Inspection : 2nd inspection has been conducted already for 44,090 (78.0%) of the beneficiaries which shows that 2,406 (4.3%) beneficiaries are still awaiting 2nd inspection.
- Completed up to the roof : 43,854 (77.6%) beneficiaries have already completed construction up to the roof and they are ready for final inspection.
- Final Inspection : Final inspection has been conducted already for 6,712 (11.9%) beneficiaries which shows that 37,142 (65.7%) beneficiaries are still awaiting final inspection.
- Completion Certificate : Completion certificate has been distributed to 2,436 (4.3%) beneficiaries in JICA target areas.

4) Housing Grant Distribution Rate

- First tranche : The first tranche was received by 55,570 (98.3%) beneficiaries consisting of 54,052 (95.6%) beneficiaries supported by Government and 1,518 (2.7%) beneficiaries supported by I/NGOs.
- Second tranche : The second tranche was received by 50,499 (89.3%) beneficiaries consisting of 49,079 (86.8%) beneficiaries supported by Government and 1,420 (2.5%) beneficiaries supported by I/NGOs.
- Third tranche : The third tranche was received by 40,355 (71.4%) beneficiaries consisting of 39,128 (69.2%) beneficiaries supported by Government and 1,227 (2.2%) beneficiaries supported by I/NGOs.

(2) Ward Level Status

1) Gorkha district

Among 18 wards in target areas, Wards 2, 5 and 8 of Barpak Sulikot GP have good progress while Ward 5 of Bhimsenthapa GP has not progressed. Ward 5 of Bhimsenthapa GP has an integrated settlement of 103 house owners whose progress is slow because of delay in decision making of the settlement committee. The rate of final inspection and completion certificate is good in Ward 4 of Ajirkot GP. However, Wards 1 and 2 of Gorkha NP have not started the process yet. Gorkha NP has implemented the process of record keeping and building permit, which hindered the progress of final inspection and completion certificate.

2) Sindhupalchok district

Among 44 wards of Sindhupalchok, Wards 2, 3 and 5 of Balefi GP; Ward 2 of Chautara Sangachok Gadhi NP; and Ward 3 of Tripurasundari GP have good progress in overall reconstruction. However, Wards 3, 4, 5 and 6 of Barhabise NP; Ward 5 of Chautara Sangachokgadhi NP; and Wards 3 and 12 of Melamchi NP have relatively low progress. Barhabise NP and Chautara Sangachokgadhi NP are in urban areas, and the afore-cited wards do not have good progress because it has been found out that there are many beneficiaries who do not have immediate plan to start or continue the construction. Ward 12 of Melamchi NP has some support from NGOs like Chaudhary Foundation, Dhurmus Suntali Foundation, OXFAM and Tilganga Foundation for integrated settlement. Because of the delay in the support and decision of these organisations, the beneficiaries have not been able to work for reconstruction continuously. Almost all the wards, except 4 wards, have started final inspection and 19 wards among 44 wards have started the process for the completion certificate. The ward chairperson had planned to conduct a grand distribution programme and the remaining wards' completion certificate distribution programme is expected to start soon.

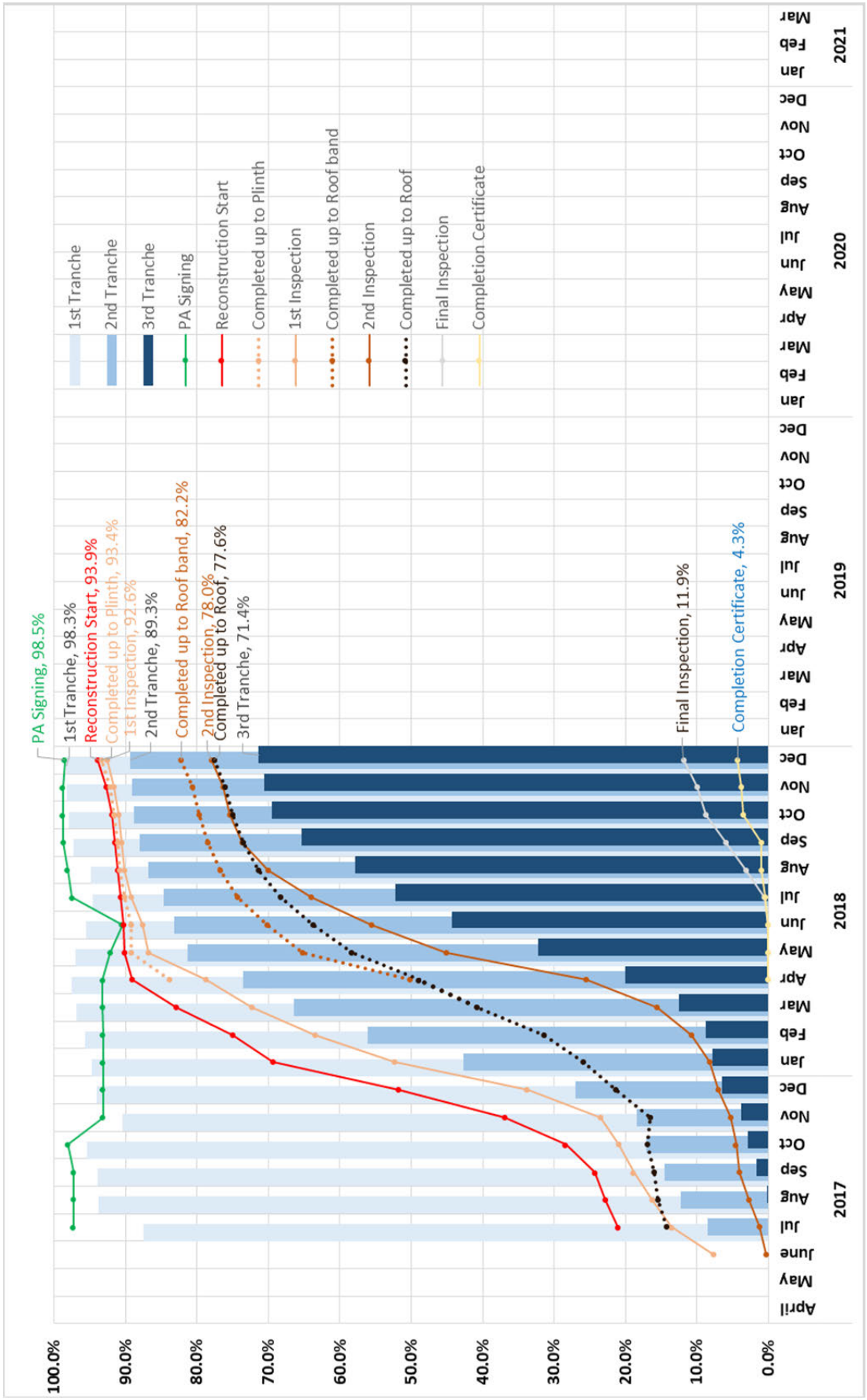
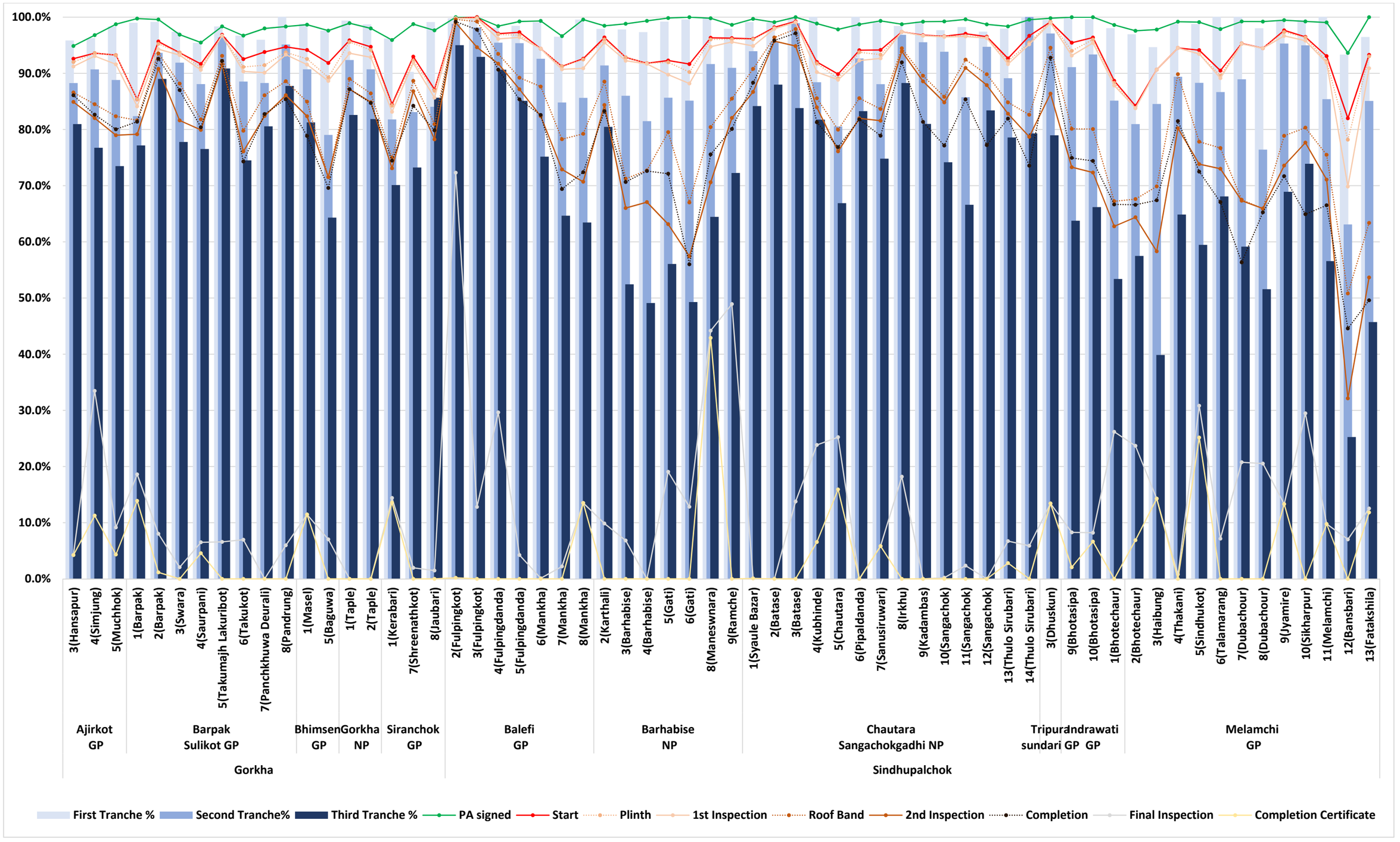


Figure 3-8 Chronological Housing Reconstruction Status

Note: The financial support and technical support from INGOs for 1,518 beneficiaries are also included in the graph
Source: EHRP, DCC



Source: This Study 2018

Figure 3-9 Housing Reconstruction Status – Ward Level

(3) District Level Status

Table 3-6 Comparison of Reconstruction Status between EHRP Target Area and Overall 14 Districts

Stages	Overall 14 Districts	Overall EHRP (Difference from 14 districts in percentage point)	EHRP Gorkha (Difference from 14 districts in pp)	EHRP Sindhupalchok (Difference from 14 districts in pp)
PA signing	89.9%	98.5% (+8.6)	97.6% (+7.6)	98.9% (+8.9)
1st tranche	89.3%	98.3% (+9.0)	97.5% (+8.2)	98.6% (+9.3)
Reconstruction Start	72.4%	93.9% (+21.5)	92.9% (+20.5)	94.3% (+21.9)
1st Inspection	68.7%	92.6% (+23.9)	91.3% (+22.6)	93.0% (+24.3)
2nd Tranche	67.5%	89.3% (+21.8)	89.0% (+21.5)	89.4% (+22.0)
2nd Inspection	49.1%	78.0% (+28.9)	82.2% (+33.1)	76.4% (+27.3)
3rd Tranche	46.0%	71.4% (+25.4)	79.2% (+33.3)	68.5% (+22.5)

Source: This Study 2018

1) PA signing rate

The PA signing rate of overall 14 districts is 89.9%. The PA signing rate of EHRP Gorkha and Sindhupalchok target areas are 97.6% (+7.6pp of 14 districts) and 98.9% (+8.9pp), respectively.

2) Reconstruction Start Rate

The reconstruction start rate of overall 14 districts is 72.4%. The highest rate 91.2% is in Sindhupalchok and this is followed by Okhaldhunga with 88.0%. The lowest rate is 34.1% in Bhaktapur District. The average reconstruction start rate of 11 districts is 78.3%, excluding Kathmandu, Bhaktapur and Lalitpur where housing reconstruction activities started later than other 11 districts.

3) Inspection Rate

The 1st inspection rate of overall 14 districts is 68.7%. Sindhupalchok has the highest inspection rate of 89.8%, followed by Okhaldhunga with 88.0%. The inspection rate of Gorkha is 83.7%. EHRP target area has 92.6% inspection rate.

The 2nd inspection rate of 14 districts is 49.1%. Okhaldhunga has the highest inspection rate of 72.2%. The inspection rates of Gorkha and Sindhupalchok are 66.9% and 66.2%, respectively. EHRP target area has 78.0% inspection rate.

4) Housing Grant Distribution Rate

First tranche grant distribution rate of 14 districts is 89.3%, which is below the rate of Gorkha (95.1%) and Sindhupalchok (97.8%).

Second tranche grant distribution rates in Gorkha and Sindhupalchok are 80.7% and 86.2%, respectively. The average of second tranche grant distribution rate in 14 districts is 67.5%.

Third tranche grant distribution rate is 62.8% in Gorkha, and 62.1% in Sindhupalchok which are higher compared with the 46.0% average in 14 districts.

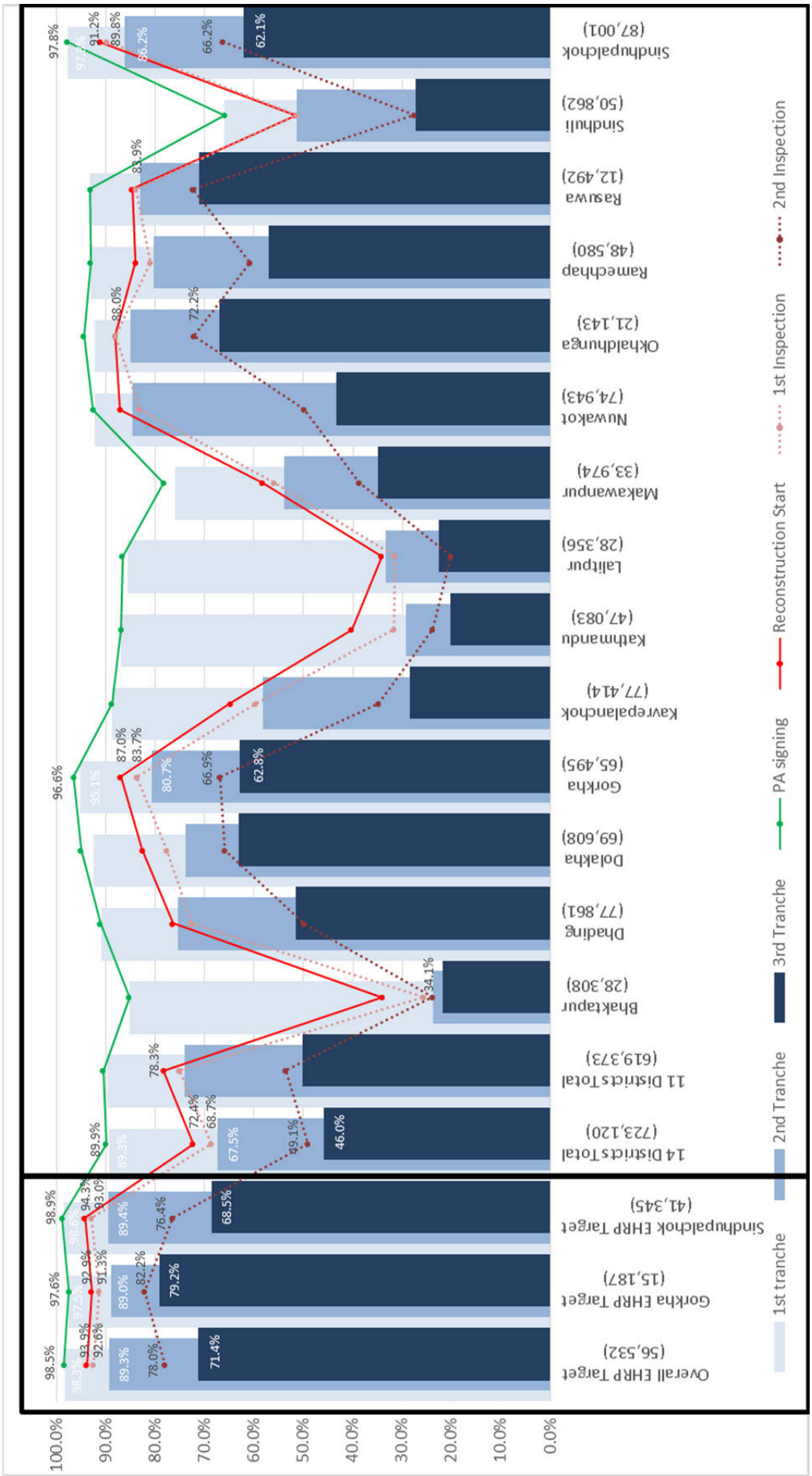
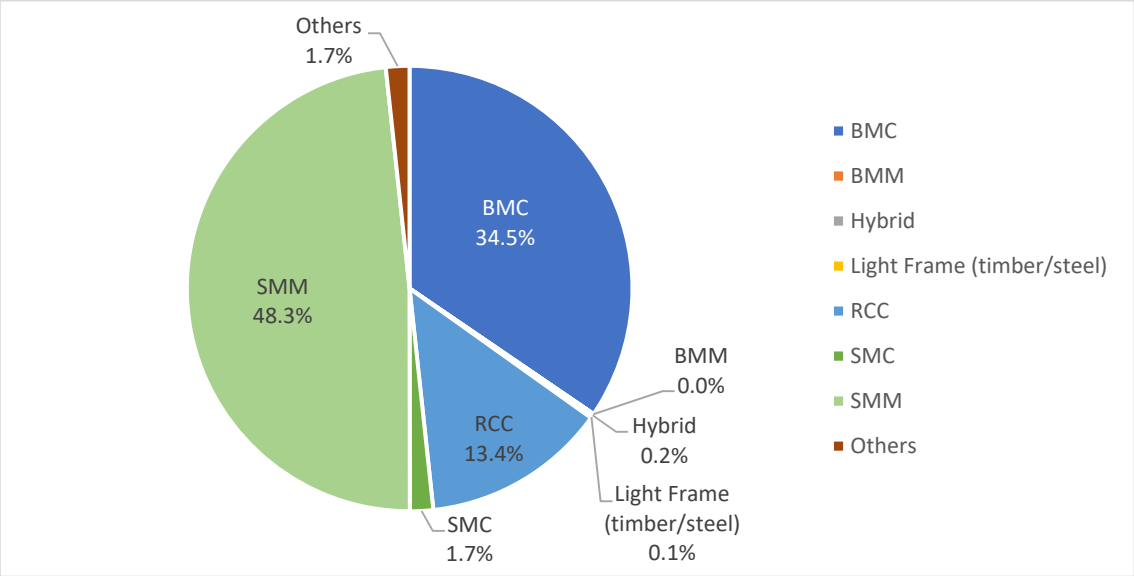


Figure 3-10 Housing Reconstruction Status – District Level

Source: This Study 2018

(4) Structure Types of Reconstructed Houses

The following chart shows the structure types of completed houses in JICA target area. 48.3% of house owners have constructed Stone Masonry with Mud Mortar (SMM) houses; followed by Brick Masonry with Cement Mortar (BMC), 34.5%; and Reinforced Cement Concrete (RCC), 13.4%. Brick Masonry with Mud Mortar (BMM) and Hybrid and Light Frame (timber/steel) types are not popular structures in JICA target area.



Source: This Study 2018

Figure 3-11 Structure Types of Reconstructed Houses (n: 44,210)

(5) Status of Female-Headed and Male-Headed Household Beneficiaries

Out of the total 56,532 beneficiaries, 12,419 (21.9%) beneficiaries have been listed as female-headed beneficiaries (Source: NRA Beneficiary List)

First Tranche grant distribution rate for beneficiaries considered as female-headed households is 95.0%, whereas first tranche distribution of counterpart male-headed beneficiaries is 99.2%.

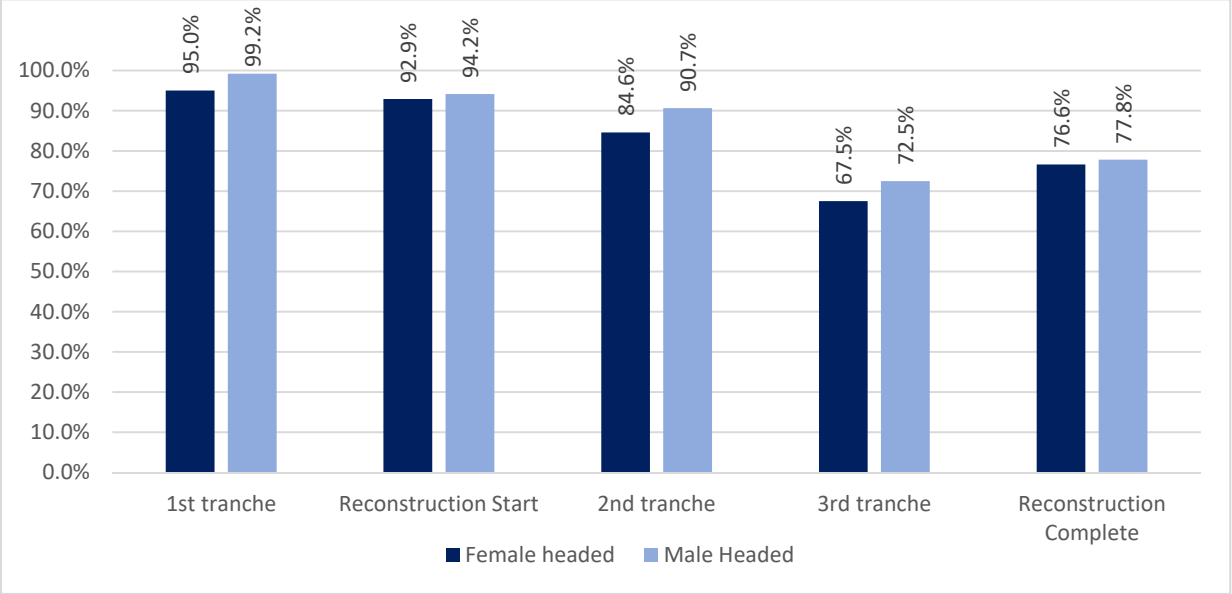
Furthermore, 92.9% of these female-headed beneficiaries have started reconstruction, compared to 94.2% rate for their counterpart male-headed beneficiaries.

Second Tranche grant distribution rate for the female-headed beneficiaries is 84.6%, whereas second tranche distribution rate for the counterpart male-headed beneficiaries is 90.7%.

Third Tranche grant distribution rate for the female-headed beneficiaries is 67.5%, whereas for their counterpart of male-headed beneficiaries is 72.5%.

76.6% of the female-headed beneficiaries have completed reconstruction, whereas it is 77.8% for the counterpart male-headed beneficiaries.

The reconstruction progress status of female-headed beneficiaries is slightly lower than that for the male-headed beneficiaries. It was found that these female-headed beneficiaries started reconstruction later than other beneficiaries as they had to spend more time in regular domestic work in comparison to male-headed beneficiaries, leaving them with less time to make decisions about reconstruction.



Source: This Study 2018

Figure 3-12 Housing Reconstruction Status – By Gender of Beneficiary

(6) Status by Vulnerability

1) Definition of Vulnerable Beneficiary

Based on the NGO Guidelines of NRA, the definition of *vulnerable beneficiary* covers the following:

- HH only with widow and underage offspring
- HH only with single women
- HH only with elderly people 75 years above
- HH only with person with disability

Based on these criteria, Field team reports until March 2016 indicated that there were 1,193 beneficiaries identified as potential vulnerable beneficiaries out of 54,443 total beneficiaries. The physical status and financial status of vulnerable beneficiaries identified based on these criteria did not differ much compared to the status of non-vulnerable beneficiaries.

In April 2017, NRA published the vulnerable beneficiary list based on the procedure in the identification of earthquake-affected vulnerable beneficiaries, 2074 (NRA) in which the definition of vulnerable beneficiary may pertain to:

- HH only with single women above 65 years
- HH only with elderly above 70 years
- HH only with orphan below 16 years
- HH only with disabled person who have received disability card (only red and blue) from GON

Based on these criteria, 885 (1.6%) beneficiaries have been identified as vulnerable out of 54,443[14] total number of beneficiaries in the target area from the list published by NRA on its website.

2) Status of Vulnerable Beneficiaries

First tranche grant distribution rate of vulnerable beneficiaries is 87.8%, which is 10.7 Percentage Point (pp) lower than that for non-vulnerable beneficiaries.

87.0% of the vulnerable beneficiaries have started reconstruction, a rate which is 7.0 pp lower than that for non-vulnerable beneficiaries.

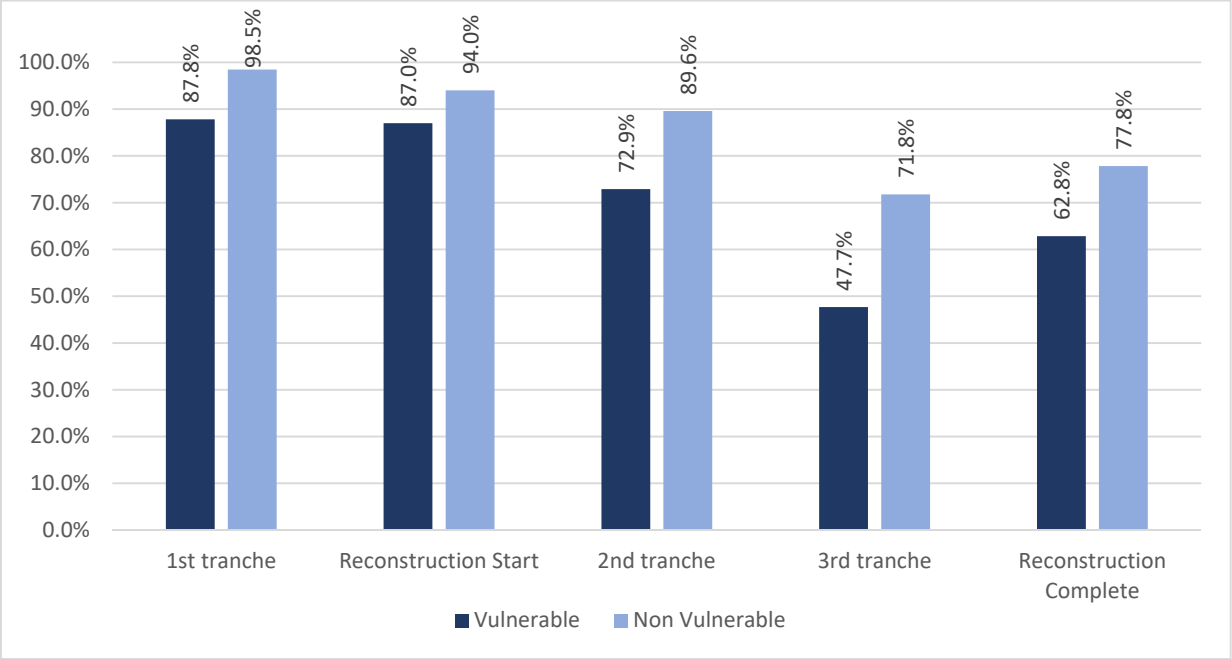
Second tranche grant distribution rate of vulnerable beneficiaries is 72.9%, which is 16.7pp lower than that for non-vulnerable beneficiaries.

Third tranche grant distribution rate of vulnerable beneficiaries is 47.7%, which 24.1pp lower than that for non-vulnerable beneficiaries.

62.8% of the vulnerable beneficiaries have completed the house reconstruction, which is 15.0pp lower than the reconstruction completion rate of non-vulnerable beneficiaries

The status of vulnerable beneficiaries was found comparatively lower than non-vulnerable beneficiaries. It was learned that the vulnerable beneficiaries identified by the government have less access to manpower, materials and money. Therefore, they could not start reconstruction work promptly. After the provision of special support from Mobile Masons their rate of reconstruction gradually increased.

[14] The total number of beneficiaries as of December 2018 was 56,532, but NRA identified vulnerable beneficiaries only from a list with 54,443 beneficiaries.



Source: This Study 2018

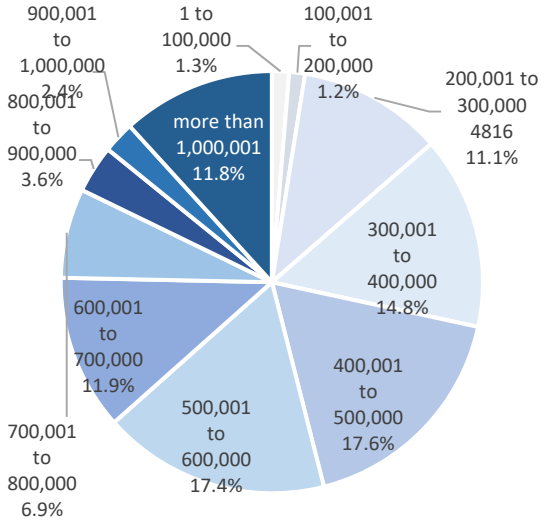
Figure 3-13 Housing Reconstruction Status – Vulnerable Beneficiary

(7) Debt Situation

Financial information related to housing reconstruction was collected from 43,416 beneficiaries who completed housing reconstruction as of December 2018. It is generally challenging to obtain accurate financial information through formal interview by engineer and social mobilizer. Therefore, TPIS-ERP collected those information through informal conversation by Mobile Mason who is well acquainted with local villagers. There may be some data which is not completely accurate due to miscommunication between household and Mobile Mason or household's level of understanding of questions. Nevertheless, the data shows a trend of financial situation.

- Total Number of Surveyed Beneficiaries: 43,416 beneficiaries
- Average Construction Cost: NPR 633,330
- Beneficiaries Who Loaned: 28,075 beneficiaries
- Total Loan Amount: NPR 7,586,650,000
- Average Loan Amount: NPR 270,228
- Average Loan Interest: 21.9 %

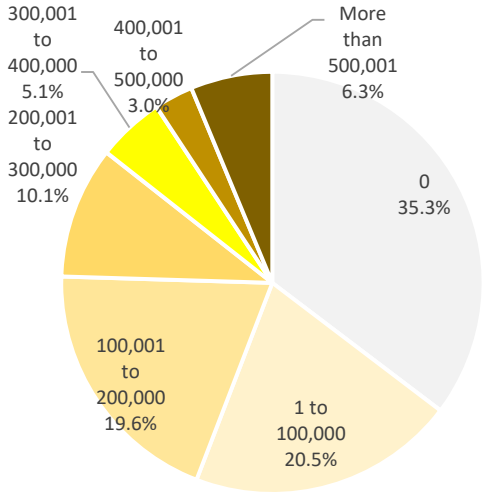
Out of the total beneficiaries, 43,854 beneficiaries completed the construction. Among them the cost information of the houses were taken from 43,416 beneficiaries. It was found that the average construction cost was NPR 633,330 and the average loan amount was NPR 270,228, which means that the beneficiaries invested NPR 333,330 (NPR 63,102 from own fund and NPR 270,228 from loan) in addition to the government support of NPR 300,000. The percentage of the loan interest is 21.9% which is very high and the beneficiaries took the loan from unofficial sectors like neighbours and relatives in which the process is easy for them.



(n:43,416)

Source: This Study 2018

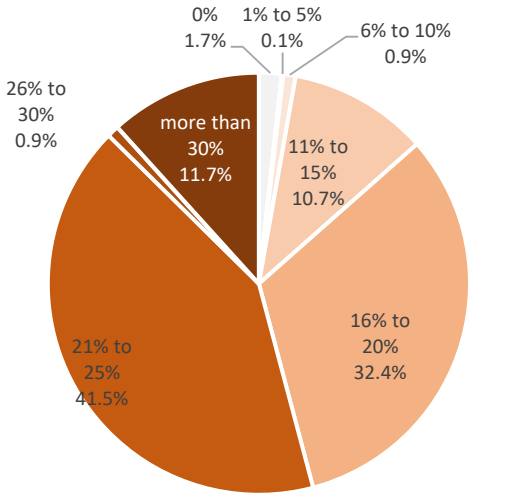
Figure 3-14 Reconstruction Cost



(n:43,416)

Source: This Study 2018

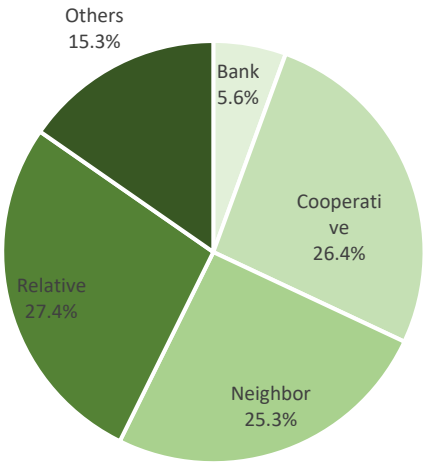
Figure 3-15 Loan Amount



(n: 28,077)

Source: This Study 2018

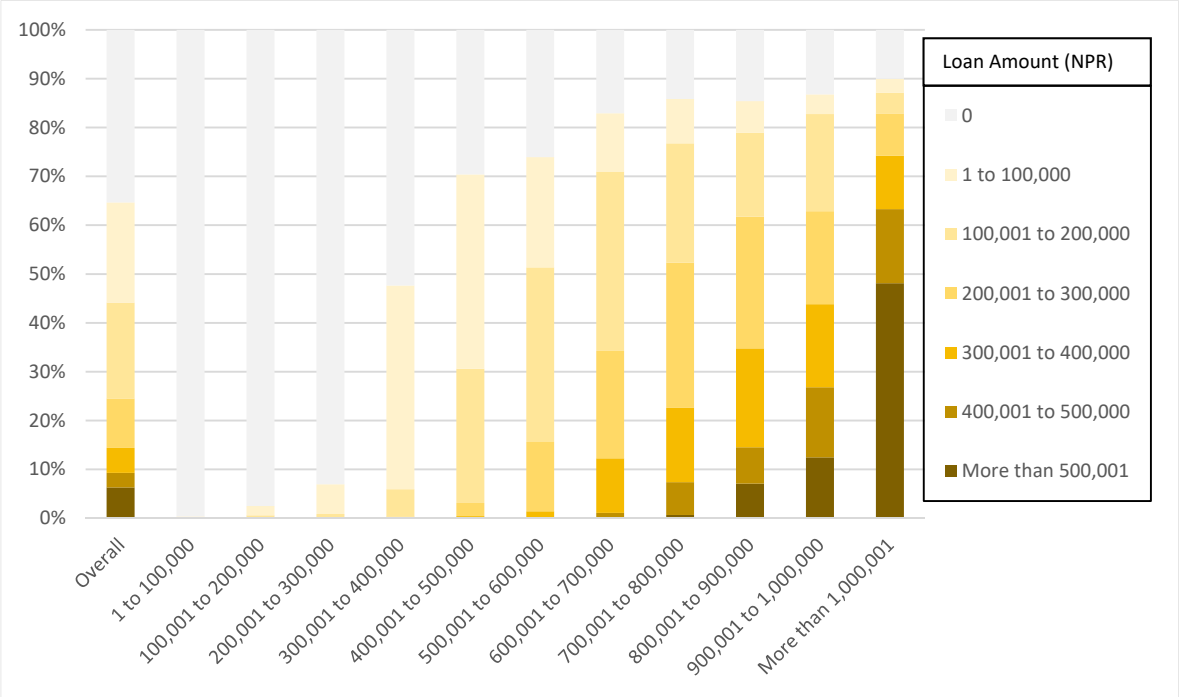
Figure 3-16 Loan Interest Rate



(n: 28,077)

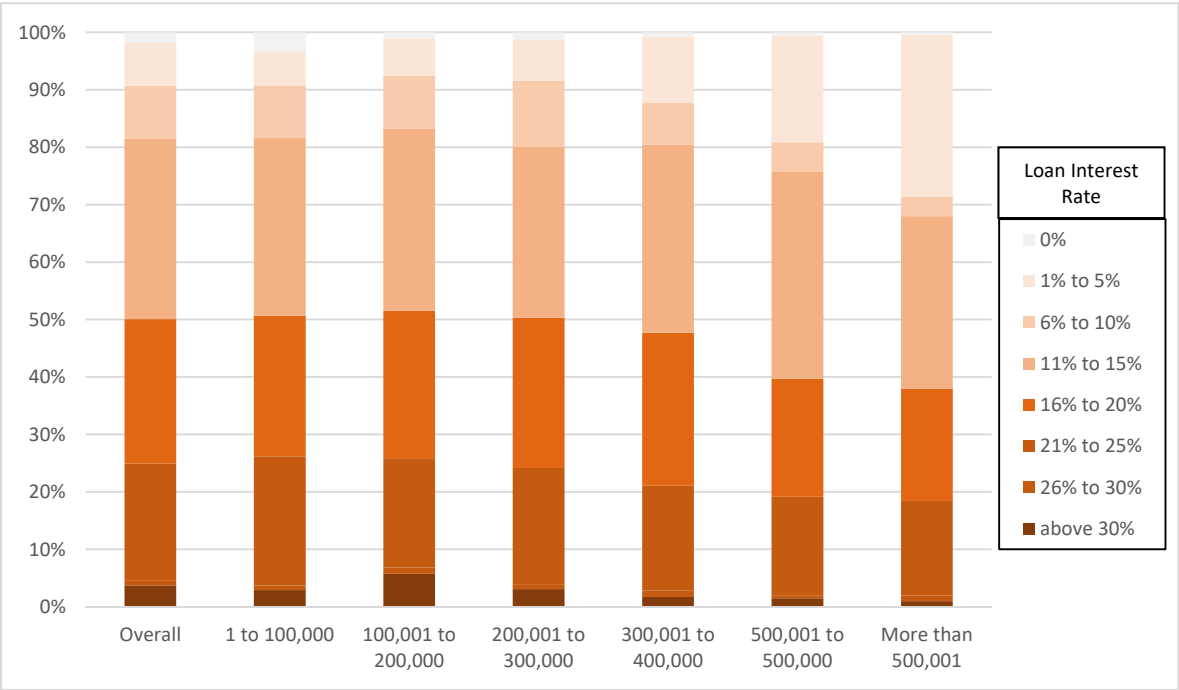
Source: This Study 2018

Figure 3-17 Lenders



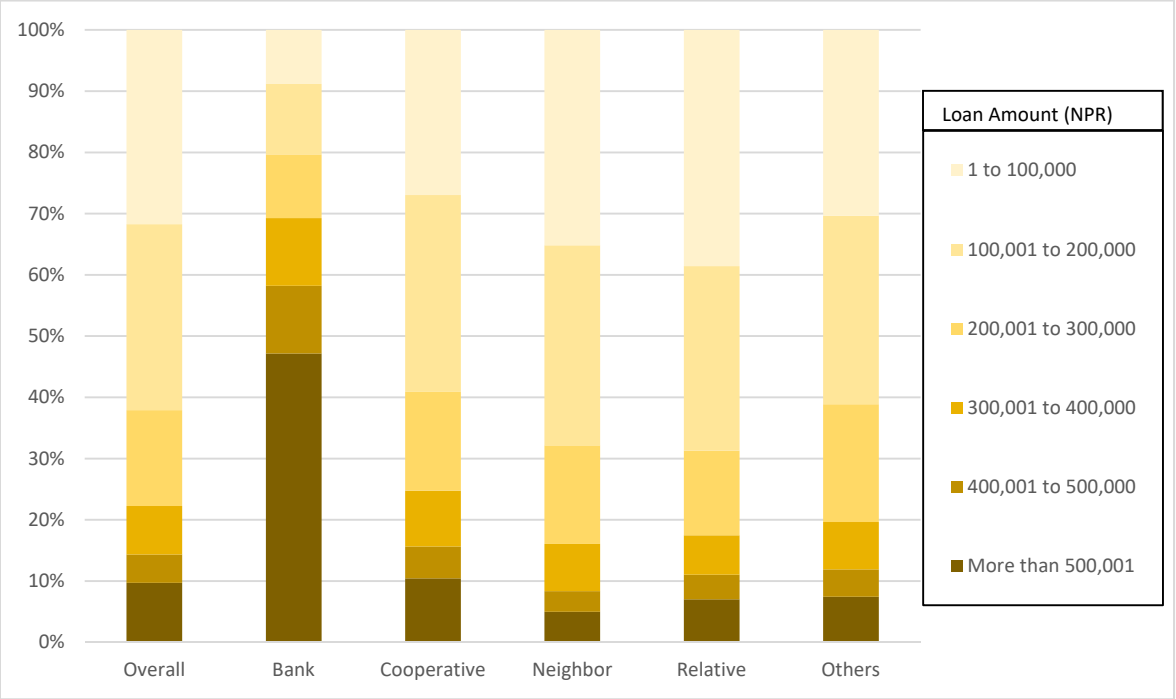
Source: This Study 2018

Figure 3-18 Proportion of Loan Amount by Reconstruction Cost



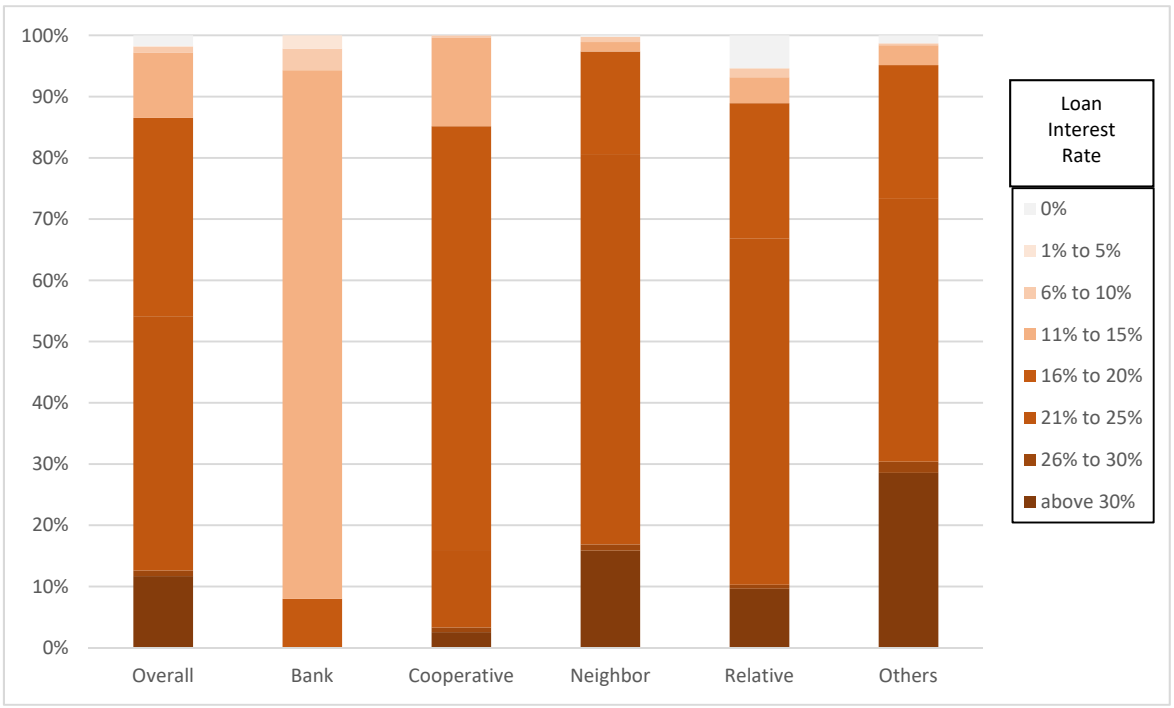
Source: This Study 2018

Figure 3-19 Proportion of Loan Interest Rate by Loan Amount



Source: This Study 2018

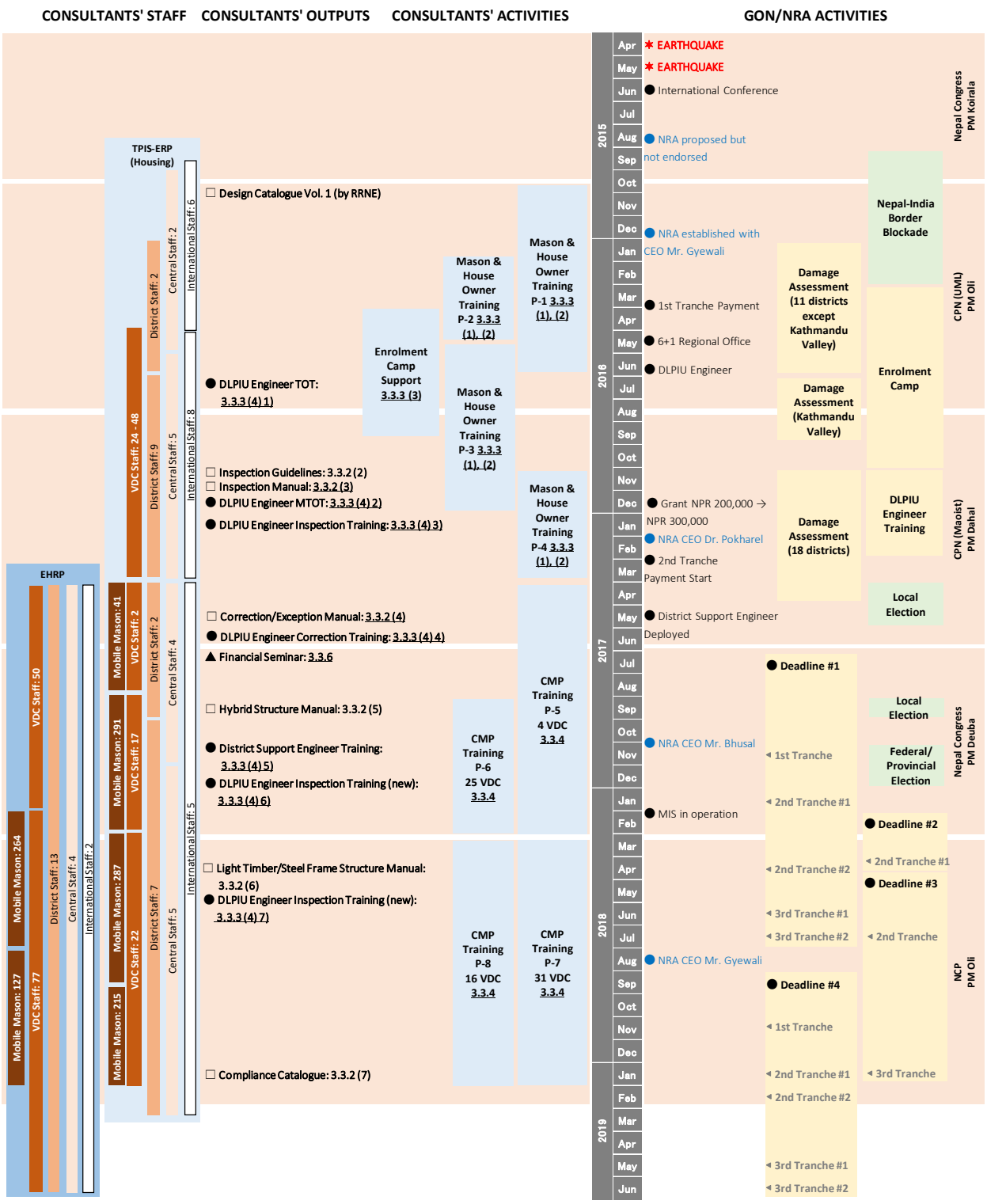
Figure 3-20 Proportion of Loan Amount by Lender



Source: This Study 2018

Figure 3-21 Proportion of Loan Interest Rate by Lender

3.3 TPIS-ERP Technical Assistance Outputs



Source: This Study 2018

Figure 3-22 Overall Consultants Activities and Outputs

3.3.1 Status of Contractual Scope of Work

The following table shows the scope of work stipulated in TPIS-ERP Consultants Agreement ([Scope of Work for Housing Reconstruction] of (2) Field Work, 7. Scope of Work, Particular Specification) and its status as of December 2018.

Table 3-7 Status of Contractual Scope of Work as of December 2018

Scope of Work	Status	Accomplishment
1) Confirmation of Japanese ODA LOAN Project Implementation Manual	Consultants have monitored the modification of the Program Operations Manual (POM) by NRA.	100%
2) Selection of housing reconstruction grant beneficiaries in the target area	NRA selected beneficiaries for housing reconstruction/retrofitting grant based on the results of damage survey. Consultants have monitored the selection of additional beneficiaries through the grievance redressal.	100%
3) Preparation of priority criteria for housing reconstruction grant distribution	Criteria were not prepared since every beneficiary was able to receive the grant without any prioritisation	Not applicable
4) Preparation and implementation of trainings	Consultants have conducted the following trainings: • House owner training • Mason training • DLPIU Engineer training • Mobile Mason training on correction work • Community Mobilization Program	100%
5) Confirmation of fund flow	Consultants have confirmed and monitored the fund flow at both central and district levels specially money transfer from the assigned Participating Financial Institutions to beneficiary.	100%
6) Consideration of retroactive financing and support for disbursement	Retroactive financing has not taken place.	Not applicable
7) Procurement Seminar including anti-corruption measure	Consultants have conducted a seminar on advance procedure fund flow and management of evidencing documents for loan disbursement. Anti-corruption measure was introduced as part of DLPIU Engineer training.	100%
8) Development of monitoring, inspection and reporting system	Consultants have developed the system by the following guidelines: • Minimum Requirements • Inspection Guidelines	100%
9) Environmental and Social Monitoring System		
a) Baseline survey on environmental and social considerations	Consultants have collected the baseline information.	100%
b) Confirmation of government legislation and organisation in the matter of environmental and social considerations	Consultants have confirmed government legislation and organisation in the matter of environmental and social considerations.	100%
c) Confirmation of selection criteria and procedure for environmental and social subprojects	Consultants have confirmed subproject through ESMS Checklist and excluded subproject under category A in principle.	100%
d) Confirmation of government ESMS capacity and preparation of proposal for improvement and monitoring (in case of deficiency in capacity)	Consultants have prepared and conducted the monitoring plan on ESMS implementation as a trial.	100%
e) Preparation of ESMS Checklist	Consultants have prepared the checklist which JICA and the government approved.	100%
f) Confirmation of World Bank policy on environmental and social considerations	Consultants have collected and shared information with World Bank periodically.	100%

Scope of Work	Status	Accomplishment
g) Support for environmental and social subprojects, if needed	Consultants have provided assistance for integrated settlement.	100%
h) Preparation of Indigenous Peoples Plan Framework (IPPF), if needed	No Issue related to indigenous people was reported.	Not applicable
10) Coordination with Earthquake Housing Reconstruction Project implemented by World Bank	Consultants have coordinated not only with World Bank but also with other donors and I/NGOs.	100%

Source: This Study 2018

3.3.2 Standards and Manuals

The formulation of the standard and manual for seismic resistant construction is fundamental for achieving Build Back Better (BBB) through recovery and reconstruction.

(1) Seismic Standard for Housing Reconstruction Program

To establish a unified seismic resistant construction standard for GON Housing Reconstruction Program, the following points on how to set the targets from the view of BBB have been discussed deeply since 2015.

- The GON considers the reconstruction of houses following NBC200s as BBB reconstruction. The house types in the Hosing Catalogue include brick/stone masonry with mud mortar.
- JICA proposed brick/stone masonry with cement mortar, NBC202, based on engineering and experimental study with the idea of BBB to avoid heavy damage from earthquakes that may occur in the future.

Considering the above gaps, the scope of the housing reconstruction program was discussed from the view of cost, workability, feasibility including the capacity of beneficiaries, social acceptability and sustainability.

The 2nd Japanese Technical Committee was held at the end of February 2016 in Japan to finalise the scope of project in terms of housing reconstruction. In this venue, the RRNE project team explained the result of structural calculation and analysis based on the conclusion of 1st Japanese Technical Committee. As a result of the discussion, the conclusion of Japan side was mainly on the following: NBC105 is the requirement for the BBB, Verification of earthquake resistance should be done with structural calculation, etc.

NRA organised the Technical Standardization Committee on 23rd February 2016 where the RRNE project Team explained the conclusion of Japanese Technical Committee and it was discussed whether NBC105 should be applied to residential buildings in the reconstruction programme as the seismic standard.

Following this discussion, the Minimum Requirements for housing reconstruction program based on NBC105 was developed with RRNE Team playing the central role.

The Minimum Requirements consist of ten items, namely: site selection, shape/size of house, materials, foundation, vertical member, plinth, walls, and doors/windows, horizontal band, and roof.

There are four Minimum Requirements by types of construction methods as follows:

- SMC: Stone masonry in cement mortar
- BMC: Brick masonry in cement mortar
- SMM: Stone masonry in mud mortar
- BMC: Brick masonry in mud mortar

Through long process with deep discussion, the Minimum Requirements was finalised based on NBC105.

After the setting of the Minimum Requirements, NRA Technical Working Group had worked on many guidelines and manuals.

Below are the guidelines and manuals published by NRA:[15]

- Inspection Guidelines for Housing Reconstruction Program
- Approved：11 November 2016, Size: A4, 93 pages, Language: English and Nepali
- Inspection Manual for Housing Reconstruction Program (Appendix of Inspection Guidelines)
- Size: A4, 93 pages, Language: English and Nepali
- Correction/Exception Manual for Masonry Structure for Housing Reconstruction Program
- Approved：9 May 2017, Size: A4, 87 pages, Language: English and Nepali
- Hybrid Structure Manual for Housing Reconstruction Program
- Approved：24 September 2017, Size: A4, 98 pages, Language: English and Nepali
- Light Timber/Steel Frame Structure Manual for Housing Reconstruction Program
- Approved：17 April 2018, Size: A4, 129 pages, Language: English
- Compliance Catalogue of Housing Reconstruction Program
- Size: A4, 86 pages, Language: English

(2) Inspection Guidelines

TPIS-ERP in collaboration with NRA and the World Bank developed an inspection manual in order for the housing quality inspection to be carried out rigorously and fairly. The inspection manual was approved by NRA on 11th November 2016 as the governmental guideline. This guideline stipulates the procedure of quality inspection and roles of related organisations, and includes forms

[15] Guidelines and manuals can be downloaded from NRA official Web site (http://nra.gov.np/#).

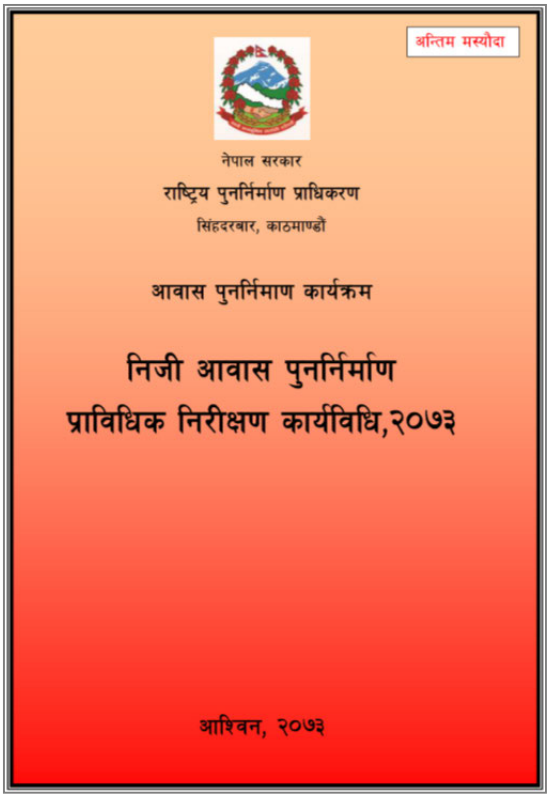
as attachments. The outline of the inspection procedure is as follows.

1) A beneficiary indicates own choice of a building type from Annex-3 or the beneficiary reconstructs a flexible house design in PA during the period of enrolment camp.
2) The beneficiary receives NPR 50,000, the first tranche of the grant.
3) When it turns out that the construction site has geographical, geological or other types of problems, the beneficiary may receive a technical instruction by submitting Annex-4.1 (Application Form for Inspection of site and foundation, Technical assistance). An inspector shall inspect the site using Annex-5 (Certification of site and foundation). If a problem is confirmed, the inspector shall present methods of correction (Annex 4-3).
4) When the construction up to plinth level is completed, the beneficiary requests the government for the first inspection by submitting Annex-4.2. The inspection team shall inspect according to the inspection sheet in Annex-6. There are different inspection sheets by structural type.
5) The beneficiary receives NPR 150,000, as the second tranche of the grant, provided that the construction passes the inspection.
6) If the construction failed the inspection, the inspector shall present methods of correction or retrofitting using Annex-7 (Correction/Retrofitting inspection form). After the correction or retrofitting works are done, the beneficiary requests the government for a re-inspection by submitting Annex-4.2.
7) The second inspection shall be carried out at the completion of construction of the wall up to roof band for a one-storey building, and at the completion of the works of the 1st floor for a two-story building. As in the case with the first inspection, the beneficiary requests the government for an inspection by submitting Annex-4.2, to be followed by an inspection by the inspector based on Annex-10 (Forms for Inspection Sheet). There are different inspection sheets by structural type.
8) The beneficiary receives NPR100, 000, as the third tranche of the grant, provided that the construction passes the inspection. At this point, the beneficiary has received NPR 300,000 in total, a full amount of the grant.
9) If the construction fails the inspection, as in the case with the first inspection, the inspector shall present methods of correction or retrofitting using Annex-7 (Correction/Retrofitting inspection form). After the correction or retrofitting works are done, the beneficiary requests the government for a re-inspection by submitting Annex-4.2.

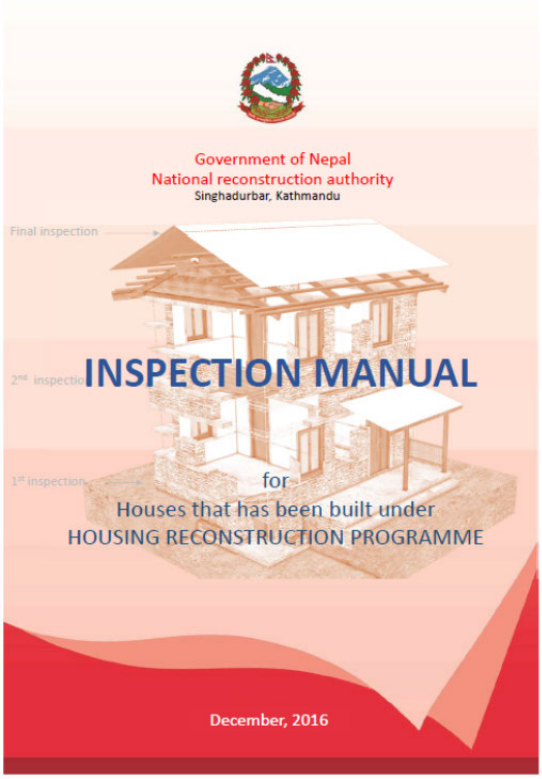
With the construction completion (finishing roof works), the inspector shall inspect it to issue a "House reconstruction completion certification" (Annex-13) and "description of the completed construction."

Inspection Sheet consists of ten items, namely: site selection, shape/size of house, materials,

foundation, vertical member, plinth, walls, and doors/windows, horizontal band, and roof based on the Minimum Requirements. (Inspection sheets are attached as Appendix A)



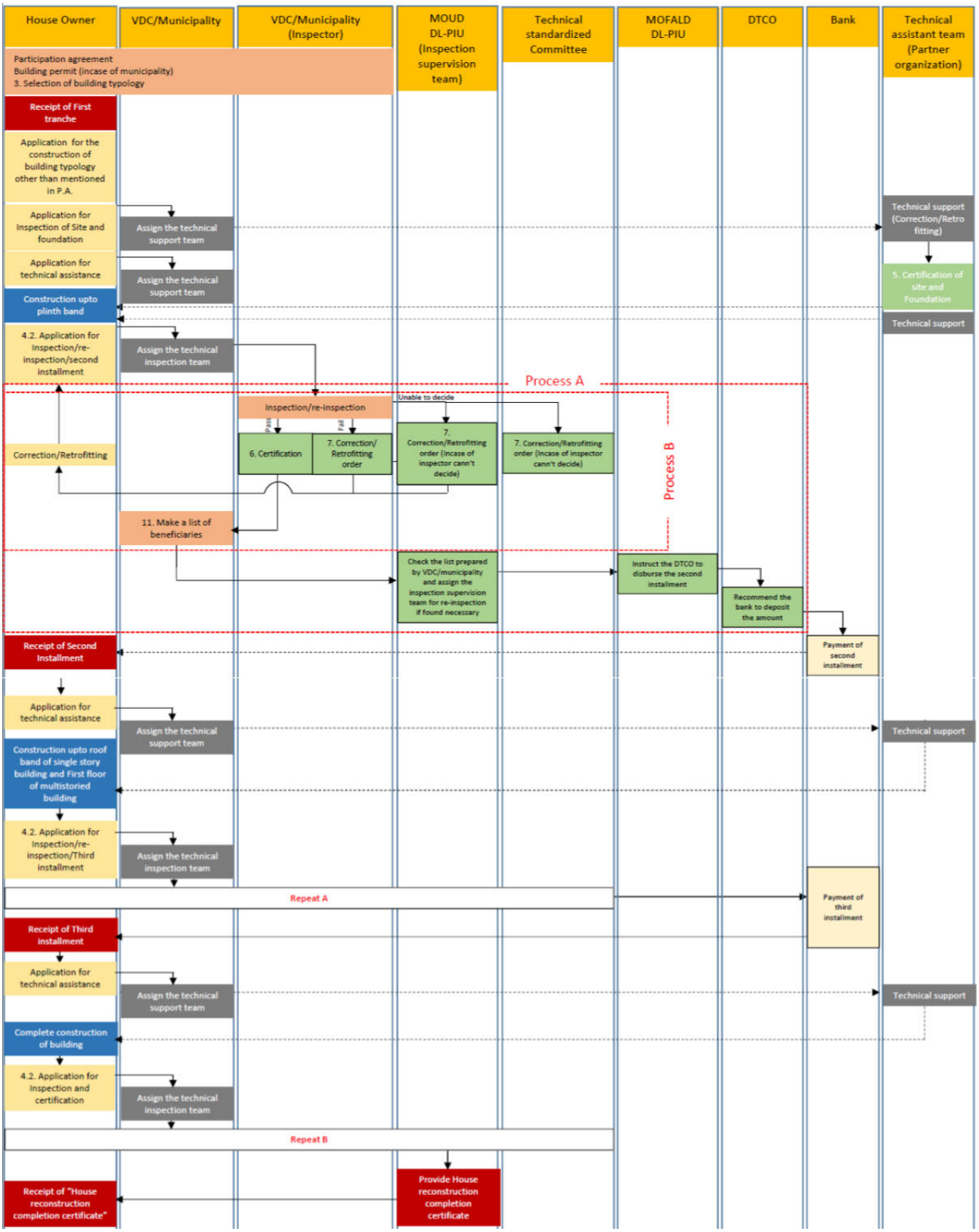
Inspection Guidelines



Inspection Manual

Source: This Study 2018

Figure 3-23 Guideline/Manual for Inspection



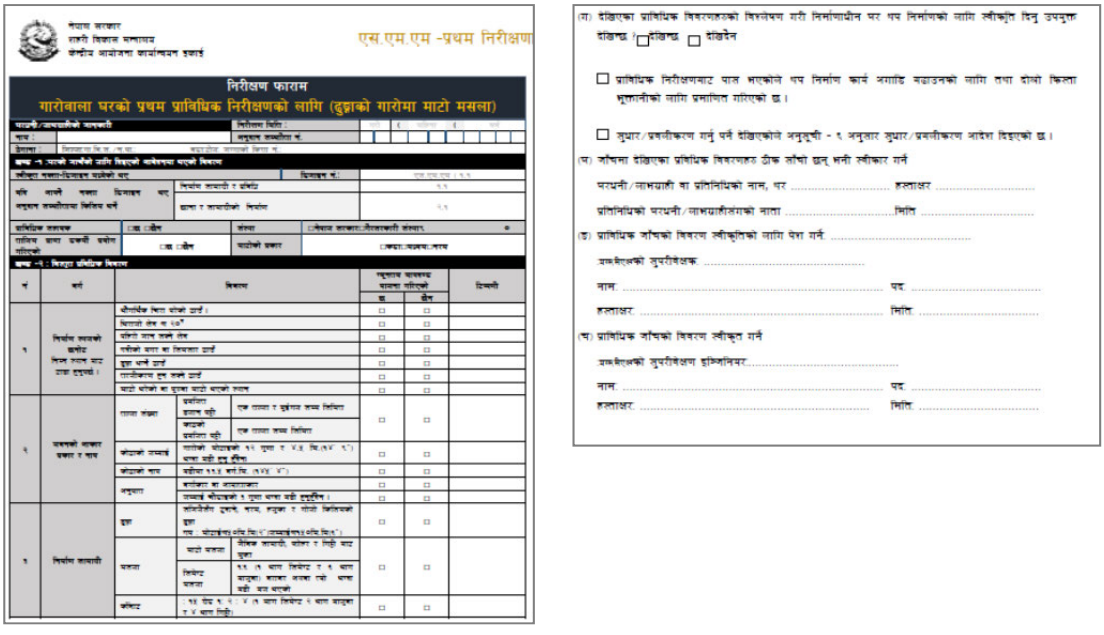
Source: This Study 2018

Figure 3-24 Flowchart of Inspection System

List of Annexes are shown below:

- Annex-1: Procedure of housing reconstruction program under the method of inspection and responsibility of related agencies.
- Annex-2: Flowchart of construction and inspection procedure
- Annex-3: Type of house selected by beneficiary
- Annex-4.1: Application form for Technical Assistance
- Annex-4.2: Application form for Inspection
- Annex-4.3: Correction/Retrofitting order and Inspection form for site selection and layout
- Annex-5: Form to be filled by the inspector for the certification of Site selection and layout for the construction of foundation
- Annex-6.1: Form for First technical inspection and certification of category "A" and "B" buildings of RCC
- Annex-6.2(A): Form for First technical inspection and certification of category "C" buildings of Stone Masonry with Mud mortar
- Annex-6.2(B): Form for First technical inspection and certification of category "C" buildings of Stone masonry with Cement mortar
- Annex-6.2(C): Form for First technical inspection and certification of category "C" buildings of Brick masonry with Mud mortar
- Annex-6.2(D): Form for First technical inspection and certification of category "C" buildings of Brick masonry with Cement mortar
- Annex-6.2(E): Form for First technical inspection and certification of category "C" buildings of RCC
- Annex-7: Correction/Retrofitting order and Inspection form
- Annex-8: If the construction of the building is different than what was agreed in PA
- Annex-9: Inspection for under construction house
- Annex-10-1: Form for Second technical inspection and certification of categories "A" and "B" buildings of RCC
- Annex-10.2 (A): Form for First technical inspection and certification of category "C" buildings of Stone masonry with Mud mortar
- Annex-10.2 (B): Form for First technical inspection and certification of category "C" buildings of Stone masonry with Cement mortar
- Annex-10.2 (C): Form for First technical inspection and certification of category "C" buildings of Brick masonry with Mud mortar
- Annex-10.2 (D): Form for First technical inspection and certification of category "C" buildings of Brick masonry with Cement mortar

- Annex-10.2 (E): Form for First technical inspection and certification of category "C" buildings of RCC
- Annex-11: Recommendation form to be filled by the VDC/Municipality and MOUD-DLPIU
- Annex-12.1: Form for Final technical inspection and certification of categories "A" and "B" buildings of RCC
- Annex-12.2 (A): Form for Final technical inspection and certification of category "C" buildings of Stone masonry with Mud mortar
- Annex-12.2 (B): Form for Final technical inspection and certification of category "C" buildings of Stone masonry with Cement mortar
- Annex-12.2 (C): Form for Final technical inspection and certification of category "C" buildings of Brick masonry with Mud mortar
- Annex-12.2 (D): Form for Final technical inspection and certification of category "C" buildings of Brick masonry with Cement mortar
- Annex-13: Building completion certificate
- Annex-14: Details of completed houses



Annex-6.2(A): Form for First technical inspection and certification of category "C" buildings of Stone masonry with Mud mortar

Source: This Study 2018

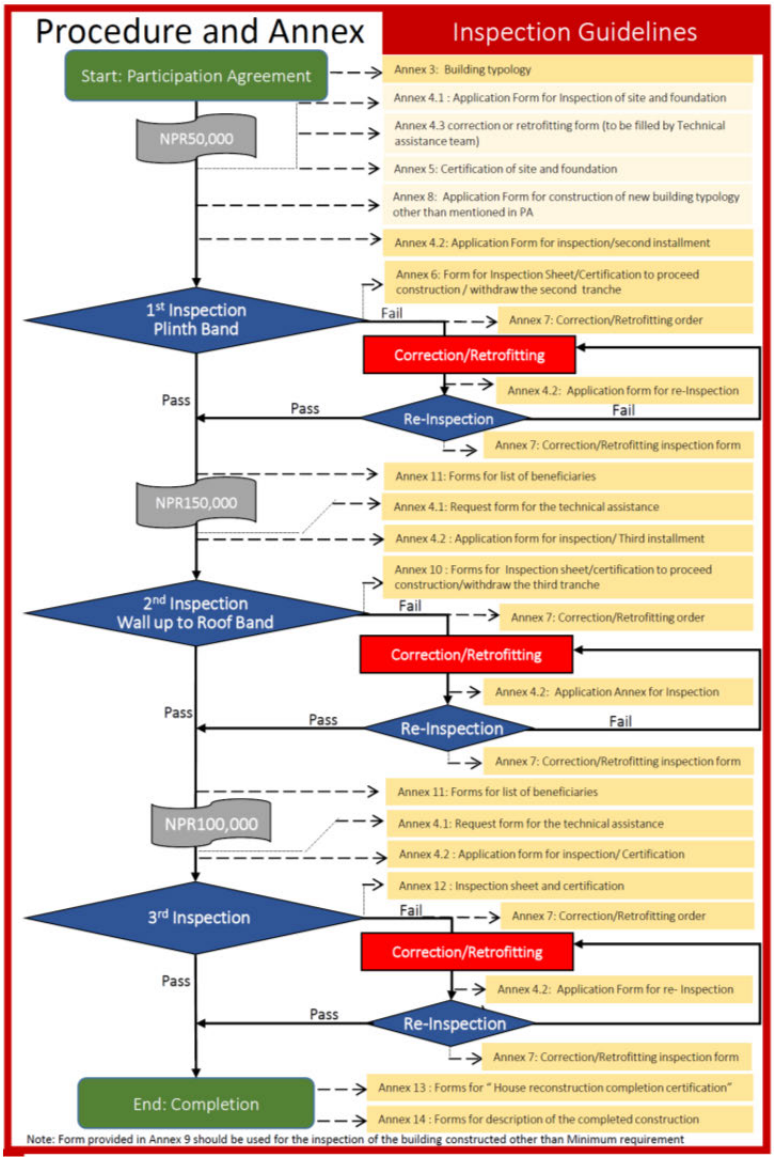
Figure 3-25 Sample of Inspection Sheet : 1st Inspection for SMM

(3) Inspection Manual

This Inspection Manual was published as appendix document of the Inspection Guidelines. TPIS-ERP Technical Standards Team took a main role in NRA Technical Working Group in the preparation of this manual. This manual is intended for the government-employed engineer who act as inspector in the field. Because majority of these engineers are young and new graduates without practical experience yet, it is necessary to provide such manual for the field inspection.

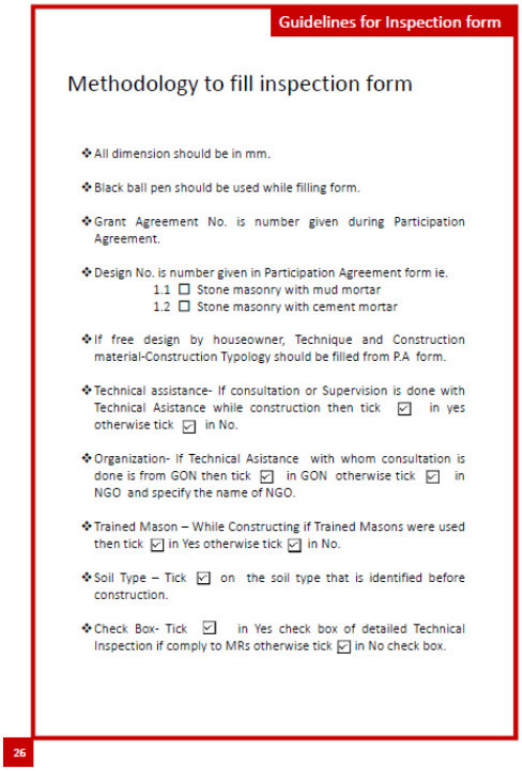
It consists of the following contents.

- Inspection procedures and relevant documents
- Methodology in filling in the Inspection Form
- Methods to evaluate each inspection item

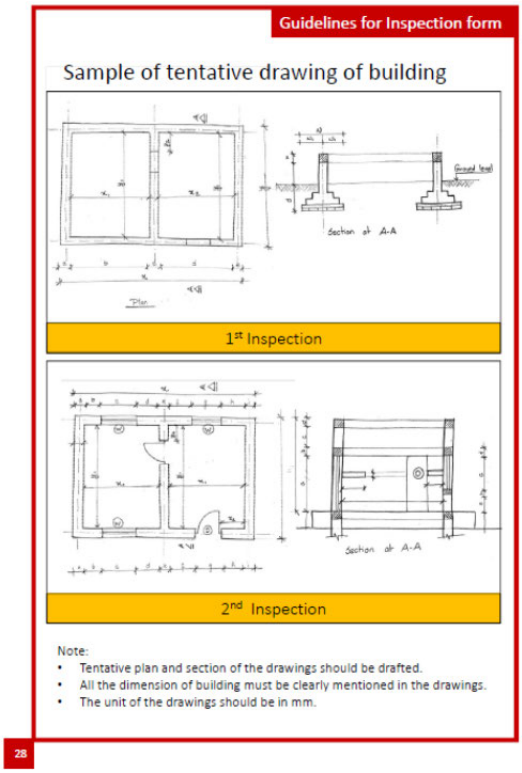


Source: This Study 2018

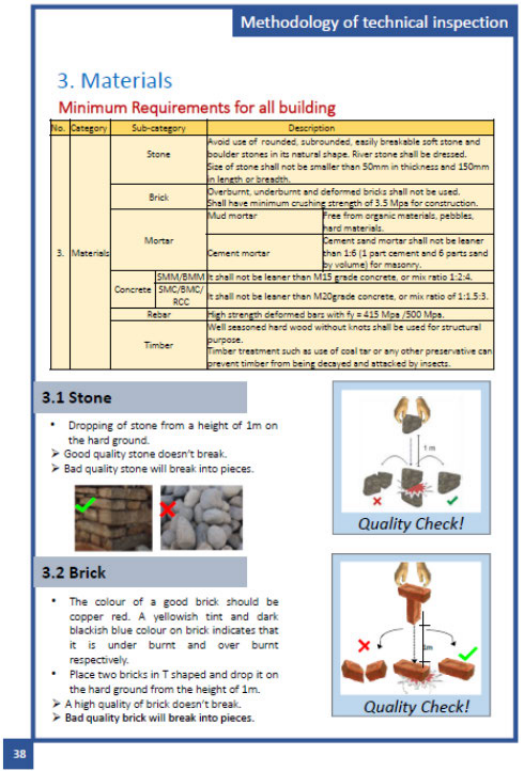
Figure 3-26 Inspection Procedures and Relevant Documents



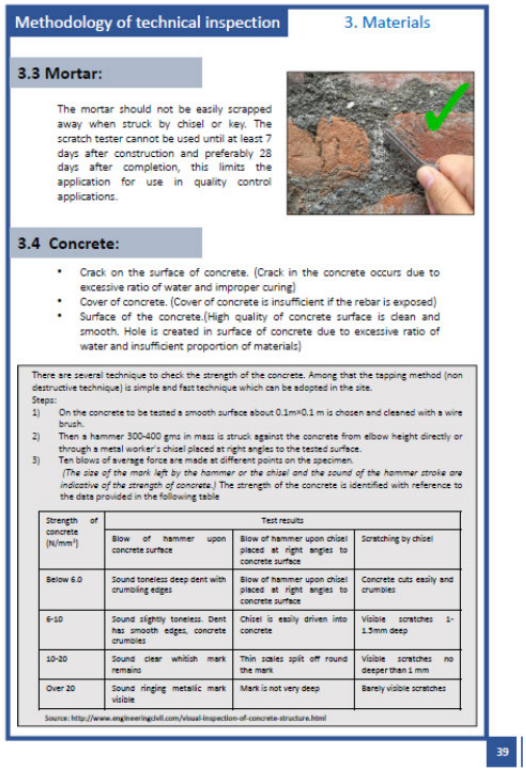
Methodology in filling in the Inspection Form



Sample drawings of a plan and section plan



Inspection Method



Evaluation criteria

Source: This Study 2018

Figure 3-27 Items from Inspection Manual

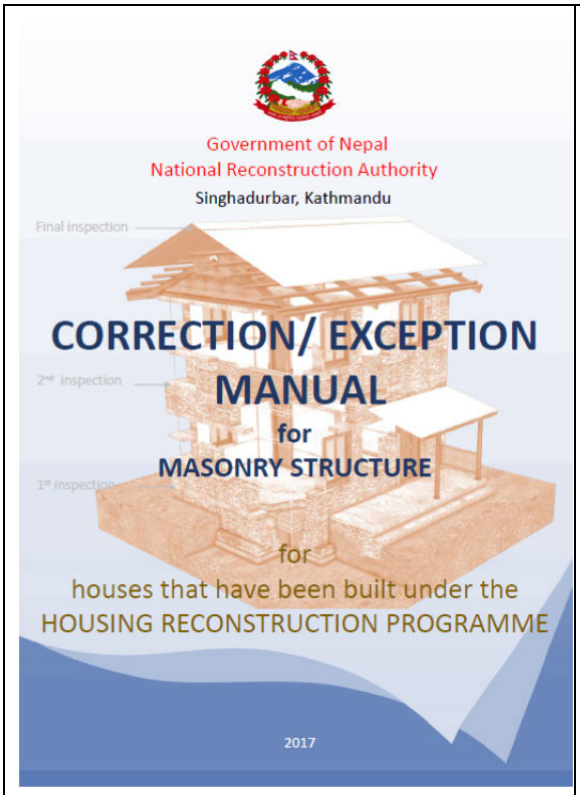
(4) Correction/Exception Manual

As GON Housing Reconstruction Program had started full-scale, "Correction/Exception Manual" was developed in order for the inspections to cope with various issues in actual construction. The manual was put together by NRA Technical Working Group in which TPIS-ERP played a central role. Following the technical review on 13th April 2017 by NRA Technical Standardization Committee, the manual was officially approved by NRA on 9th May 2017.

Correction is the corrective measures required to make noncompliant, newly constructed or under construction houses compliant with the Minimum Requirements as per NBC 105. The appropriate corrective measures can be carried out on any individual building which is missing earthquake-resistant elements as per the Minimum Requirements at any stage of construction. These measures were confirmed by the NRA Technical Standardization Committee on the basis of the Minimum Requirements following NBC 105. Hence, when all required corrective measures have been completed, the building can be approved for the subsequent tranche of the housing reconstruction grant.

Exception could be cases when the buildings that do not comply with the Minimum Requirements are structurally safe as per NBC 105, these cases include the ones mentioned in NBC. The exception cases were confirmed by the NRA Technical Standardization Committee on the basis of seismic standard following NBC 105. Hence, when all required exception measures have been completed, the building can be approved for the subsequent tranche of the housing reconstruction grant.

With the completion of the Correction/Exception Manual, the Minimum Requirements, inspection standard and correction methods for masonry buildings, which are the most common architectural methods for housing reconstruction after the earthquake, have been set. Likewise, the Minimum Requirements and inspection standards for RC buildings have been established after NRA simultaneously set the Minimum Requirements for masonry and RC buildings.



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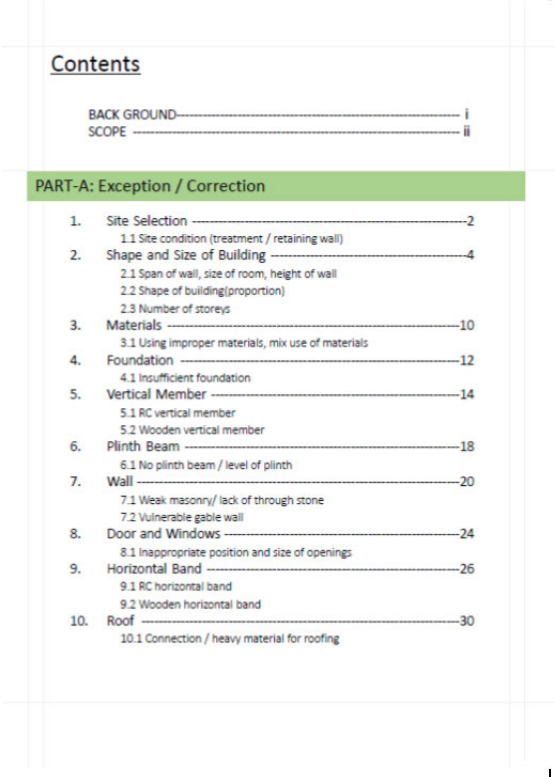

Contents

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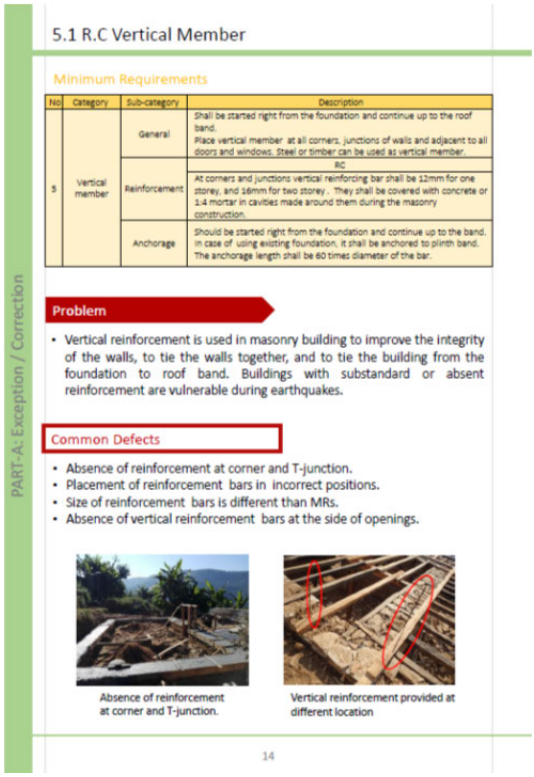


5.1 R.C Vertical Member

Minimum Requirements

No	Category	Sub-category	Description
5	Vertical member	General	Shall be started right from the foundation and continue up to the roof band. Place vertical member at all corners, junctions of walls and adjacent to all doors and windows. Steel or timber can be used as vertical member.
		Reinforcement	RC At corners and junctions vertical reinforcing bar shall be 12mm for one storey, and 16mm for two storey. They shall be covered with concrete or 1:4 mortar in cavities made around them during the masonry construction.
		Anchorage	Should be started right from the foundation and continue up to the band. In case of using existing foundation, it shall be anchored to plinth band. The anchorage length shall be 60 times diameter of the bar.

PART-A: Exception / Correction

Problem

- Vertical reinforcement is used in masonry building to improve the integrity of the walls, to tie the walls together, and to tie the building from the foundation to roof band. Buildings with substandard or absent reinforcement are vulnerable during earthquakes.

Common Defects

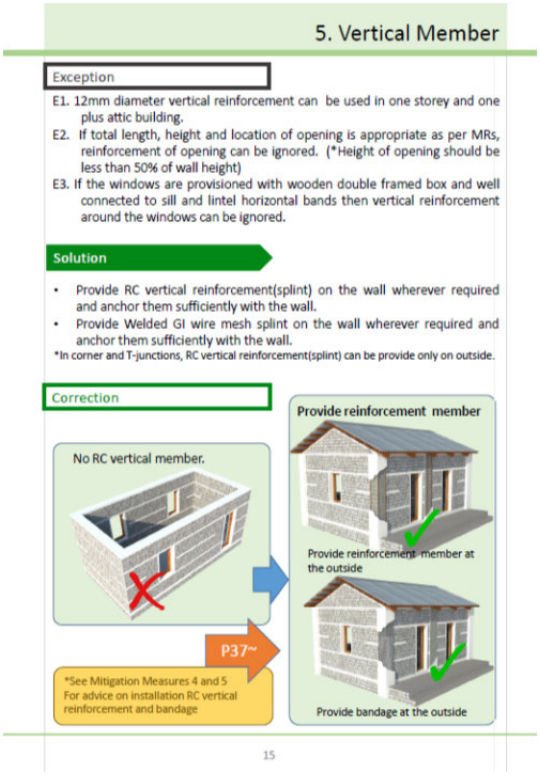
- Absence of reinforcement at corner and T-junction.
- Placement of reinforcement bars in incorrect positions.
- Size of reinforcement bars is different than MRs.
- Absence of vertical reinforcement bars at the side of openings.

Absence of reinforcement at corner and T-junction.

Vertical reinforcement provided at different location

14

Minimum Requirements and common defects



5. Vertical Member

Exception

E1. 12mm diameter vertical reinforcement can be used in one storey and one plus attic building.
E2. If total length, height and location of opening is appropriate as per MRs, reinforcement of opening can be ignored. (*Height of opening should be less than 50% of wall height)
E3. If the windows are provisioned with wooden double framed box and well connected to sill and lintel horizontal bands then vertical reinforcement around the windows can be ignored.

Solution

- Provide RC vertical reinforcement(splint) on the wall wherever required and anchor them sufficiently with the wall.
- Provide Welded GI wire mesh splint on the wall wherever required and anchor them sufficiently with the wall.

*In corner and T-junctions, RC vertical reinforcement(splint) can be provide only on outside.

Correction

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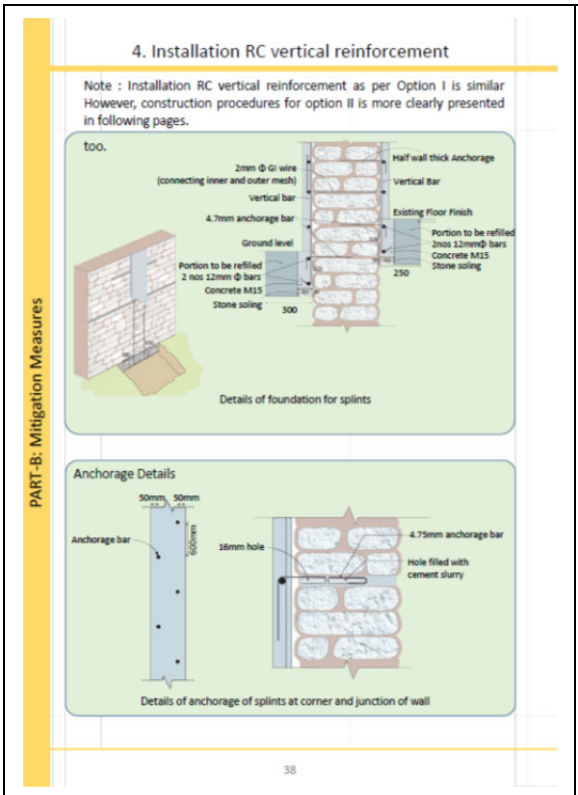
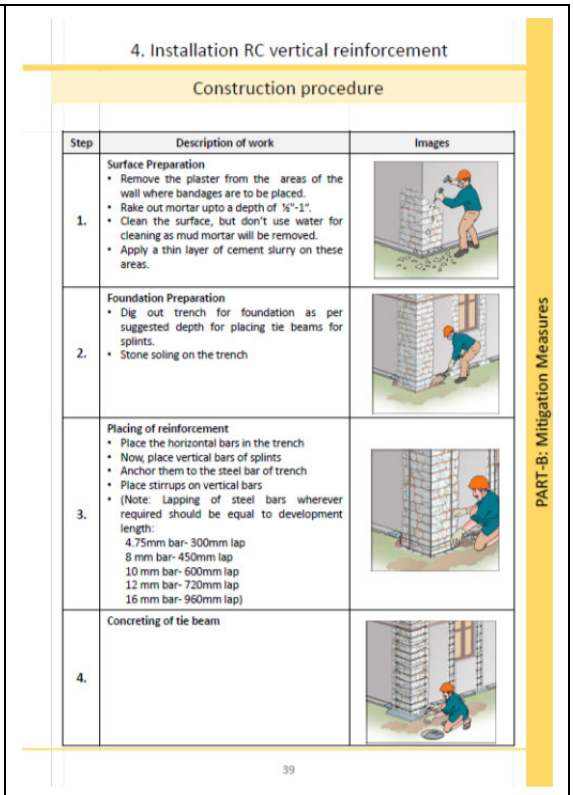
Exceptions and Correction Methods





Sample of Reinforcement	Reinforcement Method （Step by Step）

Source: This Study 2018

Figure 3-28　Correction/Exception Manual

(5)　Hybrid Structure Manual

After the Housing Reconstruction Program started full-scale in early 2017, and the inspection by DLPIU engineers began, various issues and problems were reported from construction sites.

Most types of the building structures are masonry and RC. However, other structures are more commonly adopted in some areas. For example, a hybrid structure is commonly observed, which is a combination of masonry structure for the ground floor and wooden structure for the 1st floor. This may be due to the necessity to construct multiple storey buildings, so residents used light-weight materials such as wood for superstructure. It should be recalled that when the earthquake occurred in 2015, multiple storey masonry buildings were more vulnerable.

Under Housing Reconstruction Program, in order to make the buildings that to be constructed earthquake resistance, NRA has formulated the Minimum Requirements based on NBC 105. The Minimum Requirements clearly stated that for the buildings with stone/brick masonry in mud mortar, the number of story is restricted to only one if wooden band is used; and if RC band is used, allowable number of story is one plus an attic, based on structural analysis.

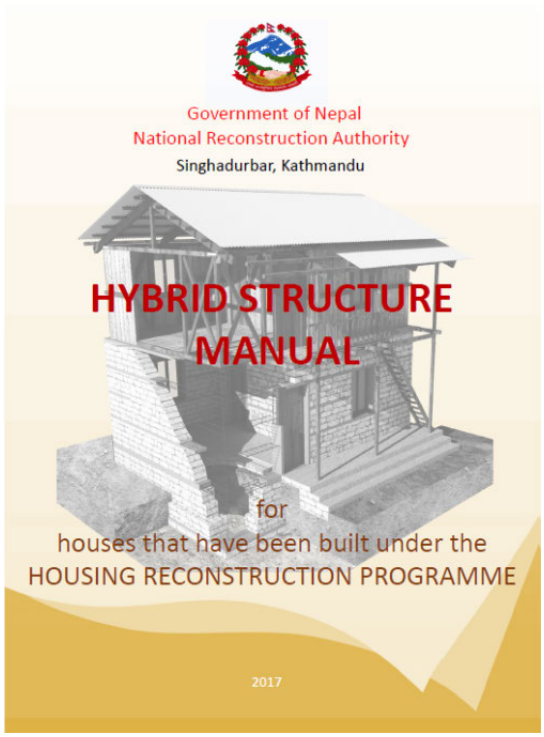
Nevertheless, the people tend to construct two-story buildings to meet their living functional requirements. Furthermore, they have felt the risk of multi-story building constructed with low

strength masonry structure. Hence, they have built the upper story mostly with timber frame structure using the available materials such as CGI sheet on the masonry structure at ground floor. Demand for hybrid structure is huge in the reconstruction field.

As there had been no inspection standard for such hybrid structure, no inspection was carried out. Thus, establishing the inspection standard was an urgent issue tackled. To ensure the safety of these buildings against earthquake load and wind load, it became an urgent task to make the construction guideline along with proper connection details and standards of hybrid structures.

In establishing the inspection standard, since the building codes of Nepal had no rules on wooden structures, the Technical Working Group incorporated "Wall ratio calculation" based on the building codes in Japan so that the new inspection method can be applied to the construction method in Nepal.

"Hybrid Structure Manual" was developed by NRA Technical Working Group in which TPIS-ERP played a central role. Following the technical review on 31st August 2017 by NRA Technical Standardization Committee, the manual was officially approved by NRA on 24th September 2017.



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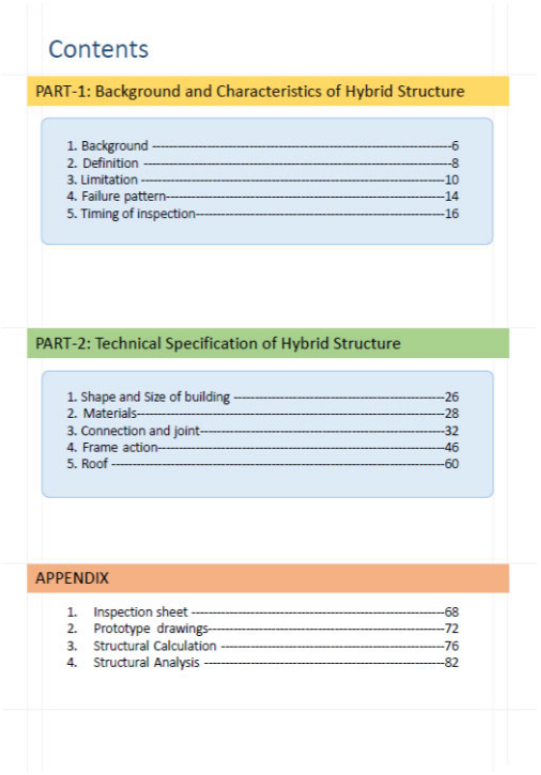

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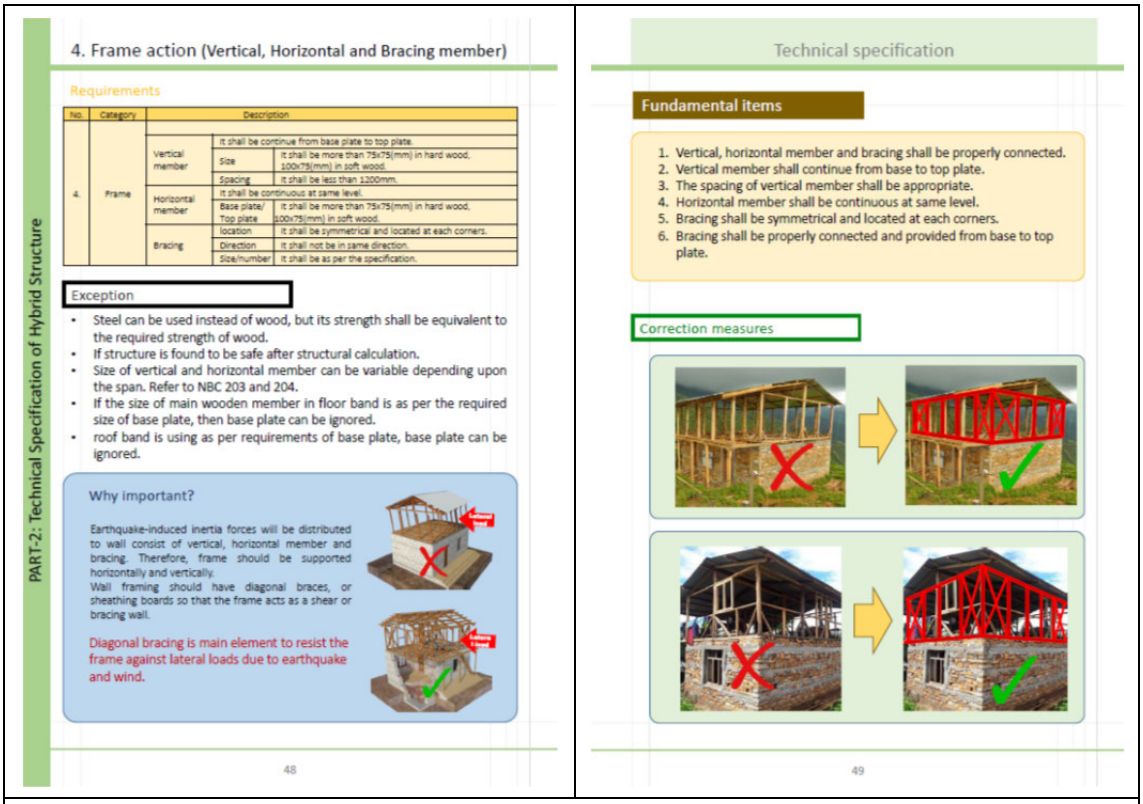
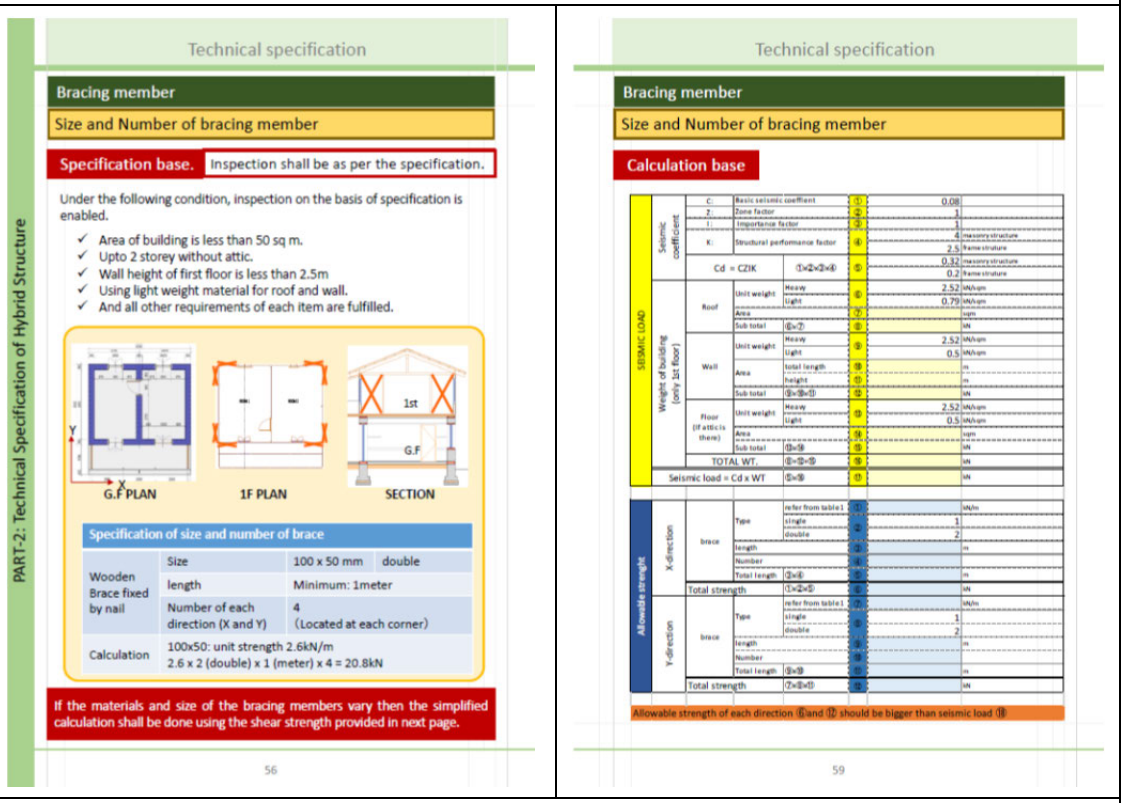


Technical standard for frame structure



Calculation of wall ratio (bracing member)

Source: This Study 2018

Figure 3-29 Hybrid Structure Manual

(6) Light Timber/Steel Frame Structure Manual

Construction of various building typologies is being practice in many parts of the country. The typologies include masonry buildings, RCC buildings and traditional (local area specific) building using wooden or steel, etc. Likewise, masonry and RCC construction (traditional construction) shall have an appropriate technical guideline (including the Minimum Requirements and inspection sheet) to ensure seismic resilience to support the Housing Reconstruction Program.

In some parts of Siwalik range, use of wood in building construction is found quite high. Also, wooden frame building is constructed using traditional method in Sindhuli, Makawanpur and Okhaldhunga districts which are not in JICA target area. In order to inspect traditionally built houses, development of light timber/steel frame structure manual (seismic evaluation manual) had been necessary. This manual consists of inspection sheet and evaluation methods in detail.

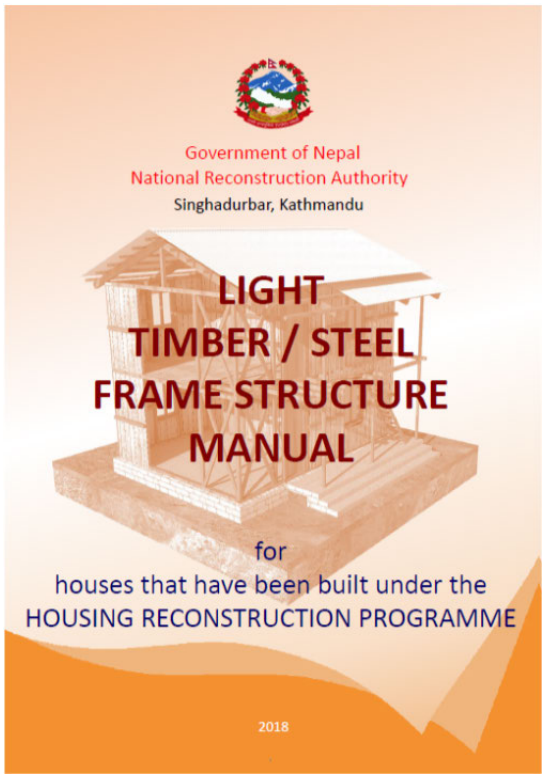
As in the case with hybrid structure, there had been no inspection standard for wooden and lightweight steel structure, thus, no inspection was carried out for such buildings. Thus, establishing the inspection standard was an urgent issue tackled. Based on the analysis output for the superstructure frame for hybrid structure, NRA Technical Working Group established an evaluation method for seismic-resistance capacity and developed an inspection guideline for housing construction of wooden and lightweight steel structure.

In establishing the inspection standard, since the building codes of Nepal have no rules on wooden-structure, the Technical Working Group incorporated "calculation method of necessary wall quantity" based on the building code of wooden structures in Japan so that the new inspection method can be applied to the actual construction in Nepal.

As a result, in addition to houses of bearing wall structure, those of frame structure consisting of columns and beams have become subject to an inspection. That is, inspection guidelines for almost all types of structures of reconstructed houses have been developed. Now, the beneficiaries are able to receive guidance from the inspectors. In case of defects, they can correct or retrofit. In doing so, they cannot only build a seismic-resistant house, but also receive the grant. In other words, the reconstruction rate was raised, with various structural types of houses being inspected.

This Light Timber/Steel Frame Structure Manual was developed by NRA Technical Working Group in which TPIS-ERP acted as a main participant. Following the technical review on 18th March 2018 by NRA Technical Standardization Committee, the manual was officially approved by NRA on 17th April 2018.

The content mention in this manual is to educate engineers/technical staff who are finally involved in the inspection process of such construction. This manual is based on generally recognised engineering principles and practices. It consists of simplified calculations and hands-on correction methods.



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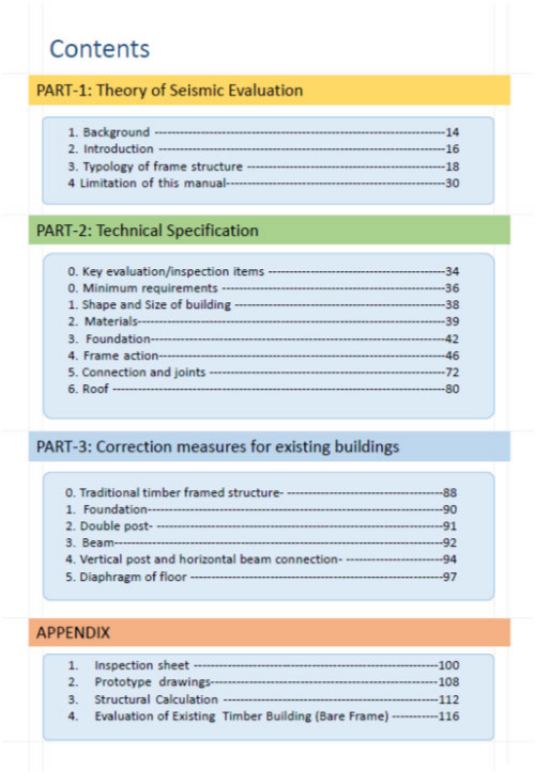

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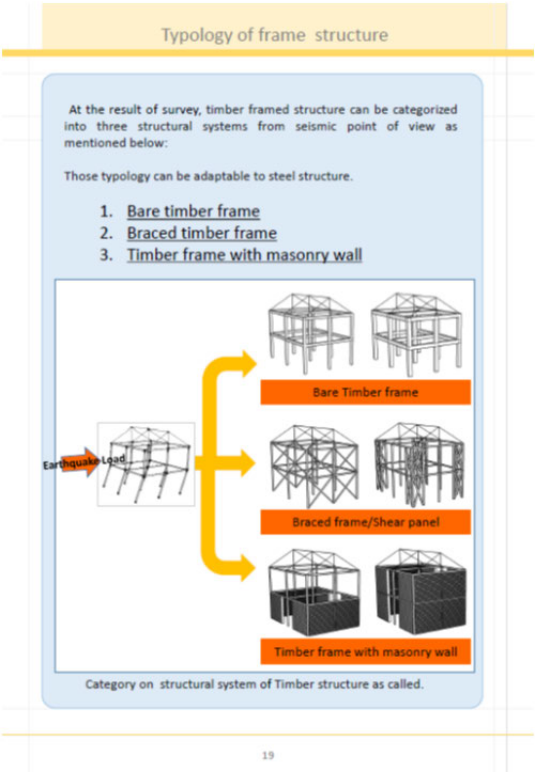
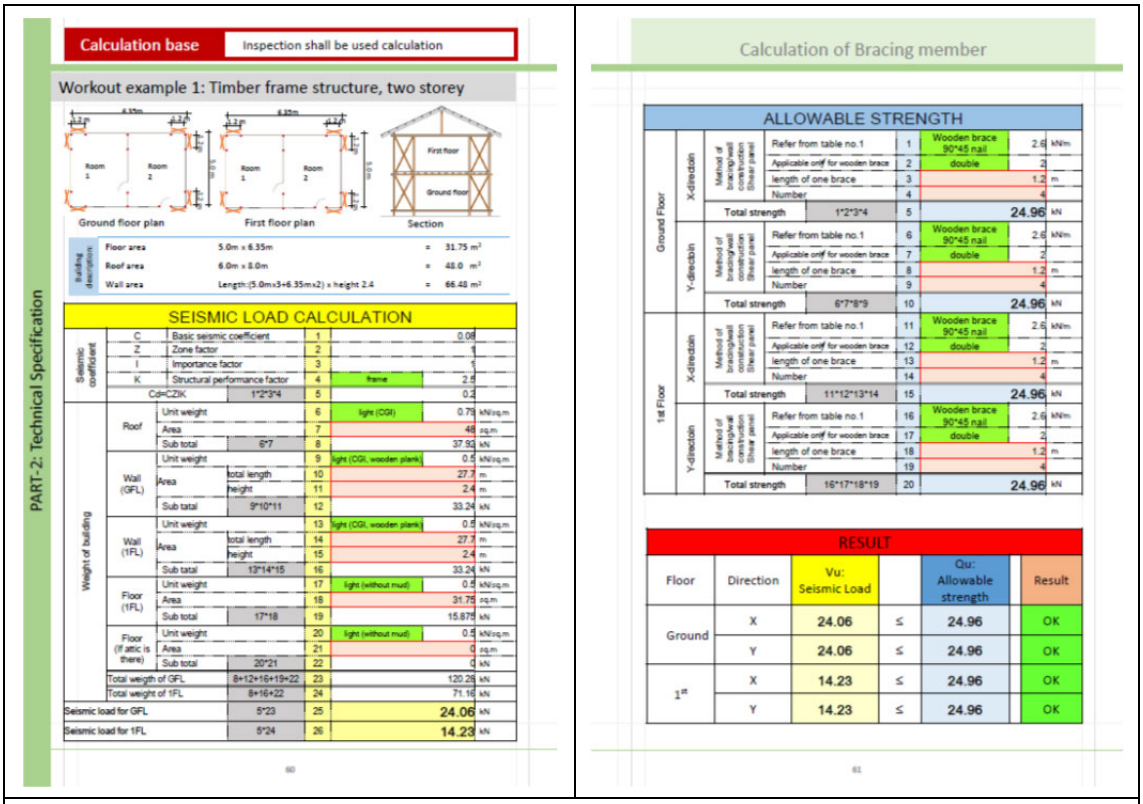


Typologies of frame structures



Calculation of wall ratio (bracing member)

Source: This Study 2018

Figure 3-30 Light Timber/Steel Frame Structure Manual

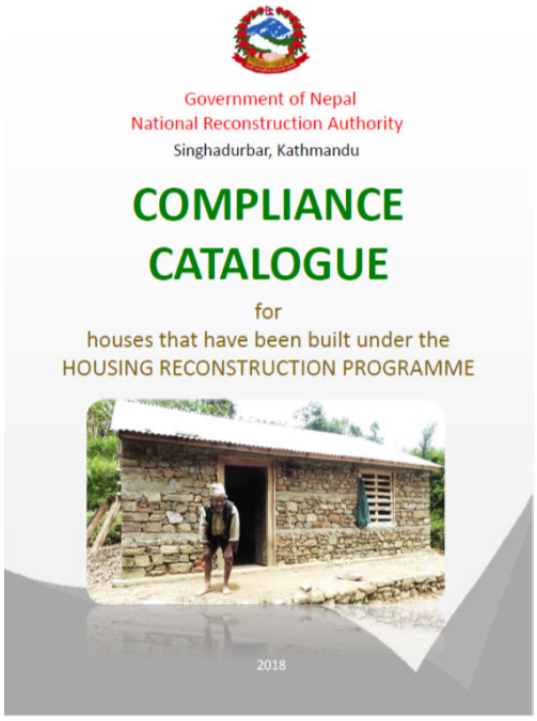
(7) Compliance Catalogue

Three years have passed since the earthquake of 25th April 2015 that rattled Nepal to its very core. Since 2017, significant progress has been achieved in the current situation of reconstruction of houses. However, in expediting housing reconstruction as BBB, a great deal still remains to be done. For example, there are still non-compliant houses, or those which do not fulfil the Minimum Requirements under the Housing Reconstruction Program, that have been found during inspection.

New actions have to be taken to solve noncompliance. The Correction/ Exception Manual for Masonry Structure proved to be a very useful tool of technical assistance for houses which are yet to meet the Minimum Requirements. However, applying the correction measures to make a structure compliant requires significant technical support. This catalogue aims to provide correction measures and step-by-step guidance for appropriate construction.

As the housing reconstruction is primarily based on owner driven and non-engineering construction, various cases of construction other than basic technologies mentioned in the correction manual and design catalogue can be found in the field. To bring uniformity in correction of different typologies of houses, this catalogue introduces many compliant and non-compliant cases, with several correction measures along with their step-by-step procedures for mitigation measures. Hence,

when all the required correction measures have been completed, the building can be approved for the subsequent tranche of the housing reconstruction grant.



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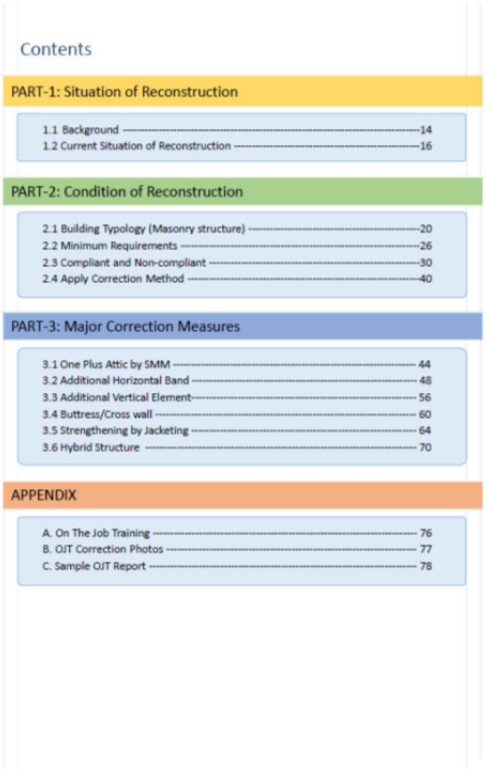

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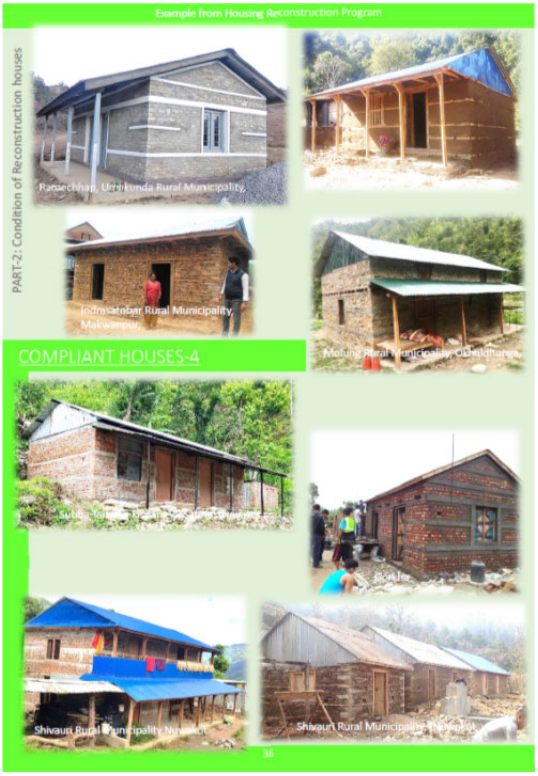
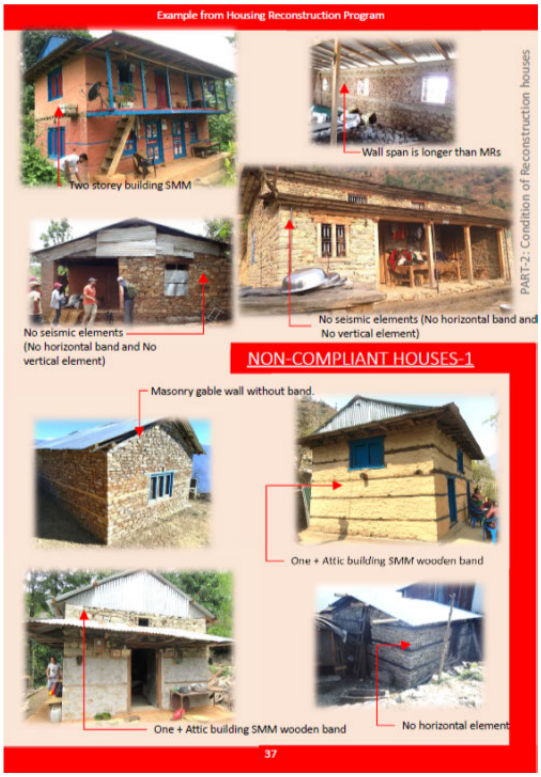
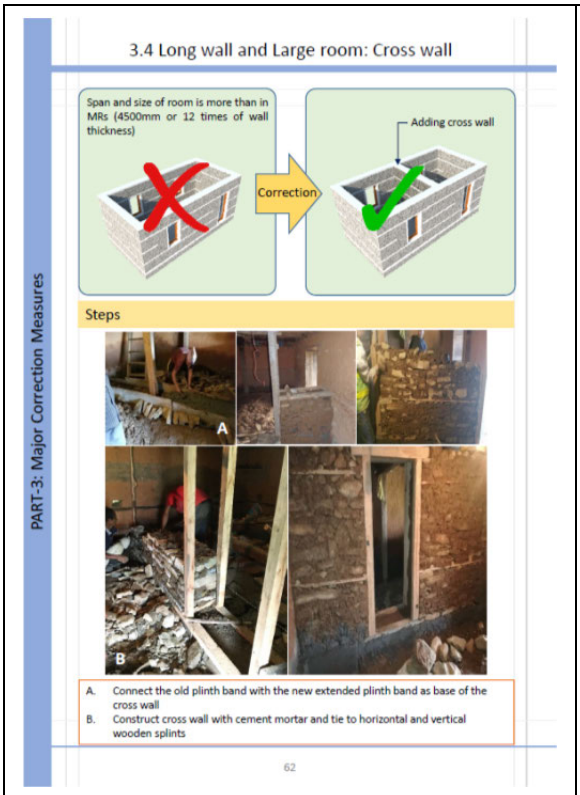


Compliant Houses



Non-compliant Houses



Correction Measures

Corrected Houses

Source: This Study 2018

Figure 3-31 Compliance Catalogue

3.3.3 Training

In order to promote higher quality housing reconstruction than before the earthquake, the dissemination of suitable construction skills and communication on the Housing Reconstruction Program procedure were necessary. In response to the requested of NRA, TPIS-ERP has implemented trainings for house owners and masons. In addition, TPIS-ERP assisted NRA in the management of enrolment camp for the Housing Reconstruction and conducted the Community Mobilization Program as part of the training.

The following table shows the trainings implemented by TPIS-ERP through sub-contractor.

Table 3-8 Training List

Sub-contract Package	Contents	Participant	Contract period / situation	Sub-con tractor
Training (Package 1)	Mason Training on earthquake resilient housing reconstruction skill (lectures and practices, 6/7 days): 9 times	282 masons (280 male and 2 female masons)	Oct 2015 – Jun 2016	TCN
	House Owner Training on earthquake resilient housing reconstruction concept (lectures, site tours, theatrical performance, 1 day): 17 times	711 house owners (350 male and 361 female house owners)		
	Enrolment camp management including confirmation of required documents and communication about earthquake resilient housing, etc.	944 applicants to the Housing Reconstruction		
Training (Package 2)	Mason Training on earthquake resilient housing reconstruction skill (lectures and practical, 7 days): 7 times	218 masons (218 male masons)	Feb 2016 – May 2016	TCN
	House Owner Training on earthquake resilient housing reconstruction concept (lectures, site tours, theatre appreciation, 1 day): 14 times	512 house owners (375 male and 137 female house owners)		
	Enrolment camp management including confirmation of required documents and communication about earthquake resilient housing, etc.	About 2,000 applicants to the Housing Reconstruction Program		
Training (Package 3)	Mason Training on earthquake resilient housing reconstruction skill (lectures and practical, 7 days): 31 times	918 masons (914 male and 4 female masons)	May 2016 – Dec 2016	ERTech
	House Owner Training on earthquake resilient housing reconstruction concept (lectures, site tours, theatre appreciation, 1 day): 62 times	2,454 house owners (1,674 male and 780 female house owners)		
Training (Package 4)	Mason Training on earthquake resilient housing reconstruction skill (lectures and practical, 7 days): 25 times	739 masons (726 male and 13 female masons)	Nov 2016 – Mar 2017	TCN
	House Owner Training on earthquake resilient housing reconstruction concept (lectures, site tours, theatre appreciation, 1 day): 50 times	2,841 house owners (1,310 male and 1,531 female house owners)		
	Refresher Course on earthquake resilient housing reconstruction skill (lectures, 1 day) 49 times	1,404 already trained masons (1,384 male and 20 female masons)		
Training (Package 5)	Community Mobilization Program including CBRC support and Mobile Mason dispatch	House owners in the target 4 VDCs	Apr 2017 – Mar 2018	TCN
	Refresher Course on earthquake resilient housing reconstruction skill (lectures, 2-day): 6 times	191 already trained masons (156 male and 35 female masons)		
	Mobile Mason Training: 4 times	95 masons (89 male and 6 female masons)		
Training (Package 6)	Community Mobilization Program including CBRC support and Mobile Mason dispatch	House owners in the target 21 VDCs	Sep 2017 – Mar 2018	SSE
	Mobile Mason Training: 21 times	561 masons (553 male and 8 female masons)		
Training (Package 7)	Community Mobilization Program including CBRC support and Mobile Mason dispatch	House owners in the target area of Sindhupalchok	Feb 2018 – Jan 2019	SSE
Training (Package 8)	Community Mobilization Program including CBRC support and Mobile Mason dispatch	House owners in the target area of Gorkha	Feb 2018 – Jan 2019	TCN

Source: This Study 2018

(1) House Owner Training

a) Outline

It was necessary for house owners to comprehend why earthquake-resilient houses are important, and to understand the principle and procedure of GON Housing Reconstruction Program. Every training accommodated 60 participants, including leaders of the community, female house owners and economically vulnerable house owners selected by the Ward Citizen Forum. The house owners were given theoretical session along with the demonstration of the models prepared during mason training. The main attraction of the house owners training was theatrical performance which had a message on the importance of earthquake-resilient construction. A total of 6,518 house owners were trained, of which 2,809 were female participants.

Theoretical Session

Theatrical Performance

Source: This Study 2018

Figure 3-32 House Owners Training

b) Curriculum

The training comprised of lecture without practical training. However, its presentation was understandable to all types of house owners including illiterate person by the utilisation of housing models constructed during the Mason Training.

Table 3-9 House Owner Training Curriculums

Time	Activities
11.30 to 12.00 (30 minutes)	Introduction
12.00 to 12.45 (45 minutes)	Lecture on housing handbook
12.45 to 13.15 (30 minutes)	Lunch Break
13.15 to 14.00 (45 minutes)	Visit models of practical works& lecture
14.00 to 14.30 (30 minutes)	Theatrical Performance questionnaire
14.30 to 15.30 (45 minutes)	Orientation (including Preference Survey)and evaluation/tea

Source: This Study 2018

(2) Mason Training

Based on the need of the beneficiaries and masons working in the field, different types of mason training were conducted in the target areas.

1) Mason Training (6 or 7-day[16])

a) Outline

Mason training started in JICA target area in December 2015. The training was intended for the existing masons with more than 1-year working experience who had not received trainings from other donors and provided them knowledge on earthquake-resilient constructions. About 30 masons, nominated by Village Development Committee (VDC) and screened through interviews and practical examination, were trained and provided with allowances and meals. Theoretical knowledge on earthquake-resilient construction followed by practical sessions was the main content of the training. TPIS-ERP conducted 72 trainings and trained a total of 2,157 masons from the target areas, of which 19 were female masons.

b) Curriculum

TPIS-ERP developed a training curriculum with MOUD DUDBC approval based on the DUDBC curriculum. It consisted of the earthquake-resilient technic as per NBC and the latest housing reconstruction information and focuses on practical sessions.

At the end of March 2016, DUDBC announced the revision of mason training curriculum into "Urban type" and "Rural type" that both included the Minimum Requirements. TPIS-ERP revised the training curriculum accordingly and applied it for package 3.

[16] 1st training in Package 1 was a 6-day training. However, it was found that 6 days were not enough to cover the contents, and so the training period was changed to 7 days.

Table 3-10 Mason Training Curriculum (Urban Type)

Time	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
09:30-10:00	Registration	Recapitulation of Day 1	Recapitulation of Day 2	Recapitulation of Day 3	Recapitulation of Day 4	Recapitulation of Day 5	Recapitulation of Day 6
10:00-10:45	Session 1.1 Orientation on Probability of Earthquake and Nepal	Session 2.1 Building Structures, Shapes	Session 3.1 Exercise on Load Bearing Masonry	Session 4.1 Exercise on Load Bearing Masonry	Session 5.1 Exercise on Load Bearing Masonry	Session 5.7 Exercise on connecting wall with floor	Session 7.1 Video Show: Shake Table
10:45-11:30	Session 1.2 Orientation on Probability of Earthquake and Nepal	Session 2.2 Exercise on Building Structures, Shapes	Session 3.2 Exercise on Load Bearing Masonry	Session 4.2 Exercise on Load Bearing Masonry	Session 5.2 Exercise on Load Bearing Masonry (Discussion on the field for 10 Minimum Requirements by using models)	Session 6.2 Wooden truss construction	Session 7.2 National Building Code and role of Masons
11:30-11:45	Tea Break	Tea Break	Tea Break	Tea Break	Tea Break	Tea Break	Tea Break
11:45-12:30	Session 1.3 Training Objective, introduction and Expectation of participation, Pre-test	Session 2.3 Exercise on Building Structures, Shapes	Session 3.3 Exercise on Load Bearing Masonry	Session 4.3 Exercise on Load Bearing Masonry "There sub group should be made for stone dressing, wall construction, mortar preparation."	Session 5.3 Theory on RC Frame Structure Technology Session	Session 6.3 Wooden truss construction	Session 7.3 JICA (Manual for masons and (Design Catalogue)
12.30- 13.15	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
13:15- 14.00	Session 1.4 Theory and Exercise on the construction of Slab, Stonecrete and Block	Session 2.4 Quality of Construction and Construction Materials	Session 3.4 Exercise on Load Bearing Masonry	Session 4.4 Exercise on Load Bearing Masonry	Session 6.1 Wood and Bamboo House Construction Technology	Session 6.4 Periodic Maintenance of Building	Session 7.4: Post-test of the slab, stonecrete and block
14:00-14:45	Session 1.5 Theory and Exercise on the construction of Slab, Stonecrete and Block	Session 2.5 Testing of Quality of Construction Materials (Sand, Brick, Cement, Reinforcement)	Session 3.5 Exercise on Load Bearing Masonry	Session 4.5 Exercise on Load Bearing Masonry	Session 5.4 Exercise on wooden and bamboo bands construction	Session 6.5 Alternative Construction Materials and sustainable development	Session 7.5: Post-test of the masons
14:45-15:30	Session 1.6 Earthquake Risk minimization and Preparedness	Session 2.6 Weakness of Traditional Building construction Technology/Theory on Load Bearing Masonry	Session 3.6 Exercise on Load Bearing Masonry (Description of the work and make them prepared for how to detail rebar for all remaining bands i.e. sill, corner ,lintel and roof and also vertical rebar)	Session 4.6 Exercise on Load Bearing Masonry	Session 5.5:Exercise on wooden and bamboo bands construction	Session 6.6: Theory on Retrofitting	Session 7.6 Evaluation of the training program and closing ceremony
15:30-15:45	Tea Break	Tea Break	Tea Break	Tea Break	Tea Break	Tea Break	
Time	**Day 1**	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**	**Day 7**
15:45-16:30	Session 1.7 Site Selection	Session 2.7 Theory on Load Bearing Masonry	Session 3.7 Exercise on Load Bearing Masonry	Session 4.7 Exercise on Load Bearing Masonry	Session 5.6 Exercise on connecting wall with floor	Session 6.7Environment and Building construction	
16:30-17:00	Review of the day	Review of the day	Review of the day (Discussion in the field with model and prepare them to change into other model i.e. SM to BM and BM to SM)	Review of the day	Review of the day	Review of the day	

Source: This Study 2018

Table 3-11 Mason Training Curriculum (Rural Type)

Time	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
9:30-10:00	Opening Ceremony, Registration	Recapitulation of Day 1	Recapitulation of Day 2	Recapitulation of Day 3	Recapitulation of Day 4	Recapitulation of Day 5	Recapitulation of Day 6
10:00-11:00	Session 1.1 Introduction Expectation Collection and objective of training	Session 2.1 Layout Exercise	Session 3.1 Exercise of Construction Technology of RCC Frame Structure	Session 4.1 Exercise of Construction Technology of RCC Frame Structure	Session 5.1 Theory on Load Bearing Masonry Construction Technology	Session 6.1 Exercise of Load Bearing Masonry Construction Technology	Session 7.1 Video Show: Shake Table
11:00-11:45	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
11:45-12:30	Session 1.2 Group Division and pre test	Session 2.2 Layout Exercise	Session 3.2 Exercise of Construction Technology of RCC Frame Structure	Session 4.2 Exercise of Construction Technology of RCC Frame Structure	Session 5.2 Exercise of Load Bearing Masonry Construction Technology	Session 6.2 Description of Load Bearing Structure and Minimum Requirements	Session 7.2 National Building Code and role of Masons
12:30-13:15	Session 1.3 Earthquake Basic and Preparedness	Session 2.3 Quality of Construction and Construction Materials	Session 3.3 Exercise of Construction Technology of RCC Frame Structure	Session 4.3 Exercise on Staircase Construction Technology	Session 5.3 Exercise of Load Bearing Masonry Construction Technology	Session 6.3 Wooden and Bamboo Building Construction Technology	Session 7.3 JICA Session (Manual for Masons and Design Catalogue)
13:15-13:30	Break	Break	Break	Break	Break	Break	Break
13:30-14:15	Session 1.4 Theory and Exercise on the construction of Slab,Stonecrete and Block	Session 2.4 Quality of Construction and Construction Materials	Session 3.4 Exercise of Construction Technology of RCC Frame Structure	Session 4.4 Exercise on Staircase Construction Technology	Session 5.4 Exercise of Load Bearing Masonry Construction Technology	Session 6.4 Periodic Maintenance of Building	Session 7.4 Testing of Slab, Brick and Block
14:15-15:00	Session 1.5 Theory and Exercise on the construction of Slab,Stonecrete and Block	Session 2.5 Testing of Quality of Construction Materials (Sand, Brick, Cement, Reinforcement)	Session 3.5 Exercise of Construction Technology of RCC Frame Structure	Session 4.5 Exercise on Construction Technology of Slab and Projection	Session 5.5 Exercise of Load Bearing Masonry Construction Technology	Session 6.5 Alternative Construction Materials and sustainable development	Session 7.5 Post Test and Feedback
15:00-15:15	Snack Break	Snack Break	Snack Break	Snack Break	Snack Break	Snack Break	Snack Break
15:15-16:00	Session 1.6 Site Selection	Session 2.6/2.7 Theory on Construction Technology of RCC Frame Structure	Session 3.6 Exercise of Construction Technology of RCC Frame Structure	Session 4.6 Exercise on Construction Technology of Slab and Projectio6	Session 5.6Exercise of Load Bearing Masonry Construction Technology	Session 6.6 Retrofitting Technology	Session 7.6 Training Evaluation, Certificate Distribution and Closing Ceremony
16:00-16:45	Session 1.7 Building Structures, Shapes		Session 3.7 Exercise of Construction Technology of RCC Frame Structure	Session 4.7 Brifing of RCC exercise (From foundation to slab including staircase)	Session 5.7 Exercise of Load Bearing Masonry Construction Technology	Session 6.7 Environment and Building Construction	
16:45-17:00	Review of Day	Review of Day	Review of Day	Review of Day	Review of Day	Review of Day	

Source: This Study 2018

Trainee screening

Practice training of the reinforcement of band

The slab reinforcement test by Mobile Mason

Ceremony for the distribution of training certificate

Source: This Study 2018

Figure 3-33 Mason Training (Package-3)

c) Training Results

The following pictures show the difference in house quality constructed by trained and untrained mason. A house constructed by a mason trained by TPIS-ERP has seismic capacity with the installation of vertical reinforcement and horizontal band.

	
A house with reinforcement and horizontal band constructed by trained mason	A house without reinforcement constructed by untrained masons

Source: This Study 2018

Figure 3-34 House with Seismic Capacity constructed by Trained Mason

2) Refresher Course (1 or 2 days)

a) Outline

To brush up the technique on earthquake-resilient construction of the masons that were already trained by TPIS-ERP or other donors, and to equip them with new technologies and revised guidelines, a 2-day refresher training was conducted with model-based training approach. The participants were taken for site visits to make them understand the real complications regarding non-compliance issues of the on-going constructions. A total of 1,595 masons were trained during the refresher course of the project, of which 55 were female masons.

	
Refresher course training session	Trainer explaining the Minimum Requirements by model

Source: This Study 2018

Figure 3-35 Refresher Course

b) Curriculum

TPIS-ERP developed the refresher course curriculum and got an approval from MOUD DUDBC. The following is the curriculum used from December 2016 to March 2017.

Table 3-12 Refresher Course Curriculums (Original)

Time		Session	
9:00	9:15	S 1.0	Registration
9:15	10:00	S 1.1	Course objective/overview, introduction and Pre test
10:00	10:30		Tea Break
10:30	12:00	S 1.2	Minimum Requirements (With Small Scale Demo Model)
12:00	12:45		Lunch Break
12:45	13:30	S 1.3	Non-compliance issues (Photos)
13:30	14:15	S 1.4	Discussion on technical issues
14:15	14:30		Tea Break
14:30	15:15	S 1.5	Training Video with key Information
15:15	16:00	S 1.6	Role of masons and Inspection Guideline
16:00	17:00	S 1.7	Post-test evaluation of the training and Closing

Source: This Study 2018

TPIS-ERP revised and upgraded the curriculum, extending the training period to 2 days. Theoretical session for understanding the Minimum Requirements, session on correction/exception manual and on-site training on noncompliant houses were added to the curriculum. The following is the revised refresher course curriculum.

Table 3-13 Refresher Course Curriculum (Revised)

Time	Day-1	Day-2
10:00 - 10:45	Session 1.0-Introduction of Refresher Training and Pre-Test	Session 2.0-Compliant and Non-Compliant Photos Slide Presentation
10:45 - 11:30	Session 1.1-Video with Key Information	Session 2.1-Design Catalogue Volume I and Design Catalogue Volume II
11:30 - 12:15	Session 1.2-Role of Masons and Inspection Guidelines	Session 2.2-Correction/Exception Manual
12:15 - 13:00	Lunch Break	Lunch Break
13:00 - 14:45	Session 1.3-Minimum Requirements using Model	Session 2.3-Site Measurement and Site Layout
14:15 - 14:30	Snack Break	Snack Break
14:30 - 16:15	Session 1.4-Minimum Requirements using Model	Session 2.4-Field Visit
16:15 - 17:00	Session 1.5-Review	Session 2.5-Post-Test

Source: This Study 2018

3) Mobile Mason Training (6 days)

a) Outline

TPIS-ERP conducted training for the masons who were already trained by TPIS-ERP to be Mobile Masons under the CMP. The training provided them more detailed practical training and the

opportunity to find out the best masons in the community who would be appropriate to work as Mobile Mason in the field. This would also create a roster of trained masons and so if any mason would leave the job, the next trained mason could be selected without undergoing any other training. A total of 656 masons were trained, of which 14 were female masons.

b) Curriculum

TPIS-ERP developed Mobile Mason Training curriculum that covered the following points:

- Brush up on the Minimum Requirements
- Practical session for RCC structure
- Role and responsibility of Mobile Mason in Housing Reconstruction Program
- Instructional method to house owners and unskilled labour

Table 3-14 Mobile Mason Training Curriculum

Time	Day-1	Day-2	Day-3	Day-4	Day-5	Day-6
9:30 - 10:00	Session 1.0-Registration	Session 2.0-Review	Session 3.0-Review	Session 4.0-Review	Session 5.0-Review	Session 6.0-Review
10:00 - 10:45	Session 1.1-Introduction and Pre-test	Session 2.1-Theory on RCC Building Construction	Session 3.1-Practice in RCC Building Construction - Reinforcement Detail	Session 4.1-Practice in RCC Building Construction -Slab	Session 5.1-Field Visit with Supervisor and Discussion	Session 6.1-Field Visit and reporting to Supervisor
10:45 - 12:00	Session 1.2-Minimum Requirement-SMM, SMC, BMM, BMC	Session 2.3-Compliance and Non-compliance photos slide presentation				
12:00 - 12:45	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
12:45 - 14:15	Session 1.3-Site Measurement and Site Layout	Session 2.4-Practice in RCC Building Construction - Foundation	Session 3.2-Theory on RCC Building Construction -Staircase and Slab	Session 4.2-Correction Methods (Based on Correction Manual) and Design Catalogue Volume II	Session 5.2-Field Visit with Supervisor and Discussion	Session 6.2-Field Visit and reporting to Supervisor
14:15 - 14:30	Snack Break	Snack Break	Snack Break	Snack Break	Snack Break	Snack Break
14:30 - 15:15	Session 1.4-Reading of Drawing	Session 2.5-Practice in RCC Building Construction - Reinforcement Detail	Session 3.3-Practice in RCC Building Construction -Staircase	Session 4.3-Inspection Guideline and Role of Mobile Mason	Session 5.3-Discussion and Feedbacks	Session 6.3-Field Visit and Reporting to Supervisor
15:15 - 16:00	Session 1.5-Theory and Practical on Quality of Construction Materials and Construction			Session 4.4-Teaching Style and Reporting		Session 6.4-Post-Test and Completion of Training
16:00 - 16:30	Session 1.6-Review	Session 2.6-Review	Session 3.4-Review	Session 4.5-Review	Session 5.4-Review	

Note:
Sites with different stages of construction shall be shown during the field visit.
For the 5th day, the trainees will visit the site with Supervisor and provide suggestions to working mason with support of Supervisor.
For the 6th day, the trainees will go to different sites on their own and report to supervisor.

Source: This Study 2018

(3) Enrolment Camp

Enrolment Camp was the place for selected beneficiaries to make the participation agreement (PA) and enrol in the GON Housing Reconstruction Program. NRA conducted the first enrolment camp in Dolakha in March 2016 and planned to expand to other districts. However, the District Coordination Committee was not so familiar with the procedure on how to start the enrolment camp and its contents.

TPIS-ERP learned lessons from the Enrolment Camp in Dolakha and improved the procedure and contents.

1) Communication

Beneficiaries have to be well informed of necessary information prior to attending the enrolment camp so that this would be implemented smoothly. TPIS-ERP prepared the illustrated poster about the following information, disseminating them at field level so that all types of house owners would understand the procedure and realise that congestion at the camp had been eased.

- Purpose of the camp
- Required documents
- Schedule
- Minimum Requirements

2) Camp site arrangement

Management of applicants' activity flow is necessary in a camp with many applicants. The following figure shows the camp site plan in Hansapur VDC, Gorkha.

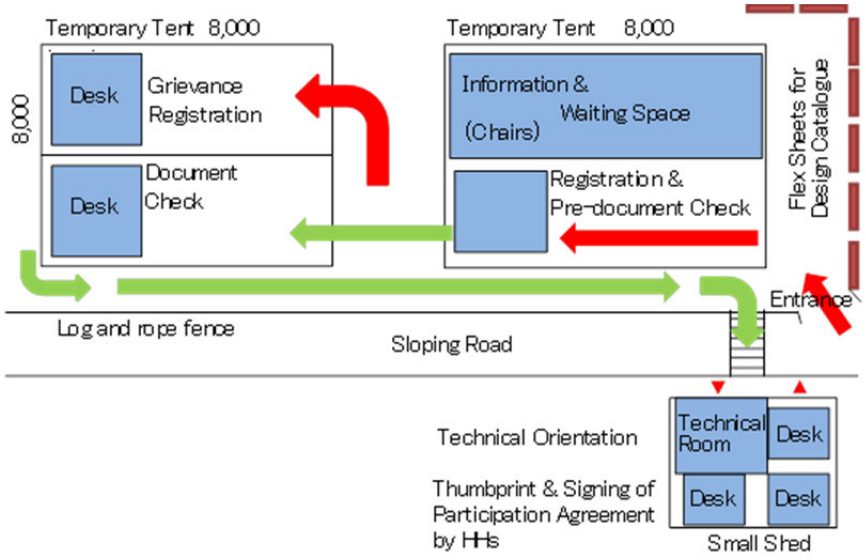


Figure 3-36 Enrolment Camp Site Layout in Hansapur VDC

	
Tent for Waiting Area	Posters about Procedure of the Housing Reconstruction Program
	
Application Desk and Posters of the Minimum Requirements	Pre-confirmation of required documents
	
Information Desk	Document Check (right) and Grievance Desk (Left)
	
Document Check	PA Signing

Figure 3-37 Enrolment Camp

3) Enrolment camps supported by TPIS-ERP

TPIS-ERP conducted enrolment camps for the following VDCs, and other partner organisations conducted the same for the rest of VDCs in JICA target area.

- Hansapur VDC, Gorkha : 10th April 2016 ~
- Barpak VDC, Gorkha : 26th April 2016 ~
- Chautara Municipality (1st), Sindhupalchok : 24th April 2016 ~
- Saurpani VDC, Gorkha : 19th May 2016 ~
- Irkhu VDC, Sindhupalchok : 27th May 2016 ~
- Muchhok VDC, Gorkha : 6th June 2016 ~
- Baguwa VDC, Gorkha : 19th June 2016 ~
- Chautara Municipality (2nd), Sindhupalchok : 13th June 2016 ~
- Mankha VDC, Sindhupalchok : 14th June 2016 ~
- Melamchi Municipality, Sindhupalchok : 27th June 2016 ~
- Batase VDC, Sindhupalchok : 1st July 2016 ~
- Barhabise VDC, Sindhupalchok : 21st July 2016 ~
- Syaule VDC, Sindhupalchok : 31st July 2016 ~
- Bhotechaur VDC, Sindhupalchok : 30th August 2016 ~

(4) Government Engineer Training

CLPIU (Building)[17] conducted the Training of Trainers (TOT) for DLPIU engineers on earthquake resilient building in July 2016. After completion of the Inspection Guidelines and the Inspection Manuals for Housing Reconstruction Program in December 2016, CLPIU (Building) implemented the Master Training of Trainers (MTOT) for selected DLPIU engineers on the guidelines so that they would be able to conduct the Inspection Training for other DLPIU engineers in their districts.

1) Training of Trainers (TOT)

From July 2016 to March 2017, NRA recruited technical officers who were engaged in housing quality inspection. As most of them were new graduates without hands-on experience, NRA requested JICA to provide training for its newly employed staff. JICA decided to conduct the training for 600 technical officers in Sindupalchok and Gorkha districts.

In fact, as some were not employed and some had already left, only 493 of them were trained in 19 trainings (16 trainings were implemented in the 1st phase and 3 trainings in 2nd phase.

Table 3-15 TOT List

Sub-contract Package	Content	Participants	Contract Period / Situation	Sub-contractor
Training (Package 2 and 4)	Training for newly employed government engineers (lectures and practical, 7 days): 19 times (16 times at 1st phase and 3 times at 2nd phase)	493 government engineers (275 for Sindhupalchok and 218 for Gorkha)	Jul 2016 - Mar 2017	TCN

Source: This Study 2018

[17] The then MOUD CLPIU conducted the training which was changed to CLPIU (Building) later.

Icebreaker

Group discussion

Cleanliness and tidiness at construction site as part of safety measures

Trainee experienced masonry work and realised the practical difficulties in the field.

Source: This Study 2018

Figure 3-38 TOT Activities

2) Master Training of Trainers (MTOT)

TPIS-ERP produced the training curriculum and training materials for a 2-day training based on the Inspection Guidelines and the Inspection Manual, and also provided/contributed as lecturer.

- Date: : 1st MTOT: 20th and 21st December 2016
  2nd MTOT: 23rd and 24th December 2016
- Location : Local Development Training Academy, Jawalakhel, Lalitpur, Kathmandu
- Participants : 120 DLPIU engineers
- Content : Training of trainers who would implement the trainings at district level

3) Inspection Training for DLPIU Engineers

- Date : January 2017~
- Location : Each district
- Participants : DLPIU engineers
- Contents : Training on inspection work for DLPIU district engineers by MOUD CLPIU so that the inspections for housing quality are done in a rigorous manner.

Table 3-16 Curriculum of 2-day Inspection Training

S. N.	Time		GROUP-A				GROUP-B			
	From	To	Session	Day 1	Session	Day 2	Session	Day 1	Session	Day 2
1	9:00	9:30	S 1.0	Opening Ceremony	S 2.0	Review of Previous day	S 1.0	Opening Ceremony	S 2.0	Review of Previous day
2	9:30	10:15	S 1.1	Inspection Guidelines and Forms (NM)	S 2.1	Class exercise for inspection (NSET/JICA)	S 1.2	Overview of construction sequence	S 2.1	Class Exercise for Inspection
3	10:15	11:00		Inspection Guidelines and Forms (NM)			S 1.6	MIS and use of Tablet		
4	11:00	11:45	S 1.2	Overview of construction sequence (MKB)	S 2.2	Field Visit Briefing and Preparation (NSET/JICA)	S 1.3	General Consideration for Construction	S 2.2	Field Visit Briefing and Preparation
	11:45	12:45	Lunch		Lunch		Lunch		Lunch	
5	12:45	13:30	S 1.3	General Consideration for Construction (MRT)	S 2.3	Field Visit(JICA/NSET)	S 1.1	Inspection Guidelines and Forms	S 2.3	Field Visit
6	13:30	14:15	S 1.4	Masonry Procedure (RCT)						
	14:15	14:45	Tea Break		Tea Break		Tea Break		Tea Break	
7	14:45	15:30	S 1.5	R. C. frame procedure (JMB)	S 2.4	Field Visit Discussion (JICA/NSET)	S 1.4	Masonry Procedure	S 2.4	Field Visit Discussion
8	15:30	16:15	S 1.6	MIS and use of Tablet (MR)			S 1.5	R. C. frame procedure		
	16:15	17:00	S 1.7	Review of the day	S 2.5	Closing and Certification	S 1.7	Review of the day	S 2.5	Closing and Certification

Source：TPIS-ERP

All participants of Inspection Training

Training in progress

Source: TPIS-ERP

Figure 3-39 Master Training of Trainers at Kathmandu

4) Correction/Exception Manual Training for MTOT

Following the completion of the Correction/Exception Manual in May 2017, CLPIU (Building) conducted the training for its implementation attended by government engineers (DLPIU engineers) and NPO engineers who were engaged in the reconstruction of houses as inspectors. TPIS-ERP was in charge of the technical sessions of the trainings.

a) Correction/Exception Manual Training for MTOT at Kathmandu

- Date : 1st MTOT: 24th ~26th May 2017
  2nd MTOT: 30th May ~ 1st June 2017
- Location : DUDBC Hall, Kathmandu

- Participants : 75 DLPIU engineers and NGO engineers
- Content : Training at the central level to introduce the use of the newly produced Correction/Exception Manual

b) Correction/Exception Manual Training for DLPIU Engineers

- Date : July 2017 ~
- Location : Each district
- Participants : DLPIU engineers, NGO engineers, etc.
- Content : Training at the district level to introduce the use of the newly produced Correction/Exception Manual

Table 3-17 Curriculum of 3-day Training for Correction/Exception Manual

S. N	Time				
	From	To	Day 1	Day 2	Day 3
	9:30	10:00	Opening Ceremony	Review of Previous day	Review of Previous day
1	10:00	10:50	Course Introduction Overviews (Policies, Guidelines etc.)**(CLPIU)**	Alternative Technologies / inspection, design catalogue 2**(CLPIU)**	Seismic retrofitting guidelines (Masonry/ Adobe)**(UNDP)**
2	10:50	11:40	NBC 105, IS 1893, IS 456, IS 13920, NBC (201-205)**(NSET)**	Alternative Technologies / inspection, design catalogue 2**(CLPIU)**	Seismic retrofitting guidelines (RCC) **(UNDP)**
	11:40	11:55	Tea Break	Tea Break	Tea Break
3	11:55	12:45	Damage Assessment for RC, Masonry and timber with case study**(NSET)**	New RCC Type Designs prepared by MoUD CL-PIU, low cost house designs**(CLPIU/ HRRP)**	Cases for Non Compliance in housing reconstruction (RCC building)**(HRRP/ NSET)**
	12:45	1:15	Tiffin	Tiffin	Tiffin
4	1:15	2:05	Introduction to Correction/ Exception Manual with major Non Compliance issues **(JICA)**	New RCC Type Designs prepared by MoUD CL-PIU, low cost house designs**(CLPIU/HRRP)**	Cases for Non Compliance in housing reconstruction (Masonry Building) **(JICA)**
5	2:05	2:55	Correction / Exception (Site Selection, shape and material for masonry buildings **(JICA)**	Confined Masonry **(CLPIU/HRRP)**	Problem sharing and Discussion **(HRRP)**
	2:55	3:10	Tea Break	Tea Break	Tea Break
6	3:10	4:00	Correction / Exception (Foundation, Vertical Member and wall)**(NSET)**	Confined Masonry **(CLPIU/HRRP)**	Community FAQs, communication skills **(HRRP)**
7	4:00	4:50	Correction / Exception (Plinth Beam, doors and window, horizontal band and roof)**(NSET)**	Revised Inspection Forms/ Implementing Correction Manual **(CLPIU/ HRRP)**	Closing Ceremony
8	4:50	5:15	Review of Day	Review of Day	

Source: TPIS-ERP

5) Training for District Support Engineers

- Date : 8th ~10th November 2017
- Location : Kathmandu
- Participants : District Support Engineers, etc.
- Content : NRA employed 27 structural engineers who would technically support the DLPIU engineers. They were expected to deal with matters individually which could not be dealt with by the DLPIU engineers at the site.
  TPIS-ERP provided lectures regarding the structural calculation method of hybrid structure.

Training for District Support Engineers at Kathmandu

Source: TPIS-ERP

Figure 3-40 Training for District Support Engineers at Kathmandu

6) Training for Newly Employed DLPIU Engineers

- Date : 23 November~4 December, 2017
- Location : Kathmandu
- Participants : Newly employed DLPIU engineers
- 274 engineers (23rd November ~ 2nd December 2017, 10 days)
- 391 sub-engineers (1st ~ 2nd December 2017, 2 days
- 336 assistant sub-engineers (3rd ~4th December 2017, 2 days)
- Content : DLPIU engineers who were newly employed in December 2016 were 1,346 (engineers), 659 (sub-engineers) and 575 (assistant sub-engineers). However, as they were required to reside at local construction site at times and the working condition was severe, the turnover rate was high. Thus, NRA employed a pool of new engineers to whom the Inspection Guidelines and the newly introduced structural calculation method of Hybrid Structure were lectured.
  The trainings for engineers were implemented in a small group of around 30~35 engineers per class. Twelve classes were held simultaneously.

Table 3-18 Curriculum of 10-day Training for Newly Employed DLPIU Engineers

Time		Day 1	Day 2	Day 3	Day 4	Day 5
8:15	8:45	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
8:45	9:00	Registration	Previous day Review	Previous day Review	Previous day Review	Previous day Review
9:00	10:20	Opening and pretest (DN & SA)	Building configuration and site selection (SP)	Detailing of R.C.C. ductile requirements (Sm.P.)	Training management/excerice in training delivery (RK)	Overview of construction sequence/General consideration for construction/Minimum reuirement (R.C.C./Masonry) (JICA)
10:20	11:40	earthquake basic and effect of earthquake (DA)	Earthquake preparedness (DN)	Seismic damage assessment in R.C.C. structure (AA)	Geological performance of ground in earthquakes (YRP)	Overview policies and guidelines etc) Introduction to correction and exceptional manuals with major non compliance issues (JICA)
11:40	1:00	Earthquake resistant design and construction philosophy (SP)	National building code status/Implementation strategy (SGC)	Adult learning/presentation style/communication skills (DKS)	Role of mason in earthquake resistance construction (SA)	Alternative technologies/Inspection,design catalogue Vol I/Vol II (DA)
1:00	1:40	Lunch	Lunch	Lunch	Lunch	Lunch
1:40	3:00	Behaviour of earthquake resistance component in Masonry structures/MRT 202 and guidelines 203 (Sm.P.)	Architectural design requirements (AA)	Structural design procedure R.C.C. (SP)	Training management/excerice in training delivery (RK)	Alternative technologies/Inspection,design catalogue Vol I/Vol II (DA)
3:00	3:20	Tea time	Tea time	Tea time	Tea time	Tea time
3:20	4:40	Behaviour of earthquake in R.C.C. structure/MRT 205 (KM)	Load bearing structures earthquake resistance detailing (PP)	Structural design procedure (masonry) (DA)	Quality control (SGC)	Correction/Exception (Site selection., Shape and size, materials, foundation)for masonry building (JICA)

Time		Day 6	Day 7	Day 8	Day 9	Day 10
8:15	8:45	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
8:45	9:00	Previous day Review	Previous day Review	Previous day Review	Field visit briefing and preparation	Previous day Review
9:00	10:20	Correction/Exception (Vertical member, wall, plinth beam, opening, horizontal band and roof)for masonry building (JICA)	Inspection guideline and forms including revised form (MOUD) (RK)	MIS and inspection app. (WB)	Field Visit	Purposed session for retrofitting
10:20	11:40	Mitigation measures of correction/Exception (JICA)	Inspection guideline and forms including revised form (Sm. P.)	MIS and inspection app. (WB)	Field Visit	
11:40	1:00	Repair and retrofitting in masonry structure/Inspection form (SP)	Repair and retrofitting in R.C.C structure/ Inspection form (AA)	Inspection procedure in masonry structures (SR)	Field Visit	
1:00	1:40	Lunch	Lunch	Lunch	Lunch	
1:40	3:00	Hybrid structure manual and inspection checklist (JICA)	Cases for non-compliance in housing reconstruction (R.C.C/Masonry building) (SP)	Seismic retrofitting practices (Masonry/R.C.C.) (BC) (BRA)	Field Visit	
3:00	3:20	Tea time	Tea time	Tea time	Tea time	Tea time
3:20	4:40	Confined masonry (DN)	Inspection procedure in R.C.C. frame/ new R.C.C type design prepared by MOUD/CLPIU, low cost house design (SP)	Administrative, political and social responsibility of reconstruction engineer (RK)	Field visit discussion/exercise 203/205	Post test and closing

Source: TPIS-ERP

Lecture

Lecture

Closing ceremony

Newly employed engineers

Source: TPIS-ERP

Figure 3-41 Training for Newly Employed DLPIU Engineers

7) Training for Newly Employed DLPIU Engineers in Sindupalchok and Gorkha Districts

- Date : 6~26 May, 2018
- Location : Sindupalchok and Gorkha
- Participants : 152 newly employed DLPIU engineers

Table 3-19 Participants per Training

	Sindupalchok		Gorkha		Total
	1st	2nd	1st	2nd	
Engineers	14	14	7	11	46
Sub-engineers	6	14	16	18	54
Assistant sub-engineers	19	13	9	11	52
Total	39	41	32	40	152

Source: TPIS-ERP

- Content : The new engineers were continuously employed even after the above-mentioned training conducted on 23 Novmber~4 December, 2017. By the request of CLPIU, TPIR-ERP implemented the same training to the newly employed engineers at the district level.

Table 3-20 Curriculum of 7-day Training for Newly Employed DLPIU Engineers

Phase I (6th -12th May 2018)								
Time		Day1	Day2	Day3	Day4	Day5	Day6	Day7
10:00	11:10	Registration/Opening/ Objectives and scope of housing reconstruction project **(GoN 1)**	Earthquake resistant design and construction **(Individual Consultant)**	Inspection manual / Revised forms (Masonry) **(Individual Consultant)**	Correction/ Exception Manual **(JICA 1) Sabika Mastran**	Alternative Technologies (Design catalogue volume -2) **(Str Engineer 1)**	Hybrid structure manual **(JICA 1) Sabika Mastran**	Presentation from participants **(JICA 1/ JICA 2)**
11:10	11:20	**Break**	**Break**	**Break**	**Break**	**Break**	**Break**	**Break**
11:20	12:30	Inspection Guidelines (Policies, guidelines, procedure etc.) **(JICA 3) Bhupendra Bahadur Basnet**	Behaviors of earthquake resistant component **(Individual Consultant)**	Confined Masonry **(Individual Consultant)**	Correction/ Exception Manual **(JICA 1) Sabika Mastran**	Alternative Technologies (Low cost design) **(Str Engineer 2)**	Light timber/steel framed structure manual **(JICA/Str Engineer 1)**	Presentation from participants **(JICA2/JICA 3)**
12:30	12:40	**Break**	**Break**	**Break**	**Break**	**Break**	**Break**	**Break**
12:40	13:50	MIS and inspection App **(EHRP -MIS)**	Exercise on Masonry **(Individual Consultant)**	MR of RCC and type design **(Individual Consultant)**	Mitigation measures **(JICA2) Madhusudan Baral**	Inspection manual / Revised forms(RCC) **(JICA 1) Sabika Mastran**	Light timber/steel framed structure manual **(JICA/Str Engineer 2)**	Review **(JICA 1 / JICA 2)**
14:00	15:00	**Snacks**	**Snacks**	**Snacks**	**Snacks**	**Snacks**	**Snacks**	**Snacks**
15:00	16:10	Architecture design requirement Minimum requirement/ Design catalogue vol-1/ **(JICA 1)**	Seismic damage assessment **(Individual Consultant)**	Repair and retrofitting in RCC/masonry structure, inspection forms **(Individual Consultant)**	Major Non Compliance issues. (Masonry/RCC) **(JICA 2) Madhusudan Baral**	Exercise **(JICA 1/ JICA 2)**	Preparation of Presentation from participants **(JICA 2/ JICA 3)**	Administrative, Political and social responsibility of Reconstruction Engineer **(GON 1)**
16:10	16:20	**Tea Time**	**Tea Time**	**Tea Time**	**Tea Time**	**Tea Time**	**Tea Time**	**Tea Time**
16:20	17:00	Test **(JICA 1/JICA 2)**	Test **(JICA 1/JICA 2)**	Test **(JICA 1/JICA 2)**	Test **(JICA 1/JICA 2)**	Test **(JICA 1/JICA 2)**	Test **(JICA 1/JICA 2)**	Closing **(JICA 1/ JICA 2)**

Source: TPIS-ERP

Lecture at Sindupalchok

Lecture at Gorkha

Group study

Certification awarding ceremony

Source: TPIS-ERP

Figure 3-42 Training for Newly Employed DLPIU Engineers

3.3.4 Community Mobilization Program (CMP)

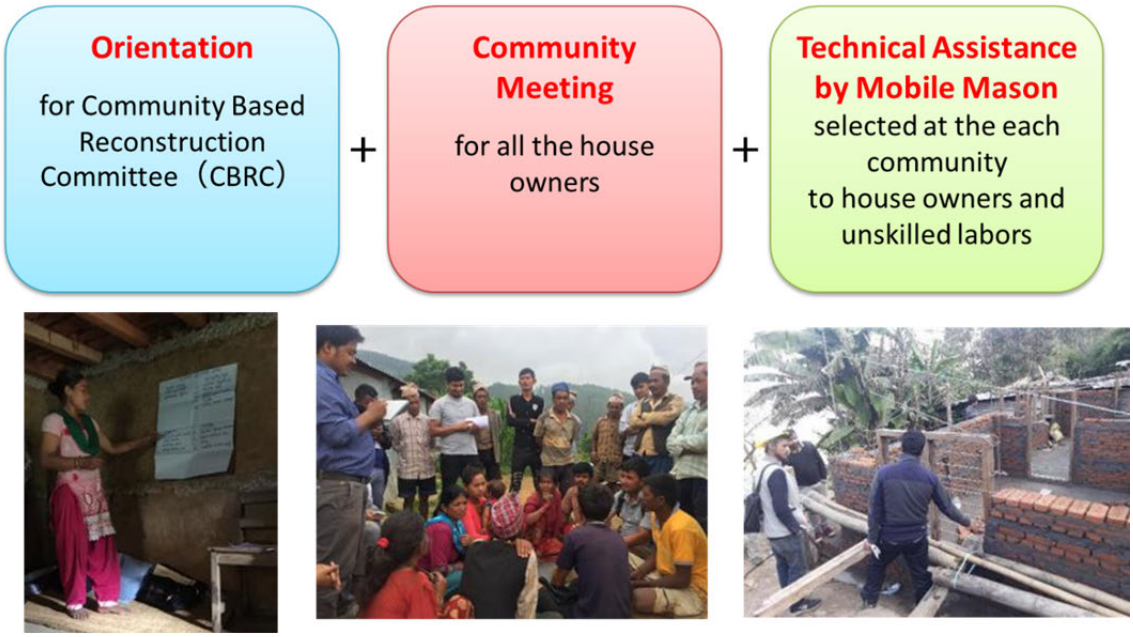
Reconstruction start rate was as low as 21.3% in March 2017, according to the complete survey in 10 VDCs conducted by TPIS-ERP even though the Minimum Requirements were set in place, house owners and mason trainings were conducted, and DLPIU engineers were trained as inspectors. TPIS-ERP assumed that this reconstruction rate lower than expected could be attributed to lack of mutual support in the community. Therefore, CMP was planned to accelerate the housing reconstruction by promoting mutual support and ownership of reconstruction work.

First, the Technical Assistance Team (TA Team) facilitated the formation of Community-Based Reconstruction Committee (CBRC) which was directed by the Community-Based Reconstruction Committee Guideline 2017 published by NRA. CBRC was the committee composed of one president, five members (including three females) and one secretary selected from the community to increase the participation and ownership of reconstruction work through mutual support and coordination with VDC. However, there was no guidance and budget from NRA so CBRC did not know how to accelerate housing reconstruction. Hence, TPIS-ERP started the orientation training to CBRC on how to address issues related to housing reconstruction such as shortage of masons, procurement and transportation of construction materials, and noncompliance to the Minimum Requirements.

Once CBRC became acquainted with its responsibilities, TPIS-ERP supported it in facilitating community meetings where all house owners in the community gathered and discussed issues related to housing reconstruction.

TPIS-ERP also dispatched the Mobile Masons to communities who would work as working masons at the site free of charge as well as train other mason and unskilled labour on earthquake resilient technology. Maximum number of Mobile Mason was 548 of which 10 were female Mobile Masons.

The project started CMP by doing the CBRC orientation (workshop) with the Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis, community follow-up meetings and dispatch of the Mobile Masons for each CBRC with activities listed below:



Source: This Study 2018

Figure 3-43 Community Mobilization Program Phase 1

(1) CMP Phase 1 (May 2017 – April 2018)

Orientation to CBRC: TA Team conducted CBRC orientation by doing the presentation of promotion of mutual work like mutual procurement, labour exchange, and exchange of construction tool, collective application for the inspection and follow up of tranche status. As facilitator, TA Team supported each CBRC to do the SWOT analysis of the community, make community map and prepare the community action plan. The facilitator had to control the direction of the group meeting. Usually, households were categorised depending on their progress in housing reconstruction as well as on their level of willingness to participate in community.

1) Community Meetings

TA Team considered the ideal time for holding community meetings since these should not conflict with other working time, such major harvesting time or lunchtime Most of the participants from rural area preferred holding the meeting during early morning before the temperature rises or after lunch, and then they would become busy with their daily activities.

Community meeting includes members of CBRC, elderly men and women, mothers of infant, middle-aged men and women and even younger people. The facilitator explains the aim of CBRC, gives them chance to discuss on reconstruction matter, and highlights the opportunities and constraints in order to process further with the activities of CBRC.

During such meetings, community itself tries to find out the major challenges in reconstruction and possible solutions to overcome these challenges while identifying the responsible persons, groups and concerned institutions.

Communities willing to support each other have potential to work in a collective way, and they have material and access advantages. These communities could prepare an action plan and facilitate further activities to start housing reconstruction, hence provided with Mobile Mason to supervise the work. Such kind of communities achieved the result in short time from CMP.

2) Selection and dispatch of Mobile Mason

Dispatch of Mobile Mason is the key component of CMP. Mobile Mason selection process starts from the collection of applications by local masons, confirmation of individual applicant's experience, and conduct of 6-day training for the selected applicants and examination. Mobile Masons are selected and recruited from the community where they are supposed to work. In the beginning, TPIS-ERP faced political pressure from wards for the selection of Mobile Masons and this was reduced eventually after TPIS-ERP explained to ward chairpersons the purposes of Mobile Masons and the selection criteria. In case competent masons suitable to be Mobile Masons were not found in some areas, those with good performance from other communities could be assigned to look after those areas. A Mobile Mason is assigned to assist around 100 beneficiaries.

Selection criteria for Mobile Mason are as follows:

- Experienced and locally trained mason
- Good knowledge of the Minimum Requirements
- Excellent capacity to deliver on local language
- Motivational skill

Mobile Mason is very effective in encouraging house owners who have not started to reconstruct their houses through door-to-door visit. Mobile Mason also helps the house owners make a reconstruction schedule suitable for his/her conditions and provides a lecture for both skilled and unskilled masons at construction site, facilitates site selection and building layout, supports inspections and tracks the inspection and tranche release status.

Being community members, Mobile Masons have good knowledge on local language and culture, and it was easy for them to work in their own communities. TA teams reached out to beneficiaries for technical assistance before Mobile Masons were employed, and the beneficiaries shared only the financial and human resources problems. After intervention from Mobile Masons, it was realised that the beneficiaries were stuck mainly due to social rather than financial problems. So, TPIS-ERP intervened accordingly and increased the rate of reconstruction.

Mobile Masons serve as key components in the following:

- Motivate people to start reconstruction
- Make a group for reconstruction with collective approach

- Facilitate doing of the layout of housing
- Give lecture about the Minimum Requirements for local trained, untrained and unexperienced masons
- Disseminate information regarding housing reconstruction such as deadline of reconstruction
- Support to ensure compliance with the Minimum Requirements in every step of housing reconstruction
- Support filing of collective application for inspection to DLPIU Engineer
- Disseminate the inspection status of beneficiaries
- Solve onsite problem at the local level

Initially, Mobile Masons were sent to work in limited area as a pilot programme. As the effectiveness in reconstruction progress was clearly observed in the pilot area, mobilisation of Mobile Mason was spread to other areas. The number of Mobile Masons was adjusted according to the necessity and reconstruction progress. In case a Mobile Mason was evaluated as negligent and irresponsible, then TPIS-ERP replaced him/her even during middle of the contract.

Mobile Masons were provided monthly salary of NPR 25,000 (inclusive of tax) and provided with necessary equipment such as bags, stationary and measurement tapes. They got opportunity to work as lead mason in the community and had great experience in construction of earthquake-resilient technology. The opportunities and incentives motivated them to work in the community with increased social awareness and responsibility. Some of the Mobile Masons were found continuing their support to the beneficiaries voluntarily and motivating them in reconstruction even after the termination of their work period.

	
CBRC Orientation	CBRC member presenting action plan

	
Community Meeting	Mobile Mason explaining community map during a meeting
	
Sample Reconstruction Plan	Confirmation of building layout

Source: This Study 2018

Figure 3-44 Community Mobilization Program Activities

(2) CMP Phase 2 (May 2018 – January 2019)

The community meetings in 2017 and at the beginning of 2018 were very effective to accelerate housing reconstruction because most house owners have not started reconstruction with common challenges which they could have solved by holding meetings. However, in April 2018, it became clear that there were significant number of house owners who did not start the reconstruction or stopped the reconstruction despite the CMP. Those house owners had different specific problems which could not be solved in community meetings since such meetings were intended for collective issues and not for small specific issues.

In addition, NP and GP under new federal system became more responsible for housing reconstruction than CBRC, and the ward chairperson and members have played main role to solve issues and accelerate housing reconstruction.

Under this circumstances, TPIS-ERP modified the contents of CMP accordingly.

Source: This Study 2018

Figure 3-45 Community Mobilization Program Phase 2

1) Ward Level Coordination Meeting

After the restructuring of local government, coordination with the ward became effective to motivate the beneficiaries to reconstruct and to monitor the DLPIU Engineers. Ward level coordination meeting was conducted with ward president, ward members and DLPIU engineers to solve the problems related with reconstruction. The content of this meeting comprised the following:

- Reconstruction and inspection status updates
- Grant distribution update
- Progress and the issues in the community
- Inspection scheduling with DLPIU Engineer
- Identification of the beneficiaries who needs special support

The aim of this meeting is to support ward and DLPIU Engineer to provide leadership in the community for the beneficiaries to build earthquake-resilient houses.

2) Issue-Specific Community Meeting

After the reconstruction rate had risen, there were some beneficiaries who could not start and continue the reconstruction because of specific issues such as family problem, cultural problem, name duplication, management of construction material, arrangement of mason and carpenter, etc. Such specific issues related to reconstruction were discussed in detail in Issue-Specific Community Meeting.

The main aim is to support the beneficiaries solve the problems by issue-specific group and through mutual support enable the preparation of a support plan.

3) Technical Assistance by Mobile Mason

Mobile Mason provided regular supervision and support to house under construction based on the schedule made during ward level coordination meeting and issue-specific community meeting. He/She also provided special support for the vulnerable beneficiaries based on the decision at ward level coordination meeting.

4) Correction through Mobile Mason OJT (On-the-Job Training)

Some of the houses deviated from the Minimum Requirements and masons did not know how to correct noncompliance. Also, the DLPIU Engineer did not know how to provide the correction order.

In order to solve the problem on noncompliance, On-the-Job Training (OJT) for Mobile Mason, DLPIU Engineer, TA Engineer and Senior Engineer based on correction/exception and hybrid light frame structure manuals have been conducted as part of CMP. The main objectives were to make Mobile Mason, DLPIU Engineer, TA engineer and Senior Engineer understand necessary technics of correction/exception, Hybrid and light timber/steel framed structure manuals through the OJT.

After conducting several OJT, Mobile Masons understand necessary techniques of correction and found capable to supervise and monitor correction works done by mason in the community. Also, they have been found disseminating correction methodology to local masons and house owners.

Theoretical Session

Practical Session

Source: TPIS-ERP

Figure 3-46 Mobile Mason OJT

3.3.5 Monitoring System

(1) Biweekly Monitoring Report

Current biweekly monitoring system classifies all 56,532 beneficiaries into 13 stages and 146 status based on which TA Teams and Mobile Masons were able to take actions appropriate to each specific issue hindering house owners from housing reconstruction. EHRP Consultants will take over this

monitoring system. The following table is the biweekly report as of 26th December 2018 which shows that there are 3,611 beneficiaries who have not started reconstruction (stage A+B+C) and only 2,431 beneficiaries have received the completion certificate.

Table 3-21 Bi-weekly Monitoring Report (as of 26th December 2018)

Categories of Issues		No. of Beneficiaries			
		Previous Period	This Period		
			Unsolved	New	Total
A	**~PA Not Signed**	**819**	**662**	**140**	**810**
	a_Newly identified	10	6	14	28
	a_Out of contact	164	131	19	150
	a_Beneficary Duplication	262	246	13	259
	a_Document insufficient	30	28	2	30
	a_Death	32	32	9	41
	a_Migrated elsewhere	67	64	1	65
	a_Landless	26	22	2	24
	a_Resettlement beneficiary	-	-	-	-
	a_Not Interested	63	60	11	71
	a_Unknown Beneficiary	51	41	4	45
	a_Affected by Right of Way	2	2	1	3
	a_Insufficient/Unsuitable Land	-	-	-	-
	a_Insufficient/Unsuitable Land	-	-	-	-
	a_Beneficiary supported by other programme	34	20	62	82
	a_Deadline expired	5	4	-	4
	a_Others	73	6	2	8
B	**PA Signed~1st Tranche not deposited**	**353**	**171**	**38**	**209**
	b_On Schedule (No action required)	174	74	18	92
	b_Pending in Ward office	68	23	2	25
	b_Pending in DLPIU (GMaLI)	59	50	14	64
	b_Others	52	24	4	28
C	**1st Tranche deposited~ Not Started**	**3,010**	**2,223**	**369**	**2,592**
	c_On Schedule (No action required)	1,046	660	182	842
	c_Death	83	75	8	83
	c_Landless	68	61	5	66
	c_Affected by Right-of-Way	33	8	-	8
	c_Resettlement beneficiary	44	40	1	41
	c_Inaccessible	7	4	4	8
	c_Will not construct	160	133	30	163
	c_Willing to refund grant	45	29	5	34
	c_Already refunded grant	1	1	-	1
	c_Out of contact	234	182	36	218
	c_Migrated to other place	409	333	5	338
	c_Poor economic condition	58	39	7	46
	c_No immediate plan to construct	466	366	43	409
	c_Building permit not completed	7	-	-	-
	c_Family Issues	61	47	2	49

Categories of Issues		No. of Beneficiaries			
		Previous Period	This Period		
			Unsolved	New	Total
	c_Responsible person out of house	63	41	19	60
	c_Cultural Taboos	5	4	-	4
	c_Conversion from RCB to RTB	24	16	-	16
	c_1st Tranche deposited without PA sign	-	-	15	15
	c_Delayed due to Integrated Settlement decision	153	149	5	154
	c_Indecisive NGO support	17	15	-	15
	c_Document insufficient to withdraw grant	10	9	-	9
	c_Others	16	11	2	13
D	**Started~Plinth Not Completed**	**277**	**128**	**150**	**278**
	d_On Schedule (No action required)	187	90	115	205
	d_Poor economic condition	28	6	-	6
	d_Death	-	-	1	1
	d_Land Dispute	-	-	2	2
	d_Family Issues	8	4	1	5
	d_Migrated to other place	18	9	4	13
	d_Will not continue	6	6	-	6
	d_Out of contact	18	6	3	9
	d_Delayed due to Integrated Settlement decision	6	5	18	23
	d_Delayed by contractor	3	2	3	5
	d_Lack of Mason	2	-	1	1
	d_Others	1	-	2	2
E	**Plinth completed ~ 1st Inspection not conducted**	**404**	**183**	**180**	**363**
	e_On Schedule (No action required)	275	100	153	253
	e_DLPIU engineer not available	32	11	17	28
	e_Non compliance	64	50	-	50
	e_Constructed in public land	5	5	-	5
	e_Affected by Right-of -Way	5	4	-	4
	e_Out of contact	17	10	1	11
	e_Others	6	3	9	12
F	**1st Inspection conducted~2nd Tranche not deposited**	**1,211**	**694**	**711**	**1,405**
	f_On Schedule (No action required)	848	545	480	1,025
	f_Pending in Ward office	164	46	24	70
	f_Rejected by DLPIU (Building)	50	7	5	12
	f_Rejected by DLPIU (GMaLI)	11	8	3	11
	f_Pending in DLPIU (Building)	67	40	108	148
	f_Pending in DLPIU (GMaLI)	68	47	89	136
	f_Suspended NGO Support	-	-	-	-
	f_Others	3	1	2	3
G	**2nd Tranche deposited~Roof Band not completed**	**5,542**	**4,179**	**831**	**5,010**
	g_On Schedule (No action required)	3,081	2,207	313	2,520
	g_Death	41	36	8	44
	g_Inaccessible	39	36	7	43
	g_Affected by Right-of-Way	2	2	-	2
	g_Out of contact	180	146	40	186

Categories of Issues		No. of Beneficiaries			
		Previous Period	This Period		
			Unsolved	New	Total
	g_Migrated to other place	243	203	8	211
	g_Poor economic condition	376	270	95	365
	g_Will not continue	3	2	10	12
	g_No immediate plan to continue	1,016	846	174	1,020
	g_Family Issues	97	65	22	87
	g_Responsible person out of house	119	74	85	159
	g_Cultural Taboos	2	1	2	3
	g_Suspended NGO Support	1	1	4	5
	g_Delayed due to Integrated Settlement decision	123	121	1	122
	g_Delayed by contractor	62	45	31	76
	g_Shortage of Materials	33	16	13	29
	g_Tranche deposited without required progress	6	6	1	7
	g_Document insufficient to withdraw grant	-	-	-	-
	g_Tranche deposited without compliance	-	-	-	-
	g_Lack of Mason	41	31	14	45
	g_Lack of Carpenter	2	1	-	1
	g_Others	75	70	3	73
H	**Roof Band Completed~2nd Inspection not conducted**	**2,010**	**1,269**	**710**	**1,979**
	h_On Schedule (No action required)	656	369	310	679
	h_DLPIU engineer not available	95	41	12	53
	h_Non compliance	157	129	15	144
	h_Toilet/ Renewable energy device not constructed	946	601	321	922
	h_Electric Meter not installed	17	13	14	27
	h_Affected by Right of Way	-	-	-	-
	h_Out of contact	29	18	16	34
	h_Additional requirement of roof completion	104	94	7	101
	h_Others	6	4	15	19
I	**2nd Inspection conducted ~3rd Tranche not deposited**	**3,148**	**2,281**	**1,171**	**3,452**
	i_On Schedule (No action required)	2,292	1,678	737	2,415
	i_Pending in Ward office	385	280	97	377
	i_Rejected by DLPIU (Building)	151	127	76	203
	i_Rejected by DLPIU (GMaLI)	15	6	16	22
	i_Pending in DLPIU (Building)	245	178	69	247
	i_Pending in DLPIU (GMaLI)	51	12	136	148
	i_Suspended NGO Support	-	-	-	-
	i_Others	9	-	40	40
J	**3rd Tranche deposited~Roof not completed**	**1,408**	**1,009**	**156**	**1,165**
	j_On Schedule (No action required)	912	668	92	760
	j_Death	5	5	-	5
	j_Inaccessible	5	4	1	5
	j_Out of contact	25	21	3	24
	j_Migrated to other place	28	20	3	23
	j_Poor economic condition	73	55	7	62
	j_No immediate plan to continue	187	147	34	181

Categories of Issues		No. of Beneficiaries			
		Previous Period	This Period		
			Unsolved	New	Total
	j_Family Issues	22	17	2	19
	j_Responsible person out of house	26	21	2	23
	j_Cultural Taboos	1	1	-	1
	j_Delayed due to Integrated Settlement decision	-	-	-	-
	j_Delayed by contractor	83	19	3	22
	j_Shortage of Materials	10	7	3	10
	j_Lack of Carpenter	25	20	4	24
	j_Tranche deposited without required progress	-	-	2	2
	j_Tranche deposited without compliance	-	-	-	-
	j_Document insufficient to withdraw grant	2	1	-	1
	j_Lack of welder	-	-	-	-
	j_Others	4	3	-	3
K	**Roof Completed~Final Inspection not conducted**	**32,426**	**26,591**	**6,123**	**32,714**
	k_On Schedule (No action required)	15,550	12,777	2,335	15,112
	k_DLPIU engineer not available	4,588	3,402	919	4,321
	k_Non compliance	142	130	105	235
	k_Affected by Right of Way	-	-	-	-
	k_Out of contact	30	30	112	142
	k_Old house not demolished	104	102	466	568
	k_Electric Meter not installed	157	157	7	164
	k_Window or door not installed	2,787	2,154	1,255	3,409
	k_Record keeping not completed	5,395	5,281	904	6,185
	k_Building permit not completed	3,275	2,484	9	2,493
	k_Others	398	74	11	85
L	**Final Inspection completed~Completion certificate not distributed**	**3,601**	**3,025**	**1,099**	**4,124**
	l_On Schedule (No action required)	2,572	2,115	484	2,599
	l_Waiting for good quality certificate	408	289	549	838
	l_Unavailability of Completion Certificate	-	-	47	47
	l_Record keeping not completed	483	483	5	488
	l_Building permit not completed	138	138	14	152
	l_Others	-	-	-	-
M	**Completion Certificate distributed**	**2,187**	**2,185**	**246**	**2,431**
	m_Without issue	2,187	2,185	246	2,431
	m_Non compliance	-	-	-	-
Total		**56,396**	**44,600**	**11,924**	**56,532**

Source: This Study 2018

These statuses are summarised into four levels as per responsible entity: (1) Community and Individual Level, (2) Ward Level, (3) NP and GP Level and (4) Central Level.

1) Community and Individual Level

The major issues on this level are related to willingness to reconstruct house, poor economic condition and family business. CMP has urged house owners at this level to solve issues collectively among themselves through issue-specific community meeting.

Table 3-22 Major Community and Individual Level Issues

Major issues at community and individual level	Number of beneficiaries
Issues related to willingness (not interested, will not construct, no immediate plan to continue)	1,453
Poor economic condition	479
Issues related to family business (family issue, responsible person out of house)	342
Death	174

Source: This Study 2018

2) Ward Level

The major issues summarised in this level are related to beneficiaries' whereabouts, land and wrong information on beneficiaries' identification and duplication of beneficiaries. The ward coordination meeting with ward chairperson, ward members, Senior Engineer and TA Team is effective to address those issues based on which the ward will take the necessary action.

Table 3-23 Major Ward Level Issues

Major issues at Ward level	Number of beneficiaries
Issues related to whereabouts (Out of contact, unknown beneficiaries, inaccessible)	824
Issues related to land (Migrated to other place, landless, affected by right-of-way, land dispute)	730
Beneficiaries' duplication	259

Source: This Study 2018

3) Municipality/Rural Municipality Levels

The registration of houses and building permits are the major issues related to NP and GP. Some NP and GP take advantage of GON Housing to enforce the registration of houses and building permits by making them as conditions for inspection and issuance of completion certificate. The registration of houses and building permits requires land survey and drawings which impose financial burden on house owners. TPIS-ERP consultants have suggested at the coordination meeting with mayor and chairperson that the local government could complete the Housing Reconstruction Program without such registration and permit.

Table 3-24 Major NP and GP Level Issues

Major issues at Municipality and District levels	Number of beneficiaries
Record keeping not completed	6,633
Building permit not completed	2,645

Source: This Study 2018

4) Central Level

Issues needed to be addressed at central level are related to payment, formality and inspection. Specifically, DLPIU engineer's absence at the field is a critical issue which NRA needs to take serious action.

Table 3-25 Major Central Level Issues

Major issues at Central level	Number of beneficiaries
Issues related to unavailability of inspection engineer (DLPIU Engineer not available)	4,374
Issues related to Document (Document pending in CLPIU(GMaLI/Building), DLPIU (GMaLI/Building))	766

Source: This Study 2018

(2) GIS Monitoring Map

TPIS-ERP team created the GIS Map of beneficiary locations based on the data collected by TPIS-ERP from December 2018 and by NRA. EHRP consultants will take over this monitoring system which enable them to analyse the housing reconstruction status visually. (GIS Maps are attached as Appendix B.)

3.3.6 Financial Seminar

Seminar on Financial Management for Housing Reconstruction (Advance Procedure) was conducted on 4 June 2017. On the other hand, the training for countermeasures for corruption was included in the Inspection Training for DLPIU Engineers.

- Date and Time : 4th June 2017 from 10:30am to 14:00pm
- Venue : MOUD Conference Hall
- Language : English (close discussion was held in Nepali toward the end)
- Organised by : CLPIU (GMaLI)[18]
- Participants : DCC and DTCO (Gorkha and Sindhupalchok), MOUD CLPIU, MOFALD CLPIU, PFIs, TPIS-ERP Consultants, EHRP Consultants

(1) Objectives of the Seminar

Seminar on financial management for housing reconstruction (advance procedure) was organised by CLPIU (GMaLI) and co-supported by TPIS-ERP and EHRP Consultants who prepared presentation materials for project profile, Japanese ODA LOAN and the advance procedure. The seminar provided information on challenges faced at district level and samples of necessary documents to be submitted by DCC, DTCO and PFIs.

[18] The then MOFALD CLPIU conducted the seminar. It was later changed to CLPIU (GMaLI).

The objectives of the seminar were as follows:

- Understand and review the overall project implementation, progress, project issues and solutions.
- Identify target areas of JICA to support and finance.
- Explain Japanese ODA LOAN as well as how to deal with advance procedure.
- Obtain feedbacks, difficulties and different opinions from the participants to correct financial flows and necessary evidences to be submitted.
- Request headquarters of Participating Financial Institutions (PFI) to inform their district managers (Gorkha and Sindhupalchok) to submit summary of payment records to beneficiaries.

(2) Seminar Programme

Table 3-26 Financial Seminar Programme

Time	Agenda	Duration
11:00 - 11:10	Opening Remarks by CLPIU (GMaLI)	0:10
11:10 - 11:30	Project Outline by EHRP	0:20
11:30 - 12:00	Japanese ODA LOAN and Advance Procedure by TPIS-ERP	0:30
12:00 - 12:10	Tea Break	0:10
12:10 - 12:40	Local Disbursement Flow by EHRP	0:30
12:40 - 13:00	Q&A	0:20
13:00 - 13:10	Closing Remarks by CLPIU (GMaLI)	0:10
13:10 - 14:00	Lunch Time	0:50

Source: This Study 2018

1) Opening Remarks

Welcome speech was given upon opening of the seminar. It was noted that keeping close coordination with DCC, DTCO, Rural Municipality, Municipality and PFIs is very important for the Project. There were various financial issues confronting the project, which discourage beneficiaries to receive 2nd tranche of the grant. Various technical issues also existed and CLPIU (GMaLI) and other relevant authorities have been trying to solve all challenges in the Project, such as educating young staff who lacked technical experience and also required to cope with the sensitiveness of social aspect in the community in the district. Disbursements from Japanese ODA LOAN required many financial documents and evidences which have been realised that number of documents is missing or not kept in order.

Reconstruction Coordination Committee is now training newly elected body of Municipalities and Rural Municipalities for their role as representative in CBRC and District, collecting PA for updating MIS system.

2) Financial Management for Housing Reconstruction (Advance Procedure)

Project background, major issues of housing reconstruction and JICA's disbursement by Advance Procedure were introduced to the participants.

3) Financial requirements for JICA fund disbursement

The presentation specially focused on financially concerned parties for the Project, which are PFIs, DCC and DTCO. Requirements and role of each organisation who are financially concerned was explained. Issues identified and solutions / possible assistance by EHRP financial consultants have been presented. The session was followed by Q&A and discussions.

4) Discussion/ issues raised by participants

Participants raised feedbacks based on the presentation made by TPIS-ERP and EHRP Consultants.

Table 3-27 Issues raised by participants

DTCO Officers
- DTCO Officers are preparing VDC and PFIs wise payment order. Beneficiary list had been verified and issuance of check for grant release had taken place. - DTCO Officers are monitoring the bank deposit situation by their internal system, normally once a week, to confirm that the grant has been released. But sometimes DCC officers are late in delivering bank check to the concerned bank due to limited manpower and geographical difficulties. This type of delay in delivery should be improved by DCC. - Due to software problem, DTCO Officers are releasing 2nd beneficiary tranche manually. This manual system does not function well if number of certified beneficiaries is high. - DTCO officer said, "Grievances record is being updated but not uploaded in LMBIS. So DTCO cannot verify to release tranche to those households already eligible."
DCC Officers
- DCC finance section has massive workload of financial operation of other budget activities, including EHRP housing grant release, hence it cannot keep intact recording of grants released to beneficiaries.
Representatives of PFIs
- PFIs verified the beneficiary list in their own system. But if the system does not accept the name of a certain beneficiary then PFI returns the check to DCC for correction. - All beneficiaries of JICA target VDC which have savings account in bank. Due to miscommunication and wrong interpretation about receiving grants, some beneficiaries misuse their fund. - PFIs Head Office expects a request letter from National Reconstruction Authority to provide evidence of amount deposited in the account of beneficiaries. - District level PFIs expects an instruction letter from their head office to provide evidence of amount deposited in the account of beneficiaries as requested by DCC in proposed format.
Other issues
- Newly elected local bodies are demanding to release fund to all earthquake victims immediately regardless of noncompliance to Minimum Requirements. This indicates necessity of effective coordination and facilitation meeting with newly elected bodies as soon as possible. - Government-appointed field technical staff are immature, fresh graduates and lack experience. They have been hiding personal expectations. This situation discouraged beneficiaries to take 2nd tranche.

Source: This Study 2018

(3) Conclusion and Way Forward

Various financial issues concerning DTCO, DCC and PFIs were raised during the seminar. It was confirmed that EHRP consultant will follow up on each detailed issue and assist in the smooth implementation of financial management for the Project. Below is the list of immediate items to be followed up:

Table 3-28 Issues raised during the Financial Seminar

No	Issues	Actions to be taken /Way forward	Responsible Agency
1	Collection of PO copy and beneficiaries list	DCC will provide the copy of documents to EHRP Consultant's DFM (District Financial Manager). DFM will support collecting the document.	DCC/DFM
2	Missing PO documents in DCC	Arrange PO documents in proper way to be filed and copied easily when required. Missing PO and beneficiaries list will be copied from DTCO records.	DCC/DTCO
3	Delayed delivery of bank check to PFIs	DCC should deliver check in a timely manner. DFM will remind DCC and assist on the timely delivery of check to PFIs.	DCC/DFM
4	Data uploading problem in DTCO system to release the 2nd tranche	The manually released 2nd tranche is required to be uploaded in the system later on. Technical problem of software shall be solved by FCGO, and notice to FCGO can be made by MOFALD-CLPIU.	DTCO/ MOFALD-CLPIU
5	Names of beneficiaries identified and added by confirmation of grievance have not been uploaded in the system	MOFALD-CLPIU required to coordinate with NRA/MIS to solve the issue.	NRA/ MOFALD-CLPIU
6	Evidences of released grant amount and deposited in beneficiaries' account	PFIs are required to provide the necessary evidences for payment record to beneficiaries. NRA should inform Bank Association of Nepal to instruct PFIs head office to provide such evidences.	NRA/ Bank Association of Nepal
7	Collection and compilation of PO, summary of released grant and evidence from PFIs	EHRP Consultant finance team will collect and compile the record and evidences. DFM will collect required documents in each district.	EHRP finance consultants

Source: This Study 2018

	
Opening Remarks	Participants from Gorkha, Sindhupalchok and Kathmandu.
	
Participants from government agencies and government and private banks.	Participants from government agencies and government and private banks.

Source: This Study 2018

Figure 3-47 Financial Seminar

Chapter 4 Emergency School Reconstruction Project

The report on ESRP was separately prepared and submitted to JICA in May 2017.

Chapter 5 Environmental and Social Management System

5.1 Brief Summary of District-wide Environmental and Social Baseline Condition

5.1.1 Introduction

This section gives a summary of baseline environmental and social information of the following two districts, namely: (1) Gorkha, and (2) Sindhupalchok. The detailed baseline natural and social environmental information of each of two districts are summarised within sets of final study reports, entitled "Baseline Environmental and Social Profile Study for Emergency Reconstruction Project", separately. Figure below shows the major protected areas in Nepal.

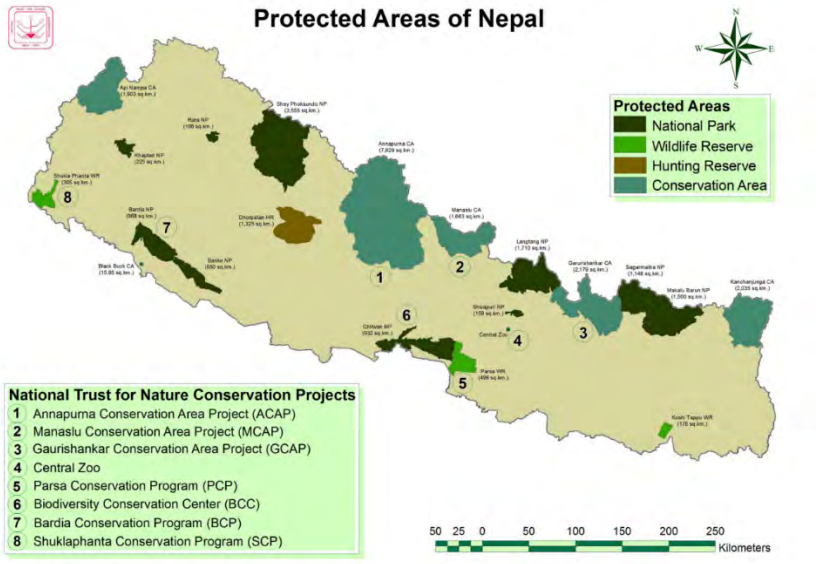


Figure 5-1 Protected Areas in Nepal

5.1.2 Gorkha District

Gorkha District lies in Gandaki zone and has 60 VDCs and 2 Municipalities[19]. It stretches from Chitwan District (Mugling) in the south to the Tibetan border with elevation ranging from 488 to

[19] In line with the transformation to federal system, VDC was changed to NP and GP. Gorkha district is now composed of 2 NP and 9 GP.

8,156 EL-m (Mt. Manaslu). The climatic condition in Gorkha also changes with altitude and comprises of all the climatic zones from Upper Tropical in the south to Nival in the north. The temperature ranges from maximum of over 35 °C in upper tropical region to minimum of around -10 °C in nival zone with the average maximum of 20 °C and average minimum of about 4 °C. The total average annual rainfall in Gorkha is 1,400 mm with about 80% of the annual precipitation occurring during the monsoon season.

Gorkha District is drained by large number of rivers, their tributaries and subtributaries, which are both perennial and seasonal in nature. Trishuli, Budigandaki, Marshyangdi, Daraundi and Chepe Rivers are major perennial and snow-feed rivers. Despite the richness of water resources in Gorkha, water is not sufficiently available for drinking and irrigation purpose due to terrain characteristics, which become worse after the 2015 Gorkha Earthquake in upper two-thirds part of the district, specially in Daraundi catchment. Nevertheless, the major rivers can be sources of large hydropower projects.

Geologically speaking, Gorkha District falls both in the Lesser Himalaya and the Higher Himalaya. The Lesser Himalaya is made up of sedimentary, metamorphic and igneous rocks, which are highly folded, jointed and faulted and have developed complicated geological structures. The Higher Himalaya rocks are fresh and hard and exhibit high mountain ranges with steep-very steep slopes. The epicentre of the 2015 Gorkha Earthquake was located at the northern edge of the Lesser Himalaya. Because of the climate, topography, accessibility and presence of fertile soil, most of the people live in the Lesser Himalayan zone.

Gorkha District has river valleys, hills, middle mountains (midland) and high mountains. It is a river terrace made by the Marshyangdi River. Mountain slopes are composed either of bare bedrock or, more commonly, of bedrock mantled by thick to very thick unconsolidated soil cover. Physical weathering of rocks in the northern part of this district is relatively high because of the daily high temperature difference, along with freeze. Soils in the lower slope of river valleys of Budigandaki, Daraundi and Chepe Rivers and their tributaries consist of alluvial soils, whereas mountain soils are either residual or colluvial or their combination.

Landslides are common phenomena in this district, especially in monsoon rain season. In addition, the 2015 Gorkha Earthquake triggered widespread landslides in more than three-fourths part of Gorkha in the north and the damage, destruction and casualties related to them during and after the earthquake were highest among the affected districts.

Pollutants in soil, water and air affect environment in different ways. Chemical fertilisers have become a source of soil pollution in several VDCs in the south. Open defecation has been a major concern after the earthquake since toilets in most of the areas have been damaged or destroyed. Leak from toilets/septic tanks or its direct discharge to rivers (e.g., Budigandaki, Daraundi and Chepe Rivers) and their tributaries and subtributaries close to settlements, has been polluting the

water. VDCs are not seen having problem with solid waste but Prithivinarayan Municipality is facing pollution issues as it has not developed proper disposal site and the wastes are disposed in the stream bank close to Laxmi Bazar. Burning of wastes in this site is polluting the air, and liquid waste (leachate) generated from solid waste is contaminating water sources. Air pollution is recognised in the form of dusts produced by vehicles on the earthen roads throughout Gorkha. Crusher industries along the Daraundi valley blow dusts into the atmosphere and pollute air around them to some extent.

This district has 66,458 households and a population of 271,061 in 60 VDCs and 2 Municipalities[20]. It has 44 caste/ethnic groups and Gurung is the largest group followed by Hill-Brahmina, Chhetri and Magar. There are 7 Dalit groups with total population of 44,113, or 16% of the total district population. There are 8 caste ethnic groups reported as marginalised groups. Chepang, a nearly extinguished marginalised group, is in the district. The average family size is 4.1 while the sex ratio is 80.68. About 65 % of total district population are economically active. Major livelihood source for 80% of the district people is agriculture.

Out of the total area of this district, about 29 % is barren land. Forest covers about 27% of the area followed by agricultural land (19%), grassland (14.64 %), and bushland (5.76 %). Snow and glacier cover about 3.5% area of the district. The northern part of the district has parts of Manaslu Conservation Area.

The averaged districtwide population density is 74. The northern VDCs are sparsely populated and thus have lower population density. The south-central part of the district has higher density particularly the Municipalities. The district is fairly accessible except few northern VDCs. The southern central part has better road access. Although gravel roads access to almost all VDCs located in the southern part, the average walking time distance to nearest road is 2 hours in central part while it takes up to 4 hours to people living in the northern part of the district to reach the nearest road.

5.1.3 Sindhupalchok District

The soil of this district is alluvial along the river valleys with boulder, gravel, sand, silt and clay in different proportions. Mountain soils are residual and colluvial. The places up to 1,000 E.L.m are very hot in summer having maximum temperature of 33 °C which drops to the lowest of 5 °C in winter (i.e., the tropical zone). The subtropical zone, starts at 1,000 E.L.m and goes up to 2,000 E.L.m, is warm and humid climate and good for forestation. The mid-hill area is generally a complex physiographic condition with stepwise rise in altitudes from south to the north, providing the formation of deep river valleys.

[20] National Population and Housing Census 2011

The total average annual rainfall is 1,615 mm and most of local run-off waters are drained by large number of rivers and their tributaries and subtributaries. Most of this district is located under the lesser and higher Himalayas. The Lesser Himalayas in this district consists of low grade meta-sedimentary rocks, such as slate, phyllite and schists of different names and ages, with some carbonate rocks (limestone and dolomite) in certain places. Except the carbonates, the rocks are mostly soft and moderately to highly weathered and develop low topographic reliefs of the midland zone.

It is reported that this district has almost 1,955 species of animals and 3,720 species of plants under different taxonomic groups, having a unique potential site of endemic flora and fauna. Seventy-four plant species among the list match with the national list of endemic and different threat status. Likewise, 97 species of animals match with the national threatened animal species.

Out of the total district area (2,489.8 km^2), 29.7 % is covered by agricultural land, followed by forest area (29 %), and then barren land (18%). The southern part of the district is mostly covered with agricultural land whereas the northern part mostly by Langtang National Park and Gauri-shankar Conservation Area.

Most of the people in this district live in the Lesser Himalayan zone, and the southern 62 VDCs and two Municipalities of this district are entirely located in the Lesser Himalaya[21]. The district has 66,688 households and a population of 287,798 in 68 VDCs and 2 Municipalities[22]. The average family size is 4.32. Among the households, 24.05% are female-headed households. The district has 93 caste/ethnic groups, and Tamang is the largest group (34.25 %), followed by Chhetri (18.23 %), Newar (11.11 %), Brahman Hill (10.23 %), and Kami (3.88 %). Remaining caste ethnic groups are Sanyasi/Dashnami, Sherpa, Majhi, Damai/Dholi, Hyolmo and others. It has been reported in 2011 Census that there are 15 Dalit Groups with a total population of 21,351. Also, it is reported that there are 23 marginalised caste ethnic groups therein.

The average districtwide population density is 115. The northern VDCs are sparsely populated and thus has lower population density. There is higher population density in the southern part, especially in the municipal area and along the Arniko Highway. Barhabise VDC has the highest population density, followed by Mankha, and Chautara Municipality, and then Bhimtar. Lower population densities are in Gumba, Baruwa, Bhotang, Helambu, and Golche VDC.

[21] Sindhupalchok district has 3 NP and 9 GP after transformation to federal system.
[22] National Population and Housing Census 2011

5.2 Environmental Legal Framework and Organisations

5.2.1 Key Environmental Codes in Nepal

There are several key environmental and social legal codes enacted in Nepal that shall be well-addressed within the proposed reconstruction project. The outline of those legal codes is described separately as follows:

(1) The Interim Constitution 2007 of Nepal

The Constitution has guaranteed every person the right to live in a clean environment as a fundamental right. GON has made necessary arrangements to maintain clean environment through different environmental laws and regulations. The State has also vowed to give priority to the protection of the environment, prevent its further damage due to physical development and increase the awareness of the general public about environmental cleanliness. The State has also promised to make special arrangements for protection of rare wildlife and their habitats. Protection of forest, vegetation and biodiversity, its sustainable use and for equitable distribution of the benefit derived from it, are other constitutionally recognised legislations.

(2) The Environmental Protection Act of 1997 (EPA 96) and Environmental Protection Regulation of 1997 (EPR 97)

EPA 96 is notable here with the intention to minimise the adverse impacts of environmental degradation, and to protect the environment, keeping in mind sustainable development. EPR 97 also has mentioned that any development project, before implementation is required to pass through environmental assessment, which may be either Initial Environmental Examination (IEE) or an Environmental Impact Assessment (EIA) depending upon the location, type and size of the project. In Act No. 24 of EPA 96, there is legal provisions to maintain clean and healthy environment by minimising, as far as possible, adverse impacts likely to be caused from environmental degradation on human beings, wildlife, plants, nature and physical objects; and to protect environment with proper use and management of natural resources, taking into consideration that sustainable development could be achieved from the inseparable interrelationship between economic development and environment protection.

There is the provision of prevention and control of pollution. EPA 96 says that nobody shall create pollution in such a manner as to cause significant adverse impacts on the environment, or likely to be hazardous to public life and people's health, or dispose or cause to be disposed sound, heat radioactive rays and wastes from any mechanical devices, industrial enterprises, or other places contrary to the prescribed standards. There is the provision of environment inspector in EPA96. In order to effectively carry out or cause to be carried out the acts of the mitigation, avoidance or control of pollution or the acts required to be carried out in accordance with the IEE or the EIA

report, the ministry may, by fulfilling the procedures prescribed by the Public Service Commission, appoint Environmental Inspectors or designate any employee to carry out functions of such Inspectors. The qualifications for the Environment Inspectors shall be as prescribed. In the act, the functions, duties and powers of the Environment Inspector have also been given.

In EPA 96, there is the provision of protection of National Heritage. EPA 96 also explains about environment protection area; provisions for the establishment of laboratories; establishment and operation of environment protection fund; and power to constitute environment protection council. Likewise, there is the provision of Concession and Facility, formation of different committees, compensation, punishment, appeal, delegation of power and power to frame rules as well.

(3) Forest Act 1993 and Forest Regulations 1995

This act and regulation are another notable legislation related to environment in Nepal. Under the Environmental legal framework, the role of forest rules is also equally important. In the forest rules 1997, considering the environmental protection some provision such as collection, sale and distribution of the forest product; provisions relating to the sale and distribution of timber and firewood; license for grazing the animals have been explained clearly to protect environment and biodiversity.

Section 68 of the Forest Act, 1993 empowers GON in case of no alternatives, to use the Forest Area for the implementation of the project if it is considered as a national priority by GON. If a subproject is proposed on forest lands. If there are no significant adverse effects on the environment while conducting such a plan, GON may give assent to use any part of the Government Managed Forest, Community Forest, Leasehold Forest or Religious Forest for the implementation of such a plan or project.

(4) Solid Waste Management Act 2011 and Solid Waste Management National Policy 1996

This act and policy are another important environmental-related legislation formulated for the systematic and effective management of solid waste by minimising the solid waste at source, reusing, processing or disposing of the solid waste, and to maintain the clean and healthy environment by minimising the adverse effects of the solid waste in the public health and environment. Solid Waste Management and Resource Mobilization Act 1987 (with amendment in 1992) describes the procedures for disposing solid waste. It categorises harmful hazardous wastes and provides information on several controlling measures. There is provision to appoint inspection officer for checking and monitoring solid waste control and management. The inspector has authority to take action against the polluter or polluting agency. Disposal of battery and electronic goods can be carried out on the basis of this act but it does not provide specific guidelines for the disposal of such wastes. Auctions are the procedure usually followed to dispose such wastes.

(5) The Labour Act, 2048 BS (1992)

This act regulates the working environment and deals with occupational health and safety aspects. Local Self Governance Act (LSGA), 2055 BS (1999) empowers the local bodies for conservation of soil, forest and other natural resources. Sections 28 and 43 of the Act provide VDC a legal mandate to formulate and implement programs related to protection/conservation of environment during the formulation and implementation of a district level plan. This act provides more autonomy to DDC, Municipalities and VDCs. The LSGA empowers the local bodies for the conservation of soil, forest and other natural resources and implements environmental conservation activities. Sections 28 and 43 of the Act provide the VDC a legal mandate to formulate and implement programmes related to protection of environment during the formulation and implementation of a district level plan.

(6) Land Act 1964

The role of this Act is also equally crucial for protecting the environment. In Chapter 9A of this Act considering the issue of environment, there is the provision relating to land use, control of land fragmentation, and plotting (Chaklabandi). Appropriate land fragmentation and plotting are important to protect environmental degradation such as landslide, soil erosion, etc. In Plant Protection Rules, 2010 (the elaborated version of Plant Protection Act, 2007), some key provisions like procedures to destroy plants, quarantine, pest-free production area, and pest-free area have been explained properly to protect the environment.

Prior to 1990, there was no constitutional obligation for GON to pay compensation for the acquisition of personal property. The right to receive compensation was therefore not a fundamental right. Article 17 of the Constitution of the Kingdom of Nepal (1990), however, established the right to property as a fundamental right, stating that "no person shall be deprived of his property save in accordance with the law". Article 25 (1) establishes the right to property for every citizen of Nepal. Article 25 (2), states that except for social welfare, the state will not acquire or exercise authority over individual property. According to the Article 25 (3), when the state acquires or establishes its right over private property, the state will compensate for loss of property and the basis and procedure for such compensation will be specified under relevant laws. The basis of compensation and the procedures for delivering compensation for any property acquired by the State are therefore prescribed by law. Land and asset acquisitions are undertaken within the framework of the Land Acquisition Act (for permanent land acquisition) and the Public Road Act (for temporary land acquisition). The 1978 amendment to the Public Road Act, to be described later, was promulgated to ensure uniformity with the Land Acquisition Act, also to be described later. The following comprised the main legal framework related to the land acquisition of Nepal.

(7) Land Acquisition Act (1977)

This Act empowers GON to acquire any land for public purposes or works on payment of compensation. The acquisition and compensation of privately owned assets are undertaken according to a formal procedure consisting of (a) initial procedures, (b) a preliminary investigation process, (c) an acquisition notification, (d) a compensation notification and (e) appeal procedures.

Compensation Fixation Committees (CFC) is established at district level to ascertain compensation rates for land and other assets. Compensation is paid (a) for damages caused as a result of investigations during the preliminary investigation process and (b) for land and assets permanently acquired by the project (including standing crops, trees and houses). Compensation is paid in a cash lump sum although title holders who have lost all of their landholdings may be given replacement land, if available. Title holders are required to submit compensation claims or complaints within a specified period after the land acquisition notice has been issued by the local authority (Chief District Officer). Compensation for land is paid after the determination of rates and verification of the list of entitled applicants by the CFSC.

(8) Public Road Act (1974)

This act empowers the Department of Roads (DoR) to acquire any land on a temporary basis (for storage facilities, construction camps, etc.) during road construction and upgrades. The temporary acquisition of land containing any buildings (e. g., houses, sheds, temples and schools) is avoided where possible. The Act also empowers the DoR to "lift earth, stone or sand from any adjoining land" during construction and upgrading works but does not provide for the leasing of land. However, the DoR is required to pay compensation for any damages caused to buildings, crops and trees where the farming activity of the landowner is interrupted or the landowner incurs expenses to restore the land after its return.

(9) Land Reform Act (1964)

The provisions of this Act that relate to the maximum permitted size of individual land holdings also apply to land acquisition since a landowner may not be compensated for more land than he is entitled to under this Act. In 1996, this Act was amended and this step was considered revolutionary in that it changed the existing system of land tenure by establishing the rights of tenants and providing ownership rights to the actual tiller. Different ceilings of agricultural land were set for Kathmandu Valley (50 ropani), hills and mountains (80 ropani) and the Tarai (25 bigha). It is noted that one *bigha* is the equivalent of 0.66 hectares, while one *ropani* equals to 0.05 hectares. In addition to this ceiling, for houses and kitchen gardens, a family may own 8 ropani in the Kathmandu Valley, 16 ropani in hills and mountains and 3 bigha in the Tarai.

This Act also specifies compensation entitlements for registered tenants on land sold by the owner or acquired for development purposes. The provisions of the Land Acquisition Act are consistent

with those of this Act of 1964, namely, that a registered tenant is entitled to 25% of the total compensation. However, the fourth amendment of the Land Reform Act in 1996 increased the tenant's entitlement to 50 %.

(10) Guthi Corporation Act (1976)

Land acquisition must also comply with the provisions of this Act. Section 42 of this Act states that Guthi (i.e., religious trust land) acquired for development must be replaced with other land rather than compensated in cash.

(11) Forest Act (1993)

This Act recognises the importance of forests in maintaining a healthy environment. Therefore, Section 49 of this Act prohibits the reclamation of land, the setting of fires, grazing, removal or damage to forest products, the felling of trees or plants, wildlife hunting and the extraction of boulders, sand and soil from the national forest without prior GON's approval. Clause 68 (1) of this Act states that GON may allow the use of any part of a GON-managed forest, leasehold forest or community forest but only if the plan or project is of national priority and there is no alternative for its implementation. According to Clause 68 (2), if any people or communities experience loss while the land is in use, GON is required to compensate the loss (MoSTE, 2006).

(12) Water Resources Act (1993)

The main objective of this Act is to make legal arrangements for determining beneficial uses of water resources, preventing social, environmental and other hazardous effects to water resources, and also for keeping these resources free from pollution. There is a provision in Section 16 for land acquisition from GON or the public for the construction of water resource projects. If the project is undertaken by the GON or a licensee, GON may forbid the use of a house or land located in the area where the construction work is being performed or within a prescribed distance from the construction work by any other person for any reason. GON or licensee is, however, required to pay compensation, as prescribed under Land Acquisition Act, to the concerned person for any resultant damage or loss.

(13) Local Self Governance Act (1999)

Part 5 of Clause 258 states that if a local governing body needs to acquire land to carry out any development and/or construction work within its area, it can acquire the land required as long as it follows the requirements of the prevailing law and provides compensation to the concerned landowner for the land.

(14) Town Development Act (1988)

This Act provides the legal basis for implementing town development plans. This Act empowers both central and local government agencies to carry out land pooling projects. The Local Self Governance Act also allows Municipalities and village development committees to carry out town development plans but should not be as comprehensive as this Act. According to Clause 12.1.1 of this Act, the government can acquire pieces of land so that it can integrate them and add facilities and services. The Town Development Committee can then reimburse its investment by selling the developed plots of land and transferring the remaining land to the original landowners. In Clause 5.2 of the Town Planning Directives (2005), there is provision to distribute the plots to marginal and excluded communities albeit with certain conditions.

(15) Act Relating to Reconstruction of the Earthquake Affected Structures, 2015 (2072) (Reconstruction Act 2015) and Rule of Relating to Reconstruction of the Earthquake Affected Structures, 2016 (2072) (Reconstruction Rule 2016)

GON has published a notice in Nepal Gazette, section 65, number 49 part 5 on 2072/12/1 B.S. (14th March 2016), specifying this Reconstruction Act 2015 and Reconstruction Rule 2016, including re-construction environmental assessment working procedure. This Act and Rule were enacted to promote reconstruction and/or recovery from the damage caused by the earthquake in 2015. This Act and Rule delegate authority of the environment clearance and the land acquisition of all types of land (private, public or government) and trust to the NRA in order to speed up reconstruction and/or recovery project, except land compensation of trust land. For the trust land compensation, the government shall follow the regular law, Guthi Corporation Act (1976).

According to the procedure of environmental assessment of this Act and Rule, overall examination process of both IEE and EIA tend to be made simpler, more transparent and effective for the purpose of quick implementing the development and reconstruction projects. The procedure has lessened the time taken for IEE and EIA to facilitate the speedy completion of reconstruction work.

5.2.2 International conventions, protocols and treaties related to the environment

Nepal is a signatory of many international conventions, protocols and treaties related to the environment. Nepal signed the United Nations Framework Convention on Climate Change (UNFCCC) on 12nd June 1992 during the UN conference on Environment and Development in Rio de Janeiro, Brazil. The Instrument of Ratification was submitted to the Convention Depository on 2nd May 1994 and the UNFCCC entered into force in Nepal from 31st July 1994. The parties to the Convention adopted the Kyoto Protocol (KP) on 11th December 1997 in order to pursue the ultimate objective of mitigating climate change. Nepal submitted the Instrument of Accession to the Kyoto Protocol to its depository on 16 September 2005. The Protocol entered into force in Nepal from 14th December 2005. In the process of implementing the Rio Convention, Nepal has implemented

various measures with respect to the UNFCCC such as preparing action plan to implement the Convention, issuing Clean Development Mechanism (CDM) project-approval processes to benefit from the provisions of the Kyoto Protocol, preparing the National Adaptation Program of Action (NAPA), and implementing a project on strengthening capacity for managing climate change and the environment.

United Nations initiated actions towards the environment by establishing United Nations Environment Program (UNEP) in 1972 that aims to coordinate the development of environmental policy by keeping the global environment under review and bringing emerging issues to the attention of the governments and the international community for action.

Table 5-1 Status of Major International Conventions, Protocols and Treaties Related to Environmental and Social Considerations in Nepal

	Signature	Ratification	Accession	Succession	Acceptance	Provisional Application
Convention on the High Seas	29 Apr 1958	28 Dec 1962				
Optional Protocol of Signature concerning the Compulsory Settlement of Disputes	29 Apr 1958*					
Constitution of the United Nations Industrial Development Organization	11 Aug 1983	6 Dec 1983				
International Tropical Timber Agreement,1994						23 May 1997
Constitution of the Asia-Pacific Tele-community	15 Sep 1976	12 May 1977				
Convention and Statute on Freedom of Transit			22 Aug 1966			
Agreement establishing the International Fund for Agricultural Development			5 May 1978			
Convention on the Prevention and Punishment of Crimes against Internationally Protected Persons, including Diplomatic Agents			9 Mar1990			
International Convention on the Suppression and Punishment of the Crime of Apartheid			12 Jul 1977			
Convention on Transit Trade of Land-locked States	9 Jul 1965	22 Aug 1966				
Vienna Convention on Diplomatic Relations			28 Sep 1965			
Customs Convention on the Temporary Importation of Private Road Vehicles			21 Sep 1960			
United Nations Convention against Corruption	10 Dec 2003	29 Mar 2011				
Convention concerning Customs Facilities for Touring			21 Sep 1960			
Slavery Convention, signed at Geneva on 25 September 1926 and amended by the Protocol			7 Jan 1963			
Convention on the Political Rights of Women			26 Apr 1966			

	Signature	Ratification	Accession	Succession	Acceptance	Provisional Application
Constitution of the World Health Organization					2 Sep1953	
Convention for the Suppression of the Traffic in Persons and of the Exploitation of the Prostitution of Others			10 Dec 2002			
International Covenant on Economic, Social and Cultural Rights			14 May 1991			
Agreement establishing the Asian Development Bank	4 Dec 1965				21 Jun 1966	
Convention on Biological Diversity	12 Jun 1992	23 Nov 1993				
Convention on the Prevention and Punishment of the Crime of Genocide			17 Jan 1969			
Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction	19 Jan 1993	18 Nov 1997				
Agreement establishing the Asia-Pacific Institute for Broadcasting Development	15 May 1980	11 Sep 1980				
Kyoto Protocol to the United Nations Framework Convention on Climate Change			16 Sep 2005			
Convention on the Rights of the Child	26 Jan 1990	14 Sep1990				
Montreal Protocol on Substances that Deplete the Ozone Layer			6 Jul 1994			
Vienna Convention for the Protection of the Ozone Layer			6 Jul 1994			
International Convention against Apartheid in Sports	24 Jun 1986	1 Mar 1989				
Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment			14 May 1991			
Agreement establishing the Common Fund for Commodities	7 Sep 1981	3 Apr 1984				
United Nations Framework Convention on Climate Change	12 Jun 1992	2 May 1994				
United Nations Convention on the Law of the Sea	10 Dec 1982	2 Nov 1998				
Convention on the Safety of United Nations Associated Personnel			8 Sep 2000			
International Convention for the Suppression of the Financing of Terrorism			23 Dec 2011			
Vienna Convention on Consular Relations			28 Sep 1965			
Convention on the Privileges and Immunities of the Specialized Agencies			23 Feb 1954			
Convention on the Privileges and Immunities of the United Nations			28 Sep 1965			
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade			9 Feb 2007			
Convention on the International Maritime Organization					31 Jan 1979	

	Signature	Ratification	Accession	Succession	Acceptance	Provisional Application
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal			15 Oct 1996			
International Convention on the Elimination of All Forms of Racial Discrimination			30 Jan 1971			
United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances			24 Jul 1991			
Convention on psychotropic substances			9 Feb 2007			
International Covenant on Civil and Political Rights			14 May 1991			
Convention on the Elimination of All Forms of Discrimination against Women	5 Feb 1991	22 Apr 1991				
Stockholm Convention on Persistent Organic Pollutants	5 Apr 2002	6 Mar2007				
United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa	12 Oct 1995	15 Oct 1996				
WHO Framework Convention on Tobacco Control	3 Dec 2003	7 Nov 2006				
Intergovernmental Agreement on the Asian Highway Network	26 Apr 2004	14 Jun 2010				
International Convention Against the Taking of Hostages			9 Mar 1990			
Intergovernmental Agreement on the Trans-Asian Railway Network	10 Nov 2006	6 Mar 2012				
Convention on the Rights of Persons with Disabilities	3 Jan 2008	7 May 2010				
Convention on the International Trade in Endangered Species of Wild Fauna and Flora			18 Jun 1975			
Single Convention on Narcotic Drugs, 1961, as amended by the Protocol amending the Single Convention on Narcotic Drugs, 1961			29 Jun1987			

Note: * Definitive signature

Source: JICA (2013)

5.3 Environmental Standards

5.3.1 Generic Standards for Industrial Effluents

Ministry of Science, Technology and Environment (MOSTE, 2001) had developed "generic standards of tolerance limit for industrial effluents to be discharged into inland surface waters". According to this, the tolerance limit for Biological Oxygen Demand (BOD) for 5 days at 20 ℃ is between 30 – 100 mg/L. The table below shows the tolerance limit for industrial effluents:

Table 5-2 Tolerance limits for industrial effluents to be discharged into inland surface water

S. No.	Characteristics	Tolerance limit
1	Total suspended solids, mg/L, Max	30-200
2	Particle size of total suspended particles	Shall pass 850-micron sieve
3	pH	5.5 to 9.0
4	Temperature	Shall not exceed 40 °C in any section of the stream within 15 metres downstream
5	BOD for 5 days at 20 °C, mg/L, Max	30-100
6	Oils and grease, mg/L, Max	10
7	Phenolic compounds, mg/L, Max	1
8	Cyanides (as CN), mg/L, Max	0.2
9	Sulphides (as S), mg/L, Max	2
10	Radioactive materials:	
	a. Alpha emitters, c/ml, Max	10-7
	b. Beta emitters, c/ml, Max	10-8
11	Insecticides	Absent
12	Total residual chlorine, mg/L	1
13	Fluorides (as F), mg/L, Max	2
14	Arsenic (as As), mg/L, Max	0.2
15	Cadmium (as, Cd), mg/L, Max	2
16	Hexavalent chromium (as Cr), mg/L, Max	0.1
17	Copper (as Cu), mg/L, Max	3
18	Lead (as Pb), mg/L, Max	0.1
19	Mercury (as Hg), mg/L, Max	0.01
20	Nickel (as Ni), mg/L, Max	3
21	Selenium (as Se), mg/L, Max	0.05
22	Zinc (as Zn), mg/L, Max	5
23	Ammoniacal nitrogen, mg/L, Max	50
24	Chemical Oxygen Demand, mg/L, Max	250
25	Silver, mg/L, Max	0.1

[Published in Nepal Gazette in 2058/01/17(April 30, 2001)]
Source : www.moste.gov.np [Ashad 2071 (2014)]

5.3.2 Air Quality Standards

MOSTE (2003) had developed "generic standards of tolerance limit for ambience air". Some of relevant parameters set by the GON are presented in the table below. The emission from industrial plants is monitored in accordance to the following standard.

Table 5-3 National Ambient Air Quality Standard, 2012

No.	Parameter	Unit	Averaging time	Concentration Max	Test methods
1	TSP	µg/m^3	Annual	-	
			24-hours	230	High volumetric sampling Gravimetric Analysis
2	PM10	µg/m^3	Annual	-	
			24-hours	120	High volumetric sampler and Gravimetric Analysis, TOEM, Beta analysis
3	Sulphur Dioxide	µg/m^3	Annual	50	Ultraviolet Fluorescence, West and Gaeke Method
			24-hours	70	Same as annual
4	Nitrogen Dioxide	µg/m^3	Annual	40	Chemiluminescence
			24-hours	80	Same as annual
5	Carbon Monoxide	µg/m^3	8-hours	10,000	Nondispersive Infra-Red Spectrophotometer (NDIR)
6	Lead	µg/m^3	Annual	0.5	High-volume sampling, followed by atomic absorption spectrometry
7	Benzene	µg/m^3	Annual	5	Gas Chromatographic Technique
8	$PM_{2.5}$	µg/m^3	24-hours	40	$PM_{2.5}$ sampling gravimetric analysis
9	Ozone	µg/m^3	8-hours	157	UV spectrophotometer

Source: www.moste.gov.np [Ashad 2071 (2014)]

5.3.3 Indoor Air Quality Standards

During the production process, industries emit several kinds of air pollutants. As GON has developed the indoor air quality standards, these standards are expected to be maintained by the industries. The following table shows the government-endorsed indoor air quality standards to be followed.

Table 5-4 National Indoor Air Quality Standards, 2009 (Max Concentration)

No.	Pollutant	Level	Average Time
1	Particulate Matter (PM_{10})	120 µg/m^3	24-hour
		200 µg/m^3	1-hour
2	Particulate Matter ($PM_{2.5}$)	60 µg/m^3	24-hour
		100 µg/m^3	1-hour
3	Carbon Monoxide (CO)	9 ppm (10 mg/m^3)	8-hour
		35 ppm (40 mg/m^3)	1-hour
4	Carbon dioxide (CO_2)	1000 ppm (1800 mg/m^3)	8-hour

ppm = parts per million by volume
Source: www.moste.gov.np [Ashad 2071 (2014)]

5.3.4 Vehicle Emission Standards

Similarly, MOSTE has developed vehicle emission standards. Department of Transport is expected to check emission standards based on the following standards at the time of registration and renewal of the vehicle registration.

Table 5-5 Vehicle Emission Standards for Green Stickers, effective since October 23, 2000
Petrol-operated vehicles

S. No.	Type of vehicle	CO % by volume	HC (ppm)
1	Four wheelers 1980 or older	4.5	1000
2	Four wheelers 1981 onwards	3	1000
3	Two wheelers (two-stroke)	4.5	7800
4	Two wheelers (four-stroke)	4.5	7800
5	Three wheelers	4.5	7800
Gas-operated vehicles			
1	Four-wheelers vehicles	3	1000
2	Three wheelers vehicles	3	7800
Diesel-operated vehicles			
1	Older than 1994 A.D.	75	
2	1995 A.D. onwards	65	

Source: www.moste.gov.np [Ashad 2071 (2014)]

5.3.5 Brick Industry: Chimney Height and Emission Standards

Brick factories emit carbon mixed smokes and deteriorate the environment of nearby places. GON has attempted to relocate such factories away from residential areas. It was also realised to regulate levels of emission from brick factories. MOSTE has also developed the standards for Brick Industries, their chimney height and emission standards. Brick factories are expected to maintain these standards in order to continue operation. The following table shows the chimney height and emission standards to be maintained by brick factories.

Table 5-6 Brick industry, Chimney height and Emission standards

S. No.	Type of Kiln	Suspended particulate matter (Maximum limit)	Height of Chimney (Minimum limit)
1	Bull's Trench Kiln, Forced Draught (Fixed Chimney)	600mg/Nm^3	17 metres
2	Bull's Trench Kiln, Natural Draught (Fixed Chimney)	700mg/Nm^3	30 metres
3	Vertical Shaft Brick Kiln (VSBK)	400mg/Nm^3	15 metres

Source: www.moste.gov.np [Ashad 2071 (2014)]

5.4 Preparation of ESMS Checklist

ESMS Checklist shall be developed in order to make the proposed housing sector reconstruction project environmentally and socially sound. The development of this ESMS checklist was initiated in August 2015 and completed in November 2015 through a series of discussions among JICA and DOLIDAR. Relevant ESMS implementation-related capacity development (CD) programmes, to be described later, are developed based on this ESMS checklist as well as engineering results of the proposed housing-sector reconstruction project.

Table 5-7 ESMS Checklist (Housing Sector)

	Questions	Original Response from DoE	Improvement Plan
1. Policy (environmental and social policy)			
1	Do you have any formal environmental policy or procedures? If yes, please describe them and provide appropriate documentation. If no, do you have any plan to set such policy or procedures?	Yes, we have. 1. Environmental Protection Act 1996 (EPA) 2. Environmental Protection Rules 1997 (EPR)	ESMS of all DOLIDAR projects are conducted based on the following two environmental protection codes, 1. Environmental Protection Act 1996 (EPA) 2. Environmental Protection Rules 1997 (EPR) For this Project, the separate Environmental and Social Management Framework (ESMF), Resettlement Policy Framework (RPF) and Vulnerable Community Development Planning Framework (VCDF) will be established in consultation with the government stakeholders, DUDBC, WB, JICA, etc. These documents will be referred for process of environmental and social considerations under the Project. Principles of these documents are explained below. Under laws and regulations of Nepal, no IEE nor EIA study is to be required for reconstruction of individual house within subprojects. And also involuntary resettlement is not expected for reconstruction of houses. However, it is assumed that original sites are not suitable for the reconstruction of each house in some areas due to potential risks of future disasters, and community-wide relocation will be necessary in such cases. DOLIDAR, in cooperation with relevant authorities, take necessary measures to prepare the relocation site, IEE/EIA and Resettlement Action Plan (RAP) preparation and obtaining necessary permits in accordance with ESMF and RPF, thus abiding by relevant Nepalese environmental regulations such as EPR97 as well as JICA Guideline for Environmental and Social Considerations (April 2010) (JICA Guidelines). The following are guiding principles that will be adopted for the housing reconstruction in this subproject. 1) The first preference of GON in building a house is in one's own land as long as the land is safe for rebuilding purposes. If the original land is not safe for reconstruction, 2) Obtain land on donation from the relatives/neighbours in the villages and build in the land, 3) Build in GON's land in the same area, 4) Build in barren land/land patches of community forest; and 5) Build in leased land from private owners for which GON will pay rent for land used under the lease agreement. In case of above 3), 4) and 5), DOLIDAR, in cooperation with relevant authorities, take necessary measures to prepare the relocation site, in order to secure eligibility of housing reconstruction grant for the eligible house owners. When the decision of relocation site is made, DOLIDAR, in cooperation with relevant authorities, shall offer alternative land options for house owners. Even in case of above 3), 4) and 5) DOLIDAR, in cooperation with relevant authorities, take necessary measures such as conduct of IEE/EIA and RAP preparation and obtaining necessary permits, abiding by relevant Nepalese environmental regulations such as EPR97 as well as JICA Guidelines. In addition, when community-wide relocation site is prepared, public consultations shall be conducted to avoid social adverse impacts to both households to be relocated and host communities, and to prepare relocation plans which ensure

	Questions	Original Response from DoE	Improvement Plan
			parcels of land to those relocated. The environmental and social management framework will envisage such procedures.
2	Are there any types of projects in which you will not take part due to the environmental risks (e.g., projects involving handling of hazardous wastes or endangered plants or animals)?	No	Environmental risks of all projects are examined based on EPA96 and EPR97, mentioned above. Note that development subprojects, causing significant negative impacts such as "Category A"-classed ones, specified within JICA Guidelines, causing large-scale resettlement, land acquisition, and /or requiring EIA study, based on EPR97, are to be rejected from the subproject selection process, as designed specifically for the proposed Project. (The positive list to be used for this subproject selection is not finalised yet.) EIA/IEE categorisation criteria, specified in EPR 97 (amended in 2013), are summarised in Attachment 1.
2. Procedures (screening category classification and review procedures)			
3	Do you have any environmental procedures such as screening, categorisation and environmental review? If yes, please describe.	Yes, we have. 1. IEE for those projects which are listed in Schedule (1) of Environmental Protection Rules 1997. There are ready list of such projects covering various sectors such as health, housing, industries, etc. 2. EIA for those projects which are listed in Schedule (2) of Environmental Protection Rules 1997. There are ready list of such projects covering various sectors such as health, housing, industries, etc.	EPA96 and EPR97 of Nepal specify relevant environmental procedures such as screening, categorisation, IEE and/or EIA studies and environmental review processes. For this project, under the establishing ESMF, the following review process on environment and social considerations will be taken. 1) Village-level screening 2) Development of village-level ESMP (Environmental and Social Management Plan) 3) Specification of minimum requirements on environment and social safeguard issues into grant agreements with households 4) Review and clearance of village-level screening and ESMPs, including household level customised requirements 5) Consultation, communication and awareness raising 6) Implementation and monitoring of village level and household level ESMPs 7) Grievance redress mechanism
4	Please describe how you ensure that your subproject companies and their subprojects are operated in compliance with the national laws and regulations and applicable JICA's requirements.	The government permission for IEE and EIA as per acts and rules are taken for the approval of the projects. The EPA and EPR describe the process of scoping, screening, EIA/IEE report preparation method. Similarly, these documents also describe the permission granting process. In case of IEE the concerned ministry may grant permission, whereas in case of EIA, MOSTE grants permission. All the provisions of EPA and EPR are mandatory. The proponent shall mandatorily comply with the matters mentioned in the report, as well as on the conditions prescribed by the concerned body or the MOSTE, while implementing the proposal. There is also provision of Environmental Inspector, monitoring, evaluation and environmental auditing. In case of violation on provisions of Act and rule, there is a provision	In the procedures described above about the environmental and social management framework, the following assurance to the compliance to national regulations and JICA's requirements will be made. 1) Screening Stage Village-level screening will be implemented, identifying the potential risk in environment and social considerations such as forest resources, landslides and erosion, and exclusion of vulnerable groups. Upon this screening process, relevant directions for proper environmental and social considerations will be determined in compliance with relevant laws and guidelines. Based on the screening results and other information, Environmental and Social Management Plan (ESMP) for each subproject will be developed by District level PIU for appropriate implementation. 2) Implementation Stage Minimum standards will be highlighted in the grant agreement with the households, including earthquake resilience, sanitation facilities and payment condition. The review process of ESMP will be turned among VDC, District level PIU and Central PMU. Also, in order to timely and effectively receive the claims from the beneficiaries, grievance redress mechanism will be established including VDC grievance management committee, DDC grievance management sub-committee, district level grievance management committee and central grievance

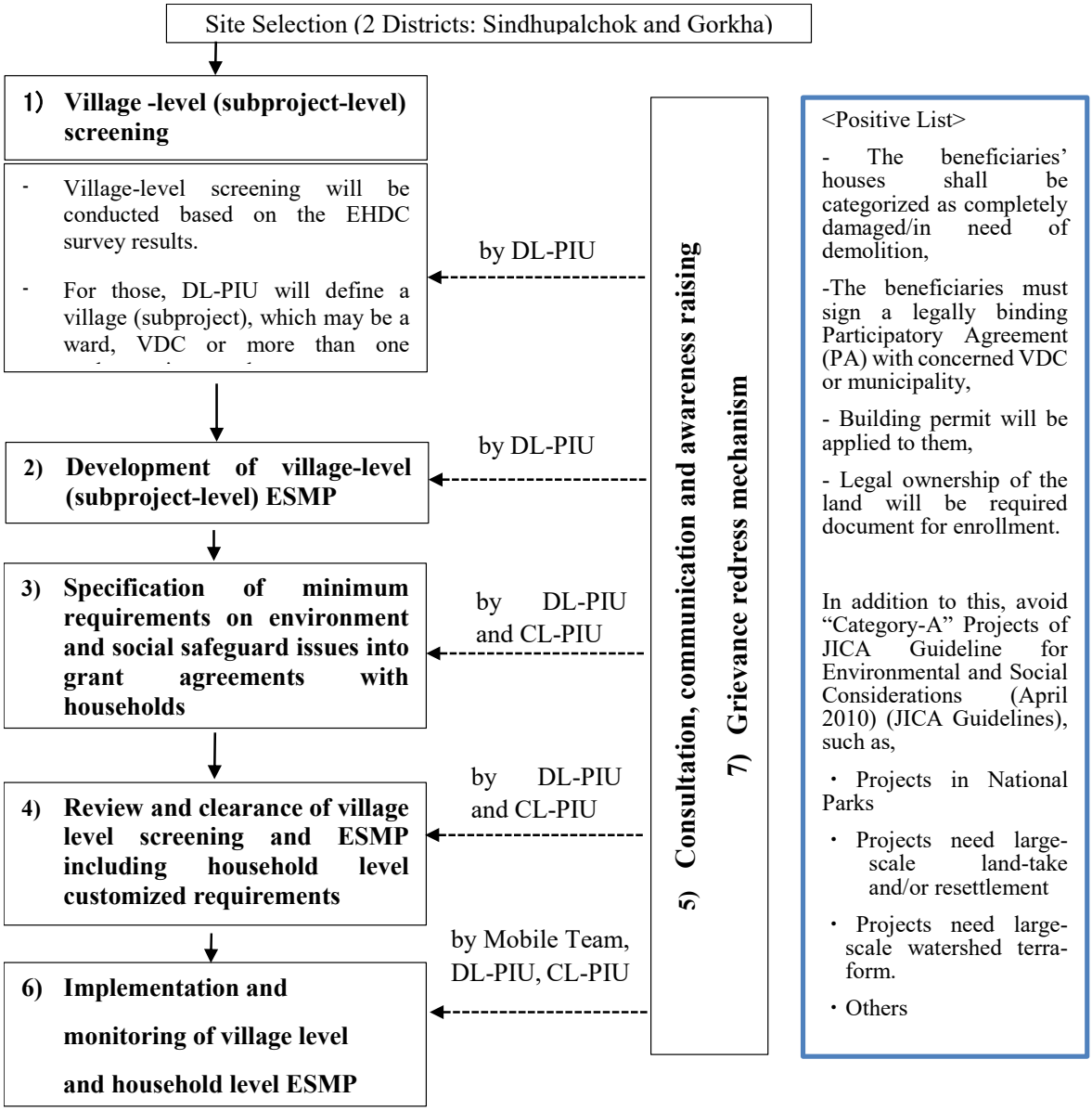
	Questions	Original Response from DoE	Improvement Plan
		of punishment, penalties. And MOSTE and concerned ministry may stop the work of the project.	management and policy reform recommendation committee. 3) Monitoring Stage Periodic site monitoring will be implemented by District level PIU who will prepare also the monitoring report. Central PIU will consolidate this report and submit to JICA the quarterly report. Central level PMU will be responsible for overall compliance to existing environmental regulations and guidelines.
5	How are environmental considerations taken into account in the credit review and approval process for project loans or equity investments?		N/A
6	How are environmental issues taken into account in deciding whether to offer or extend commercial credit, working capital finance, trade finance, payment services and other financial services to a company?		N/A
3. Organisation and Staff			
7	Please provide us with the organisation chart of your ESMS.	1. Ministry of Science, Technology and Environment 2. The concerned ministry (MOFALD in this case) 3. DOLIDAR Monitoring, Environment and Technology Development Section in DOLIDAR	See Figure 5-2
8	Who is responsible for environmental and social management? (name/role and title)	Mr. Uma Shankar Shah, Section Chief of Monitoring Environment and Technology Development Section, DOLIDAR.	Mr. Uma Shankar Shah, Section Chief of Monitoring Environment and Technology Development Section, DOLIDAR.
9	Are there any staff with training on environmental and social considerations? If so, describe.	Currently, about 10 staff cover all DOLIDAR-projects across the country. Within this proposed project, a large number of housing sector subprojects are to be formulated within relatively short term period. Work load (such as preparation of relevant ESMP documents, including IEE/EIA for those newly formulated subproject) will exceed entire capacity of current Environmental Section of DOLIDAR. Definitely, capacity development regarding the strengthening of environmental governance and clearance of DOLIDAR is required.	Currently, about 10 staff cover all DOLIDAR projects across the country. Within this proposed project, a large number of housing sector subprojects are to be formulated within relatively short term period. While no IEE/nor EIA study is to be required for reconstruction of individual house within this subproject, community-wide environmental screening and/or scoping works are to be carried out like WB's environmental clearance process. Definitely, capacity development is required regarding the strengthening of environmental governance and clearance of DOLIDAR, DTO (District Technical Office), DDC; and environmental and social monitoring of VDC (Village Development Committee), Municipality and community. The capacity building will be made by the consultants through the development of tools and guidelines and training and orientation programme, and then be implemented at central, district, and cluster* levels. *Cluster contains several VDCs/Municipality.

	Questions	Original Response from DoE	Improvement Plan
10	Are there any technical staff with an engineering/industry background responsible for technical analysis of credit proposals?	Some of current staff of environmental section of DOLIDAR have engineering background (they were transferred from engineering section to the current section).	Four of current 6 staff of environmental section of DOLIDAR have engineering background (they were transferred from engineering section to the current section).
11	What experience, if any, do you have on hiring or dealing with environmental consultants?	In DOLIDAR, there are some environmental consultants for other donor infrastructure projects like those of WB and ADB, but the consultants do not have sufficient environmental expertise.	There is not much experience in hiring environmental consultants so far. Thus, the consultant employed by this Project will provide the above-mentioned capacity building measures. Within the proposed subproject, following two ESMS-related experts/officers (1 environmental and 1 social expert/officer) are to be assigned at Kathmandu, and ESMS-related works and coordination among JICA, DOLIDAR, MOFALD, DUDBC, MOUD and others are to be conducted. (see Figure 5-3) At District level, another two ESMS-related experts (1 environmental and 1 social expert/officer) are to be assigned. They will support local level staff to prepare the community-wide environmental scoping/ screening work. Besides them, another two experts for mobile ESMS team (1 environmental and 1 social expert/officer) are to be assigned. This mobile team conducts periodic on-site ESMS-related work such as monitoring, auditing and others. The capacity building will be made by the consultants through the development of tools and guidelines and training and orientation programmes, and then implement these at central, district, and cluster levels.
12	What is the budget allocated for the ESMS and its implementation in a year? Please provide budget details, including staff costs and training as well as any actual costs.	No specific budget for ESMS, including EIA/IEE application fees (free of charge). Specific budget for entire EMP for all DOLIDAR projects is not known (need to dig further). This proposed Project will hire several local consultants to take care of all aspects related to environmental and social safeguards. The local consultants will be: ・ One (1) Environmental Safeguard Expert ・One (1) Social Consideration Expert Total budget is not known and this is to be calculated based on the proper ESMS implementation framework formulated within this study. In addition, training on environment governance will be required for the improvement of environmental compliance of entire DOLIDAR. Total budget for this training is not known and this is to be calculated based on the proper ESMS implementation framework to be formulated within this study.	The cost for consultancy services for international and national experts are borne by the principle of yen loan eligible portion, enabling the EA/IA to review the environment and social considerations. The necessary cost for staff stationed in EA/IA will be covered by the general budget of GON.

	Questions	Original Response from DoE	Improvement Plan
4. Monitoring and Reporting (Reporting procedures and monitoring)			
13	Do you receive environmental and social monitoring reports from subproject companies that you finance?	No periodical environmental and social monitoring reports are prepared. Under this Project, appropriate environmental and social monitoring reports shall be prepared and submitted periodically as part of the progress report to Project Director (CL-PIU) of DOLIDAR. These monitoring reports will be also submitted to JICA, as part of PMU's status report.	Under this Project, appropriate environmental and social monitoring reports of each subproject shall be prepared by District PIU. Those monitoring reports are collected by Central PIU, and then submitted periodically as part of its quarterly progress report prepared by the Central PIU, and this will be submitted to JICA for its review.
14	Please describe how you monitor the subproject company and their subprojects' social and environmental performance.	No specific monitoring framework at central and local level is established yet. So that, certain type of assistance is required for the meaningful ESMS implementation. For example, at VDC or District, Local Development Facilitator (note: this is tentative position name) will assist VDC or District to monitor the environmental governance status of all subprojects, in particular, EMP status (Environmental Approval included). At CL-PIU of DOLIDAR, a permanent environmental safeguard specialist is in charge of supervising EMP status of all Districts and/or VDCs.	Please see number 4 above.
15	Is there an internal process to report on social and environmental issues to senior management?	Yes. Monitoring Environment and Technology Development Section will report on Environmental and Social safeguards issue.	
16	Do you prepare any social and environmental reports for other multilateral agencies or other stakeholders -E&S reporting in the Annual Report?	Environmental and Social Monitoring Reports for this Project are to be periodically prepared by CL-PIU, and delivered to JICA as well as other international donors.	Environmental and Social Monitoring Reports for this Project are to be prepared periodically by CL-PIU, and delivered to JICA as well as other international donors.
5. Experience (Results of the environmental and social management)			
17	Have you signed any national or international agreements or declarations concerning environmental issues?	No. However, the official responsibility of the government to monitor those agreements is held by the MOSTE. DOLIDAR is following the agreements once it is officially approved by the government.	Compliance to the signed international treaty/law will be necessary. List of international conventions and/or treaties that Nepal ratifies is summarised in "Status of Major International Conventions, Protocols and Treaties Related to Environmental and Social Considerations (Nepal)" of Table 1 in Section 2.2.
18	Have you ever received any criticism on its environmental record? If so, what is the criticism?	No.	No.

	Questions	Original Response from DoE	Improvement Plan
19	Do you carry out environmental audits on its properties to analyse health and safety issues, waste disposal, etc.?	Environmental audit, including environmental monitoring and management related to the implementation of development project, is mandatory (EPR97). So far, DOLIDAR has not carried out any environmental audits. That means proper environmental audit framework is to be developed in this study.	Under the environmental and social management framework, the monitoring of ESMS will be ensured. As mentioned in Column 11, ESMS-related units are to be set up at both central and district levels. This ESMS-related unit is to conduct environmental audits on subprojects of concerns. Article 13 of ECR97 specifies the requirement of relevant monitoring and evaluation activities on environmental impacts to be caused by projects applying for environmental approval. Within this subproject, no IEE/nor EIA is to be conducted for the application of the environmental approval. So, this article will not apply for the proposed subproject, but its concept shall be respected. As mentioned in Column 11, environmental audit and monitoring are to be conducted at district level by ESMS unit, to be set up within this ESMS framework.
20	Please state any difficulties and/or constraints related to the implementation of the ESMS.	No environmental expert works in all DOLIDAR district offices (District Technical Office: DTO), but engineers do environmental and social work in all District Offices (DTO and/or DDC). Therefore, comprehensive capacity building shall be necessary to develop the expertise of environmental staff at local level. Capacity development programs for the improvement of environmental governance are to be developed and implemented by CL-PIU as well as by hiring environmental and social consultants who will oversee all Districts and/or VDCs' environmental and social management.	No environmental expert works in all VDCs and/or District Offices, so that no accumulation of experience and/or knowledge of environmental and social considerations for project implementation exist. Therefore, comprehensive capacity building shall be necessary to develop the expertise of environmental staff at local level. Capacity development programs regarding the improvement of environmental governance are to be developed and implemented by CL-PIU as well as by hiring environmental and social consultants who will oversee all Districts and/or VDCs' environmental and social management.
6. Need of Capacity Development and Improvement Plan (Improvement and the need for capacity building measures)			
The training is highly needed.			As mentioned above, no environmental staff exists at all Districts and/or VDCs. It is strongly recommended to implement capacity development on environmental clearance for selected housing sector recovery projects while raising strong environmental awareness within Districts and/or VDCs in order to improve environmental governance therein. Overall environmental clearance and governance regarding the implementation of development project in Nepal are still at the rudimentary stage. So, it is essential for the consultant hired under this Project to provide capacity building such as development of assessment tools/guidelines, hands-on training and orientation, and awareness raising to the beneficiaries being supported by social mobilisers. Both WB and ADB plan to implement the following capacity development programs at central and district levels: 1. Improvement of overall Environmental Governance 2. Environmental Management 3. Environmental Monitoring 4. Consultation and Information Disclosures Currently, details of those capacity development programs by WB and ADB are being prepared or in process.

Source: This Study, 2018



Remark:

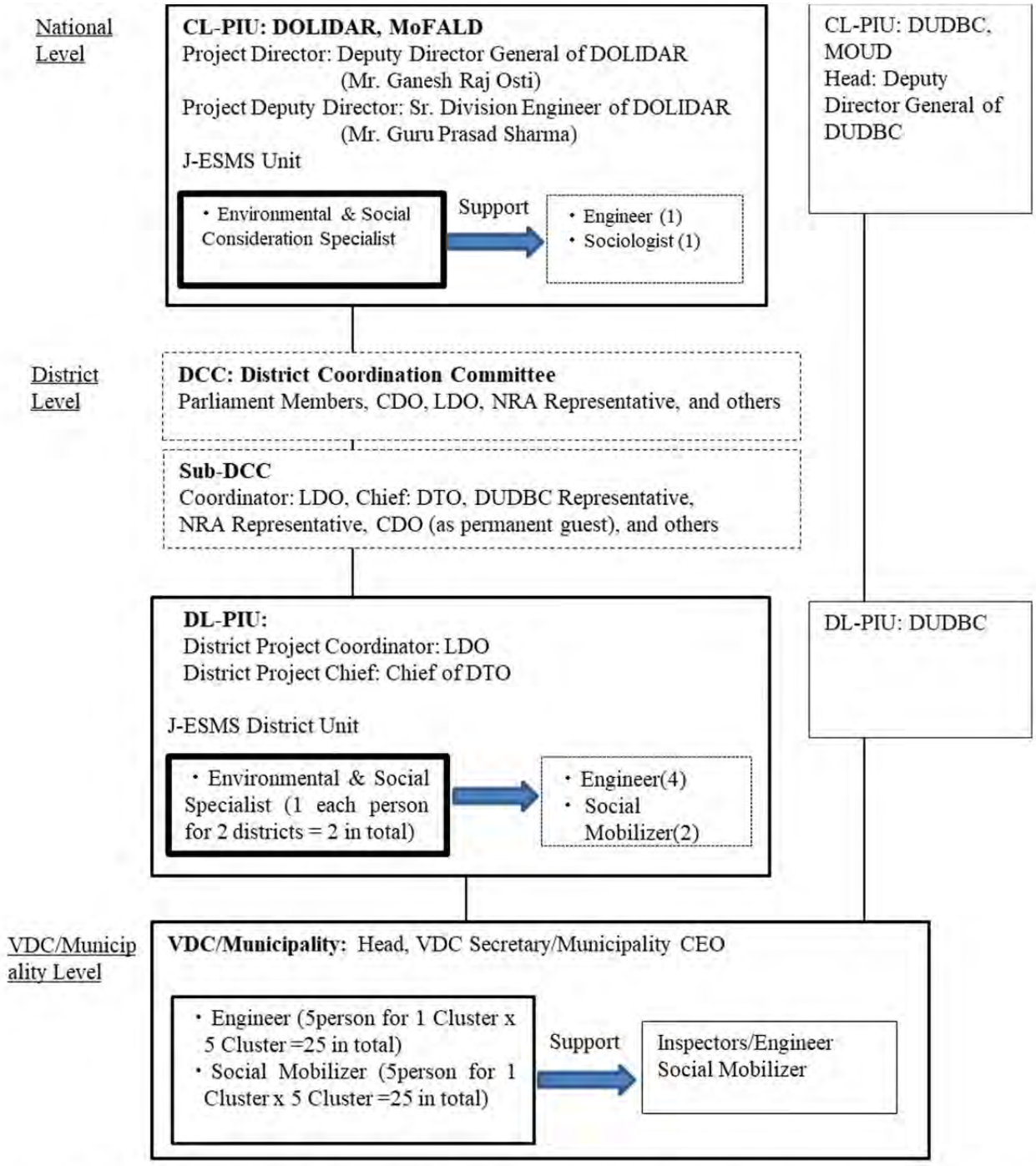
1. The number with parenthesis of this flowchart refers the same number in subsection 3 of section 2. Procedures (screening category classification and review procedures) of the ESMS Checklist DOLIDAR.

2. The Earthquake Household Damaged and Characteristics (EHDC) survey has been conducted by the Government of Nepal in the most-affected 14 districts including Sindhupalchok and Gorkha targeted by JICA in order to establish database and a list of potential eligible beneficiaries for the proposed project.

3. Subproject will be defined by DL-PIU as the coverage area of a village-level ESMS, which may be a ward, VDC or more than one settlement in a ward.

Source: This Study 2018

Figure 5-2 Flow chart of Environmental Safeguards (Tentative)



Note: In principal, two staffs will be stationed at the central and district level. A mobile team composed by two members at the cluster level and an inspection team composed by two members at the village and municipality will be mobilized, providing monitoring and supervision of implementation of the ESMS adherence at villages and municipalities. Environmental monitoring at villages and municipalities will be focused on community wide environmental management, i.e., natural reserve, steep slope, debris and waste disposal, river, important religious facilities, pollution, rendering the technical assistance and capacity building on ESMS implementation to the DOLIDAR and DUDBC subsidiaries.

Source: This Study 2018

Figure 5-3 Staff/Consultant Allocation for proposed ESMS Implementation

5.5 ESMS Implementation Framework

5.5.1 Introduction

It is important to make this JICA-funded housing sector reconstruction project environmentally safe and sound. As mentioned earlier, 83,408 and 63,775 damaged houses are targeted to be reconstructed in Gorkha and Sindhupalchok District, respectively (Post Disaster Recovery Framework: PDRF, published in May 2016).

Within the JICA-funded housing sector reconstruction project, VDC is the local administrative body that manages the reconstruction of the damaged houses, so that about 38 VDCs (i.e., 16 VDCs in Gorkha and 22 VDCs in Sindhupalchok) are concerned in the entire project[23]. It is noted that 56,532 beneficiaries (15,187 in Gorkha and 41,345 in Sindhupalchok) are registered in this reconstruction project as of December 2018.

5.5.2 Implementation Framework

As mentioned earlier, existence of more than 140,000 damaged houses in both Gorkha and Sindhupalchok Districts were reported in 2016, and that number would be reduced (may be increased) as the proposed housing reconstruction project progressed. So, the implementation of JICA-ESMS and its relevant examinations are to be conducted for selected households at VDC level (i.e., 25 to 40 HH ESMS monitoring activity per one VDC). Within this housing sector reconstruction project, three ESMS staff are to be assigned (2 months/year each, in total 4 months/year, one person working with CL-PIU, one working at Gorkha District, and the remaining one working at Sindhupalchok District) within the Japanese ODA LOAN project.

Upon considering the accessibility (e.g., current road conditions and network) from Kathmandu to each reconstruction site of two districts mentioned above, ESMS reporting schedule (4 times per year) and assignment schedule of three ESMS staff to be assigned for the Japanese ODA LOAN project (One Environment and Social Expert working with CLIPU and Two District Environment and Social Managers (DESM) working at each district), it would be quite difficult to conduct meaningful ESMS-related monitoring works in all reconstruction sites and reporting to JICA by JICA-ESMS staff within 4 months every year.

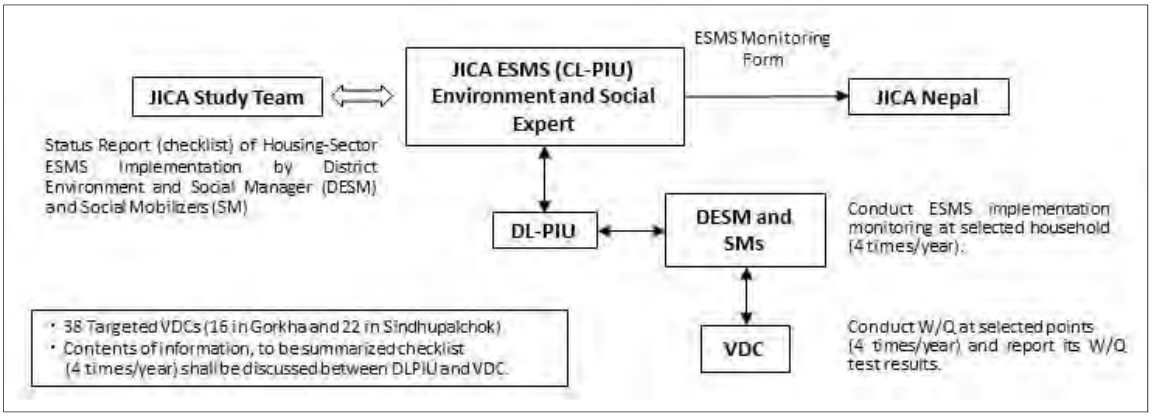
For example, theoretically speaking, assigned three ESMS staff shall conduct entire ESMS activities covering from the periodical site monitoring, preparation of ESMS survey sheet and relevant discussion with various stakeholder such as VDCs and household owners, submission of approved ESMS monitoring survey sheet to CLPIU, compiling those ESMS reports into quarterly ESMS report after its report review and check, and then, submission to JICA within 1 month four times per

[23] After the transformation to federal system, NP and GP became responsible for housing reconstruction.

year. To make this housing-sector ESMS monitoring more workable and meaningful, on-site ESMS monitoring tasks are to be conducted by 25 Social Mobilisers (8 in Gorkha and 17 in Sindhupalchok), hired through the Japanese ODA LOAN project.

As mentioned earlier, to increase the transparency and guarantee the accountability of ESMS implementation, each social mobiliser is to have explanation meeting with household owners to explain contents of draft ESMS monitoring sheet before starting ESMS-related information collection. After the ESMS-related data collection in each household, the data are to be compiled by each VDC for the VDC-wide preliminary environmental evaluation. Then the compiled data and environmental evaluation results are to be submitted from each DESM to CLPIU while liaisoning with each DLPIU. After CLPIU examines those ESMS monitoring results, to be submitted by DESM, then periodical reporting of ESMS-related monitoring progress to JICA from CLPIU (GMaLI) are to be conducted. It is noted that the ESMS-related monitoring survey sheet is prepared by the JICA Study Team, based on JICA Guidelines, EPA96, EPR97 and others. This reporting is planned to be conducted quarterly (4 times per year during implementation of the entire reconstruction project). Figure 5-4 shows the entire framework of housing sector ESMS implementation.

ESMS-related water quality test at nearby tributaries and/or water bodies such as springs, located at both upstream and downstream sides in the reconstruction site, are to be conducted, using water analysis kits by DESM.



Source: This Study 2018

Figure 5-4 JICA ESMS Implementation Framework (Housing Sector)

As mentioned within the column, entitled as "６. Need of Capacity Development and Improvement Plan (Improvement and the need for capacity building measures)" of ESMS Checklist, no environmental staffs exists at both Districts and/or VDCs. So, it is strongly recommended to implement capacity development (CD) regarding the JICA-ESMS-based environmental clearance for selected housing-sector recovery projects while raising strong environmental awareness within Districts, VDCs and/or household owners in order to improve environmental governance therein. More detailed descriptions of this CD program are to be presented within the following section.

5.6 Capacity Development (CD) Program for ESMS Implementation

5.6.1 Introduction

Objectives of the housing sector ESMS capacity development program are as follows:

(1) To improve and/or enhance the perception and/or common understanding of environmental safeguard for the JICA-funded housing sector reconstruction project in two districts while deepening the understanding of JICA Guidelines of Environmental and Social Considerations (2010)

(2) To strengthen district-wide VDC and/or cluster-based ESMS implementation framework and skill for the housing sector reconstruction projects

5.6.2 Outline of Capacity Development (CD) Program

(1) Participants of Concern

This ESMS-related CD program was conducted between January 2017 and June 2017 in Gorkha and Sindhupalchok Districts as well as Kathmandu as a kick-off meeting for relevant central governmental organisations (see Table 5-8). It is noted that relevant community-level workshops were held at 16 VDCs in Gorkha and 22 VDCs/Municipalities in Sindhupalchok District.

Table 5-8 Schedule of ESMS Capacity Development Workshop (Housing Sector)

Activities	01, 2017	02, 2017	03, 2017	04, 2017	05, 2017	06, 2017
Preparation						
Kick-off Workshop (Central)						
CD at DLPIU						
CD at community						
Theatre Preparation						
Theatre Performance						
Post Training Data Processing						
Preparation of deliverables						
Deliverable Inspections						
Submission of Final Report						

Source: This Study 2018

Most participants were CL-PIU, Engineers, Sub-Engineers of DLPIU, other DLPIU staff, Representatives of VDCs and others from targeted two districts. The following tables summarise the number of participants in the ESMS-related capacity development program held in each district and community.

Table 5-9 Summary of Participants of Capacity Development Workshop (District Level)

	Gorkha		Sindhupalchowk
	Barpak and Masel	Chautara and Bahrahise	Melamuchi
DUDBC Engineer	9	10	8
DUDBC Sub-Engineer	1	1	1
DUDBC Asst. Sub-Engineer	1	5	1
VDC/Ward Secretary	14	15	10
Social Mobiliser	11	16	8
TPIS Cluster Leader	2	3	0
T.A. Engineer	0	1	0
Office Assistant	0	9	2
Total Participants	38	51	30
Ground Total	**119**		

Source: This Study, 2018

Table 5-10 Summary of Participants of Capacity Development Workshop (Community Level)

Total Participants of Communities Level CD Workshop														
Total Participants of Community Level CD-Workshop														
VDC	Ward									NA	Total HH Participants	TPIS Engineer	TPIS SM	Total Participants
	1	2	3	4	5	6	7	8	9					
Gorkha(Barpak Cluster)														
Barpak	4	3	4	4	2	4	4	4	4	0	33	1	1	35
Simjung	4	1	5	0	4	0	2	4	6	3	29	1	1	31
Muchhowk	4	7	0	3	5	4	2	3	4	0	32	1	1	34
Hansapur	5	4	4	7	5	4	0	1	4	0	34			34
Kerabari	2	3	4	5	4	5	3	4	2	0	32	1	1	34
Jaubari	5	0	0	14	6	0	4	6	1	0	36			36
Shreenathkot	4	4	6	6	3	4	4	1	1	0	33			33
Saurpani	0	3	4	9	5	6	1	0	1	0	29			29
Gorkha (Masel Cluster)														
Swara	4	4	0	4	0	0	4	4	4	0	24			24
Takumajh Lakuribot	0	4	0	1	2	2	5	2	4	0	20			20
Takukot	6	2	3	4	4	4	1	8	4	0	36			36
Panchkhuwade urali	6	0	5	5	7	3	4	4	0	0	34	1	1	36
Pandrung	3	4	4	3	8	0	4	4	2	0	32			32
Masel	4	3	1	4	4	2	4	4	8	0	34	1	2	37
Baguwa	4	0	4	4	3	0	4	4	4	0	27			27
Taple	4	4	4	4	5	3	4	4	4	0	36	1	1	38
Total											501	7	8	516
Sindhupalchowk (Chautara Cluster)														
Chautara	3	4	1	2	2	3	8	2	3	0	28	0	2	30
Sanusirubari	3	3	3	3	3	3	3	0	2	0	23			23
Syaule	2	0	3	2	3	1	3	3	3	0	20		1	21
Pipaldanda	2	4	7	0	0	4	2	2	0	1	22			22
Batase	1	5	1	5	2	4	4	3	2	0	27			27
Kubinde	3	3	2	1	3	18	3	4	3	0	40			40
Irkhu	6	15	0	0	3	2	3	2	0	0	31			31
Kadambas	0	2	0	0	0	2	3	1	18	0	26			26
Bhotasipa	6	3	2	0	2	0	7	1	5	1	27			27
Sangachowk	3	2	3	3	2	3	0	3	5	0	24			24
Thulosirubari	3	3	4	3	3	5	1	3	3	0	28			28
Sindhupalchowk (Barhabise Cluster)														
Bahrabise	5	6	0	5	1	2	2	3	2	0	26			26
Karthali	3	2	3	2	2	3	2	5	3	0	25			25
Ramche	3	0	2	0	2	2	3	7	2	1	22			22
Dhuskun	3	3	3	2	5	2	2	3	3	0	26			26
Gati	2	0	0	7	1	2	0	3	0	0	15			15
Maneshwara	3	3	3	1	4	4	3	4	5	0	30			30
Fulpingkot	0	3	3	3	0	2	3	0	3	0	17			17
Fulpingdada	3	3	3	9	5	3	3	4	3	0	36			36
Mankha	3	2	0	3	2	9	6	3	2	0	30			30
Sindhupalchowk (Melamchi Cluster)														
Dubachaur	2	5	1	4	5	3	3	2	3	0	28			28
Talamarang	3	2	2	1	1	7	2	2	4	0	24			24
Jyamire	5	4	1	5	4	4	3	1	2	0	29			29
Shikharpur	2	4	1	2	0	5	3	3	3	0	23			23
Melamchi	0	4	3	6	0	0	3	5	4	0	25			25
Bansbari	5	3	3	3	5	2	1	1	3	0	26			26
Fatakshila	1	2	2	4	4	6	7	2	4	0	32		1	33
Sindhukot	3	5	1	2	0	1	1	0	0	0	13			13
Thakani	7	3	5	3	4	3	3	2	2	0	32			32
Haibung	0	3	0	4	5	0	2	0	0	0	14			14
Bhotechaur	6	6	0	2	5	3	5	2	3	0	32	4	5	41
Total											801	4	9	814
Grand Total											1302	11	17	1330

Source: This Study 2018

(2) CD Program Implementation Schedule

The following tables summarise the entire schedule of the CD program implementation for CLPIU/DLPIU and VDCs (community), respectively.

Table 5-11 Schedule of Housing Sector ESMS CD Workshop (CL-PIU and DL-PIU Level)

District	Organisation of Concern	Venue	Date
Kathmandu	CLPIU	Hotel Himalaya	Feb 07, 17
Move to Gorkha			Feb 27, 17
Gorkha	DLPIU	Hotel Miracle	March 01, 17
Move back to Kathmandu			March 16, 17
Move to Sindhupalchok			March 24, 17
Sindhupalchok	DLPIU Workshop	Chautara Hotel Araniko (March 26) and Melamchi: Hotel Melamchi River Side Inn (March 28)	March 26 and 28, 17
Move back to Kathmandu			April 19, 17

Source: This Study 2018

Table 5-12 Schedule of Housing Sector ESMS CD Workshop (Community-Level)

District	VDC	Subcluster	Date
Gorkha	**Barpak Cluster (8)**		
	Barpak	Barpak	March 03, 2017
	Saurpani	Baluwa	March 04, 2017
	Simjung		
	Hansapur	Bhachhek	March 06, 2017
	Muchhok		
	Kerabari	Jaubari/chipleti	March 07, 2017
	Jaubari		
	Shreenathkot	Shreenathkot/tallogohre	March 08, 2017
	Masel Cluster (8)		
	Sawara	Sawara khrcthok	March 10, 2017
	Takukot	Takukot/Palkhu	March 11, 2017
	Takukmajh Lakurebot		
	Panchkhuwa Deurali	Deurali	March 13, 2017
	Pandrung		
	Masel	Gyampesal	March 14, 2017
	Baguwa		
	Teple	Taple/Kokheaale	March 15, 2017
Sindhupalchok	**Chautara Cluster (11)**		
	Chautara	Chautara	March 30, 2017
	Sanosiruwari		
	Pipaldanda	Chautara	March 31, 2017
	Shyaule Bazar		
	Kubine	Kubine	April 01, 2017
	Batase		
	Irkhu	Irkhu	April 03, 2017
	Katambas		
	Bhotasipa	Bhotasipa	April 04, 2017
	Thulo Sirubari	Sangachowk	April 05, 2017
	Sangachowk		

District	VDC	Subcluster	Date
	Barhabise Cluster (9)		
	Kharthali	Bharhabise	April 07, 2017
	Bharhabise		
	Ramche	Ramche	April 08, 2017 April 10, 2017
	Dhuskun		
	Gaiti	Maneswora	
	Maneswora		
	Fulpinkot	Phulpingdanda	April 11, 2017
	Phulpingdanda		
	Mankha	Mankha	April 12, 2017
	Melamchi Cluster (11)		
	Dubachaur	Dubachaur	April 16, 2017
	Talamarang		
	Jyamire	Melamchi	April 17, 2017
	Shikharpur		
	Melamchi	Melamchi	April 19, 2017
	Bansbari		
	Fatakshila	Fatakshila	April 20, 2017
	Sindhukot	Piple	April 22, 2017
	Thakani		
	Haibung	Bhotechaur	April 23, 2017
	Bhotechaur		

Source: This Study 2018

(3) Contents of CD Program

The housing sector ESMS CD workshop was a half-day training program, held in Kathmandu as well as in each district between February and April 2017 (see Table 5-12, Table 5-13).

To deepen the understanding of each CD participant while enhancing the interaction among instructors, facilitators and participants, an ESMS-related mini-performance (approximately 30 minutes) was conducted at ESMS public awareness program in selected communities also. CD program of each workshop held in Kathmandu (CLPIU), in both Districts (DLPIU) and VDCs are described in the following subsections separately.

5.7 CD Workshop

5.7.1 Kathmandu Kick-Off CD Workshop

(1) Outline

Kick-off CD workshop was held in Kathmandu on 7th February 2017 as an official inauguration of this ESC-related CD workshop for JICA-funded housing sector reconstruction project. Table 5-13 summarises the outline of this kick-off workshop, and Figure 5-5 summarises photo records of this workshop.

Table 5-13 Contents of Housing Sector ESMS CD Workshop in Kathmandu Kick-Off (held on February 07, 2017)

	Agenda and/or Content	Time
First Session		
1	Registration	8:00 - 8:30
2	Breakfast	8:30 – 9:00
3	Inauguration	9:00 – 9:15
4	Speech from the JICA representative	9:15 – 9:30
5	Speech from the Program Director	9:30 - 9:40
6	Opening Remarks from Chief Guest	9:40 – 9:55
7	Introduction of Participants	9: 55 – 10:10
Second Session		
8	Briefing of Reconstruction project and CD Outline of JICA-funded Housing Sector Reconstruction Project	10:10 – 10: 40
9	JICA Guidelines of Environmental and Social Considerations (2010)	10:40 – 11:10
10	ESMS-Related Social and Environmental Safeguard	11:10 – 11:50
Third Session		
11.	Discussions	11:50 -12:10
12.	Post workshop questionnaire survey	12:10 – 12:20
13.	Closing Remarks	12:20 – 12:30
Lunch		12: 30 – 1: 15
Adjourned		

Source: This Study 2018

Registration

Participants' lobbying before workshop

Inauguration and Opening Remarks

Presentation of Outline of JICA-funded Housing-Sector Reconstruction Project

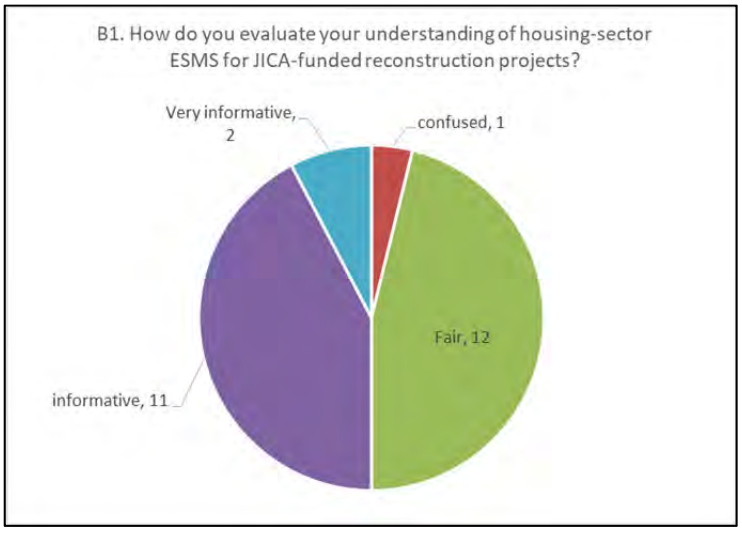
	
Presentation of JICA Guidelines for Environmental and Social Considerations (2010) by CLPIU (GMaLI)	Presentation of ESMS-related Social and Environmental Safeguard by CLPIU (GMaLI)
	
Question and Answer Session	Closing Remarks by CLPIU (GMaLI)

Source: This Study 2018

Figure 5-5 Housing Sector ESMS CD Workshop at Kathmandu Kick-Off

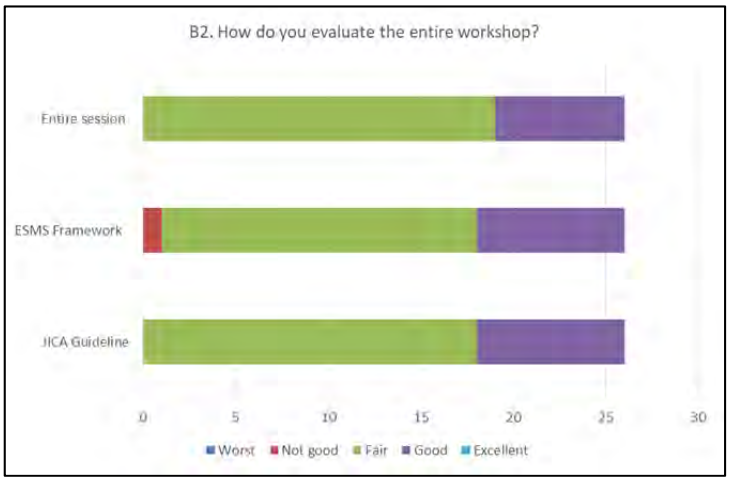
(2) Post Questionnaire-based Opinion Survey

Questionnaire-based opinion survey is conducted for the housing sector ESMS CD workshop in order to study the satisfaction of all participants regarding this CD workshop. Figure 5-6 to Figure 5-9 show the study results of this survey. It is noted that 27 participants responded in this survey (the total number of participants is of 41). From this survey result, it is found that most of respondents welcome this kick-off meeting and understand the importance of the proposed housing sector ESMS CD program. Also, it is found that most of respondents expect CD program of this proposed housing sector ESMS would strengthen the implementation of the environmental safeguard regarding the housing reconstruction activities at the community level.



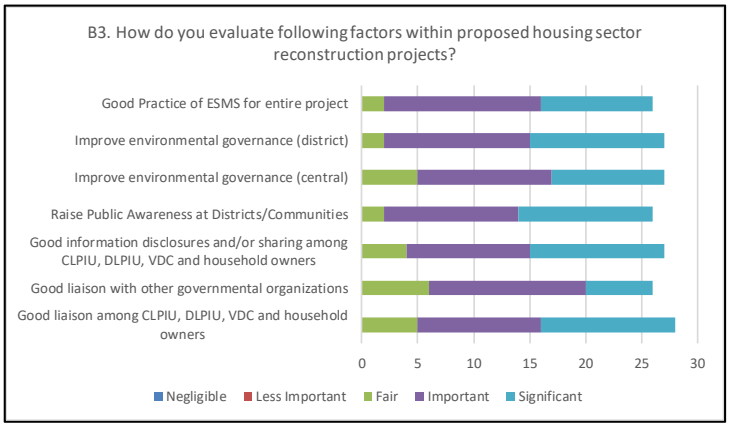
Source: This Study 2018

Figure 5-6 Evaluation of understanding of housing sector ESMS for JICA-funded reconstruction projects



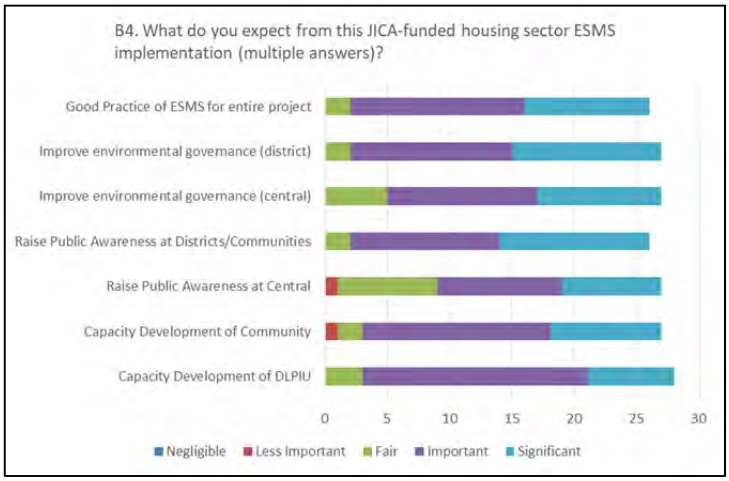
Source: This Study 2018

Figure 5-7 Evaluation of the entire workshop



Source: This Study 2018

Figure 5-8 Evaluation of the factors in proposed housing sector reconstruction projects



Source: This Study 2018

Figure 5-9 Expectations for the JICA-funded Housing Sector ESMS implementation

5.7.2 CD Workshop at DLPIU

(1) Gorkha DLPIU

1) Outline

After the Kathmandu Kick-off CD workshop, DLPIU CD workshop was held at Gorkha Bazar on 1st March 2017, attended by VDC Secretaries, Social Mobilisers, DUDBC Engineers, NRA Official, CLPIU (GMaLI) Official and others. Table 5-14 summarises the outline of this Gorkha DLPIU workshop, and Figure 5-10 summarises photo records of this workshop.

Table 5-14 Contents of Housing Sector ESMS CD Workshop in Gorkha DLPIU

	Agenda and/or Content	Time
First Session		
1.	Registration	11:00 - 11:15
2.	Chair Taking	11:15 – 11:25
3.	Introduction of Participants	11: 25 – 12:40
4.	Speech from the NRA representative	11:40 – 11:45
5.	Speech from the DUDBC-DLPIU	11:45 - 11:50
6.	Speech from the CL-PIU	11:50- 11:55
7.	Remarks from Chief of DCC	11:55 – 12:05
Second Session		
8.	Briefing of Reconstruction project and CD Outline of JICA-funded Housing Sector Reconstruction Project	12:05 – 12:35
9.	JICA Guidelines of Environmental and Social Considerations (2010)	12:35 – 13:00
	Tea/Coffee Break	13:00 - 13:10
10.	ESMS-related Social and Environmental Safeguards	13:10 – 13:50
Third Session		
11.	Discussions	13:50 - 14:05
12.	Mini-performance	14:05 - 14:45
13.	Post workshop questionnaire survey	14:45 – 15:00
14.	Closing Remarks	15:00 – 15:10
Adjourned		

Source: This Study 2018

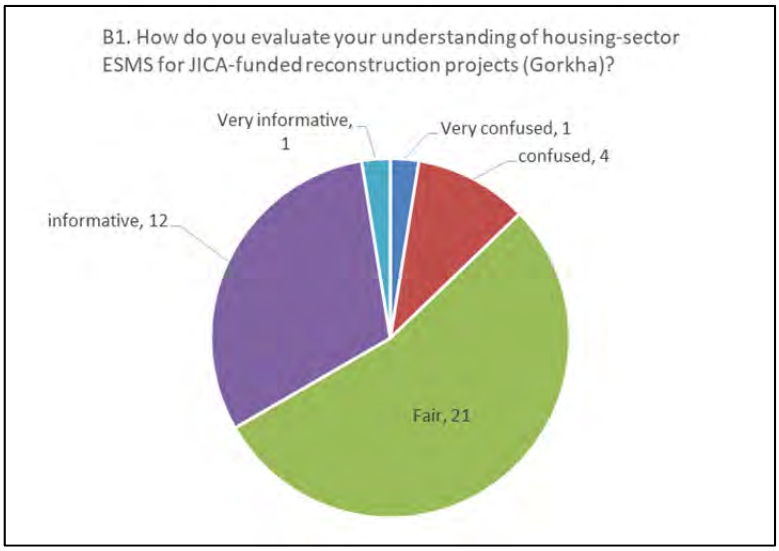
	
Registration	Speech from NRA representative Mr. Rajendra Karki
	
Presentation of JICA-funded Housing Sector Reconstruction Project Outline	Presentation of JICA Guidelines for Social and Environmental Considerations (2010)
	
Presentation of ESMS Social and Environmental Safeguards	Question-and-Answer Session
	
Post-workshop questionnaire survey	Closing Remarks

Source: This Study 2018

Figure 5-10 Housing Sector ESMS CD Workshop at Gorkha DLPIU

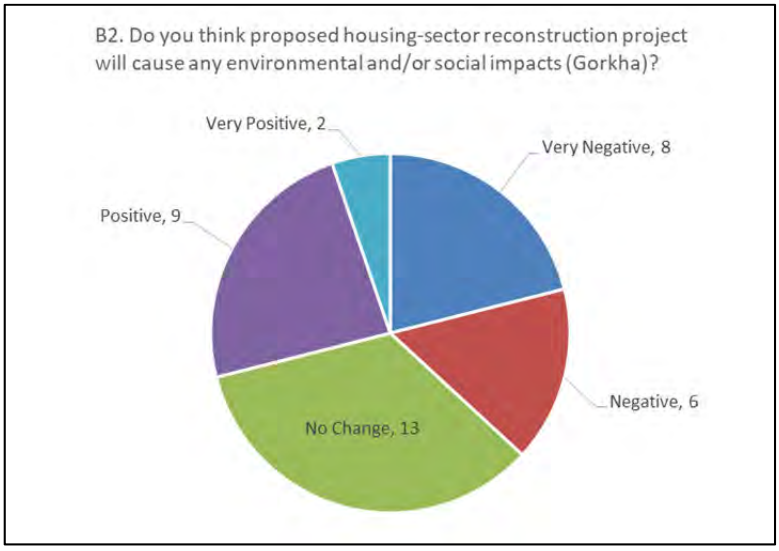
2) Post Questionnaire-based Opinion Survey

Questionnaire-based opinion survey is conducted for this housing- sector ESMS CD workshop in order to study the satisfaction of all participants with regard to this CD workshop. Figure 5-11 to Figure 5-15 show the study results of this survey. It is noted that 38 participants responded to this survey (the total number of participants was of 89). From this survey result, it is found that most of the respondents welcome this district-level meeting and understand the importance of the proposed housing-sector ESMS CD program. Also, it is found that most of respondents think that a good liaison among CLPIU, DLPIU and VDCs would be vital for the successful implementation of both reconstruction work and its relevant ESMS implementation.



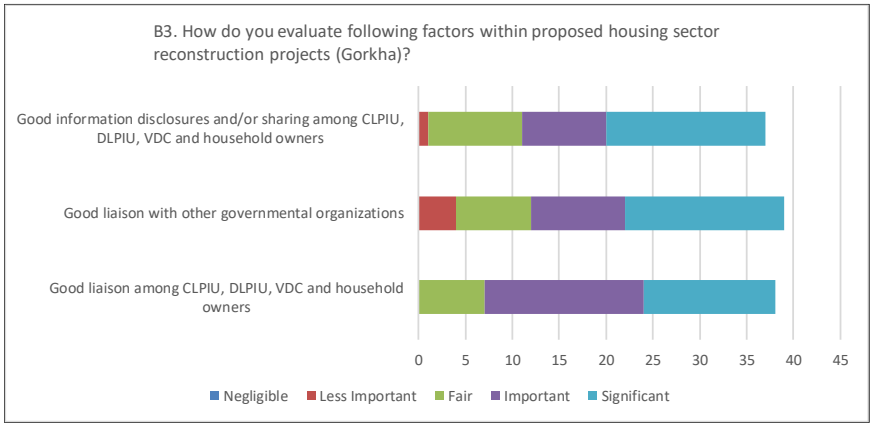
Source: This Study 2018

Figure 5-11 Evaluation to understand housing sector ESMS for JICA-funded reconstruction projects, in Gorkha



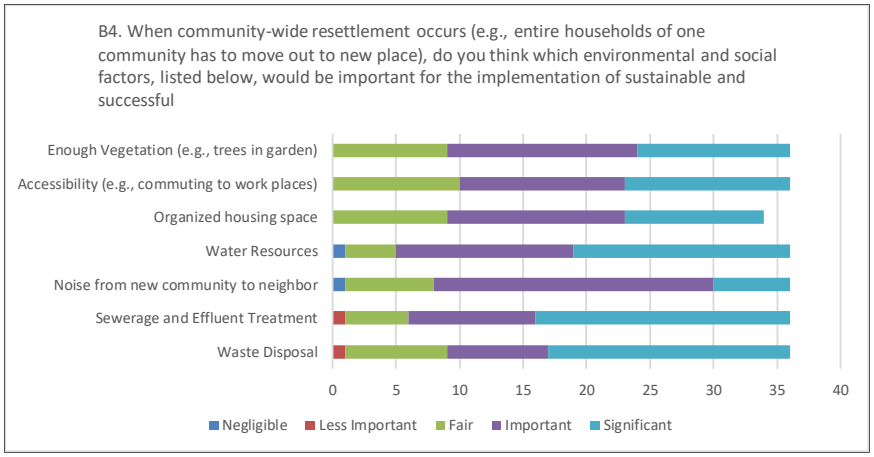
Source: This Study 2018

Figure 5-12 Evaluation of environmental and/or social impacts, in Gorkha



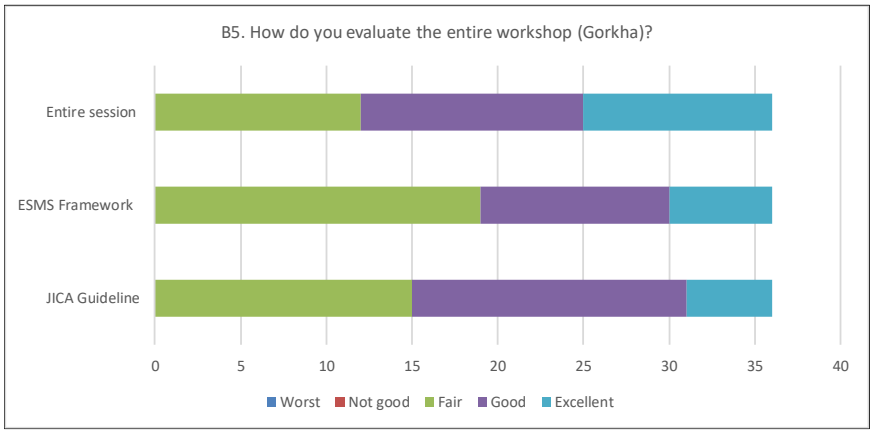
Source: This Study 2018

Figure 5-13 Evaluation of some factors within proposed housing reconstruction, in Gorkha



Source: This Study 2018

Figure 5-14 Thoughts about environmental and social factors for the implementation of sustainable and successful community-wide reconstruction project, in Gorkha



Source: This Study 2018

Figure 5-15 Evaluation of the entire workshop, in Gorkha

(2) Sindhupalchok DLPIU

1) Outline

In Sindhupalchok District, two DLPIU-level CD workshops were held at Chautara and Melamchi on 26th March 2017, and 28th March 2017, respectively, inviting VDC Secretaries, Social Mobilisers, DLPIU Engineers, NRA Official, CLPIU (GMaLI) Official and others. Table 5-15 summarises the outline of Chautara DLPIU-level workshop, and Figure 5-16 summarises photo records of this Chautara workshop. Similarly, Table 5-16 summarises the outline of Melamchi DLPIU-level workshop, and Figure 5-17 presents photo records of this Melamchi workshop.

Table 5-15 Content of Housing Sector ESMS CD Workshop at Sindhupalchok DLPIU

	Agenda and/or Content	**Time**
First Session		
1.	Registration	11:00 - 11:15
2.	Chair Taking	11:15 - 11:25
3.	Introduction of Participants	11:25 - 12:40
4.	Speech from the NRA representative	11:40 - 11:45
5.	Speech from the DTO Chief	11:45 - 11:50
6.	Speech from the CL-PIU	11:50 - 11:55
7.	Remarks from Chief of DCC	11:55 - 12:05
Second Session		
8.	Briefing of Reconstruction project and CD Outline of JICA-funded Housing Sector Reconstruction Project	12:05 - 12:35
9.	JICA Guidelines of Environmental and Social Considerations (2010)	12:35 - 13:00
	Tea/Coffee Break	13:00 - 13:10
10.	ESMS-Related Social and Environmental Safeguards	13:10 - 13:50
Third Session		
11.	Discussions	13:50 -14:05
12.	Mini-performance	14:05 - 14:45
13.	Post workshop questionnaire survey	14:45 – 15:00
14.	Closing Remarks	15:00 – 15:10
Tea and Snack/Adjourned		

Source: This Study 2018

	
Registration	Speech from NRA Sindhupalchok Office Representative, Mr. Rudra Bahadur Malla
	
Presentation of JICA-funded Housing Sector Reconstruction Project Outline	Presentation of JICA Guidelines for Environmental and Social Considerations
	
Presentation of ESMS-related Social and Environmental Safeguards	ESMS-related Educational Mini-Performance
	
Post-workshop questionnaire survey	Closing Remark

Source: This Study 2018

Figure 5-16 Housing Sector ESMS CD Workshop at Sindhupalchok DLPIU

Table 5-16 Contents of Housing Sector ESMS CD Workshop at Sindhupalchok DLPIU

	Agenda and/or Contents	Time
First Session		
1.	Registration	11:00 - 11:15
2.	Introduction of Participants	11: 15 – 11:30
3.	Opening Remarks	11:30 – 11:40
Second Session		
4.	Briefing of Reconstruction project and CD Outline of JICA-funded Housing Sector Reconstruction Project	11:40 – 12:10
5.	JICA Guidelines of Environmental and Social Considerations (2010)	12:10 – 12:40
6.	ESMS-related Social and Environmental Safeguards	12:40 – 1:20
Third Session		
7.	Discussions	1:20 -1:35
8.	Post workshop questionnaire survey	2:15 – 2:30
9.	Closing Remarks	2:30 – 2:45
Tea/Snacks/Adjourned		

Source: This Study 2018

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Registration</td><td>Opening Remark</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Presentation of JICA-funded Housing Sector Reconstruction Project Outline</td><td>Presentation of JICA Guidelines for Environmental and Social Considerations</td></tr>
</table>

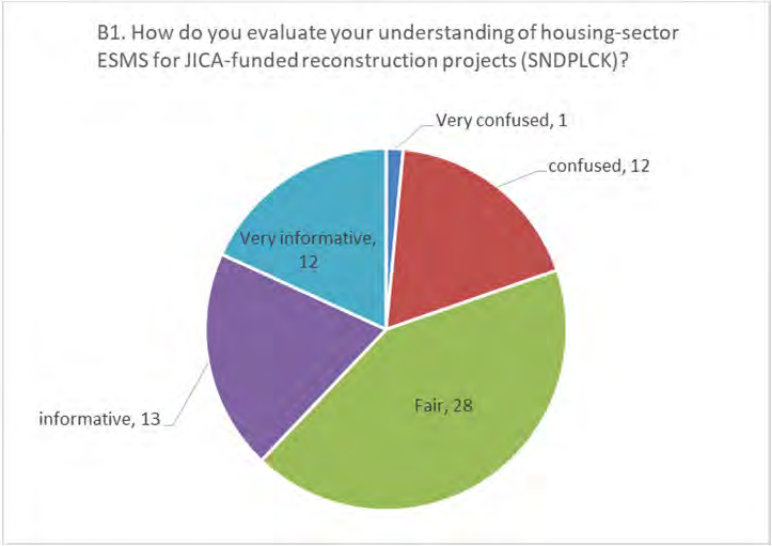
	
Presentation of ESMS-related Social and Environmental Safeguards	Question-and-Answer Session
	
Post-workshop questionnaire survey	Closing Remarks

Source: This Study 2018

Figure 5-17 Housing Sector ESMS CD Workshop in Sindhupalchok DLPIU

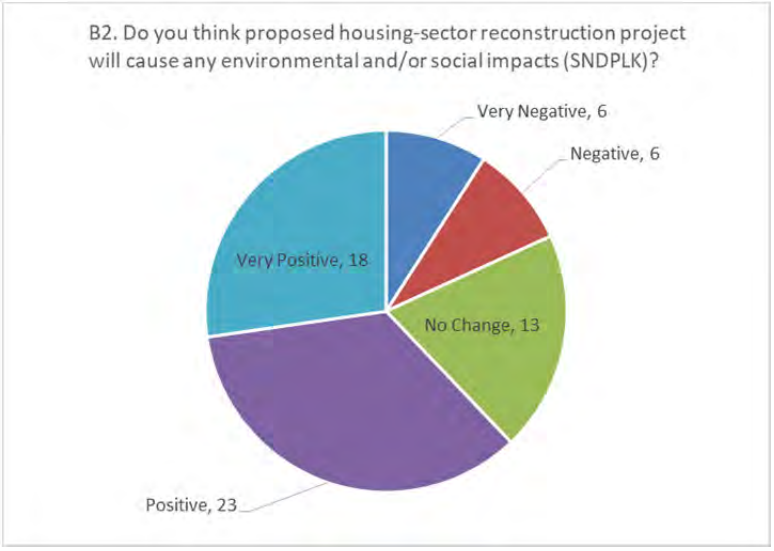
2) Post Questionnaire-based Opinion Survey

Questionnaire-based opinion survey was conducted for the housing sector ESMS CD workshop in order to study the satisfaction of all participants regarding these two CD workshops. Figure 5-18 to Figure 5-22 show the study results of this survey. It is noted that 66 participants responded to this survey (the total number of participants was 90). From this survey result, it is found that most of respondents welcome this district-level meeting and understand the importance of the proposed housing-sector ESMS CD program. Also, it is found that most of respondents think that a good liaison among CL-PIU, DL-PIU and VDCs is vital for the successful implementation of both reconstruction work and its relevant ESMS implementation.



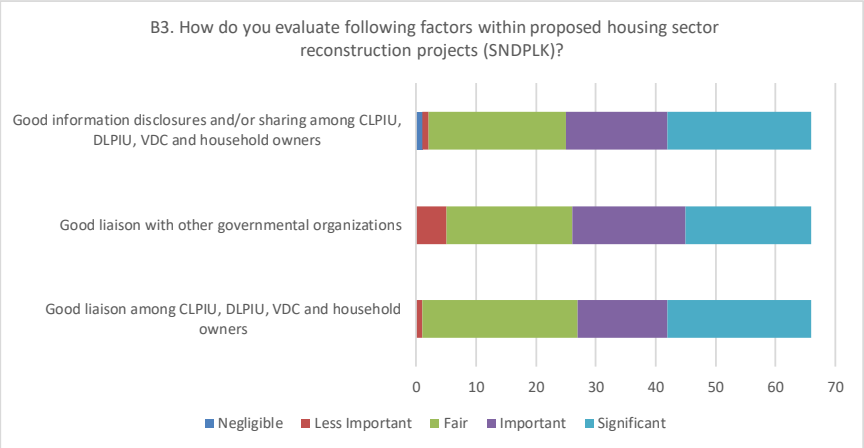
Source: This Study 2018

Figure 5-18 Evaluation of understanding of housing sector ESMS for JICA-funded reconstruction project, in Sindhupalchok



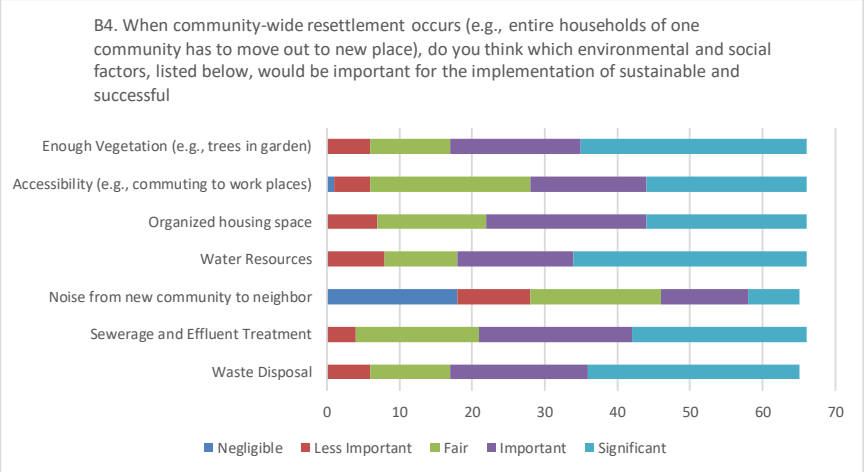
Source: This Study 2018

Figure 5-19 About housing reconstruction project environmental and/or social impacts, in Sindhupalchok



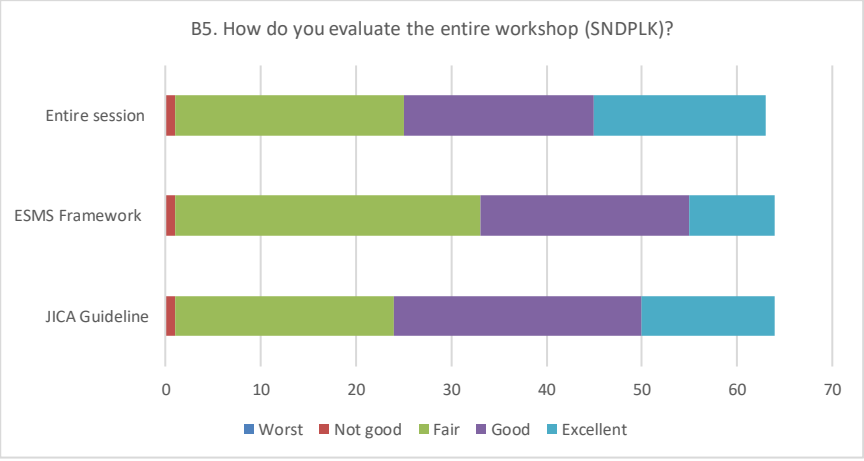
Source: This Study 2018

Figure 5-20 Evaluation of some factorsin proposed housing reconstruction, in Sindhupalchok



Source: This Study 2018

Figure 5-21 Thought about environmental and social factors for the implementation of sustainable and successful community-wide reconstruction project, in Sindhupalchok



Source: This Study 2018

Figure 5-22 Evaluation of the entire workshop, in Sindhupalchok

5.7.3 CD Workshop at Community Level

(1) Outline

As mentioned earlier, community-level CD workshop were held at 38 places in both Gorkha and Sindhupalchok Districts. In this series of Community-level workshops, ESMS-related educational mini-performance reflecting the key concepts of JICA Guidelines as well as importance of nearby ecosystem and other environmental topics were conducted to familiarise the participants with this workshop and establish strong involvement in the implementation of relevant environmental safeguards within each household reconstruction. Table 5-17 summarises the typical outline of this Community - level workshop, and Figure 5-23 and Figure 5-24 summarise photo records of this Community-level workshop, conducted in Gorkha and Sindhupalchok District, respectively.

Table 5-17 Content of Housing-Sector ESMS CD Workshop at Community Level

	Agenda and/or Content	Time
First Session		
1.	Registration	11:30 - 12:00
2.	Opening Remarks	12:00 – 12:15
3.	Introduction of Participants	12: 15 – 12:30
Second Session		
4.	ESMS-related Social and Environmental Safeguards	12:30 – 13:15
5.	Tea/Coffee Break	13:15 - 13:30
6.	Mini-performance	13:30 - 14:05
Third Session		
7.	Discussions	14:05 - 14:25
8.	Post workshop questionnaire survey	14:25 – 14:35
9.	Closing Remarks	14:35 – 14:45
Adjourned		

Source: This Study 2018

	
Registration	Opening Remarks
	
Participant Introduction	Presentation of ESMS-related social and environmental safeguards
	
ESMS-related Educational Mini-performance	Discussion
	
Post workshop questionnaire survey	Closing Remarks

Source: This Study 2018

Figure 5-23 Housing Sector ESMS CD Workshop at Gati and Maneshwara VDCs, Sindhupalchok District

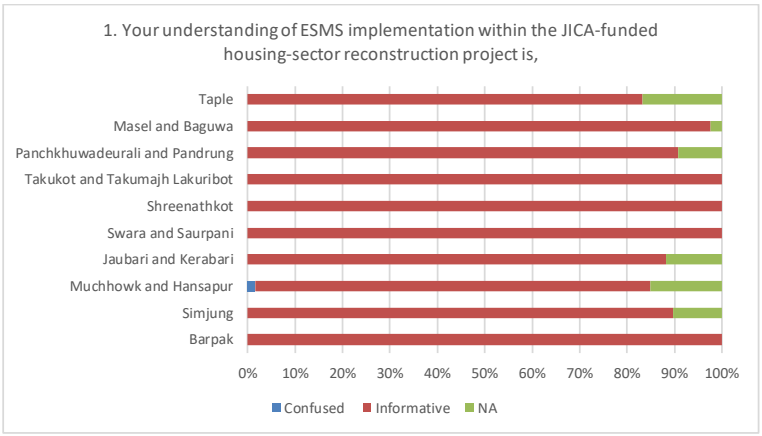
	
Registration	Opening Remarks
	
Participant Introduction	Presentation of ESMS-related social and environmental safeguards
	
ESMS-related Educational Mini-performance	Discussion
	
Post workshop questionnaire survey (1)	Post workshop questionnaire survey (2)

Source: This Study 2018

Figure 5-24 Housing Sector ESMS CD Workshop at Masel and Baguwa VDCs, Gorkha District

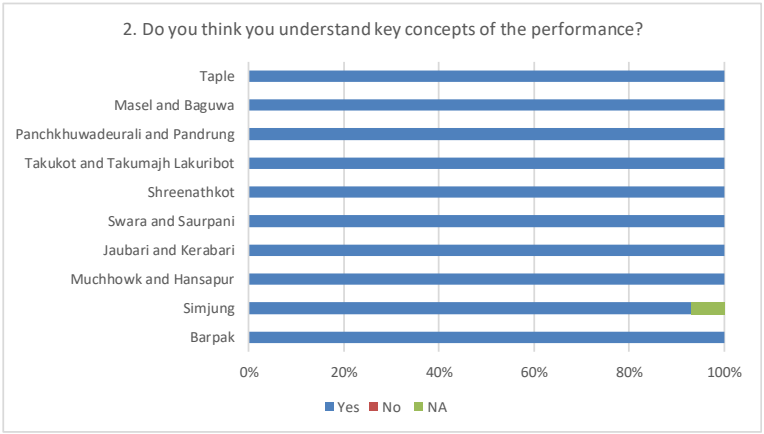
(2) Post Questionnaire-based Opinion Survey

Questionnaire-based opinion survey was conducted in this housing sector ESMS CD workshop in order to study the satisfaction of all participants regarding the workshop. Figure 5-25 to Figure 5-29 show the study results of this survey, conducted in Gorkha. It is noted that 503 participants responded to this survey in Gorkha. Similarly, Figure 5-30 to Figure 5-34 show the study results of this survey, conducted in Sindhupalchok. It is noted that 800 participants responded to this survey in Sindhupalchok. From this survey result, it is found that most of respondents welcome this community-level meeting and fully understand the importance of the proposed housing sector ESMS CD program. Also, it is found that CD workshop using ESMS-related education mini-performance works and effective at the community-level workshop.



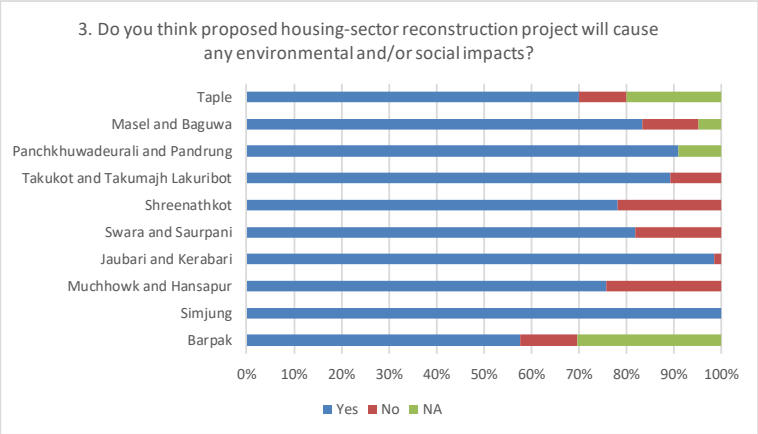
Source: This Study 2018

Figure 5-25 Survey Results: Understanding of housing sector ESMS Implementation by NP/GP, in Gorkha



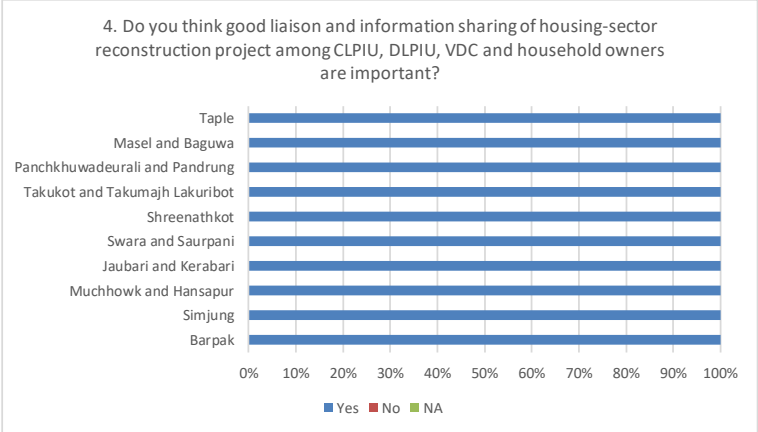
Source: This Study 2018

Figure 5-26 Survey Results: Understanding of key concepts of the performance by NP/GP, in Gorkha



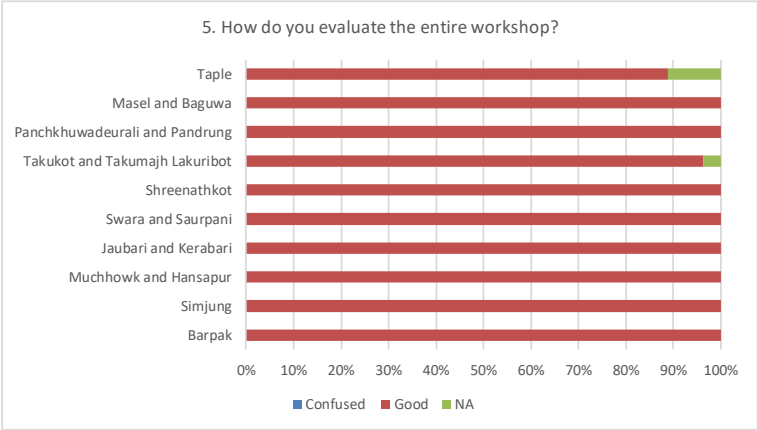
Source: This Study 2018

Figure 5-27 Survey Results: Environmental and/or social impacts of proposed housing reconstruction project by NP/GP, in Gorkha



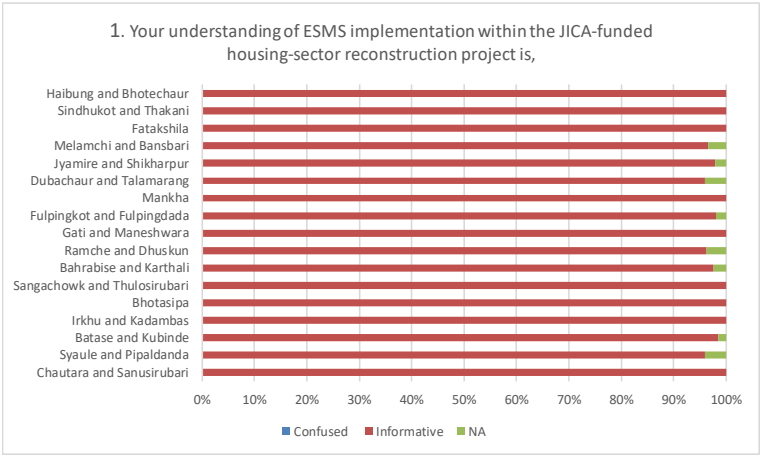
Source: This Study 2018

Figure 5-28 Survey Results: Importance of good liaison and information sharing on housing reconstruction by NP/GP, in Gorkha



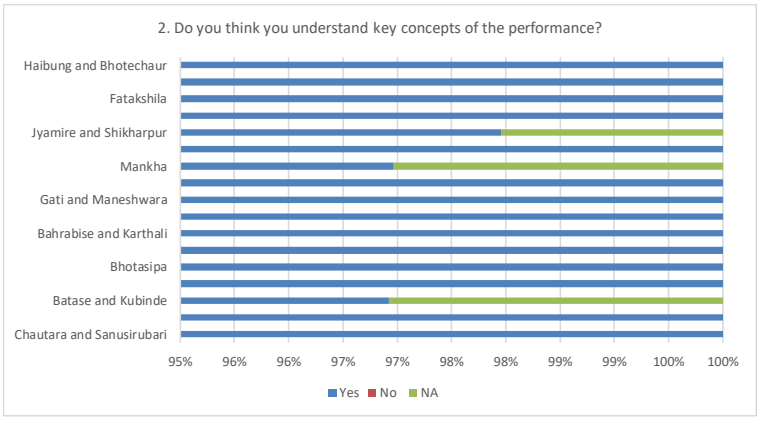
Source: This Study 2018

Figure 5-29 Survey Results: Evaluation of the entire workshop by NP/GP, in Gorkha



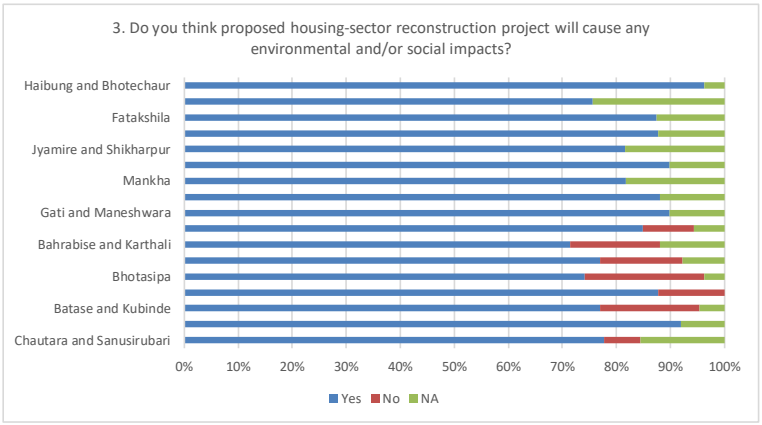
Source: This Study 2018

Figure 5-30 Survey Results: Understanding of housing sector ESMS by NP/GP, in Sindhupalchok



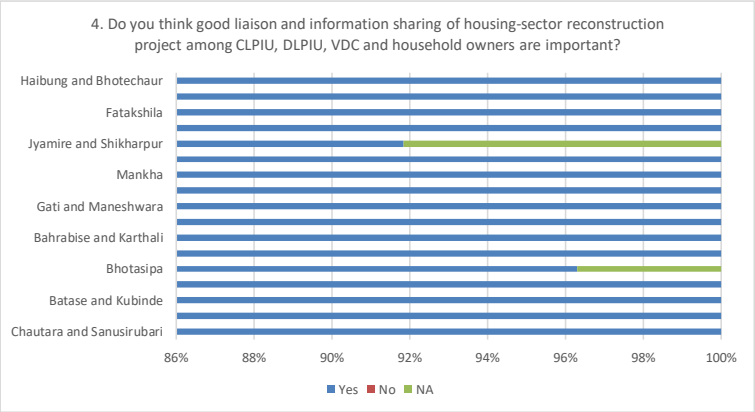
Source: This Study 2018

Figure 5-31 Survey Results: Understanding of key concepts of the performance by NP/GP, in Sindhupalchok



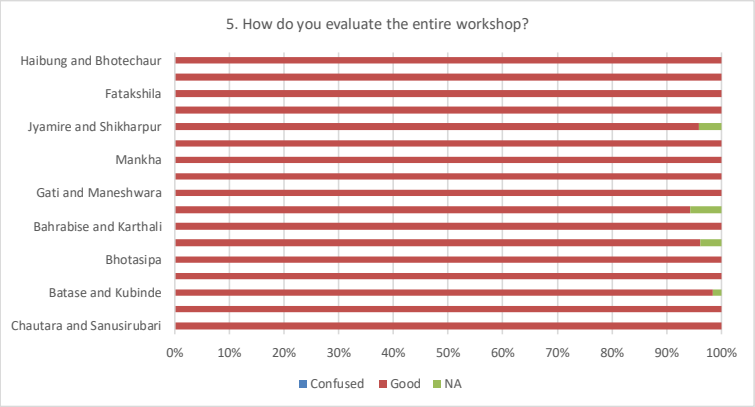
Source: This Study 2018

Figure 5-32 Survey Results: Environmental and/or social impacts of housing reconstruction project by NP/GP, in Sindhupalchok



Source: This Study 2018

Figure 5-33 Survey Results: Importance of good liaison and information sharing on housing reconstruction project by NP/GP, in Sindhupalchok



Source: This Study 2018

Figure 5-34 Survey Results: Evaluation of the entire workshop by NP/GP, in Sindhupalchok

Chapter 6 Lesson Learnt and the Way Forward

6.1 Seismic Standard

(1) Prototype Design/Fix Design from the Design Catalogue

The main purpose of the Design Catalogue was to introduce prototypes of seismic-resistant design by using many images and to facilitate easy understanding by house owners. It focuses on construction methods with seismic elements, in addition to conventional methods. The images of prototype designs were effective for people in the affected areas to understand the concept of seismic design.

In addition, by introducing the prototypes as fixed designs, it was aimed that a house owner will be able to reconstruct a house with seismic resistance using the fixed design drawings. Furthermore, the Design Catalogue aimed to simplify/accelerate the process of obtaining a building permit. Building permit system does exist in Nepal, however, it is in force in few Municipalities but much less in VDCs. At the beginning of reconstruction stage, the Government was planning to apply the building permit system to all new constructions in the affected areas, nevertheless, this plan was never realised because of a lack of human resource at field level and its time constraint.

The detailed procedure of the reconstruction program is mentioned in Chapter 2 of the Inspection guideline. The first step is for a beneficiary to choose a construction type like SMM, SMC, BMM, BMC or RCC, etc. from the Design Catalogue. Then beneficiary can receive NPR 50,000 as the first tranche of the grant to start reconstructing a house. By following this procedure, people may reconstruct houses without submitting architectural drawings. It could have been better if GON provided separate copy of each selected prototype to beneficiaries. The copy could have educated them about proper seismic design and help them to construct compliant houses.

Three years have passed since the earthquake of 25th April 2015. In particular, significant progress in the housing reconstruction has been achieved since last year. However, non-compliant houses, which do not fulfil the Minimum Requirements, are found during the inspections. Among most of non-compliant cases, in particular, shape of houses, size of wall-span, non-installation or inappropriate installation of horizontal seismic elements, and number of stories often do not meet the Minimum Requirements. These issues are due to lack of proper design and architectural drawings.

Ideally, all house owners should prepare architectural drawings for reconstruction of house, but,

considering the ground reality in rural areas where there are no architect or engineer, it is generally difficult for them to prepare complete drawings by themselves. Therefore, development of simplified drawings such as the ones introduced in the Design Catalogue is necessary. Earthquake safety will not be achieved unless a bottom-up approach is taken, through which the house owners and common people gain sufficient knowledge. This is especially true of owner-driven construction, most of which are non-engineered construction.

(2) Minimum Requirements/Inspection Sheets

The Minimum Requirements is a unified standard for seismic resistant design, and aims at popularising the National Building Code (NBC) among local population. The inspection sheets were developed as practical tools to check whether each item meets the Minimum Requirements. However, some items such as strength of concrete, steel and brick, and depth of foundation are difficult to inspect after the construction. Also, items like site selection, shape and size of building and material preparation which is supposed to be checked during design phase and permit process, are only inspected during construction.

The inspection check-sheets were developed as a practical tool to check whether each item meets the Minimum Requirements. In the building inspection, the check-sheets must produce accurate and standardised judgement. However, it needs to be easy for inspectors to use at sites because the majority of them are young graduates with little practical experience.

Regarding implementation of inspection check-sheets in the field, some items such as strength of concrete, steel and brick, depth of foundation, are difficult to inspect after the construction. Though evaluating procedure for above-mentioned items are clearly stated in inspection manual. However, it is not implemented in the field due to lack of availability of trained inspectors during construction. Also, items like site selection, shape and size of building and material preparation which is supposed to be checked in design phase and permit process, is only inspected during construction. Some items were referred from NBC which is based on mandatory rules of thumb and does not contain a variety of range.

To build earthquake-resilient house, it is not only a matter of construction quality but also planning, hence the importance of architectural design. Therefore, building permit system should be implemented. Furthermore, we have given exceptional cases which do not comply with the Minimum Requirements but are structurally safe as per NBC105, including cases mentioned in NBC, and also confirmed by the NRA Technical Working Group on the basis of seismic standard following NBC105. So tolerance level according to site Conditions have been provided in correction/exception manual and the inspection sheet has been revised. The use of exceptional case from correction/exception manual were also found to be very supportive in making earthquake-resilient houses and in decreasing the number of noncompliance cases.

The Minimum Requirements for architectural design should be introduced with detail of each item, because that will support a house owner to construct an earthquake resistant design building satisfying seismic code NBC 105. Furthermore, it could have been much better if inspection check-sheet were more practical to check and instruct in the field.

Basically, a building inspection should be conducted by a registered engineer with practical experience, because evaluating seismic safety involves various factors. For ensuring fair and adequate inspections, both appropriate inspection items and experienced engineers are necessary.

(3) Retrofitting

First of all, it is important to define clearly and uniform description of terminology of the Repair, Restoration and Retrofitting. In earthquake engineering terminology, repair, restoration and retrofitting are defined as follows:

- **Repair** consists of actions taken to patch up superficial defects such as re-plastering of walls, patching up cracks, relaying tiles and roofing sheets and rebuilding non-structural walls. Repairs do not add any strength to the structure.
- **Restoration** consists of actions taken to restore the lost strength of structural elements in a building. If the structural restoration is properly executed, the structure will be as strong as before the earthquake.
- **Retrofitting** (also known as seismic strengthening) consists of actions that upgrade the seismic resistance of an existing building so that it becomes safer in the occurrence of future earthquakes.

Under the Housing Reconstruction Program GON announced that houses under Damage Grade 3 (minor repairs) and 2 (major repairs) together with technical solution required as Major and Minor Repair shall be eligible to receive NPR 100,000 retrofitting grant for partially damaged houses. As mentioned above, retrofitting consists of actions that upgrade the seismic resistance of an existing building. Therefore, under the reconstruction program, the retrofitting construction has to follow NBC105 as the seismic standard.

Inspection for retrofit work is carried out in two phases. The first inspection is done before providing the first tranche of NPR 50,000 and the second inspection is carried out after the completion of retrofitting works. The second tranche of NPR 50,000 is released only after technical approval from the inspector. Only those beneficiaries whose house fall under Damage Grade 3 or 2 will receive the retrofit grant. Beneficiaries can change their status from reconstruction to retrofit and vice versa provided proper protocols are followed and the inspector approves the change.

During the inspection of house for repair and retrofitting, the inspector has to check existing condition of the house for all structural, non-structural members and structural connections of the

house then he provides recommendation for necessary retrofitting works. The first inspection form examines the damage level of existing building in foundation, structural and non-structural components of the building.

In this way, the inspector approves the damaged house for repair and retrofitting and recommends specific technical correction as necessary then the first tranche for retrofitting work is provided to the beneficiary. However, if the beneficiary has transferred their status from reconstruction then he can begin the retrofitting work with the first tranche of reconstruction. Either way, the beneficiary has to follow and complete the retrofitting works before applying for the final inspection. The final tranche of NPR 50,000 is released only after the final inspection. During the final inspection, the inspector fills up the inspection sheet based on previous sheet and confirms whether the house owner has properly followed the recommendations or not. If the work is found to be satisfactory, the inspector approves the release of final tranche and completion certificate. However, if it is not possible to retrofit the building due to various reasons then the beneficiary must change their status to reconstruction and rebuild their house to receive additional tranches. In this way, the GON is ensuring proper retrofitting works in the field for beneficiaries who wish to retrofit their existing house rather than reconstruction new one.

As of 21st January 2019, NRA has identified 61,591 eligible households who can apply for retrofitting grant, out of which 15,462 households have enrolled in the program, while 14,148 households have received the first tranche after first inspection, and only 20 households have received the final tranche. The primary reason behind the low number of households to receive retrofitting grant is lack of trained inspectors.

Table 6-1 NRA, CLPIU (GMaLI and Building), Grant Disbursement Data

Retrofit Grant	24th December	7th January	21st January
Total No. Eligible HHs	61,591	61,591	61,591
HHs Enrolled	13,591	15,025	15,462
HHs Received 1st Tranche	11,974	13,689	14,148
HHs Received 2nd Tranche	4	4	20

Source: CLPIU (GMaLI) as of 21st January 2019

We can observe only few examples of retrofitting by reconstruction program in Nepal and other countries. There should be many lessons learnt about retrofitting. However, it is too early to draw a conclusion. Thus, it is necessary to continue researching construction methods on retrofitting and the overall subsidy system.

6.2 Implementation

(1) Owner-driven Approach

It was difficult to start the mass reconstruction by owner-driven approach even with intensive door-to-door technical assistance.

As hilly region, the communities have some common characteristics and socioeconomic conditions such as accessibility, availability of water and local construction materials. Level of capacity to understand the government guideline such as the Minimum Requirements and the process to involve and to get the financial and technical assistance have determined the performance of the community for reconstruction. The area-affected by the Nepal Earthquake 2015 have the tremendous trend of labour migration to foreign country and urban area due to which there is a shortage of working age population and skilled labour. While physically, demographically and geographically similar, communities show same level of willingness to support each other as recognised as primitive technique known as *PARMA*[24], which they usually practice in regular housing construction and during the cultivation of agricultural crop.

In such circumstance, direct mass communication and intensive technical assistance through the construction technician was realised from the field to solve the common issues of community to accelerate the housing reconstruction. By combining the mass awareness through the TA Team and support through the Mobile Mason as construction technician to intensive support, CMP was introduced to accelerate the reconstruction in the project area.

CMP consists the different tire of workshops/meetings such as NP and GP level, ward level, settlement level and small beneficiary group level which were organised to identify the problem faced by the beneficiaries and community, and to prepare the action plans to address those problems by means of mutual work. CMP is a community-driven participatory approach that empowers beneficiaries and communities to organise themselves and to develop strategies and plan that support on reconstruction by using the social capital of Nepalese community as mutual work.

At the same time, Mobile Mason from the community motivates and supports the house owners to manage construction material and masons/labours, and provides onsite instruction to semi-skilled masons to ensure earthquake-resilient building technology. The advantage of recruiting Mobile Mason from the same community is he/she can easily understand problem of the community and to deliver the probable solution in simple communicable local language. Empowerment is driving forces to motivate rural people for reconstruction efforts and sustaining the community-based processes. Access to Mobile Mason as a resource is a means to empower rural people and to respond to the technical needs of the community.

[24] 1. Parma system is a social practice of performing or receiving labour or services within the community, it is also defined as giving (lending) and taking (borrowing) of labour or services within a community.

Owner-driven approach supplemented by community-driven approach with support of local mason was identified as a major supportive key for accelerating housing reconstruction.

(2) Housing Grant Amount

As per the data collected from the survey of 43,416 house owners until December 2018, the average construction cost is NPR 633,330 which is twice as much as housing grant provided by the government. Therefore, beneficiaries who are financially incapable take loans at interest rate of 21.7% on average to complete the construction of their house. This situation further adds financial burden to the beneficiaries as they have fairly low income to pay back the loan with such a high interest rate. One of the major issues always raised by local politicians is the amount of grant provided by the Government.

The housing grant provided to the beneficiaries is certainly not enough for complete construction of the house. Not only increasing the grant amount but the Government should have also launched programmes to provide subsidised loans and materials to the beneficiaries. Provision of subsidised loans would certainly have regulated the high interest loans that house owners are forced to take and a low interest would have been easy to repay in given time. The Government could have further supported the house owners by providing subsidised construction materials and manpower. This would have ensured quality of construction as government can regulate the quality of materials and provide skilled masons through proper training. The awareness related to proper use of salvages from the old house and use of construction materials from the community forest helped to reduce the financial burden.

The government should focus not only on the housing grant distribution but consider other indirect supports like subsidised loans, construction materials and manpower in an organised way to reduce the economic burden of the beneficiaries.

(3) Delay in Preparation of Legal Framework

Much time has been consumed in preparation of legal framework even after the establishment of NRA. During the preparatory time of guidelines and standards, many people had already started to reconstruct their houses without proper technical support, standards and guidelines. Hence, many houses constructed before the Inspection Guidelines was set in place in November 2016 were found noncompliant with the Minimum Requirements.

Timely formulation of standard and guideline plays a crucial role to the momentum of owner-driven reconstruction.

(4) Effectiveness of Inspector

Delays in employment and dispatch of engineers, assistant engineers and sub-engineers, who were responsible to provide technical support to mason and house owners and inspection, affected timely

monitoring and inspection that increased non-compliance rate of houses. After the deployment of the engineers and sub-engineers, a high turnover rate was observed because of unstable employment status, less attractive incentive, lack of transportation means and accommodation and geographical remoteness. Similarly, the engineers and sub-engineers are not regularly present in the field as there are no monitoring mechanism in their duty. They were appointed and paid by CLPIU/DLPIU (Building) however they were working for NP and GP which created misunderstanding and confusion in administration.

In this scenario, the TA Team played an important role to bridge the gap created by DLPIU engineers due to various reasons. The DLPIU engineers are not provided with any transportation facilities which has made their work more time consuming and their input is not as effective as expected. They have been provided incentive for working in remote areas but the payment is not in time which created dissatisfaction among the engineers. The TA Team not only provided technical assistance to the beneficiaries but also supported DLPIU engineer to expedite their duty. At the same time, TPIS-ERP has provided training to 493 DLPIU engineers in cooperation with CLPIU which supported in uniform dissemination of the technical message of the Minimum Requirements. Close monitoring of activity and timely provision of payment and other logistic support will increase effectiveness of the inspectors.

(5) Noncompliance

Lack of timely technical support and awareness to the beneficiaries, houses non-compliant with the Minimum Requirements in the project target area were found 1.46% of total targeted 56,532 beneficiaries as of December 2018.

The main reason for noncompliance was lack of timely proper technical guidelines to address noncompliance cases. Hence, NRA Technical Working Group developed different guidelines which proved to be very useful tool for technical assistance of houses which are yet to meet the Minimum Requirements. However, applying the correction measures, to make a structure compliant, requires significant technical support. In order to solve the lack of technical support, the concept of OJT for Mobile Mason, DLPIU Engineer, TA Team and Senior Engineer was developed. There are about 740 houses corrected by Mobile Mason until December 2018 whose owners were able to receive the subsequent tranches and live in earthquake-resistant house.

For owner-driven reconstruction, the house owner's willingness and financial capability are the key in correction of the noncompliant houses. However, the correction manual and the On-the-Job training for the mason, engineers and technical team have successfully supported to correct the noncompliant houses and to transfer the know-how to the technical personnel.

(6) Condition for 3rd Tranche and Completion Certificate

NRA considered the terms of payment into three tranches. The first tranche of NPR 50,000 after signing PA has become very supportive to start the construction as the cost of construction up to plinth level can be covered by the first tranche amount using the salvaged stones. The second tranche of NPR 150,000 which is the highest proportion among all tranches, supports the largest part of housing reconstruction and it has been properly used. The concept of third tranche to be distributed after roof band construction is to support beneficiaries to construct roof along with toilet or renewable energy source. However, as there is no financial benefit after roof completion, people are not motivated somehow to construct earthquake-resilient structure above roof band. It was found after receiving third tranche that the house owners do not care about the completion certificate and build the superstructure after roof band on their own which has finally resulted in noncompliant cases. This is also evident because 95.5% of beneficiaries who received 1st tranche have started construction and 92.1% beneficiaries who received 2nd tranche have continued construction up to roof band. However, only 6.0% beneficiaries who received 3rd tranche have received the completion certificate. To avoid this situation, EHRP consultant will continue to encourage beneficiaries to construct compliant house up to roof and receive the completion certificate.

Due to the lack of proper communication and coordination between NRA and Rural Municipality/Municipality, distribution of completion certificate is facing challenges in some of the local government. Some of the Municipalities links it with regular task and will not issue the completion certificate unless the beneficiary applies for Record Keeping and Building Permit System. Some of the Municipalities do not like the quality of printed certificate and distributed by NRA. However, some of the Municipalities are interested to do the final inspection and distribution of completion certificate to show the high reconstruction performance to others.

Reconsidering the terms of payment also could be one of the solutions to avoid this situation. Dividing the tranche into four phases, or payment of third tranche after roof completion can be some of the ways of consideration. Alternatively, the Government can also provide some kind of financial incentive for beneficiaries who receive the completion certificate. A solution that does not create a financial burden to the owner and also promotes construction of compliant structures must be considered for terms of payment.

(7) Sustainability of Community Approach

The community approach provides the opportunities for sustainable economic development at a local level. Considering the time constraint and urgency of housing reconstruction, TPIS-ERP has focused on time-limited community approach only for the housing reconstruction but not its sustainability.

However, during project implementation, CBRCs were formed in communities and they were carrying out their responsibility successfully and is expected to continue their efforts for other activities as well. Principally it is worthwhile to continue such community committee to carry out the future community activities. The knowledge and know-how learnt by the community from the project will definitely be utilised in development activities of the community and to face whatever future disasters come along by minimising their risk and damage. It is suggested that these kind of community groups must be institutionalised by the government to be prepared for future disasters for sustainability.

(8) Project Implementation by Two Ministries

NRA was structured to work for housing reconstruction in coordination with two different ministries. The objective of this structure was to utilise the expertise of each ministry to execute the works of reconstruction effectively. For housing reconstruction, Ministry of Federal Affairs and Local Development (MOFALD which was changed to MOFAGA) and Ministry of Urban Development (MOUD) were provided the main responsibility to implement the program. CLPIUs were formed under two ministries to execute the works in coordination with NRA. MOFALD CLPIU was responsible for administrative and financial part whereas MOUD CLPIU was responsible for technical part.

The employees of PIUs were supposed to be responsible to both NRA and their ministry depending upon the type of work which created problem to prioritise the housing reconstruction program. The lack of coordination was clearly observed from the beginning when MOUD CLPIU could not train and dispatch engineers at local level at the same time MOFALD CLPIU had already started to distribute the first tranche. Some of the beneficiaries already had started to construct the houses without guideline which resulted in high non-compliance rate at that time. In the central and district level two offices were located in two different places, which created a time-consuming environment for the administrative procedure.

The lack of coordination between the CLPIUs also created the environment of miscommunication. MOFALD CLPIU has its own data information system while MOUD CLPIU has another system. The data source of both CLPIU is the same but there is a difference in between the data. Actually MIS run by MOFALD CLPIU and MOUD CLPIU has not been coordinated well.

For the efficient process of tranche payment to the beneficiaries, well-coordinated system between MOFALD and MOUD was expected. MOUD had role in site inspection, filling up the form, rechecking of the inspection sheet and forwarding to MOFALD. While MOFALD had the role in collecting the inspection sheet, signing in the summary of inspection, and forwarding to DTCO. It was found that some of the files were even lost after inspection and even at office due to miss management of file. A beneficiary had to wait for at least a month for the tranche even if the file

smoothly processed. To support MOFALD and MOUD at district level, EHRP mobilized a district facilitator, DLPIU Support engineer and data management engineer. A file tracking mechanism was developed to track the inspection files and the information of the files whether rejected or processed for tranche was provided to the beneficiaries through TA Teams.

In April 2018, NRA restructured its organisational structure to make the effective reconstruction implementation with operative chain of command. This restructuring brought CLPIUs under the NRA. NRA has also been trying to handover the responsibilities to the local governments to make the process faster.

(9) One-room House

As of December 2018, 11,381 beneficiaries (20.1% of the total target beneficiaries) constructed one-room house. The data says, 9.1% houses among them are smaller than 120 square feet while 90.9% houses are more than 120 square feet.

At the end of 2017, NRA Technical Standardization Committee recommended 120 square feet as a minimum size of the room for the houses to be reconstructed. However, that recommendation was not officially disseminated and NRA could not finally decide the size of the room since many houses smaller than 120 square feet were already constructed before that. Still there is no clear guideline about the size and number of rooms.

Based on the survey with all the households who built one room house, the following are the reasons for building such structure.

Table 6-2 Reasons for Building One Room House (December 2018)

Reasons	No. of Beneficiaries	%
1 person staying in house	2,016	17.7%
2 persons staying in house (others stay outside)	764	6.7%
One room is enough	1,624	14.3%
To receive government grant within deadline	3,354	29.4%
Financial Problem	2,714	23.8%
Lack of Land	859	7.5%
Others	53	0.5%
Total Surveyed	11,381	

Source: EHRP Database

As NRA could not clearly stipulate one-room house standard, DLPIU (building) and some ward chairpersons made their own opinion regarding inspection of one room house. Some of the wards decided that the one room house is allowed only for vulnerable beneficiaries and others prohibited it and stopped inspection while some did not make any instructions regarding one room and continued inspection. Because of this non-uniformed judgment, the number of one-room house varies in different district.

Since most of the local mason and beneficiaries have got well familiar with the earthquake resilient standard for housing reconstruction, beneficiaries can expand their house compliant with standard in the future.

(10) Enrolment Camp

Even after one year since the earthquake, there was no institutional setup to support the reconstruction beneficiaries in the local level. Huge number of the beneficiaries were waiting for the government support to start the reconstruction. The administrative responsibility was provided to the VDC secretaries. However, some VDC secretary thought it was an additional task and went on strike demanding allowances and facilities for reconstruction works. Due to absence of accountable person in local level, it was challenging to facilitate the enrolment in housing reconstruction program.

The first enrolment camp was conducted in March 2016 in Singati, Dolakha. Due to lots of grievances from people regarding required documents such as land ownership certificate, only one participation agreement was signed on that day. Based on the feedback from first enrolment camp, NRA published a FAQ with answers related to it. Learning from Singati, TPIS-ERP planned to conduct enrolment camp in Hansapur, Gorkha. Enrolment camp required organised and effective communication in advance to invite people in the program. It also required a huge setup to process the whole program smoothly in an organised way. In such scenario, whole TPIS-ERP team concentrated to support the government and beneficiaries for enrolment camp including logistics support with the help of Ward Citizen Forum (WCF). WCF plays connecting role between the beneficiaries and VDC. At the same time effective communication were made to deliver the housing reconstruction guideline, lecture on earthquake resilient technology (Minimum Requirements), required document for enrolment, condition of housing grant, housing grant distribution guideline with the help of technical help desk grievance registration desk and illustrated poster for certain days. So, with support of local volunteers and paid extra staffs, from TPIS the camp was successfully conducted.

It was planned that all the record of enrolment would be uploaded directly to MIS through the tablet from the field. However, MIS was not ready and tablets were not sufficient so that TA Teams had to create excel database for recording the information in detail of the beneficiary. This record was later shared with DLPIU (GMaLI) and ultimately to the banks for first tranche payment. Based on the experience in Gorkha, TPIS ERP supported enrolment camp in Sindhupalchok and continued the direct support for 15 former VDCs.

NRA with support from DFID, provided logistics to the local bodies through UNOPS. The engineers were provided with tablet to record the participation agreement. But even with this intensive support, the digitisation was not successful due to the coverage of internet in rural area and

insufficient tablet and operator. Eventually it was realised later that some of the record of participation agreement were lost in some areas.

Even though the weak government institutional set up, enrolment camp became the opportunity to conduct mass participation agreement signing and to make the people aware of whole housing reconstruction program process and earthquake resilient technology.

(11) Deadline for Housing Grant

NRA started distribution of 1st tranche of housing reconstruction grant from March 2016. It was expected that once the grant is provided to the beneficiaries, the beneficiary would start reconstruction. However, only 96,722 (15.0%) beneficiaries out of 563,158 (87.1%) of beneficiaries who had received the 1st tranche started reconstruction as of June 2017 according to CLPIU (Building). One of the reason why beneficiary had not started reconstruction was assumed that there was no clear housing reconstruction timeline directed by NRA. Therefore, NRA announced the deadline of housing grant distribution in July 2017 which resulted that 169,269 (25.4%) beneficiaries started reconstruction in November 2017.

In a way, the deadline for housing reconstruction was effective to accelerate the housing reconstruction. However, it also led beneficiaries to reconstruct houses which did not satisfy their needs solely in order to receive the housing grant. Those beneficiaries continued to utilize their old houses to supplement new houses, planned to construct another house or expand new houses later.

Even after the deadline was set many beneficiary was not likely to meet it so that NRA extended the deadline time and again. Eventually, some of beneficiaries began not to take the deadline seriously and would not start the reconstruction.

Table 6-3 Deadline for Housing Reconstruction Grant

Original Reconstruction deadline (July 2017)

SN	Subject	Original Deadline
1	1st tranche to be received by the identified beneficiaries after signing agreement	16 Nov 2017
2	2nd tranche to be received by the beneficiaries who received 1st tranche by 13 Jan 2017	14 Jan 2018
3	2nd tranche to be received by the beneficiaries who received 1st tranche by 16 Nov 2017	13 Apr 2018
4	3nd tranche to be received by the beneficiaries who have received 2st tranche by 14 Jan 2018	14 June 2018
5	3rd tranche to be received by the beneficiaries who will receive 2nd tranche by 13 April 2018	16 July 2018

First Revision (9 February 2018)

SN	Subject	Extended Deadline
1	2nd tranche to be received by the beneficiaries who will receive 1st tranche by 14 January 2018	13 Apr 2018

Second Revision (3 April 2018)

SN	Subject	Extended Deadline
1	2nd tranche to be received by the beneficiaries who received 1st tranche	16 Jul 2018
2	3rd tranche to be received by the beneficiaries who received 2nd tranche	14 Jan 2019

Third Revision (6th September, 2018)

SN	Subject	Extended Deadline
A	**Those beneficiaries who have already received 1st tranche**	
1	2nd tranche to be received by the beneficiaries who received 1st tranche by 16 July 2018	14 Jan 2019
2	3rd tranche to be received by the beneficiaries who received 1st tranche by 14 Jan 2019	14 May 2019
B	**Those beneficiaries who are remaining to receive 1st tranche**	
1	1st tranche to be received by all the identified beneficiaries after PA signing agreement	16 Nov 2018
2	2nd tranche to be received by the beneficiaries who received 1st tranche by 16 Nov 2018	12 Feb 2019
3	3rd tranche to be received by the beneficiaries who have received 2nd tranche by 12 Feb 2018	15 Jun 2019
C	Tranche distribution deadline for newly identified beneficiaries from grievance and resurvey, vulnerable, traditional settlement and relocation beneficiaries will be according to the decision of executive committee	Date not fixed

Fourth revision (17 January 2019)

SN	Subject	Extended Deadline
1	First trance to be received by the beneficiaries	16 July 2019
2	Second and third tranche to be received on time by reconstructing the house	Data not fixed

Source: This Study 2018

6.3 Environmental and Social Concerns

(1) No Significant Environmental Adverse Impact

It was assumed that effluence from construction materials and mass transportation might impact on the local natural resources. However, it was found that the housing reconstruction are of small-scale, largely labour-based, and takes place in-situ or at alternative nearby location which did not have significant impacts on environment. Results of water quality test also shows no significant impact of reconstruction on water resources and has least possibility for negative impact on water resources.

Even there is no impact, it was also important to give awareness to local level stakeholders about the impact. TA Teams regularly encouraged the beneficiaries to maximise reuse of debris from demolished house during reconstruction supported, to reduce pressure on natural resources and reduced the financial burden of the beneficiaries. Capacity development program of ESMS-related environmental and social safeguards for housing sector was implemented to enhance the awareness level of national, district and local level stakeholders with local people and train social mobilisers. These programs focussed on BBB principle, such as best practice of site selection, debris and waste management, avoid pollution for environmental sustainability with social friendly reconstruction.

(2) Grievance

Grievance redressing mechanism is slow because of limited human resources and still there are many grievances to be addressed after 3 years since the earthquake.

Grievance registration and management process is continuous in in order to include all earthquake victims into the housing reconstruction program. Through grievance redress, 4,843 households were identified as new beneficiaries in targeted area in different phases until December 2018.

The initial grievance registration was conducted during the enrolment. At first phase, NRA published the list of grievants and resurvey was conducted. Even after that, it was found that there are many beneficiaries who are not surveyed and not satisfied with the results of resurvey. So, NRA is accepting grievances until to date and it is planning to conduct the resurvey and reverification through the engineer currently working at local level. However, it will be difficult to check evidence of earthquake damage in the house after such long period of time.

Though many grievants, who have been left out during the process of beneficiary selection, have already been listed as beneficiaries through the grievance redressal process, there are still some more left and the expectation of people about efficient and quick response has not been addressed by NRA. So, it is necessary to accelerate the ongoing process of deploying the engineers in the field and checking the data at central level.

Table 6-4 Grievance Status

Description	Households
Summary	
Total Number of registered Grievances	**424,886**
1. Number of redressed grievances	355,038
(1) Number of newly identified beneficiaries	137,203
I. Number of reconstruction beneficiaries	83,987
(Reconstruction beneficiaries in JICA targeted VDCs)	(4,843)
II. Retrofitting beneficiaries	53,216
(2) Identified as non-beneficiaries	217,835
2. Number of non-redressed	69,848
First Phase	
Total Number of registered grievances	**205,580**
1. Number of redressed grievances	205,580
(1) Number of newly identified beneficiaries	54,979
I. Number of newly identified reconstruction beneficiaries	40,967
(Reconstruction beneficiaries in JICA targeted VDCs)	(2,754)
II. Retrofitting Beneficiaries	14,012
(2) Identified as a non-beneficiary	150,601
2. Number of non-redressed grievance	0
RS/RV Phase	
Total number of registered grievances	**129,410**
1. Number of redressed grievances	114,286
(1) Number of newly identified beneficiaries	80,008
I. First lot redressed (27 May 2018)	10,845
I. Reconstruction beneficiaries	5,344
(Reconstruction beneficiaries in JICA targeted VDCs)	(626)
II. Retrofitting beneficiaries	5,501
II. Second lot redressed (1 June 2018)	2,341
I. Reconstruction beneficiaries	2,078
(Reconstruction beneficiaries in JICA targeted VDCs)	(180)
II. Retrofitting beneficiaries	263
III. Third lot redressed (12 June 2018)	5,704
I. Reconstruction beneficiaries	4,058
(Reconstruction beneficiaries in JICA targeted VDCs)	(705)
II. Retrofitting beneficiaries	1,646
IV. Forth lot redressed (17 June 2018)	3,578
I. Reconstruction beneficiaries	2,548
(Reconstruction beneficiaries in JICA targeted VDCs)	(133)
II. Retrofitting beneficiaries	1,030
V. Fifth lot redressed (28 June 2018)	9,139
I. Reconstruction beneficiaries	6,282
(Reconstruction beneficiaries in JICA targeted VDCs)	(0)
II. Retrofitting beneficiaries	2,857
VI. Sixth lot redressed (4 July 2018)	34,779
I. Reconstruction beneficiaries	19,054
(Reconstruction beneficiaries in JICA targeted VDCs)	(429)
II. Retrofitting beneficiaries	15,725

Description	Households
VII. Seventh lot redressed (October 2018)	155
I. Reconstruction Beneficiaries	155
(Reconstruction beneficiaries in JICA targeted VDCs)	(7)
II. Retrofitting beneficiaries	0
VIII. Eighth lot redressed (November 2018)	13,467
I. Reconstruction Beneficiaries	3,090
(Reconstruction beneficiaries in JICA targeted VDCs)	(9)
II. Retrofitting beneficiaries	10,377
(2) Identified as non-beneficiaries (December 2018, updated)	34,278
2. Number of non- redressed grievances	15,124
Second Phase	
Total number of registered grievances	**89,896**
1. Number of redressed grievances	35,172
(1) Number of newly identified beneficiaries	2,216
I. Number of newly identified reconstruction beneficiaries	411
(Reconstruction beneficiaries in JICA targeted VDCs)	(0)
II. Retrofitting beneficiaries	1,805
(2) Identified as non-beneficiaries	32,956
2. Number of non-redressed grievance	54,724

Source: This Study 2018

(3) Resettlement

The earthquake resulted in population displacement as habitable lands were damaged due to cracks/fissures, making them inappropriate for house reconstruction. Central level office of NRA has small unit of geological section consisting of 3 government officers to look after 32 earthquake-affected districts and there are 2 person each at Gorkha and Sindhupalchok which slows the resettlement process specially the phases of assessment and identification of resettlement beneficiaries, land purchase and land transfer to the beneficiaries.

NRA conducted the separate geological study for those beneficiaries. Based on the geological assessment report, beneficiaries were listed as resettlement beneficiaries. The project is not expected to cause involuntary settlement and involuntary land acquisition. However, in case households are technically identified to be living in areas at risk to geo-hazards, relocation is required.

Most of the listed resettlement beneficiaries took part in the resettlement process of shifting themselves to safer land, purchasing the land with government grant. Some of them have already started reconstruction. It is realised that there are still some beneficiaries who stay in the vulnerable land and are not included yet in the resettlement list. These beneficiaries have reported to ward to check their land.

Table 6-5 Resettlement Beneficiary Status in 32 districts

Description	Number of beneficiaries
Resettlement beneficiaries published on NRA MIS for 32 districts	3,663
1. Resettlement beneficiaries in 30 districts	2,332
2. Resettlement beneficiaries in Gorkha and Sindhupalchok	1,331
(1) Resettlement beneficiaries in non JICA target area	1,116
(2) Resettlement beneficiaries in JICA target area	215

Source: This Study 2018

Table 6-6 Resettlement Beneficiary Status in the Project Target Area

Description	Sindhupalchok	Gorkha	Total
Number of resettlement beneficiaries in EHRP target VDCs *	121	94	215
(Actual number of resettlement beneficiaries in EHRP target VDCs)	(117)	(88)	(205)
1. Land purchase with the government support	36	18	54
(1) Reconstruction Started	35	16	51
(2) Reconstruction Not started	1	2	3
2. Land Purchase with own money	74	31	105
(1) Reconstruction Started	73	25	98
(2) Reconstruction Not started	1	6	7
3. Land Not purchase	7	39	46
(1) Reconstruction Started	0	21	21
(2) Reconstruction Not started	7	18	25

Source: This Study 2018

Involvement and coordination among different stakeholders such as local government, district land surveyor office, DLPIU (GMaLI) and NRA are the major challenges in resettlement. GON has involved some NGOs to support the process, however, it has not gained speed as much as expected due to lack of sufficient manpower.

(4) Retention of trained Masons

Due to limited employment opportunity at villages, masons are likely to migrate to bigger cities or outside Nepal. This created shortage of local manpower for reconstruction works. When TPIS-ERP provided training to existing masons, it was difficult to find required number of masons at local level in some areas and even after training some of them couldn't stay in their communities.

As a result, migrant workers took part in house reconstruction who did not have proper knowledge for construction. To support these migrant workers, TPIS-ERP implemented the Community Mobilization Program where Mobile Masons were deployed in each communities and gave technical assistance to migrant workers. After the deployment of Mobile Masons, it was easy to check the quality of the construction of migrant workers and retention of local masons because the Mobile Masons took the ownership of reconstruction and oriented the local masons.

For retention of trained masons, it was necessary to involve them from the beginning of the program in some activities. Later on, the project realised that the trained masons must be deployed as Mobile Masons in their community immediately after training program. It is also necessary to include the migrant workers and contractors during training program to accelerate the reconstruction process smoothly.

(5) Women's participation in reconstruction

Out of total target beneficiaries of 56,532, there were 12,419 (22.0%) female-headed households. Notably, most of male family members of male-headed households were out of the village for employment and the decision-making responsibility was temporarily passed to the female members. However, there was no special attention from government to increase female participation in housing reconstruction.

During the implementation of different activities in the field such as public awareness campaign, enrolment camp, house owner training, CBRC orientation and community meetings, the active participation of female was highly observed. Though government did not have any policy in the ground, the voluntary participation of female in reconstruction has resulted in good reconstruction rate in target area.

Hence, in this scenario where many female members are available in the community, government should focus on increasing the women's participation and prepare a gender inclusive reconstruction policy to accelerate the process of reconstruction.

(6) Safety issues

Most of the beneficiaries have been residing temporary shelters until the reconstruction of their permanent houses is completed. These temporary shelters do not meet adequate safety standards and consequently pose safety issues in terms of location and structural design. Also, houses that were not completely damaged by earthquake are being used as storage or for other purposes.

In some of the NP and GP, DLPIU engineers have not conducted final inspection until the damaged house is demolished by the beneficiaries as per instruction from chairperson. This has worked effectively and created environment for beneficiaries to stay in the safe houses. TA Teams are encouraging beneficiaries not to stay in old house and demolish it for safety.

Considering this situation, it is advised that the old houses which are not in inhabitable conditions should be prohibited to stay even at the beginning of the process.

6.4 Financial Mechanism

(1) Issues and Countermeasures for the Distribution of Housing Grant

Regarding the distribution of housing grants, the following issues and countermeasures are particularly required.

1) Verification of housing grant distribution

Regarding the latest status of housing grant distribution, verification between the Payment Order (PO) issued by the DCC and the check list of the housing grant issued by DTCO, and furthermore confirmation of the issued checks by DTCO with the expenditure on the LMBIS under the Ministry of Finance have been carried out.

Originally, the confirmation of the housing grant distribution status was considered to verify by uploading information on housing grant distribution to MIS. However, the preparation stage of settlement or evidencing documents at DCC and DTCO before the uploading to MIS, there were some mistakes occurred. Therefore, the EHRP Financial Team provided a support for verification of settlement and documentary of evidencing documents with DCC and DTCO.

Furthermore, uploading to MIS is obliged by each financial institution that provides housing grant payment, but since the upload deadline is not specified, it is faster to confirm with DCC, DTCO and LMBIS for the latest situation of housing grant distribution. In any case, because it is possible to occur any mistakes in settlement and evidencing documents at DCC and DTCO (mistakes in entry, duplication of beneficiaries, omission of information, etc.) in the future, the verification works by the EHRP consultant will be continued.

2) Uploading housing grant distribution status to MIS and its verification

MIS operating under NRA manages information and status on housing grant distribution for beneficiaries, which started up the system since the beginning of the Project. Although bugs on the system were initially discovered, these bugs have been greatly eliminated. Because MIS data is very important supporting document for the EHRP MIS Team, the Team needed to strongly recommend verification of the system and provided advice on improvement to NRA, and these resulted great improvement in the system.

In addition, it is necessary to improve user-friendliness so that MIS becomes a system that is easy for the data input by PFI as well as viewers to use. The EHRP Finance and MIS Team are providing on going improvement on the system. In the past, the operability of the MIS upload of the second and third tranches were inferior, and it was very difficult to operate, but due to the improvement in the system and calls on NRA, many additional PFIs uploaded the payment status of housing grants.

In the future, it is necessary to increase the MIS upload for status of the third tranche, which is an important parameter for JICA for the verification on the project completion, and the EHRP consultants will continue to support.

(2) Operational challenges of Participating Financial Institutions

As this project progresses, PO and checks issued by DCC/DTCO and even though payment was completed, there were still some voices from beneficiaries saying that housing grants would not be received and delayed payment to their bank accounts. Although some improvements were made for accelerating payment distributions, some of bank branches continue to be limited for daily allocation of payments, and the delay in payment continues. These issues could be seen continuously are as follows:

- Beneficiaries were unable to withdraw cash from their bank accounts due to delays in cash transport to remote bank branches or allocation restrictions on cash transport.
- Because the payment allocation per day of the local bank branches is limited, it is not possible to allocate tens of persons per day. For example, 1,000 beneficiaries in Sindhupalchok District in June 2018, despite being eligible for the third tranche, only 25 beneficiaries were possible to withdraw per day from target PFI.

Because timely housing reconstruction grant payment is a key of the program, it is necessary to discuss countermeasures on accelerating housing grant payment between bank associations that have signed an agreement with NRA. EHRP Consultant will continue to address this issue with NRA.

(3) Financial linkage

In general, formal financial services were not available to people in remote areas because of the complicated application procedure, and long admissions process. Most of the beneficiaries did not have the bank account to do the formal transaction of their financial activities.

After the earthquake, the Housing Reconstruction Program facilitated to open a bank account in the name of the beneficiaries to formalise the tranche distribution free of cost. All the beneficiaries came under the financial link with the nearest bank. The program set strategies for attracting beneficiaries, promoting opportunity, facilitating empowerment and enhancing security by continuing that bank account for future. It provides access to financial services that can help to reduce poverty by promoting opportunities and facilitating empowerment. The tranche provided by the government is in instalment basis. It supports the beneficiaries to practice banking process.

The importance of financial access, which entails not only obtaining credit but also making deposits and money transactions and finally supporting them to overcome poverty in long term.

(4) Fund Management in Community Level

Looking into the debt situation of the beneficiaries of our target areas, 64.7% of the beneficiaries who completed their construction, have taken loan from the formal and informal sectors to manage the cost of their reconstruction. Managing fund for reconstruction of even just one house was also found challenging for the beneficiaries.

The concept of the CBRC was to work collectively with mutual support to each other. There are certain examples of some communities in our target areas who have collected fund in the same basket and started reconstruction of the houses with mutual support. We can take an example of one of the communities, Bojini CBRC in Sindhupalchok, consisted of 47 households. Among them 36 households was listed as beneficiaries and remaining 11 filed grievance for resurvey. Regardless of listed beneficiaries or not, once the money was deposited in their personal bank account, all of them collected the tranche in same basket. Implementation and monitoring committee was formed to look after the overall works. Some amount of loan was taken from local finance company and interest to be paid was shouldered by all the members of community. As a result of the collective procurement, each house owners could save average of NPR 46,000 for completing their construction. These kind of collective fund management in the community level was effective thanks to the active leaders of the community and continuous technical support from our TA Team.

There are some other communities in our target areas who managed 10-15 houses to work together and saved the cost of reconstruction.

Though working collectively is difficult since the interest of each individual is found different, some of the communities have become a good example of managing fund and whole reconstruction in co-ordination with our team and local government.