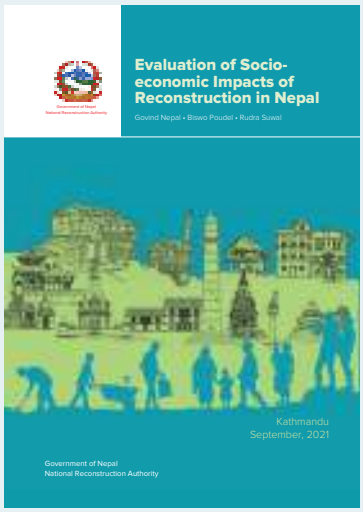
Government of Nepal
National Reconstruction Authority

# Evaluation of Socio-economic Impacts of Reconstruction in Nepal

Govind Nepal • Biswo Poudel • Rudra Suwal

Kathmandu
September, 2021

Government of Nepal
National Reconstruction Authority

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Government of Nepal
National Reconstruction Authority

# Evaluation of Socio-economic Impacts of Reconstruction in Nepal


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# FOREWORD

In 2015 April and May, two deadly earthquakes hit Nepal, with traumatizing impacts on the general public at large in the affected districts. Almost 9,000 people lost their lives, over 22,000 people were injured and more than a million houses collapsed or were damaged in the catastrophe. All sectors of the country's economy were crippled. Six years ago, embracing the principle of "Build Back Better", the National Reconstruction Authority (NRA) began a revitalizing nation-building process with an ambitious reconstruction program. Since then, the recovery process has resulted in the reconstruction of over 800,000 private houses, about 50,000 classrooms at 7583 schools, 1,164 health institutions and about 1,800 cultural and historical monuments, including monasteries.

With the NRA heading towards the end of its mandate, an independent study on the socio-economic impact of reconstruction activities was conducted in April 2021, including a quantitative household survey and qualitative fieldwork. I believe this report, along with the results of the study, will be beneficial to the Government of Nepal to better address post-disaster recovery and better align reconstruction with mainstream development efforts in the future. This report highlights the tangible output of post-earthquake reconstruction and the impact of reconstruction on the national economy. Findings of the independent study show that, with an injection of an enormous reconstruction budget into the rural economy, access to rural infrastructure, including education, health, and transportation services, has improved.

I would like to extend my sincerest gratitude to our research experts: Dr. Govind Nepal (Team Leader), Dr. Biswo Poudel, and Dr. Rudra Suwal. I equally thank Catholic Relief Services (CRS) for funding this study, the UK Foreign, Commonwealth and Development Office (FCDO), the World Bank and the Housing Recovery and Reconstruction Platform (HRRP), for their technical support and everyone who contributed to this report.

**Sushil Gyewali**
Chief Executive Officer
NRA

# ACKNOWLEDGEMENTS

National Reconstruction Authority is pleased to publish this report, which is intended to contribute towards a better understanding of the socio-economic impacts of reconstruction on national development. It gives me immense pleasure to thank the Chairman of the ICNR Organizing Committee and the CEO of the NRA, Mr. Sushil Gyewali, under whose supervision and guidance this report was prepared.

The National Reconstruction Authority is indebted to Dr. Govind Nepal (Team Leader), Dr. Biswo Nath Poudel and Dr. Rudra Suwal for undertaking this study. This seminal piece of work demonstrates their ingenuity, dedication and professionalism. This study enables us to verify the reconstruction efforts that have begun to successfully generate social and economic impacts in the affected areas and beyond, which in some cases are truly transformative in nature.

This thematic learning report was reviewed by national and international experts. I would like to particularly acknowledge the contributions of Dr Nigel Fisher, the international expert, for his invaluable comments and suggestions on the draft of the report. We sincerely acknowledge the contribution of the technical team consisting of Dr. Chandra Bahadur Shrestha, ECM - NRA & ICNR Convener – Coordinator; Mr. Manohar Ghimire, Under Secretary, NRA; Ms. Jasmine Rajbhandari, Sr. Social Protection Specialist, World Bank; Mr. Nayan Krishna Joshi, Economist, World Bank; Ms. Sulochana Nepali, DRM Analyst, World Bank; Mr. Ram Khadka, Economist, Foreign, Commonwealth & Development Office (FCDO) and Mr. Bishal Thapa, Independent Economist who authenticated the methodology and outcome of the study.

We also like to express thanks to other ICNR Secretariat members Ms. Sulochana Nepali, Mr. Janardan Nepal, Mr. Minar Thapa Magar and Mr. Sandeep Gurung dedicated unquestioned commitment, drive and efficiency.

NRA owes special thanks to CRS and HRRP for supporting this study. Particularly Ms. Katherine Price, Ms. Reshma Shrestha, and Mr. Uttam Poudel deserve our earnest appreciation. The study received important support from Mr. Sufi Mohammad Faiz, Ms. Sabina Bhandari, Mr. Ruplal Aidi, Mr. Rahul Pratap Singh, and Mr. Ishor Neupane on the management part, while Mr. Yubaraj Bhandari, Mr. Keshab Shrestha, Mr. Sandeep Dhakal and Mr. Ram Sharan Subedi, provided technical support in processing the data and producing outputs under the guidance of the study team. Ms. Astha Wagle assisted the team in interpreting modeling results and polishing the draft.

We would like also to express thanks to everyone for their support. Our sincere thanks also bestowed to all NRA district engineers for collecting data which is the foundation for this study.

This study was greatly benefitted from the enthusiastic contribution of relevant political leaders, top-notch professionals and bureaucrats, NRA employees and cadres from the partner organizations. The contributors of all contributors are highly acknowledged.

I am confident that this study will not only reveal NRA's adherence to value for money but also will be a trailblazer for post-disaster reconstruction in the future.

Thank you.

**Sushil Chandra Tiwari**
Secretary
NRA

# ABOUT THIS PUBLICATION

Nepal has made a substantial investment of NPR 867,890 million (US $ 7,353.13) in the post-earthquake reconstruction in the six years following the 2015 mega earthquake of 7.6 magnitude on 15th April, 2015. Following the remarkable success of the reconstruction of infrastructure damaged by the 2015 Nepal earthquake, NRA began documenting its work, with a view to publishing and sharing its experiences and lessons learnt in various ways - through the scientific, institutional and open routes.

The NRA executed this study to evaluate the socio-economic impact of post-earthquake reconstruction and has recommended institutional frameworks that could best sustain and build on the accomplishments of reconstruction following the completion of the NRA's mandate. The specific aims of this study are: to evaluate the physical and financial performance of NRA; to assess socio-economic impacts of reconstruction activities; to estimate the contribution of reconstruction activities to GDP; to record the lessons learned that will help the government to better address post-disaster recovery and reconstruction in the future; to suggest the best circumstances under which to close the NRA and to sustain and scale up the most significant reconstruction achievements identified by the reconstruction study.

These investments and efforts have begun to generate social and economic impacts in the affected areas and beyond, investments which, in some cases, are transformative in nature. Therefore, an independent study was carried out to measure the socio-economic impact of reconstruction activities and explore the institutional options that could maintain and build on the accomplishments of reconstruction and ensure the momentum of building of a resilient Nepal.

We are confident that this evaluation report will contribute to consolidating and sharing post-disaster reconstruction best practices, both nationally and internationally. The outcomes of the study will also contribute to the advancement of Nepal's future disaster management and the development of appropriate strategies and policies policy for building resilient Nepal.

**Dr. Chandra Bahadur Shrestha**
Member, NRA Executive Committee
Convener - ICNR

# ABBREVIATIONS

| | |
|---|---|
| APC – MADRO | Asia Pacific Military Assistance to the Disaster Relief Operations Disaster Response Operations |
| CBS | Central Bureau of Statistics |
| CE | Compensation of Employees |
| CEOs | Chief Executive Officer |
| CLPIU | Central Level Project Implementation Unit |
| CSEB | Compressed Stablished Earth Blocks |
| DI | Disposable Income |
| DLPIU | District Level Project Implementation Unit |
| DoA | Department of Archeology |
| DPs | Development Partners |
| DPC | Damp Proof Course |
| DRR | Disaster Risk Reduction |
| FGD | Focus Group Discussions |
| FY | Fiscal Year |
| GDI | Gross Disposal Income |
| GDP | Gross Domestic Product |
| GFCF | Gross Fixed Capital Formation |
| GNDI | Gross National Disposable Income |
| GoN | Government of Nepal |
| GVA | Gross Value Added |
| HH | Households |
| HuMOCC | Humanitarian - Military Operations Coordination Center |
| HRRP | Housing Recovery and Reconstruction Platform |
| I/NGOs | International and National Non-Government Organizations |
| KII | Key Informant Interview |
| MNMCC | Multinational Military Coordination Center |
| MoHA | Ministry of Home Affairs |
| MoUD | Ministry of Urban Development |
| NA | Nepal Army |
| NEOC | National Emergency Operation Centre |
| NDRRMA | National Disaster Risk Reduction and Management Authority |
| NGOs | Non-Government Organizations |
| NPC | National Planning Commission |
| NPDRR | National Platform for Disaster Risk Reduction |
| NPISH | Non Profit Institutions Serving Household |
| NPR/NRs | Nepali Rupees |
| NRA | National Reconstruction Authority |
| OSOCC | On-Site Operations Coordination Center |
| PDNA | Post Disaster Need Assessment |
| PDRF | Post Disaster Recovery Framework |
| PNC | Post Natal Care |
| SEIA | Socio Economic Impact Assessment |
| SOP | Standard Operating Procedures |
| SPV | Special Purpose Vehicle |
| SUT | Supply and Use Table |
| TI | Transparency International |
| TAF | The Asia Foundation |
| UK | United Kingdom |
| UNDAC | United Nations Disaster Assessment and Coordination |
| USD | US Dollar |

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# CONVERSION TABLE

| Nepalese Month | Gregorian Month |
|---|---|
| Baisakh | Mid -May |
| Jetha | Mid.-June |
| Ashad | Mid - July |
| Shrawan | Mid-August |
| Bhadra | Mid-September |
| Ashoj | Mid –October |
| Kartik | Mid - November |
| Mangshir | Mid.- December |
| Poush | Mid - January |
| Magh | Mid-February |
| Phalgun | Mid- March |
| Chaitra | Mid -April |

# EXECUTIVE SUMMARY

Nepal made a substantial investment of Rs. 867,890 million in the post-earthquake reconstruction within the six years after the mega earthquake of a magnitude of 7.6 on the richter scale hit the country on 15th April 2015. The National Reconstruction Authority (NRA) led and delivered the challenging mandate of reconstruction in the face of adversity and limited resources. Massive reconstruction projects in the private housing, school, health, public buildings, heritage and other infrastructure sectors were launched. Livelihood promotion projects were also implemented in the earthquake-affected districts. These investments and efforts have begun to generate social and economic impacts in the affected areas and beyond, which in some cases are transformative in nature. Therefore, NRA, towards its closure, decided to carry out an independent study on the socio-economic impact of reconstruction activities and explore intuitional options that could maintain and build on the gains of reconstruction and ensure a resilient Nepal.

The objective of this study is to evaluate the socio-economic impact of post-earthquake reconstruction and recommend institutional frameworks to sustain and build on the gains of reconstruction after the closure of the NRA. The specific aims of this study are to - a) evaluate the physical and financial performance of NRA, b) assess socio-economic impacts of the reconstruction activities, c) estimate the contribution of reconstruction activities to Gross Domestic Product (GDP), d) record the lessons learned that will help government better address post-disaster recovery and reconstruction in the future, and e) suggest possibilities for optimum closure of NRA to sustain and build on the gains of reconstruction.

The study employed both quantitative and qualitative methods to interpret and analyze the data collected from primary and secondary sources. The primary sources include the structured questionnaire-based household survey, focus group discussions with the affected households participating in the reconstruction process and key informant interviews with NRA executive members, former Chief Executive Officers (CEOs) of NRA, support organizations and independent experts. Secondary sources comprise the records of initial surveys of affected households conducted by the Central Bureau of Statistics, the decisions made by the cabinet, NRA publications, reports of various government and non-government agencies, and journal articles of experts and researchers. The study has used the difference-in-differences method, which estimates the counterfactual for the change in outcome for the treatment group by calculating the change in outcome for the comparison group, for analyzing the socio-economic impacts of reconstruction. The contribution of reconstruction investment to GDP has been based on the National Accounts Method. Indicators are disaggregated on the data by major economic divisions. The option for optimum closure of NRA was based on the review of relevant reports, decisions of NRA Steering Committee, and analysis of the mandate of the National Disaster Risk Reduction and Management Authority (NDRRMA).

**Accomplishments of NRA**

Despite extreme internal and external challenges, the NRA was successful in achieving most of its targets, but the extent of achievement was not uniform across all sectors. As of the end of 2077/78, the reconstruction of 93 percent of government buildings, 88 percent of school buildings, 86 percent of roads, 65 percent of health buildings, and 64 percent of heritage buildings and sites has been completed. Major reconstruction of Dharahara, Ranipokhari, and Singha Durbar has also been accomplished.

With 99.9 percent of the beneficiaries having grant agreement received the first installment for housing reconstruction, 84.8 percent of private houses have been constructed and 6.7 percent are under construction. 4,720 households living in unsecured hazardous areas have been resettled in secured areas while land has already been provided to 12,788 households for the construction of houses. However, in the development of integrated settlements, only 31.25 percent of the target was met.

**Socio Economic Impacts**

In addition to the tangible output of the post-earthquake reconstruction, the reconstruction approach and policies have generated huge socioeconomic impacts in earthquake-affected areas. A total of 407.5 million workdays has been generated in the reconstruction and livelihood sector during the reconstruction period and in the process has built capacity of youths and economic empowerment of women. Breaking the gender barrier, more than ten thousand women masons successfully worked in housing reconstruction. Further, the NRA land registration procedure required shared ownership on land and empowered women. Financial inclusion of the rural area has deepened and widened and financialization of the rural economy has been evident through an

injection of an astronomical reconstruction budget into the rural economy. Another major impact is the access to better education, health, and transportation services with improved rural infrastructures.

**Impact of Reconstruction on the National Economy**

The total reconstruction expenditure constitutes Rs. 867890 million out of which 28 percent was contributed by the Nepal Government. Development partners, INGOs and NGOs, and households contributed 29, 10, and 33 percent respectively to the total reconstruction expenditure. Reconstruction activities carried out by this resource have made notable contributions in the national economy. These have been captured in economic indicators such as GDP, Gross National Disposable Income (GNDI), Gross Fixed Capital Formation (GFCF) and compensation of employees. The average economic growth, which is found to have been 3.39 percent in the period before the earthquake (2011-2015), rose to 5.00 percent in the post-earthquake period (2016-2020). The average annual growth rate of Gross Value Added (GVA) has increased in the post-earthquake period in all broad sectors, but the change in the average growth rate of GVA is the highest (7.48 percent) in the secondary sector, of which the construction sector is a major component.

Reconstruction has added to the GDP growth of the country. In year 2015/16 0.13 percentage was added in overall GDP, increasing it from 0.3 percentage to 0.43 percentage. The trend remained the same in the following years. In year 2016/17, 2.13 percentage was added increasing the overall GDP to 8.97%, 2.7 percent in Year 2017/18, 2 percent in Year 2018/19, 0.63 percent in Year 2019/20 and 0.8 percent in Year 2020/21, resulting in Total GDP of 7.62 percent (2017/18), 6.66 percent (2018/19) and 4 percent (2020/21) respectively. It is evident from the figure that the share of reconstruction GVA has a direct relationship with total GDP growth.

The contribution of GFCF from reconstruction to total GFCF has increased significantly and recorded a maximum of 20.61 percent in 2017/18. This implies that reconstruction expenditure has a direct positive impact on the gross fixed capital formation.

**Successor of NRA**

As of today, there is a consensus as of today among all stakeholders that NDRRMA is to be entrusted as the institutional successor to NRA. By institutional succession, what is generally understood that NDRRMA would be handed over responsibilities related to disaster resilience and would take over knowledge, lessons and good practices of NRA's past 6 years of reconstruction journey. Further it will continue to play facilitating and coordinating roles in planning and execution of programs like Nepal Disaster Resilience Framework (NDRF). In order to carry out these and other mandated responsibilities, the NDRRMA needs a higher status and more legal, financial, and human resource autonomy.

**Findings**

The reconstruction was slow in the initial years as it had to identify the problems, explore solutions and arrange legal instruments to solve identified problems. Although the disaster-related framework and acts were in place, the disaster preparedness of the country was found to be rather poor at the time of search and rescue operations. The national search and rescue team lacked equipment and logistics and the such logistics needs required for search and rescue were not properly communicated to the international Search and Rescue (SAR) team. NRA brought into effect 22 procedures addressing various critical issues in addition to the Act and Regulation and the pace of reconstruction work increased in the later years.

Housing reconstruction, which utilized 46.07 percent of the public part of reconstruction expenditure and 63.63 percent of total reconstruction expenditure (including household expenditure), is the most successful reconstruction activity and will achieve 91.46 percent of the reconstruction target by the end of extended NRA tenure. There has been a major shift in housing typologies in earthquake-affected districts, from stone and mud-based masonry to cement-based construction. The reconstruction of individual houses was owner-driven. The average cost of a private house is estimated to be Rs. 907,647, which is more than three times higher than the grants provided by the government. Households used funds equivalent to Rs. 282.6 billion (32.6 percent) of the total amount of reconstruction spending which led to widespread household indebtedness, as 31.5 percent households borrowed from banking and non-banking sources for funding required to pay their house reconstruction costs and other household consumption needs. The livelihood component of Post Disaster Recovery Framework (PDRF) did not receive the necessary attention of the NRA and was left to the purview of INGOs and NGOs. Various models were tested in limited areas and some successful models were not replicated.

International funding has played a vital role in the reconstruction process. From the beginning of the incidence of earthquake, international agencies, and, non-government organizations were involved in diverse areas of rescue, relief, recovery and reconstruction works.

**Recommendations**

As per the constitutional mandate and provisions of the acts, regulations and frameworks, all tiers of governments must have institutions, capacity, and the equipment to create awareness, and conduct rescue and relief operations. The Government of Nepal should come up with programs in the earthquake-affected areas to address the critical issues of livelihoods, unemployment, and indebtedness along with reconstruction, focusing on stimulation of different livelihoods options and income opportunities.

Sustainable construction plans and programs need to be devised for the recovery and expansion of livelihoods to reduce the incidence of household debt. Given that household debt has increased substantially in the process of house reconstruction, income-generating activities of households to overcome the burden of loans is imperative. Any relocation/resettlement must be community-initiated, community-driven and community-controlled, with the appropriate support from the state, and specific human rights protections against forced evictions should be in place.

A national construction policy and guideline for all types of construction, including private housing construction, are essential. Resilient and sustainable construction activities need to be continued in the days to come, following national construction frameworks and guidelines. The establishment of a “Nepal Disaster Land Bank” could help to secure access to land for those households who become landless in the event of any future disaster.

The Department of Archeology (DoA) should take the lead in preparedness for renovation and reconstruction of key national heritage monuments and sites, through discussion with concerned international institutions, subject experts, academia, and more importantly with the associated communities in order to resolve the multidimensional issues beforehand. Procurement policy/procedures requiring the acceptance of the lowest cost bidders should be relaxed in the case of archaeological and cultural heritage reconstruction, considering the importance and the specialized knowledge and technical skills required for reconstruction in this domain.

As regards designing of the ‘Nepal Disaster Resilient Framework 2030’, a decade - long Resilient Nation Building program, should be led by NDRRMA and approved through NDRRMA channels. In order to make informed policy decisions on critical issues of reconstruction, resettlement and financing sustainable solutions, future research should be geared towards Multi-Hazard Risk Assessment Mapping and Multi-Hazard Risk Sensitive Land Use Planning; and Urban Regeneration Program to address the issues of urban reconstruction and recovery; low-cost earthquake-resilient housing and climate-compatible infrastructure development.

# CHAPTER 1
# INTRODUCTION

## 1.1 Background

### 1.1.1 Magnitude of Earthquake

Nepal, situated in the central part of the Himalayas, is one of the seismically most active zones in the world. Nepal has witnessed several mega-quakes, with magnitude above 8 on the Richter scale and thousands of smaller earthquakes, since time immemorial and the Kathmandu Valley has been reportedly destroyed several times by destructive earthquakes in the past (Rajaure, 2021). In the series, an earthquake of 7.6 magnitude on the Richter scale struck in Nepal on Saturday 25th April 2015 with its epicenter in Barpak, Gorkha district (about 80 kilometers north-west of Kathmandu) at a depth of approximately 8.2 km (5.1 miles). It was one of the worst natural disasters in Nepal since the 1934 Nepal–Bihar earthquake, recorded as the Earthquake of 1990 *Bikram Sambat* [Transparency International Nepal (TI), 2020].

The earthquake affected the entire area of Nepal as well as parts of India, Bangladesh, and the Tibet Autonomous Region of China. Tremors were also felt as far away as in Bhutan and Pakistan (Subedi & Poudel, 2019). The earthquake was followed by about 300 aftershocks with magnitudes greater than 4 Richter Scale throughout Nepal, with one aftershock on 12th May 2015 reaching a magnitude of 6.7 Richter (NRA, 2020).

### 1.1.2 Casualties and Injury

The earthquake resulted in 8,979 deaths and 22,309 human injuries and also caused damage to private and public buildings and infrastructure. It is estimated that the lives of eight million people, almost one-third of the population of Nepal, have been impacted by these earthquakes. Thirty-one of the country's 75 districts have been affected, out of which 14 were declared 'crisis-hit' to prioritize rescue and relief operations; another 17 neighboring districts are partially - affected [National Planning Commission (NPC), 2015a].

Annual economic growth in FY 2014-2015 was expected to be the lowest in eight years, at 3 percent (basic prices). The earthquakes suppressed an earlier projection of 4.6 percent by over 1.5 points (NPC, 2015a).

### 1.1.3 Headline Figure of Loss, Damage and Recovery Needs

PDNA and subsequent assessments showed that at least 498,852 private houses and 2,656 government buildings were destroyed. Another 256,697 private houses and 3,622 government buildings were partially damaged. In addition, 19,000 classrooms were destroyed and 11,000 damaged (NRA, 2016). According to the preliminary report of the Department of Archaeology, out of the 745 monuments, 193 monuments completely collapsed, 95 monuments partially collapsed, and 517 monuments were partly damaged. UNESCO world heritage sites also suffered damage, ranging from minor to severe in various structures (KC, Sharma & Pokharel, 2020). Nationwide, more than 1,000 monasteries, temples, historic houses, and shrines were damaged or destroyed ((Benfield, 2015). Throughout Nepal, a total of 963 public health facilities were destroyed (503) or damaged (460) during the earthquakes. Among the damaged facilities were 374 health posts, 12 Primary Health Care (PHC) centers, and six hospitals. An additional 130 birthing centers were also destroyed. A further 531 public health facilities and 102 birthing centers were partially damaged. The road and highway network across Nepal was heavily impacted, with more than 2,000 kilometers (1,242 miles) – or 13 percent of the network – damaged or destroyed. (Benfield, 2015). The total loss in the agriculture sector is estimated at around NPR 28.4billion (USD 284 million), of which NPR 16.4 billion (58%) represent direct damages (NPC, 2015a). Nearly 3.5 million people were considered vulnerable, with immediate food needs. Of these nearly 1.4 million people were considered highly vulnerable (NPC, 2015a).

The earthquake affected the livelihoods of some 2.29 million households and 5.6 million workers in 32 districts, resulting in the loss of about 94 million working days. However, large scale housing reconstruction activities may generate up to 352 million workdays over the next 5 years. About a million agricultural households have been affected resulting in the loss of 46 million working days (Thapaliya, 2020). About 869,000 workers have been affected in commerce and industry with the expected loss of about 17 million working days.

The Post Disaster Needs Assessment (PDNA) 2015 published by the National Planning Commission (NPC) estimated the total damages to be US $ 7 billion (USD 1 = NPR 100). This estimate was adjusted by NRA post midterm review to US $ 5 billion in 2017. The earthquake had a combined effect on agriculture, manufacturing and service sectors, thereby weakening the entire economy. In 2015, the GDP growth rate of Nepal fell to 2.3 % from the earlier estimates 5.7% and decreased further to 0.8% in 2016 due to the earthquake, weak monsoon and trade disruptions[1].

The average value of per capita disaster effect was highest in the mountains (USD 2,195) and the lowest in Inner Terai (USD 508), with an average of NPR 130,115 (USD 1,301) in the 14 most-affected districts (NPC 2015a). The per capita disaster effect is positively correlated with poverty (0.46), indicating that less developed and poor communities, many of which are in mountain areas, endured a larger portion of disaster impacts (Rasul et al, 2015). Platt, Gautam & Rupakheti (2020) maintain that in the 2015 earthquake losses and damages incurred by poor households amounted to around US$ 6,000 per household, which was 14 times their median annual income. In comparison to the poor households, non-poor households lost more in absolute terms (more than US$ 10,000), but only three times their median annual income.

Since the 2015 events, Nepal has experienced more than 400 additional earthquakes and aftershocks, and 4,000 landslides. In 2015 and 2016, the earthquakes pushed 2.5 to 3.5 percent of the population into poverty and caused NPR 706 billion (US$ 7 billion) in damages (Gauchan et. al., 2016). The share of estimated total disaster effects among the main sectors of social and economic activity reveals that the most affected are social sectors (58 percent of the total effects), which includes housing. This is followed by productive sectors (25 percent), infrastructure (10 percent), and cross-cutting issues (7 percent) (NPC, 2015a).

## 1.2 National Reconstruction Authority

In the wake of the earthquake, the government moved to begin the reconstruction process. The National Reconstruction Authority (NRA) was formed in December 2015, supported by an Act ratified by the parliament. It was an authority mandated to plan and coordinate reconstruction and rehabilitation activities and to complete reconstruction within a period of five years and maximum one year extension, if needed. NRA worked with the support of government agencies, various multilateral and bilateral development partners, I/NGOs, private sector and communities. The PDRF (2016-20), prepared by NRA, was a guiding document for recovery and reconstruction. The NRA was mandated to focus on the following six areas:

a. Reconstruction of private houses, development of integrated settlements, and resettlement of risky residences.
b. Reconstruction of public health institutions
c. Reconstruction of educational institutions
d. Reconstruction of archaeologically and historically important heritage
e. Reconstruction of government housing
f. Reconstruction of any other public structures, and
g. Any other construction considered necessary by the authority.

## 1.3 Rationale of the Impact Study

The NRA made large investments and carried out huge reconstruction activities covering multiple sectors and segments of the society, by mobilizing government agencies, Development Partners (DPs), private sector partners, NGOs, philanthropic organizations, more importantly beneficiary households and communities. Covering 31 districts affected to different degrees of severity during its 5 + 1 years of operation, it has recorded multiple success stories and has also gained considerable learning from extensive ground experiences. Therefore, NRA decided to carry out this impact study to be complete by the end of its extended tenure. The rationale of this study was given as follows:

i. The evaluation of early rescue, relief, and recovery process will provide the government with the input to update the concerned Act, guidelines and frameworks, review the mandates and responsibility of the concerned agencies, equip agencies with skilled human resources, equipment and material resources, and redistribute roles and responsibilities to the different layers of the government as per the federal constitution of Nepal.

1 *"Assessment of Business Development and Livelihood Enhancement in Nepal" Final Report, Aug 31, 2017, page 12.*

ii. The study will help evaluate the progress achieved against the reconstruction targets. The underlying factors behind the results will not only help us understand the efficiency of NRA but also direct us to look deeply into the circumstances under which the NRA had to operate, the mandates that NRA practically executed, and the resources that were actually provided to NRA when it needed them. Such evaluation will help government make such a special purpose organization more efficient.
iii. The study will facilitate understanding of the future impacts of reconstruction in the socio - economic sphere, by generating knowledge about the initial usage of the reconstructed assets - houses, schools, hospitals, roads etc.- and the shifts in the sources of livelihoods.
iv. The study will also help to quantify the contribution of a huge reconstruction investment to the national wealth, in terms of GVA made by Government, DPs, the private sector, and NGOs during the reconstruction process.
v. Finally, and most importantly, the study will record lessons of the reconstruction experience, which will help the government plan and build an earthquake - resilient Nepal and to prepare for, and respond more adequately and efficiently to, future earthquakes.

## 1.4 Study Objectives

The major objective of the study is to evaluate the socio-economic impact of reconstruction and suggest options for the optimal closure of the NRA, in order to sustain and build on the gains of reconstruction. The specific objectives, deriving from the major objective are as follows:

i. Evaluate the physical and financial performance of NRA
ii. Assess socio-economic impacts of the reconstruction activities
iii. Estimate the contribution of reconstruction activities to GDP
iv. Record the lessons learned that will help government better address post-disaster recovery and reconstruction in the future
v. Suggest options for optimum closure of NRA to sustain and build on the gains of reconstruction

## 1.5 Scope and Coverage of the Study

i. Evaluation of the total reconstruction efforts against the estimated damages and stated goals of the NRA.
   - Summarize official mandates provided to NRA
   - Summarize the official reports of NRA on task completions
   - Summarize budgetary sources (annual or others)
   - Survey and summarize existing evaluations
ii. Documentation of the recovery process
   - Evaluate early coordination efforts between different agencies
   - Evaluate transitional arrangements before reconstruction (sector-wise)
   - Evaluate access of victims to finance during the recovery phase
iii. Evaluation of the socio-economic impact of reconstruction on aspects of poverty alleviation, household indebtedness, school attendance, procurement of health services, enterprises formation, and employment creation.
   - Impact of reconstruction on schooling and health service provision
   - Impact of reconstruction on future disaster preparedness (both at household and community levels)
   - Impact of reconstruction on household indebtedness
   - Impact of disaster and recovery on household violence
   - Impact of disaster and reconstruction on migration
   - Impact of reconstruction on skill development, enterprise formation, and employment
iv. Evaluation of the impact of reconstruction activities on different sectors of the economy (these sectors are determined according to the classification developed by the Central Bureau of Statistics (CBS), i.e., those related to the agriculture, industry, service sectors).
   - Relationship between reconstruction and agriculture sector activities (how it evolved in the last four years)
   - Relationship between reconstruction and industrial sector activities
   - Relationship between reconstruction and service sector activities
v. Quantification of the impact of reconstruction activities on the aggregate GDP growth including identification of the channels through which the growth happened.
   - Impact of reconstruction on GVA
   - Impact of reconstruction on GFCF

- Housing reconstruction
- Heritage and schools/health posts/ office buildings reconstruction
- Impact of reconstruction on employment and compensation of employees
- Impact of reconstruction on household consumption and government
- Impact of reconstruction on household income (disposable income) through current transfers

vi. Provide suggestions regarding the optimal path for the closure of the NRA as its legal life draws to an end.

- Assess reconstruction output and outcome from the sustainability viewpoint
- Optimum closure of NRA for wider replication of NRA learnings
- Sustain and build on the gains of reconstruction

## 1.6 Limitations of the Study

The study primarily focuses on the socio-economic impact of reconstruction in Nepal. It does not explicitly evaluate the ecosystem of the reconstruction as defined by the legal, policy, institutional environment. However, while evaluating what NRA achieved and what it could not, we also look at the legal, financial, and HR mandates provided by legal and policy documents.

While it might take a decade to witness substantial impact from the reconstruction of different physical structures and investment in human resources and livelihood promotion, this study assesses the initial socio-economic impacts of reconstruction. We need to wait for a few years to see the full impact of reconstruction.

The study was conducted during the period of the COVID-19 pandemic. It was extremely time-consuming and it was difficult to meet the respondents of household surveys. The study utilized existing NRA field staff to conduct the field surveys, following required orientation and guidance. This was an additional task for which the field staff had to manage their time. The completion of the survey took two additional months beyond the intended deadline.

# CHAPTER 2

# SUMMARY OF EXISTING EVALUATIONS

Immediately after the outbreak of the Earthquake, the Government of Nepal (GoN) conducted a PDNA under the leadership of the NPC with the support of bilateral and multilateral DPs and UN agencies. This initial collaboration created a shared vision for national reconstruction and shared responsibility in financing and implementation of the reconstruction program. As such, different agencies and experts carried out monitoring and evaluation of reconstruction efforts and published a series of reports. In addition, NRA organized numerous workshops and seminars (physically or virtually), inviting internal and external experts and encouraged writers to write articles on technical and other areas of reconstruction. This section of the report draws from these sources and presents how the reconstruction process/efforts were evaluated by different institutions or individual experts during different stages of reconstruction in Nepal.

## 2.1 On Legal and Policy Aspects

NRA, for its operation, brought into effect 22 procedures addressing various critical issues, in addition to the Act and Regulation (Annex 1). Most of the policies, regulations, guidelines and working procedures are considered to have been effective, while a few were partially effective. There were some regulations and working procedures that remained at an initial stage, right up to the time of this study. In addition, some policy provisions, regulations and working procedures were found to be ineffective (TI Nepal, 2020).

TI Nepal study asserts that the following policies, guidelines and working procedures were ineffective:

i. Guidelines on consolidated procedures for concessional loans (2074) - The policy provisioned concessional loans at 3% interest rate up to NRs 25,00,000 for urban areas and NRs 15,00,000 for rural areas but a large majority of earthquake affected households could not benefit from this policy. Subsequently, a new loan policy was issued in 2076 B.S. with a provision of concessional loan up to NRs 300,000, but this also proved to be ineffective.
ii. Procedure for relocation & resettlement of beneficiaries from risky areas (2073) – This policy was not effective because people disliked relocation, due to their social and livelihood attachments to their original place.
iii. Guidelines for timber production and supply to earthquake affected households 2072 – Its implementation did not benefit the earthquake- affected households during the reconstruction phase.
iv. Reconstruction Fund - As per the Article 15 (1) of the Act on Reconstruction of Earthquake Affected Structures, the “Reconstruction Fund” was provisioned as a basket to contain the reconstruction budget. However, the policy was not translated into action.

As per the NRA Act, NRA has the authority to hire staff on contract, if and when the GoN could not deploy the necessary staff as per the positions created. Further, it can hire experts on contract when needed (Article 14 of the Act). The HR authority of NRA provided by the Act was complicated by the NRA regulations by requiring the representation from the Office of the Prime Minister and the Ministry of General Affairs in the Recruitment Committee (NRA Regulations, 8 (2).

With regards to legal mandate, article 31 of the Act gives NRA the mandate to formulate and implement necessary guidelines and Standard Operating Procedures (SOPs) in conformity with the NRA Act and Rules. Similarly, the cabinet can approve rules and regulations related to the NRA. Based on these mandates, NRA formulated Guidelines and SOPs.

The financial mandate of the NRA is weak, as the Authority has no flexible funds to hire with NRA to hire required staff and incentivize the deputed staff. Although there is a provision for Reconstruction Fund in Article 15 of the NRA Act, it remained defunct, as the government did not bring this provision into operation.

The standard procedure for land acquisition for reconstruction gives NRA the right to acquires even private land on compensation and landowners have to cooperate in this matter. If the landowner refuses to take the compensation amount fixed by the compensation committee for whatever reason for more than 6 months, the owner will not be paid anything.

## 2.2 On Grants and Supports

In line with the formal reconstruction Program and post-earthquake financing provisions, the government offered financial assistance of NPR 300,000 (Approximately, USD 2,600) to earthquake-affected households whose houses were completely damaged and NPR 100,000 for retrofitting. Furthermore, the cabinet announced an additional NPR 50,000 for vulnerable groups and for homeowners within heritage areas to incorporate cultural features in their newly-built houses. The government promised subsidized reconstruction loans of up to NPR 2.5 million and NPR 1.5 million, at 2 percent interest rate, to earthquake-affected families, both within and outside the Kathmandu Valley respectively. This loan has to be repaid in three to five years. It also provisioned NPR 300,000 interest-free loans through group collateral to members of micro-finance institutions. When the subsidized loans phased out in August 2018, the government issued another concessional loan of up to NPR 300,000. Government provided a 5 percent interest subsidy for this loan.[2.]

However, most of the people did not benefit substantially from this provision, mainly due to lack of information about it and complicated loan procedures. This was despite the attempts of the NRA and the banks to make loans accessible to everyone through awareness programs about concessional loan provisions. Banks were also reluctant to promote subsidized loans, due to the experiences of Nepal's 1988 earthquake. During that time the government had also offered subsidized loans to earthquake-affected families to support reconstruction. Nepal Bank Limited, Rastriya Banijya Bank Limited, and the Agricultural Development Bank Limited were the authorized institutions to disburse the loans. But, as stated by the branch manager, most of the loan beneficiaries never paid back the loans, and the government had to convert these to grants, which represented a loss for these government banks (Suji et al., 2020). Easy access to finance accelerated the pace of reconstruction for wealthy and well-connected families, while the difficulties that poorer and more isolated families faced in securing loans slowed reconstruction for them (Suji et al., 2020)

### *Housing Grants*

Policy documents reveal that the Government finally provided NPR 300,000 housing grants in three tranches, through banks, to earthquake-affected families to reconstruct damaged houses; and NPR 100,000 for the retrofitting of partially - damaged houses. The cost of construction of a 450 sq ft core house built to seismic resilient standards was estimated at NPR 405,000 and the cost of retrofitting was estimated at 30 percent of the cost of a core house i.e., NPR 121500 (NPC, 2015b)). The grant was the same for all damaged households, irrespective of the accessibility, distance from the market, and resultant input prices. The NRA has also made efforts to address policy gaps and the diversity of housing reconstruction needs beyond new housing construction. The reconstruction grant was distributed in three tranches: the first tranche after the agreement; the second after the beneficiaries complete the building up to the damp-proof course (DPC) level, and the last tranche after completion of the construction. The third tranche is paid upon completion of roof-band level construction and inspection and certification of compliance to the reconstruction guidelines by the NRA's field engineers.

Further, vulnerable communities receiving the housing grant were eligible to receive an additional NPR 50,000 grant on top of the NPR 300,000 housing grant.

### *Grants for purchasing lands*

In April 2017, the NRA approved new procedures that provided NPR 200,000 to purchase land for every household living in earthquake-affected districts that was identified as living in settlements at risk of another disaster (TAF, 2017). The policy for land assistance has benefited 11,551 landless owners so far (Rawal, Bothara & Pradhan et.al., 2021). In fact, land grant was provided to landless as well as to those beneficiaries whose land were located at unsafe areas and who did not have any other land to relocate. As of July 15, 2021, a total of 12,788 households have received land and have been able to reconstruct their houses (NRA, 2021). Specific provisions for financial assistance to the vulnerable, and securing land ownership for the landless, along with the use of instruments vested with municipal governments, strengthened the 'owner-driven reconstruction

2 *For this loan, Government provided 5 percent interest subsidy to the banks, and the beneficiary would have to pay rest of the interest amount. In case of this loan with the banks were allowed to add only 2 percent on their base rate. Generally, beneficiaries had to pay equal to or less than 5 percent interest rate for this loan.*

framework' (Rawal et. al., 2021). The main changes made by the NRA included putting in place grants for the purchase of land for the resettlement of earthquake victims living in geologically unsafe areas and grants for landless earthquake victims (IIRM Phase 4, 2017).

### *Subsidized loans*

Recognizing the need for loans to complete the reconstruction of houses, the Government by policy provisioned subsidized loans with a 2 percent interest rate, available for up to NPR 1,500,000 outside the Kathmandu Valley and up to NPR 2,500,000 inside the Valley with collateral. The households opting for this facility were to meet the requirements of banks in order to access these loans[3].

There was an additional provision NPR 300,000 at 2 percent interest rate as top-up support for the most vulnerable households[4]. In order to be eligible, households must be recommended by the District Disaster Relief Committee (DDRC). The community acts as a guarantor for this loan.[5]

Despite the policies, most of the targeted households could not access the loans. By July 2017, only 382 earthquake victims had received these special loans from banks and financial institutions. (TAF, 2017). The same situation was reported by affected people during focus discussions conducted in the course of this study. IRM research has indicated that banks are reluctant to provide soft loans without assurances from the government. Many earthquake victims lacked knowledge about how to access soft loans from formal institutions, creating debt traps as they borrowed from informal sources at high interest rates. Policy provisions for additional financial assistance to the vulnerable through top-up grants by the Government or subsidized loans through the banks were not effective at all and failed to reach the needy. As a result, a very large number of vulnerable families face the risk of falling into the debt trap (Rawal et.al., 2021).

## 2.3 On Rescue, Relief and Recovery Process

Security personnel, namely the Nepal Police and Nepal Army, did a commendable job in the rescue operations, despite lacking necessary equipment and technology. Had they been equipped with such equipment, the number of casualties would have been less (Adhikari, 2015). The entire 67,000-strong police force had only half a dozen drilling machines and a few dozen sniffer dogs. The police borrowed – at times forcibly – excavators and bulldozers from private operators (Adhikari, 2015). Nepal did not have equipment and technology to safely demolish the damaged buildings.

Although there was a large number of international SAR teams, they could not contribute to the extent anticipated. There were 4,521 team members from 34 countries, but they were able to save only 16 lives with the help of Nepalese security personnel. The cost incurred for the foreign team was considerable. So, it can be assessed that the return was quite low in comparison to the level investment in the foreign teams (Chhetri, 2018). Lack of timely, proper communication about the situation to the SAR teams and on the types of skill, equipment, and logistics required also reduced the effectiveness of the SAR Teams.

Lack of proper management of relief goods, poor distribution mechanisms, alleged corruption in the procurement of tarpaulin sheets, tents for shelter and food, etc. added to the chaos in relief work. Even in the capital city, where all relief supplies landed at the national airport and where the Command-and-Control Centre was functioning, people suffered due to inadequate management of relief work. The performance outside the capital was even poorer (Subedi & Paudyal, 2019).

Illness and extreme physical discomfort were common hardships endured by those who were unable to make temporary shelters ready for the monsoon and winter. Children, the elderly, and pregnant women, in particular, were vulnerable to sickness in temporary shelters. To avoid hardships, some individuals moved back into their damaged homes. On the other hand, construction workers and unskilled laborer found income opportunities as the need for labor for reconstruction and repairs increased. In some areas, daily wages have risen two-fold (TAF, 2016a).

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3 *Refinancing Procedures for the Reconstruction of Private Houses destroyed by the earthquakes, 2072. Unofficial English translation: http://www.hrrpnepal.org/upload/ resources/BUE1MyWI7PXKwrJbf53 H_2017_02_22.pdf.*

4 *While the loans were previously announced, the NRA has re-emphasized them and defined vulnerable groups as women-headed households, landless, low-income farmers, laborers, households with disabled family members, child-headed households, and other poor groups.*

5 *Procedures for providing interest-free loans in collective collateral for the construction of houses of the earthquake victims, 2074 (2017). Unofficial English translation: https://drive.google.com/file/d/ 0BzAjdJstFmOdczhISXBndTAyS2c/view.*

Recovery and reconstruction have been slow due to delays from the government in establishing the National Reconstruction Authority (NRA) to oversee recovery efforts. Delays were exacerbated by violent protests and blockades along the Nepal-India border arising out of dissatisfaction with the promulgation of a new constitution in September 2015. The blockade, which ended in February 2016, resulted in a severe shortage and price hike of fuels and other goods all over Nepal, hampering recovery and impacting aid (TAF, 2016a).

## 2.4 On the Pace of Housing Reconstruction

Reconstruction activities did not continue at the same pace- everywhere or year by year. There was an initial delay in paying reconstruction grants to beneficiary households. This was due to several reasons, including: lack of a clear policy of the government on amount and disbursement of grants; inability of technicians to recommend payment of instalments on time as per the progress of construction; delay on the part of the beneficiary households to find suitable plots on which to reconstruct their houses; problem of land ownership /discrepancies in names on land ownership certificates and others (TI Nepal, 2020). TAF (2017) maintains that the reconstruction activities accelerated after the 2016 monsoon, with the widespread distribution of the first tranche of the housing grant, suitable weather, and better road access during the dry winter season. However, it slowed down again in early 2017, as most of the people found it difficult to manage resources to continue the construction. Further, the report underlines that the price hike of construction materials, water shortages, high transportation costs, labor scarcity, and resultant increase in wages were all major factors that negatively impacted the pace of reconstruction. It was observed that people in wards with higher levels of external assistance, internal community support systems, and good road access were more likely to have started rebuilding. Poor and marginalized groups were less likely to have rebuilt their houses. Dalits in particular continued to be the slowest group to recover.

## 2.5 On Heritage Reconstruction

Reconstruction of heritage sites and monuments has come up with a series of issues and challenges. As per Nepal's Ancient Monument Preservation Act 1956 & The Nara Document on Authenticity and many other international charters, heritage reconstruction demands use of traditional materials. However, a shortage of supplies of good quality traditional construction materials, like seasoned timber from Sal wood, traditional bricks whose dimensions are as they were in the mid-sixteenth century and stones, is a major issue (Dawadi, 2018). Further, heritage-related policies need to be amended. The capacity of the Department of Archaeology also needs to be enhanced to enable it to become instrumental in resolving complex reconstruction issues (Shrestha & Banskota).

Apil, Sharma & Pokharel (2019) explain the reasons behind the slow restoration process. They maintain that the delay in heritage reconstruction was primarily due to the lack of a clear and well-supported policy for heritage reconstruction; conflicts concerning construction materials to be used for reconstruction; modes of contract for reconstruction; limited governance capacity; lack of manpower for traditional artwork; and the lack of a framework to support local community-driven rebuilding initiatives. Heritage reconstruction is challenging because of its character, which involves rigorous effort, considerable time and cross-validation of authenticity. It is also important that these structures have economic value in terms of tourism, but also reflect the historical and cultural essence of the particular community and whole nation. It is of utmost importance that the reconstruction of such heritage structures is carried out with respect and integrity and as per the international charter associated with such subjects.

Shrestha (2019) outlines lengthy conceptual discussions, conflicting roles and competition among the local and international stakeholders, the lack of a proper inventory of previous historical records, data, images and architectural drawings, shortage of skilled artisans, craftsman & laborers, as contributory factors that delayed heritage reconstruction. Particularly problematic is the mandatory requirement to offer government contracts, including the restoration of ancient temples and buildings, to the lowest bidder, when appropriate contractor knowledge and skills for heritage reconstruction should be prime considerations in the award of contracts, not price alone.

## 2.6 On Coordination and Communication

The Asia Foundation (TAF 2016) highlights that coordination was found generally weak at the local level within different government offices and between government and non-governmental organizations. Because of this, both local officials and earthquake-affected people could not receive information on time or be adequately included in development of recovery strategies. The degree of coordination between the I/NGOs, foreign agencies, and UN agencies with local governments was found weak, once the emergency relief distribution

phase was over. Delays in the provision of cash grants and addressing grievances, unclear policies and communication and fairness in the distribution of aid by municipalities were concerns of the people (TAF, 2016b). A study entitled " Assessment of Housing Financing Market (2021) revealed that the NRA beneficiaries had no detailed information of the GoN financing packages e.g., grant package (0.3 million) and subsidized loan package (0.3 million concessional loans) for the reconstruction of houses. About 86.6% of the surveyed beneficiaries were not properly communicated on time.

Community engagement in the reconstruction process and research has been limited and community voices are underrepresented; so are those of other local actors, such as local governments, community organizations, masons, engineers, laborers and technical officers (IMC World, 2018).

## 2.7 On Borrowing and Debt

Households needed loans for managing livelihoods, obtaining or growing food and rebuilding houses. Higher rates of borrowing were reported in the case of vulnerable groups, including people in remote areas, low caste individuals, and people living in temporary shelters. They borrowed from informal sources and paid higher interest rates (TAF, 2016b).

A TAF (2019) report says that most earthquake-affected households covered rebuilding costs by obtaining loans. As reconstruction costs exceeded the housing grant amounts and the access to government-subsidized "soft loans" was extremely limited, borrowing at high interest rates from local cooperatives, moneylenders, and microfinance institutions was common. This caused an increase in borrowing and debts accumulated over time. The report found that the limited access to loans and the fact that reconstruction costs far surpass the housing grant, left those without access to additional resources struggling to pay for their new houses (The Asia Foundation, 2015-2017).

Households in inaccessible settlements mostly took loans from family and friends for reconstruction; households in accessible settlements primarily took bank and microcredit loans and struggled more to pay back debts. Some felt that these loans should be forgiven by the government, as households had to take on multiple loans, paying interest to one microfinance group with a loan issued from another. Many earthquake-affected households were stuck in cycles of debt and borrowing, especially those from poor and marginalized Dalit and indigenous communities. Most of the households remain unsure how to repay loans. The sale of land as a coping strategy became increasingly common, especially in urban areas and bazaar towns.

The average amount borrowed has tripled since June 2015, to NPR 391,864 in 2019 based on the report of The Asia Foundation. Monthly interest rates range between 1.2 and 3.8 percent. People borrow mostly from cooperatives (25%), savings groups (19%), and relatives and neighbors (18% each). Fewer borrow from banks, money lenders or other sources.

## 2.8 On Urban Reconstruction

Urban reconstruction lagged behind reconstruction in rural areas. Although urban land plots are smaller, people tend to build bigger houses and construction is more expensive in urban areas (TAF, 2019). Demolishing and rebuilding is more difficult due to adjoining buildings and narrow alleyways. Alternative housing options, such as renting or second houses, were more available for people in urban areas. Further, land ownership patterns, land disputes, and specific rules leading to higher costs for rebuilding in heritage areas, also prevented many in urban areas from successful rebuilding. Until late 2019, such issues were not addressed by NRA. Furthermore, reconstruction costs are higher in urban areas than in rural areas. Daly et al (2017) conducted ethnographic fieldwork in five urban settlements in Kathmandu valley for 18 months found that the delay in urban reconstruction was a function of the lack of a clear and well-supported policy for urban reconstruction; limited governance capacity and neglect of municipal- and ward-level officials; financial restrictions caused by the funding cap per family to rebuild their homes; and the lack of a framework to support local community-driven rebuilding initiatives.

## 2.9 On Total Reconstruction Efforts

In the initial years of reconstruction, the pace was slow, when compared to needs and expectations of affected people. Frequent turnover of NRA CEO's, inadequate human resources - both administrative and technical, at the center and field levels, and lack of policies and guidelines to address different issues, were the main factors

that constrained the pace of reconstruction. In addition to this, there are several factors responsible for the slow recovery, such as weak governance, lengthy bureaucratic processes, lack of long-term commitment of NGOs and wait-and-see attitudes of the affected people. All these considerations weakened the community's capacity and ability to rebound. Poor coordination among major reconstruction actors also affected the pace of recovery work (Subedi & Paudyal, 2019).

Malla, & KC in their article "Effectiveness of a holistic socio-technical and financial support to enable socio-economic vulnerable households to build earthquake resistant houses" found that socio-technical and financial support has enabled rural households, including vulnerable households, to construct houses in an owner-driven manner. Nonetheless, the financial support provided was not sufficient and local households and community institutions helped each other by labor-sharing and accessing loans and other resources in a coordinated manner.

The Asia Foundation has published "Independent Impacts and Recovery Monitoring (IRM) Project Nepal Early Findings from Round 5 Briefing Note February 2020"[6]. According to this Note, in June 2015, 45 percent of households with housing damages were staying in a temporary shelter. By October 2019, only 4 percent live in a temporary shelter and 92 percent lived in their own house. More than half of those living in rebuilt houses, lived in houses with one or two rooms. The people who were not interested in retrofitting, mostly opined that their house was too badly damaged to be retrofitted (61%) or they preferred living in a new house (24%). Albeit late, the NRA provided the options to the beneficiaries to convert from retrofitting category to reconstruction and vice versa.

## 2.10 On Livelihoods

Spoon, J., Gerkey, D., Chhetri, R. B., Rai, A., Basnet, U., & Hunter, C. E. (2020) in their article "Understanding Household Recoveries from the 2015 Nepal Earthquakes" maintain that households whose livelihoods focus on livestock (bovines, sheep/goats/pigs, and chickens) and Bari agriculture were struggling the most. Households with 'khet' agriculture and those that did not practice agropastoralism and participated instead in various businesses and tourism ventures had better recovery outcomes. Accessible households had less displacement and had an easier time adapting and restarting their agropastoral practice. Households headed by males were less displaced; households headed by females were more displaced; household heads with an education level of between class 5 and 10 had better recovery outcomes. These correlations were less strong than other demographics. Households with higher literacy rates had better recovery outcomes, but this characteristic was a less influential factor than other demographics. Joint families, single families, and age of household head did not correlate with recovery outcomes.

## 2.11 On Reconstruction and Other Social Indicators

In their article "Inclusion of the Poor and Vulnerable: Learning from Post Earthquake Housing Reconstruction in Nepal", Rawal, V., Bothara, J., Pradhan, P., Narasimhan, R., & Singh, V. (2021) highlight that the identification of vulnerable families, disbursement of top-up grant assistance and subsidized loans were not effective and that the achievement of intended results of the policy remained rather limited. Furthermore, provisions were made for the regularization of existing land tenure, or provision of alternative land or additional grants for the purchase of land by landless families. But collecting all the documents at each step of verification, approval, land measurement, and registration[7] was a long and complex process, making it extremely difficult for vulnerable households. Despite such difficulties, more than 10,000 landless households were able to receive land ownership.

## 2.12 On Household Level Construction Cost in Rural Areas

Khanal, Subedi, Panthic & Bajracharya (2021) in their article "Household Level Construction Cost and its Management in Rural Housing Reconstruction in Nepal" have presented interesting findings on the costs of different types of housing and on the experience of different social segments, by documenting housing reconstruction costs in Gorkha and Sindhupalchowk.

6 *The independent Impacts and Recovery Monitoring Project (IRM) was implemented almost immediately after two devastating earthquakes hit Nepal on 25 April 2015 and 12 May 2015. IRM is a longitudinal mixed-methods study developed to systematically monitor social impacts of the disaster and the response over the longer-term, collecting evidence that goes beyond one-off damage and needs assessments.*

7 *Multiple steps through which landless had to navigate for this entitlement involved initial application along with citizenship documents and proofs of residence, affidavits by the neighbors (muchulka), verification of landlessness and recommendation by the ward committee, further verification by Grant Management and Local Infrastructure (GMALI), recommendation by Central Level Project Implementation Unit (CLPIU) at NRA and finally, decision by the NRA Executive Committee. To ensure that the grant assistance for land was not used for any other purpose, this amount was released directly to the seller by GMALI based on the agreement between the landless houseowner and the seller. Land registration fees were also waived on the recommendation of GMALI.*

The average construction cost was found to be NRs. 681,000, which is more than double the government's housing grant. The average loan amount was about NRs. 288,000 and the average interest on the loan was 21.85 per cent, which was higher than the loans through the formal sector.

In terms of caste/ethnicity, Brahmin-Chhetri and Newar-Thakali households had invested more than the Dalits and Janajati households. The financial capacity of different caste/ethnic groups was therefore also reflected in the investment for housing reconstruction. The average loan taken by Newar-Thakali households to build houses was highest while it was lowest for Dalits. Informal sources were major lenders and also charged the highest interest rates. The lowest average interest rate was charged by banks, followed by cooperatives.
The average construction cost of the houses of male-headed households was somewhat higher (NPR 687,918) than that of female-headed households (NPR 654,519). This result showed gender was associated with the investment capacity of the households.

## 2.13 On Impact of Reconstruction Expenditure on GVA

Khalid Nawaz (2020) in his report "A Stimulus for Nepal's Economy" presents the contribution made by investment in housing reconstruction to the national GDP of Nepal. In order to assess the economic activity generated because of reconstruction in Nepal, Earthquake Housing and Reconstruction Project (EHRP) conducted a survey, the objective of which was "to assess and measure the extent of economic activities generated as a result of the EHRP in 11 of the most affected districts". Using the complete unit cost as a basis for calculation, an estimate was made of economic activities generated during 2018-20 through 422,299 complete houses and 198,700 incomplete houses in 11 most affected districts.

The estimations based on the above method show that 68% completed houses and 32% incomplete houses (assumed at 75% of completion) generated net total economic value equivalent to NPR 497 billion (US $ 4.216 billion) during the period 2018-20. The study revealed that the reconstruction of houses also resulted in employment generation for both skilled and unskilled labor of some 160 to 176 million-person days in the housing re-construction sector. If the cost of construction from 2018-20 remains constant, it concluded that reconstruction could yield an estimated turnover of NPR 185 billion during 2020-23, through reconstruction of 187,167 housing units.

## 2.14 On Weaknesses in Reconstruction

The process of reconstruction started about a year after the earthquake. The following are the major weaknesses, as pointed out to the impact study team by ordinary Nepalis, officials from foreign embassies or international organizations, and bankers who attended meetings organized by the team:

(i) The NRA fund could not be established as originally envisioned.
(ii) Large scale resettlement could not be done properly. This had mainly to do with the changes of CEO and changing priorities of the incumbents of this position.
(iii) The power of CEO was greatly diminished, compared to the authorities originally envisioned. In the current model, the secretary of NRA has powers and authorities normally associated with a CEO. If a CEO stood out, it was particularly due to his personal connection and doggedness.
(iv) Budgets were not allocated on time. There was no fast-tracked procedure for budget reallocation for reconstruction- every such request, despite the urgency, took regular government process- that significantly delayed the major procurement, release of grant and implementation.
(v) Staffs were frequently changed not only at the top levels but at the lower levels as well. Not having secretaries living in the villages also hurt the progress of NRA. In many places, the engineers deputed to the villages did the work originally expected to be done by the village secretaries. When these engineers were sick or injured, the NRA did not have funds to hire a helicopter and organize a quick medical evacuation.
(vi) It was widely believed that NRA underemphasized retrofitting of slightly damaged households. Its owner-driven approach was designed in such a way that it incentivized house reconstruction, rather than retrofitting. Some exceptions regarding retrofitting exist. For example, UNOPS, with the funding of DFID, has been working in training engineers and masons to retrofit over one thousand houses.
(vii) NRA operated largely on a top-down approach. The only mechanism for NRA to get feedback from the villages was through a UNDP-assisted helpline, but that too was rarely used.

(viii) NRA under-employed insurance. The government could have given NPR 2,90,000 in housing grants and NPR 10,000 in insurance grants. Without insurance, if these houses fall into disrepair soon, the owners would be solely responsible for rebuilding, at heavy personal cost.

(ix) The livelihood program was used sub - optimally. For sociologists, houses are not merely houses. They should be linked to livelihoods and economic activities for individuals. This non-engineering approach to the consideration of the role of housing was lacking in many places.

(x) NRA could not enforce the government regulation requiring financial institutions to create cheap formal channels for lending money to needy people. As a result, many poor households ended up borrowing from the most expensive sources of lending (either local cooperatives or moneylenders). This had implications for poverty and debt traps. Unpredictability of government actions may have also contributed to this. For the first time, they built houses on their own. Later when they hear about NRA standard for housing, they rebuilt a house to qualify for NRA grant. However, when NRA engineers found out these houses did not meet NRA standards, they built again. These cases were not numerous, but they did exist.

## 2.15 On Transparency and Accountability

People felt that transparency and accountability was generally well-maintained with regard to reconstruction-related matters at various levels i.e., local/ward levels, municipal levels, and district levels. Major ways cited for maintaining transparency and social accountability included the conduct of public hearing meetings, installation of complaint boxes, sharing information on notice boards, and displaying citizen's charters (TI Nepal, 2020). For housing grant, a robust internal control system and direct transfer of grants to beneficiary's bank account were instrumental in maintaining transparency and accountability.

## 2.16 On Optimal Closure of NRA

A number of activities implemented under World Bank supported EHRP projects including the World Bank administer Multi-donor Trust Fund contributed towards NRA's exit strategy:

- training of more than 1,800 elected representatives and officials of 282 local levels from 32 earthquake affected districts on "Resilient Reconstruction and Resilient Development"
- Training of more than 500 engineers on slope stabilization
- Training of more hand 1,100 assistant sub engineers in resilient infrastructure
- transfer of physical records of reconstruction to local governments/DCCs
- transfer of digital records of reconstruction through consolidated reconstruction portal that will be handed over to the NDRRMA, relevant government ministries departments, provincial as well as local governments.

NRA conducted a study "Disengagement Plan of Nepal Reconstruction Authority (NRA) 2021" which has provided the road map for NRA disengagement. The main purpose of the report was to support NRA and the NDRRMA to prepare jointly the disengagement plan of NRA and the engagement plan of NDRRMA, consisting of a roadmap, policy, processes, timeline, and milestones. The plan should specify in detail transition activities, indicating agencies retaining or assuming responsibilities, together with a description of their respective roles and responsibilities.

Bhandari and Hodder (2019) authored a report entitled "Learning from NRA to inform the NDRRMA" for Oxford Policy Management. When this report was prepared, the NDRRMA was yet to be set up by Government. In the report, they have proposed a set of recommendations, broadly based on the experience of NRA, to make the NDRRMA efficient and effective in its roles. These are still valid and the government may take them as inputs for further legal and policy reform. The following are key points of their proposal:

- A majority of stakeholders interviewed argued for an independent and well-resourced authority.
- NDRRMA to have an adequate level of authority and a clearly defined mandate. The authority must work with the federal, provincial and local governments, the private sector, civil society and international agencies.
- It is critical that relevant government ministries and disaster management committees at provincial, district and local levels have clear mandates to support the NDRRMA, with clearly-defined coordination relationships and engagement principles.

- The NDRRMA should have the authority to manage funds, complemented by a strong public financial management system, to operationalize activities and to hold authorities in respective government entities responsible and accountable.
- There should be strong mechanisms in place to ensure the timely transfer of funds from the Ministry of Finance to the NDRRMA, to avoid delays in the reconstruction process, in case of a major disaster.
- The NDRRMA should have a permanent core structure that comprises risk reduction, preparedness, response, and reconstruction with necessary units for planning, monitoring, procurement, and research and development.
- One of the prerequisites for an effective NDRRMA is to have a strong Human Resource (HR) strategy and plan in place with provision for career progression and promotion.
- The NDRRMA should create and maintain a roster of trained staff and experts from related government ministries and non-government agencies (with adequate technical and managerial capacity) ready to be deployed or seconded in case of a major disaster or emergency.
- Given the NRA's experience, there needs to be a robust mechanism in the NDRRMA for regular and systematic coordination and collaboration with development partners and other stakeholders.
- The NDRRMA could utilize existing structures for coordination such as the National Platform for Disaster Risk Reduction (NPDRR) and learnings from the interface of the Housing Recovery and Reconstruction Platform (HRRP) with the NRA and other development partners on post-earthquake reconstruction.

# CHAPTER 3
# APPROACH AND METHODOLOGY

## 3.1 General Methodology

The GoN conceived and developed a reconstruction plan in the aftermath of the earthquake of 2015. During this process, firstly, the PDNA was conducted and secondly the post disaster recovery framework (PDRF) was developed. PDRF is a 5 - year operational document containing annual financial inputs and anticipated program outputs. The PDRF charted out the vision and strategic objectives of the reconstruction program. But it has not developed a Theory of Change (TOC)[8] in terms of logical frameworks or result chains. It did not provide a monitoring and evaluation framework based on which we could proceed with impact evaluation. Therefore, we have designed the impact study, first, based primarily on available baseline data and information, and second, on pertinent information collected through field survey.

For the evaluation of the impact of the reconstruction effort, we have summarized the scope of works into six key tasks (already given above) which are more or less consistent with the five strategic objectives of reconstruction outlined by the PDRF. Further, these six tasks also reflect the basic elements of the results chain. Task 1 and 2 are related to the inputs and process, task 3 is related to activity and output. Similarly, Tasks 4 and 5 demonstrate outcome and impacts and task 6 discusses sustainability.

The study employs both qualitative and quantitative methods. It follows a more analytical, rather than descriptive, approach. The study utilizes available official statistics and fills data gaps following a standard sampling technique, robust survey procedure, and well-designed survey instruments. The processing of information to generate evidence/facts will be carried out using the methods that are utilized in international practice.

Unstructured in-depth interviews were conducted with key leadership figures, to gather facts and information about the measures adopted and the challenges faced, with special reference to coordination and conduct of rescue and relief operations. The research team used Focus Group Discussions (FGD) and Key Informant Interview (KII) techniques for gathering information. FGDs were conducted by researchers in four districts - Nuwakot, Kavrepalanchok, Sindhupalchok and Gorkha with different stakeholders, including different individuals and representatives of institutions who were involved in rescue and relief operations and also the victims/beneficiaries of the 2015 earthquake. The interviews were based on open-ended questions to enhance the opportunity to capture detailed descriptive data about perceptions and opinions. Similarly, a comprehensive KII was conducted with key informants representing different institutions in the donor community, policy makers, NRA executive members, the I/NGO sector, MoHA, the security sector and former CEOs of NRA. Content analysis was used to analyze the data gathered from personal interviews, to ensure that the data collected are reduced and simplified, while at the same time, produce results that can be analyzed using both quantitative and qualitative techniques.

## 3.2 Sampling Strategy

### 3.2.1 Sampling Technique

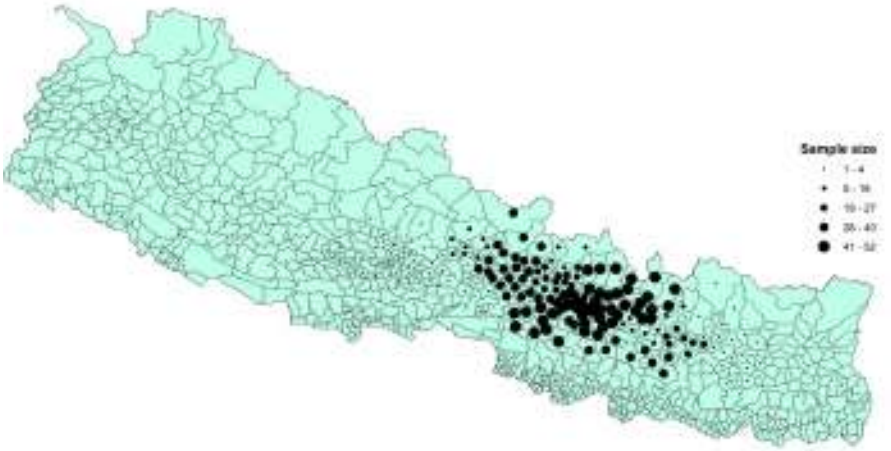
At first, the total sample size was calculated using the formula proposed by Cochran (1997). The alpha level taken was 0.95 and the margin of error was 3% as suggested by Cochran (1997). From the calculation, we get the sample size of 7265 households. The sample size was divided into beneficiaries and non-beneficiaries using their respective population. Weights for each municipality were assigned proportionately to their population size. Districts with a negligible number of beneficiaries were dropped because of resource and time constraints. Households with no information in municipality and ward data bases were also removed

Next, a unique random number was assigned to each household and the population households were sorted as per the value of the random number. While segregating the sample for municipalities, those whose weighted average sample size was below 1 were also dropped, therefore concluding with 6694 targeted samples.

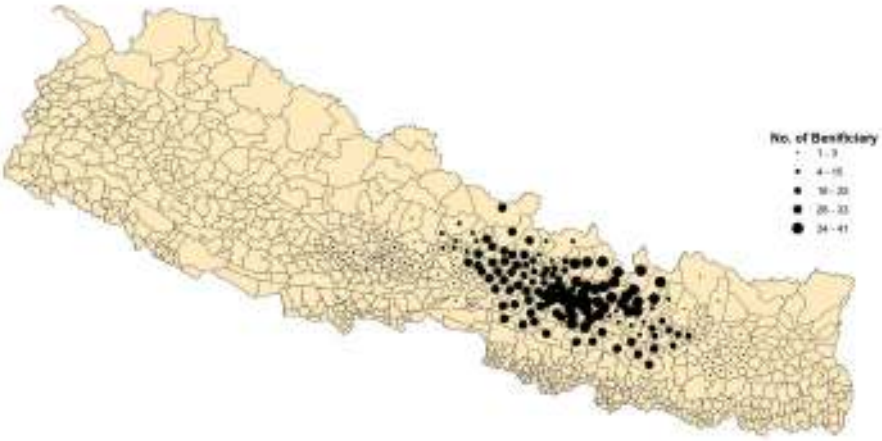
8 *An individual attempt was made by Rabindra Kumar Suwal to develop TOC based on the PDRF report in his article "A Study of Post Disaster Reconstruction Recovery Framework (PDRF) From the Perspective of Theory of Change Thinking".*

Samples were drawn randomly using the random numbers assigned. The study could collect responses from only 4,824 households, due to mobility restrictions imposed by COVID-19. Among the 4,824 Households, 4,042 were beneficiaries and 782 were non-beneficiaries. The survey was conducted in 24 districts, 163 municipalities and 1,051 wards, out of a total of 32 earthquake affected districts.

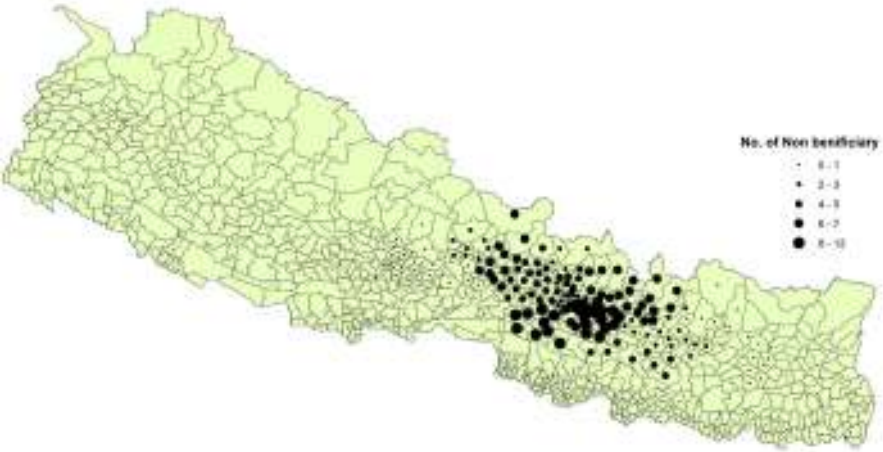
**Total Sample Households**




**Beneficiary sample households**




**Non beneficiary sample households**



### 3.2.2 Data Outlier Issues

Average was calculated excluding 5% extreme values; the outliers and extreme values were replaced with average values. Values above 5 times of average value and below the average value were considered as outliers. However, for some of the variables like farm area, income, expenditure, debt, rent, land cost and saving, the multiplier and divisor is 50.

## 3.3 Task Specific Methodology

Task 1 above carefully documents the initial recovery response to the earthquake and places the activities of the NRA in a proper organizational and chronological context. This part is important because it took a while for the NRA to start its activities, and early leadership in several reconstruction activities was at least partly assumed by other government agencies. This task investigates the effect of such a diffused approach on early recovery and how the performance of a dedicated agency like the NRA contrasted with the distributed performance of pre-NRA days. This task will look at the official NRA documents, as well as at the responses of earthquake victims, in a carefully - prepared survey carried out in the districts that suffered damages due to the earthquake.

While evaluating the reconstruction efforts, the following context within which NRA had to function was also be taken into account:

i. There was protracted national political transition, which caused frequent changes in NRA leadership. The NRA witnessed a change of its chief executive four times within just two years of its establishment[9].
ii. In practice, NRA enjoyed no or very little financial autonomy, irrespective of what was stipulated in the National Reconstruction Act.
iii. NRA did not enjoy full human resources autonomy as stipulated in the act.
iv. There was a divergence between the legal mandate and its actual practice. The regulations and by-laws that followed the act made the act itself more process-oriented and complicated.
v. Geographical inaccessibility also obstructed the pace of reconstruction

Task 2 is a straightforward check-list based task. It looks at the reports on accomplished activities carried out by the NRA and evaluate these tasks against the mandates provided to the organization. It also compares and contrast the extent of damages done by the earthquake and the degree of reconstruction carried out by the NRA to address those damages. The major source of information is the PDRF and progress reports of NRA. The financial data have been verified from the Red Book published by the Ministry of Finance.

Task 3 looks at the impact of reconstruction activities in different economic sectors. These sectors include the impact of reconstruction on agriculture, hotel and restaurants, construction, transportation, etc. This task uses an extensive database, available at the NRA secretariat, on baseline damages and supplement those data with the survey carried out by the researchers. This task uses associated with Task 5. While estimating the aggregate impact on GDP growth, sector-wise impacts were also be calculated.

Task 4 relies on the difference-in-differences method. Given that the earthquake- prone regions are divided into highly- affected and less- affected, variables have been divided into following way:

$$H_i = \begin{cases} 1 & \text{if household } i \text{ is from highly affected region} \\ 0 & \text{else} \end{cases}$$

The following treatment identification is used:

$$T_i^{(v)} = \begin{cases} 1 & \text{if treated with } v \\ 0 & \text{else} \end{cases}$$

Where
v

$\in \{\text{reconstruction of private house for household } i,$
$\text{construction of public health institutions, construction of}$

9 *What is interesting is that there is a change of its CEO every time on charges of failure to speed up the reconstruction work, but what has played a big role in the change is the political power. Kiran Bhattarai in https://www.spotlightnepal.com/magazines/vol11-no12-january-05-2018-poush21-2074-online-register-number-doi-584074-75/*

$$educational\ institutions, reconstruction\ of\ heritage\ building, construction\ of\ hospital,$$
$$reconstruction\ of\ other\ public\ infrastrcuture\ in\ the\ ward\ where\ household\ i\ is\ located\}$$

We assume;

$$E[Y_{it}|H_i, T^v, X_{it,}t] = \beta_0 + \beta_1 H_i + \beta_2 H_i T_i^v + \beta_3 (1 - H_i) T_i^v + \gamma X_{it} + \varphi t$$

So that running the regression

$$Y_{it} = \beta_0 + \beta_1 H_i + \beta_2 H_i T_i^v + \beta_3 (1 - H_i) T_i^v + \gamma X_{it} + \varphi t + \epsilon_{it}$$

provides us with the impact of reconstruction activities. In particular, the impact of reconstruction activity in highly- affected regions is $\beta_2$, and less- affected regions is $\beta_3$.

To see this, note that

$$E[Y_{it}|H_i = 1, T^v = 1, X_{it,}t = 1] = \beta_0 + \beta_1 + \beta_2 + \gamma X_{it} + \varphi$$

$$E[Y_{it}|H_i = 1, T^v = 0, X_{it,}t = 1] = \beta_0 + \beta_1 + \gamma X_{it} + \varphi$$

Now note that the impact of reconstruction among the treated population in highly affected areas is ;

$$E[Y_{it}|H_i = 1, T^v = 1, X_{it,}t = 1] - E[Y_{it}|H_i = 1, T^v = 0, X_{it,}t = 1] = \beta_2$$

Hence, the difference due to reconstruction among households in high impact regions in t=1 is $\beta_2$. This is the difference between households who received NRA assistance and those who did not receive NRA assistance.

This task has carefully taken a sample of households and collected necessary data from the survey conducted among those households. The sampling was preceded by Focus Group Discussion (FGD). A pilot survey of about 100 households was administered.

Task 5 has been completed employing the following methods:

### 3.3.1 Methodology of Estimation of GVA

i. The estimates of GVA and GDP are output- based.
ii. An output (value added) approach is followed for the estimation of GVA i.e., Output minus intermediate consumption equals GVA.
iii. The value of outputs of the construction sector is derived from all the costs involved in the reconstruction program.
iv. The estimates are made between the periods of 2015-16 to 2020-21on an annual basis.
v. The Supply and Use Table (SUT) 2011 (Annexes 7.3 A & 7.3 B) prepared by the Central Bureau of Statistics Nepal is used to obtain the input/output relationship and inter-industry relationship of the construction sector with other industries/ sectors of the economy.
vi. GVA and other related component variables; GFCF, GNDI and, consumption are derived from the SUT framework.
vii. Indicators and estimates are made based on the primary survey (Housing Reconstruction Assessment Survey 2021) and secondary data sources compiled from the NRA/ CLPIU database and other stakeholder agencies' reports.

### 3.3.2 Methodology of Estimation of GFCF

i. All types of construction activities carried out by NRA involving various stakeholders are covered in the estimation of GFCF.
ii. The value of reconstruction is derived from the annual actual expenditure records of NRA/ CLPIU. The details of expenditure by different projects are compiled to derive estimates at the major sector level.
iii. The value of fixed assets (GFCF) is set at the current prices of respective years. The basis of valuation is cost price i.e., actual expenditure made in that particular asset (capital).
iv. To cover all expenditures on the capital formation of different sectors, supplementary information/data are

gathered and used in the estimation of the value of assets.

v. The expenses on the owner-occupied buildings (private housing) made by households are derived from the current Socio-economic Impact Survey (SEIS) and reconstruction expenditure made by various bilateral and multilateral agencies, INGOs/ NGOs outside the NRA/ CLPIU are also covered through their annual reports and progress evaluation reports.

### 3.3.3 Methodology of Estimation of Compensation of Employees

The estimates of person days (employment) and compensation of employees are derived as follows:

i. Estimate an average number of person days for types and level of construction and estimate the weighted average of persons days engaged in per unit of housing reconstruction.
ii. Using the survey results, the estimates of compensation of employees per unit of building construction are constructed. The estimated weighted average cost is taken for total estimates using the number of completed reconstruction buildings.
iii. For the estimate of employment and CE of other types of construction other than buildings, an input-output ratio (Supply and Use Table, SUT)[10] is used for obtaining an estimate of CE to total output.

### 3.3.4 Methodology of Estimation of Disposable Income and Household Consumption

i. The consumption of the household is estimated using the Socioeconomic Impact Assessment Survey (SIAS) results based on the responses on annual consumption expenditure reported by respective households.
ii. Consumption of households is derived by classifying the consumption in the broad categories – food and non-food consumption. Under non-food consumption categories, expenditure of households is further categorized as education, health, fuel/electricity and others.
iii. Actual final consumption expenditure is estimated from the transfers (grants in cash and kind) of rescue and reconstruction related funds from the government and NPISHs to beneficiary households.
iv. The GVA generated through reconstruction work is estimated independently, based on total expenditure made in different years (2015/16-2019/20) of reconstruction.
v. Disposable income is estimated by adding reconstruction related current transfers received from the government and NPISH to earthquake-affected (beneficiary) private households.
vi. Gross value added is the value of output, less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector (SNA).

Task 6 provides suggestions for optimal closure of the NRA as its legal tenure draws to an end. It discusses pros and cons of different closure options and identifies the pitfalls associated with them. In order to prepare suggestions for optimum closure of the NRA, the following process will be completed:

i. Discussion with NRA Directors and institutional experts to understand attributes of an appropriate successor to the NRA and solicit feedback about the prospective institution.
ii. Mapping of prospective institutions and review of their legal and policy documents
Critical appraisal of the candidate institution on the basis of its status, scope of work, legal mandates, finance and HR autonomy.
iii. Suggest one of the organizations under review as a successor to NRA, with a set of strengthening measures.

10 *https://cbs.gov.np/supply-and-use-table-2010-11/*

# CHAPTER 4

# EVALUATION OF RECONSTRUCTION EFFORTS

## 4.1 Disaster Effects

The share of estimated total disaster effects (damage and loss) among the main sectors of social and economic activity reveals that social sectors are the most affected (58 percent of the total effects), which includes housing (Table 4.1). these are followed by productive sectors (25 percent), infrastructure (10 percent) and cross-cutting issues (7 percent).

### Table 4.1: Disaster Effects

(NPR Million)

| Sectors | Damage | Losses | Total | Share in % |
|---|---|---|---|---|
| **Social Sectors** | **355028** | **53597** | **408625** | **57.84** |
| Housing and Human settlement | 303632 | 46908 | 350540 | 49.62 |
| Health | 6422 | 1122 | 7544 | 1.07 |
| Education | 28064 | 3254 | 31318 | 4.43 |
| Cultural Heritage | 16910 | 2313 | 19223 | 2.72 |
| **Productive Sectors** | **58074** | **120046** | **178120** | **25.21** |
| Agriculture | 16405 | 11962 | 28367 | 4.02 |
| Irrigation | 383 | 0 | 383 | 0.05 |
| Commerce | 9015 | 7938 | 16953 | 2.40 |
| Industry | 8394 | 10877 | 19271 | 2.73 |
| Tourism | 18863 | 62379 | 81242 | 11.50 |
| Finance | 5015 | 26890 | 31905 | 4.52 |
| **Infrastructure Sector** | **52460** | **14323** | **66783** | **9.45** |
| Electricity | 17807 | 3435 | 21242 | 3.01 |
| Communication | 3610 | 5085 | 8695 | 1.23 |
| Community Infrastructure | 3349 | 0 | 3349 | 0.47 |
| Transport | 17188 | 4930 | 22118 | 3.13 |
| Water and sanitation | 10506 | 873 | 11379 | 1.61 |
| **Cross cutting Issues** | **51872** | **1061** | **52933** | **7.49** |
| Governance | 18757 | 0 | 18757 | 2.66 |
| Disaster Risk Reduction | 155 | 0 | 155 | 0.02 |
| Environment and Forestry | 32906 | 1061 | 33967 | 4.81 |
| **Total** | **517434** | **189027** | **706461** | **100.00** |
| **Total (US $ Million)** | **5174** | **1890** | **7064** | |

Source: PDNA, Volume A. NPC.

## 4.2 Evaluate Early (rescue and relief phase) Coordination Efforts between Different Agencies

### 4.2.1 Early Coordination Efforts

Nepal is prone to many disasters. Landslides, floods and earthquakes are common. Yet until very recently, the government did not have any established set of norms on how to act immediately after such a disaster. In 1982, Nepal had enacted the Natural Calamity Relief Act[11]. This act was more about rescue and relief and prescribed little about anticipatory preparedness related to the earthquake. Later a new act, the Disaster Management Act[12], was introduced to replace the 1982 act. In 2011, The Government of Nepal announced a

11 *Daiwi Prakop Uddhar Ain(1982)*

12 *Wipad wyawasthapan ain. The new name is due to the understanding that gods are not responsible for disasters and disasters should not be named daiwi prakop.*

new initiative, the Nepal Risk Reduction Consortium (NRRC), in partnership with different donor countries[13]. The NRRC was introduced in part to align Nepal's risk reduction strategy with the UN's International Strategy for Disaster Reduction (ISDR). The act was followed by the National Disaster Response Framework (NDRF) which prescribed actions that needs to be taken by different authorities from day 0 to 60 days after a major disaster. In that sense, NDRF was more specific about the tasks that needed to be carried out in the aftermath of the earthquake. One of the tasks recommended by NRRC was to set up a National Emergency Operation Center (NEOC) at the MoHA. NEOC had also set up about fifty different District Level Emergency Operation Centers (DEOC). DEOCs had some control over security forces situated in the districts and hence DEOCs were asked to send information to NEOC regularly. These organizations proved useful during the earthquake.

The government announced an emergency within a few hours of the first earthquake. The Central Natural Disaster and Relief Committee (CNDRC) held a meeting at 1:30pm that day, led by the acting Prime Minister Bamdev Gautam, who also the minister of MOHA at the time[14] and attended by many other ministers. Prime Minister Shushil Koirala, who was on a visit to Indonesia, returned the next afternoon, cutting short his visit and health-related scheduled checkup in Bangkok. In the absence of the Prime Minister, on the first day, acting Prime Minister Bamdev Gautam took the lead in organizing rescue efforts. It was doubly appropriate, as the Natural Calamity Relief Act (2037) gave the responsibility of organizing relief works during disasters to the home ministry. Another meeting of the same committee held at 2pm that day decided to mobilize all three security forces (police, armed forces and military) for search and rescue missions and requested the international community to provide assistance for this purpose. Secretaries of different ministries also held a separate meeting that day, and made the decision to coordinate their actions regarding rescue and relief. A report published by MOHA one month after the earthquake noted that 66,069 Nepal Army personnel, 41,776 Nepal Police and 24,775 armed police were mobilized for SAR missions at the time, apart from 22,500 civil servants who worked to manage these missions. The government provided Rs 500 million in the Natural Disaster Recovery Fund[15] immediately after the earthquake.

The earthquake-hit areas were also designated emergency areas by the government which prohibited anyone from organizing strikes or other obstructions in those areas.

Despite the long civil insurgency, both the Nepal Police and the Nepal Army were depleted in terms of their airpower. Nepal Police had no helicopter; the Nepal army at the time had only 2 functioning helicopters, only one of which was available for rescue and relief activities. The government therefore decided to use helicopters from private companies. An officer was kept at the airport to count the number of flights made by these private helicopters as per the request of NEOC. Indian rescue helicopters also arrived within six hours of the earthquake.

Supply chains were largely intact, and hence cities did not experience major shortages or any widespread price gouging[16]. Rumors circulated about tigers and cobras escaping the zoo, but the government quashed those rumors quickly and effectively. There were civil organizations that distributed food items to needy people in the cities. Politically, the quake could not have hit the country at a worse time, as the parties were still negotiating the content of the constitution of Nepal, after a failed constitutional assembly could not deliver the constitution at the first attempt. Local governments were yet to be formed.

By the end of the month, helicopters had flown 4,299 sorties and rescued 7,606 people. An additional 4,689 individuals were rescued using land routes. MOHA noted that in the first month, the government paid for the treatment of 103,686 individuals in ordinary wards and 21,952 individuals in intensive wards.

During its first week, Nepal also welcomed 4,521 members of international rescue teams with 141 canine members. They were thanked and asked to return on Baisakh 20, after one week of rescue works. During this period, sixteen people were rescued alive from the ruins[17].

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13 *Donors included the Asian Development Bank (ADB), the International Federation of the Red Cross and Red Crescent Societies (IFRC), the United Nations Development Programme (UNDP), the UN Office for the Coordination of Humanitarian Affairs (OCHA), the UN International Strategy for Disaster Reduction (ISDR), the World Bank, AusAid, the Department for International Development (DFID), the Humanitarian Aid Department of the European Commission (ECHO), the Embassy of Japan, the US Embassy, and the World Health Organization (WHO). Originally 495 million dollar was pledged to the consortium though only a fraction of that was received.*

14 *The rule at the time stated that no matter where they were and no matter whether they were invited or not, the important disaster relief related personalities have to be in MOHA as soon as possible if a major calamity strikes.*

15 *Daivi prakop uddhar kosh*

16 *XXX (show inflation, or Kalimati bajaar price)*

17 *MOHA, report of rescue efforts after one month*

The Nepal Army was coordinating with the Multinational Military Coordination Commission (MNMCC), and it set up a coordination center in Kathmandu to collaborate with military personnel coming to Kathmandu for rescue and relief efforts. Similarly, medical teams arriving at the time were coordinated by Ministry of Health.

Nepal had enacted the Disaster Preparedness and Response Planning Guidebook in April 2011. This guideline was first prepared in 2008 in response to the flood-induced Koshi river disaster. Due to this, the offices of Chief District Officers (CDOs) in 46 districts had functional emergency operations centers at the time of the earthquake. Nepal also had enacted National Disaster Response Framework in July 2013. This framework assigned specific tasks to different ministries, which reduced the confusion which had initially ensued after the earthquake hit the country. MOHA had set up the NEOCs only three years earlier, to tackle disaster related issues. An emergency storage depot was also constructed at Tribhuvan International Airport. These were some of anticipatory initiatives taken by the government before the earthquake, which proved to be useful in handling the post - earthquake chaos.

In the immediate aftermath of the earthquake, Bir Hospital was functional and serving patients. Since police did not immediately reach at destroyed monument sites such as Dharahara, there was some chaos in early rescue efforts. The government spent more than four crucial hours after the earthquake in holding meetings which instead should have been used to rescue people. random people reached monument sites before security forces which resulted in the mismanagement of the debris at those sites.

The Nepal Police hot line, which was not functional initially, became functional after some hours. However, it was inundated by so many calls that it quickly became almost inoperable. They also had very limited equipment for rescue efforts. They had a few boring machines and sniffer dogs for such rescue. Nepal Army's ground transportation was also affected, as many of its vehicles were damaged in the earthquake[18]. As a result, the police were not able to reach the fringe areas of Kathmandu for the first few days. However, the police borrowed excavators and bulldozers from private firms. Private firms also were a useful resource for air rescue.

Given the lack of helicopters to carry out domestic rescue missions and given the pledge of assistance from many governments worldwide, the government decided to establish a MNMCC in the evening of April 25[19]. On the first day, only fifty survivors were rescued and no foreign helicopters were involved. Helicopters provided by the Government of India were mobilized from April 26. The first mention of Chinese and US helicopters employed in search and rescue missions in a MOHA situation update [20] appears only on May 7. Decisions on where to send the rescue missions were made by the NEOC. The helicopters carried relief materials when they flew out of Kathmandu, delivered the materials to the District Natural Disaster Rescue Committee en route and then flew from there to the designated location.

Nepal's National Disaster Response Framework-2013 gave the main responsibility of coordinating with foreign armies to the Nepal Army. The NA had a Disaster Management Committee under its directorate of National Security and Development. This committee was supported by the United States Pacific Command in preparing its own disaster response plan. Initially, the NA was also supported by the United Nations Disaster Assessment and Coordination (UNDAC) team. The UNCOM Coordination team also advised establishing a Humanitarian Military Operations Coordination Center (HuMOCC), which would facilitate humanitarian-police-military coordination. It would help humanitarian workers in getting information about existing military and civil defense assets and in handling requests for assistance. The HuMOCC was also designed to complement the On-Site Operations and Coordination Center (OSOCC), which was mainly designed to coordinate civilian responders. OSOCC was led by UNOCHA. Since use of foreign military is everywhere a sensitive subject, these organizations made sure that they followed Asia Pacific Regional Guidelines for the Use of Foreign Military Assets in Natural Disaster Response Operations (APC-MADRO).

With these bodies and frameworks in place, NA was relatively prepared to carry out the relief and rescue mission. The army would also coordinate the military missions arriving from other countries. NA named its mission Operation Sankat Mochan. About 90 percent of all military personnel were used and 52,780 personnel were redeployed from less-affected districts to the highly-affected districts. The NA eventually rescued 23,594 people, medically treated 85,954 people and distributed 5,707 tons of relief materials.

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18 *Deepak Adhikari (ibid.)*

19 *MNMCC was chaired by NA and its initial members were foreign military liaison officers from Algeria, Bangladesh, Bhutan, Canada, China, Israel, India, Japan, Pakistan, Singapore, Spain, Sri Lanka, Thailand, UK, US.*

20 *Ministry of Home Affairs, Nepal, Nepal Earthquake 2072: Situation Update as of 11th May.*

The Nepal Army (NA) divided its operation in three phases. In the first phase, it aimed to save as many lives as possible and for that deployed as many personnel as possible for rescue and aerial reconnaissance. In the second phase, it established a coordination center at the army headquarters, to work with other security forces. NEOC would send requests to this headquarters. MNMCC, established to coordinate with international military humanitarian assistance, started functioning as explained above, while NA staff were also deployed to NEOC to work directly from there. In the third phase, the NA was also involved in some reconstruction activities.

According to the Airport Coordination Center, a total of 4,521 foreign military personnel arrived for the search and rescue missions, including 1,415 Indians, 942 Chinese and 286 Americans. A total of 134 teams from 34 countries arrived to support search and rescue missions, while Nepal received emergency relief and humanitarian assistance from sixty countries. Out of those SAR teams from 34 countries, 18 were military missions[21]. The US assistance mobilized the 3rd Marine Expeditionary Brigade and included 900 military personnel from Navy, Army, Airforce and Marine Corps under Pacific Command's Operation Sahayogi Haat[22]. A US Marine Corps Bell UH-1Y Huey went missing on May 12th and was later found at the crash site on May 15th; eight US servicemen died. The US had contributed three UH1Y Huey helicopters, four Osprey tilt rotor aircraft, four C-17 Globemaster III, four C-130 Hercules, and four KC-130J Hercules aircraft. The United Nations also launched an international appeal for US$422 million for immediate relief in Nepal on Baisakh 16, four days after the earthquake. The UN agencies had suggested that the government use the cluster approach to coordinate the rescue and relief initiatives. This had proved to be a successful practice in Indonesia. Eleven clusters were initially suggested by the UN[23].

Early rescue efforts were channeled as follows: The MoHA gathered information from villages on rescue requirements and sent the information to the army headquarters. The army's coordination center in the airport mobilized helicopters. The Humanitarian Staging Area in the airport was built with the help of the UK. This could store relief materials for 50,000 people for a month.

The earthquake had multiple impacts on people's lives. It forced the displacement of people and pulled many below the poverty line. In the aftermath of the earthquake, many people moved from villages to the cities. While rigorous studies of the impact of earthquake on the incidence of poverty have still not be done, it was claimed that the earthquake pushed more than 700 thousand people into poverty[24]. For example, many people from Sindhupalchok came to live in Bauddha or Bhaktapur. Many from northern areas of Dhading came to live near Prithvi highway. Many people thought these people should be settled in the cities, so that eventually people would not be dispersed across villages. But the NRA knew that its tiny budget of about NPR 3 lakh per household would not allow that to happen. In due course, resources were used to create approximately 100 integrated settlements[25]. Dhurmush -Suntali spent NPR 11 lakh per house, compared to the government's expenditure of NPR 3 lakh per household. However, what NRA understood was that people do not readily move to a new settlement. They have to be sure that their livelihoods would not be disrupted.

***Managing Debris***

Seemingly small things also proved to be a significant impediment in the early relief process. The total amount of debris generated in the earthquake is not known, but it was clear that as the days progressed, the activities had been generating huge quantities of debris. The Nepal Army deployed immediately after the earthquake, was engaged in debris management and management of temporary shelters. It was not clear where the debris should be dumped and in the early days of earthquake, in which uncertainties and fear about the aftershocks dominated people's thoughts, their presence in the city and damage sites would present a significant logistic challenge.

***Immediate Relief***

On 2072 Baisakh 17, the government announced a grant of NPR 40,000/- per deceased person for final rites and NPR 1,00,000/- per family for families who had lost at least one member. The government also announced a grant of NPR 25,000/- for house repairs. The government also promised to arrange food and lodge facilities for those who had lost their house. On Baisakh 20, the government announced treatment allowance for those who were being treated in hospital for earthquake-related health problems. Farmers were also promised

*21 The countries that sent military missions include Algeria, Bangladesh, Bhutan, Canada, China, Israel, India, Indonesia, Japan, Malaysia, Pakistan Poland, Singapore, Spain, Sri Lanka, Thailand, UK, and the US.*

*22 Operation Sahayogi Haat, accessed from https://www.globalsecurity.org/military/ops/sahayogi-haat.htm*

*23 The eleven UN clusters are Camp coordination and management, early recovery, logistics, education, shelter, health, emergency telecommunication, food securities, protection, WASH (Water sanitation and hygiene) and nutrition.*

*24 Towards a Resilient Nepal, Dr Ram Sharan Mahat, available at https://blogs.worldbank.org/endpovertyinsouthasia/toward-resilient-nepal*

*25 Conversation with Dhruva Sharma, Executive Committee Member, National Reconstruction Authority*

free treatment for their wounded cattle[26]. Later, after the constitution was promulgated in September 2015, the government announced a warm clothes (nyano luga) program and offered NPR 10,000 each for affected people to buy warm clothes during the winter.

On Baisakh 25, the Prime Minister announced the following relief measures in an emergency meeting of the Constitution-Assembly and Parliament:

- NPR 40,000/- per deceased person for conducting final rites
- NPR 1,00,000/- per family of a deceased person
- Free treatment of all wounded individuals in government or non-government hospitals
- Open cheap price shops in earthquake-hit regions, for food and other essential items.
- Prioritize clearance and repair of roads blocked by landslides in earthquake-hit regions.
- Implement special security measures to minimize incidences of theft, burglary etc.
- Provision of shelter and free education to children who have lost parents and houses.
- Provision of free seeds and subsidized fertilizers to farmers.
- Provision of relief for borrowers from earthquake-hit regions. Depending on the economic condition of the household, an interest-free loan of up to NPR 50,000/- would be implemented.
- Initiation of a safe housing and settlement development program, underpinned by a review of land use policy and the building code.
- Initiation of an integrated infrastructure development program and management of scattered settlements in rural areas.
- Provide up to NPR 2 lakh in housing reconstruction for those households willing to build their house according to the standards set by the government.
- Provide housing reconstruction loan of up to NPR 2.5 million in the Kathmandu valley and NPR 1.5 million outside the Kathmandu valley, at the interest rate of 2%.
- Provide a subsidized interest rate to factory owners and businessmen who were affected by the earthquake, under the Earthquake Reconstruction Loan scheme.
- Issue of a National Reconstruction Bond, to enable ordinary Nepalis to take part in reconstruction.
- Establish NPR 200 billion National Reconstruction Fund.
- Organize of an International Donor Conference to raise funds for reconstruction.
- Construction of a major earthquake memorial tower.

The Prime Minister also announced formation of an all-party mechanism at the center, and at district/village level, as well as an additional monitoring mechanism to oversee relief and reconstruction. His speech on 2072 Baisakh 25th set the tone for the rest of the reconstruction and relief activities related to the 2015 earthquake.

On Jestha 8, the government announced an Integrated Action Plan for Post-earthquake Response & Recovery[27]. This action plan identified forty different actions and delegated authority to different agencies to either accomplish the goals or prepare a plan within a stipulated timeframe. The tasks included construction of emergency shelters for senior citizens, single women, the sick, disabled and other vulnerable populations. Other tasks included helping affected farmers with free seeds and subsidized fertilizers, waiving tax, reviewing the National Building Code (2060), and dismantling partially-damaged structures deemed risky for neighboring structures.

On Jestha 22, the government announced that earthquake victims would be provided with identification cards and a relief amount of NPR 15,000. The government also decided to regulate the activities of the national and international agencies and issued National and International Non-Government Assistance Mobilization Directives (2072)[28] which would be valid until Mangshir 2072 (i.e., Dec 2015). Some features of this directive included prohibition of local fundraising; use of religious or other related signs and logos during the mobilization of assistance; and conducting activities that threaten territorial integrity and communal harmony of the people. The government also issued Disaster Accounting Directives[29] on Bhadra 30 (September 15th)

***Issues in Coordination of Relief and Rehabilitation***

Given the magnitude of the earthquake, which had struck Nepal in last 80 years, and the lack of institutions in place, there were numerous issues in coordination in relief and rehabilitation activities, mostly during the initial phase. Here are some of the highlighted issues

26 *Book on legal assistance to earthquake victims (bhukampa pidit harukaa lagi kaanuni sahayata sambandhi jaanakaari pustikaa), Forum for Nation Building*

27 *The Nepali name for this workplan is bhukampottar pratikarya tatha punarlabh ekikrit karyayojana 2072*

28 *Nepali: raashtriya tathaa antarraashtriya gairasarakaari sahayog parichalan nirdeshika (2072)*

29 *Nepali: wipad lekhajokha maargadarshan, 2072*

Nepal Rashtra Bank (NRB)'s effort to regulate incoming funds and to absorb all donated funds directly into the Prime Minister's Disaster Fund created some confusion. However, NRB maintained that it was done to curb money laundering and other issues.

Indian pilots refused to fly helicopters even with the small weather changes, due to their unfamiliarity with the topography. US choppers (Osprey) were capable of carrying only 3 quintal goods above 7000 feet and in general unsuitable for Nepali terrain. Sometimes, rescue materials did not take into account local traditions or sensitivities, or religious prohibitions. For example, a shipment of goat meat cans worth US $ 40,000 was sent by Indonesia, which was subsequently found to include beef.

In the immediate aftermath of the earthquake, it was not clear to distinguish secure houses from unsafe houses. Many houses had cracks inside the building, but people were afraid to move in. No immediate help was provided to assess the housing risks, based on the observed changes in the features of these houses.

Informational asymmetry was a major problem in coordinating the international effort. The government could not immediately tell donors what were Nepal's needs, while donors sent everything that they thought might be useful. Thus increasingly, Nepal received goods that were low priority, or of limited or no use.

The Home Ministry published a report on the first post-earthquake month, entitled "Gorkha Earthquake: A Preliminary Report on One Month of Search, Rescue and Relief". The report highlighted that the lack of SOPs for such a situation was a major drawback.

Furthermore, telecommunications networks were down immediately after the earthquake. Even the acting Prime Minister at the time was incommunicado from the rest of the world and had asked his personal security officers to relay to him any information about the damages received via walkie-talkie. This further complicated the initial confusion.

***Counting Victims***

An efficient distribution of relief and reconstruction assistance hinged on the government's ability to count the victims accurately. The earthquake had hit faraway villages severely and reaching the victims was a significant challenge. Given Nepal's particularly fragile mountain terrain, cold winters and disastrous rainy seasons, the earthquake was a difficult experience, especially for the vulnerable population. There were reports of missing children after earthquake. According to Women for Human Rights, many of those children were taken to India. In open tents, cases of sexual assaults were observed. Many places that offered quarantine or safe tent services did not have toilets and guards, where they were present, were not trained to treat women in a respectful manner. As a result, many women reported suffering while being camped outside in the aftermath of the earthquake. Most of the guards were male. This exposed women to additional risks. Police also refused to register many of the grievances because many were active in responding to other needs arising out of the earthquake.

While preparing the PDNA report, the government invited UN Women for its input, so the PDNA included a gender dimension. But overall, reconstruction efforts did not sufficiently take gender into account. The same was true for the special needs of vulnerable communities.

Reports on casualties of the earthquake started trickling in slowly as illustrated by Table 4.2.

## Table 4.2: Cumulative Numbers of Dead and Wounded, as Reported by MOHA on Specific Dates After the Earthquake

| Date | Dead | Wounded |
|---|---|---|
| 25 April | 820 | NA |
| 26 April | 2430 | 5936 |
| 28 April | 4680 | 9230 |
| 1 May | 6260 | 13868 |
| 2 May | 7040 | 1100 |
| 4 May | 7366 | 14371 |
| 7 May | 7802 | 15911 |
| 10 May | 8020 | 16033 |
| 25 May | 8659 | 21952 |
| Final | 8790 | 22300 |

Source: Record compiled by the MOHA, Nepal

A report published by MOHA one month after the earthquake noted that 500,717 houses were fully damaged, 269,190 houses were partially damaged, 4,231 government buildings were damaged, 13,312 school rooms were damaged, 5,010 classrooms were partially damaged, 375 health posts were fully damaged, 648 health posts were partially damaged, 135,187 metric tons of food items were damaged, and 54,411 animals died in the earthquake. The PDNA later presented the final numbers, which are presented in Table 4.1 of this report.

After the early estimates were prepared by the government, conducting an immediate survey proved more difficult. Arranging immediate and quick funds and mobilizing quick responses have always been a problem in Nepal. This is also an area where international agencies often contribute effectively. For example, the first round of survey of households was conducted in the worst-hit fourteen districts by the CBS with the help of the United Nations Office for Project Services (UNOPS). The funds for these tasks were provided by DFID and this survey was later extended to an additional seventeen districts. The CBS had employed more than 500 teams for the survey and each team had at least one engineer and a social mobilizer

***Social Inclusion***

The chaos following the earthquake was hard on socially marginalized groups. Women and young girls from poor families were particularly vulnerable to exploitation. People were living in open spaces and security was always an issue.

UN Women and other agencies started multipurpose women's centers in five different districts and provided women with dignity kits. However, most of the programs were still insensitive to, or unaware of, the particular needs of socially marginalized groups.

### 4.2.2 The Relief Starts

Nepali people are not unfamiliar with earthquakes. The earthquake of 1990 BS (1934AD), which destroyed sixty percent of all houses in the Kathmandu Valley, remains in the memory of many Nepalis. Others also remember the jolt felt from the earthquake of 2045BS (1988AD), which had killed 790 people and destroyed 6500 houses. Since 1998, the government had started commemorating Magh 2 (the date of the earthquake of 1934) as Earthquake Day. In 2002, the MoHA worked with JICA to estimate the potential impact of an earthquake in the Kathmandu Valley. Its report indicated that a mid-Nepal earthquake of 8 Richter Scale magnitude would result in the destruction of 53,000 (23% of all) buildings, death of 18,000 (1.3% of all) people and serious injury to 53,000 (3.8% of all) people in Kathmandu Valley[30]. In 2014, the government had introduced its Earthquake Safety Day Directive (2014), emphasizing preparedness for and awareness of earthquakes. Many people credited these measures with creating increasing awareness regarding earthquakes in Kathmandu.

The decade preceding the earthquake was also marked by political instability in Nepal. Political parties were struggling to agree on the new constitution. Yet, on Baisakh 30, three weeks after the earthquake, the constitutional assembly[31] passed a proposal (*sankalpa prastaaw*) resolving to help the earthquake victims, indicating their ability to come together at such a moment of national crisis.

The preparation of the PDNA and organization of an international conference in Nepal on June 25, 2015, were major milestones in starting relief works. Unlike most other initiatives related to disaster management, the PDNA initiative was taken by the NPC. Initially there was some lack of clarity about who should take the initiative to prepare the PDNA. The heads of UNDP, World Bank, and JICA were in communication with the NPC about helping Nepal prepare a PDNA before starting reconstruction works. On May 15, 2015, the National Planning Commission sent letter to the WB, UNDP and EU requesting support for conducting PDNA. Many of these also went to the Ministry of Finance and expressed their desire to prepare a PDNA. One of these organizations had an inception report with it. This resulted in some minor confusion in the ministry.

It was around that time that NPC approached the finance ministry and asked the ministry to delegate coordination responsibility to the NPC. The finance minister and chief secretary both expressed qualms initially about the NPC being the appropriate agency to carry out this work. They both thought the home ministry was the right agency to conduct the study. However, given that the home ministry was under a lot of pressure related to rescue and relief, both later acquiesced to the demand by the NPC's former Vice Chair, Dr. Govinda Pokharel, to allow NPC to conduct a PDNA study. While the PDNA was prepared under the overall leadership of Dr. Pokharel, then NPC Members Dr. Govind Nepal and Dr. Swarnim Waglé steered the process of PDNA preparation and provided technical guidance. Sectoral assessments were carried out under the leadership of concerned NPC Members[32].

30 *The Study on Earthquake Disaster and Mitigation in the Kathmandu Valley, JICA and Ministry of Home Affairs, Nepal (2002)*
31 *It was called wyawasthaapika-samsad (legislative parliament) those days*
32 *Post Disaster Need Assessment, page VI, Kathmandu, Nepal (2015)*

More than 250 experts from different countries were involved in the preparation of the final PDNA document, which assessed damages and needs of 23 sectors and took about a month[33]. Thirty-one joint secretaries from different ministries were made focal persons for this study and experts from the European Union provided orientation to these officers. Many foreign experts assisting in the preparation of PDNA, such as Venkatachalam Thiruppugazh, had experience of similar reconstruction activities in the region. The Global Facility for Disaster Reduction and Recovery (GFDRR) provided partial financial support for the preparation team.

The PDNA report was well received by the government, donors, and many other experts. However, it had its own limitations. The number of damaged houses was severely underestimated. The damage assessment was done from an engineering perspective, as opposed to rather a sociological angle. It therefore could not anticipate how people would react in the face of monetary incentives for reconstruction later on.

Initially, many countries (including India and Japan) had shown interest in organizing the conference, but the government decided to organize it in Kathmandu. Uncertainties persisted until the day of the conference. Aftershocks were being felt and confidence in the readiness of the international airport to host many airplanes carrying dignitaries was still low. The conference was also meant to show that Nepal was slowly returning to normalcy.

One of the suggestions of the PDNA was to establish a powerful NRA. It was primarily motivated by the recent post-earthquake experiences of India and Pakistan. Many countries who were likely to assist in Nepal's reconstruction wanted to see a powerful agency leading the reconstruction effort. For example, NPC's former Vice Chair Dr Govinda Pokhrel recalls meeting the then US Ambassador Peter Bode for a dinner meeting at his residence. The ambassador also invited the Pakistani general who had led the reconstruction in Pakistan. They both talked about the possibility of forming an authority that would lead overall reconstruction effort. This was a recurrent theme whenever government authorities met with many other national and international agencies.

Starting the NRA became surprisingly difficult. Many Members of Parliament (MPs) became active in providing suggestions. The NPC Vice Chair at the time, Dr. Govinda Pokharel, remembers receiving more than 300 suggestions from MPs. The first draft of the act that was intended to set up the NRA collapsed in Bhadra 12. The first draft included a powerful NRA, which did not have a government secretary (the highest government officer was joint secretary).

Ultimately, on Poush 10, 2072 (25 December 2015), the National Reconstruction Authority was established. The early NRA was very similar to the NPC and acted like a coordinating agency. The authority included four Central Level Project Implementation Units (CLPIUs) at respective ministries, but the ministries pushed back on the proposal to have the heads of the CLPIUs evaluated by the NRA. The MoUD, for example, was always alert to any proposal that the ministry considered to be an encroachment on its authority. Early on, NRA did not have its own NRA Fund and it also did not have procurement staff.

There were other early coordination issues as well. For example, MoUD had prepared 17 designs for new public houses. However, a major donor, JICA, objected to these designs, as they were not earthquake resistant. Resilience against future earthquake shock was probably not in the mind of the ministry officials early on. JICA brought in an Indonesian earthquake expert, who had experience of reconstruction in Aceh, to advise the ministry.

Identification of victims was itself a challenge. Out of 14 districts identified as the "worst hit districts", an early survey of 11 districts (excluding three districts in the Kathmandu Valley) was carried out in 2072/73. The survey of the remaining three districts was carried out using two methods: in dense municipalities, the verification model was used, and, in the villages, a detailed survey method was used[34]. The survey of the remaining less-affected 17 districts was conducted using the verification model. These statistics include photos of owners and damaged households. The surveys had identified 724,895 beneficiaries from 31 districts. However, after settling grievances, an additional 22,589 beneficiaries were added, and the total number of beneficiaries reached 749,796 by the end of fiscal year 2073/74. Hence within two years of earthquake, by 2074 Asadh, private residence grant contracts had been carried out with 629,611 households, out of which 596,284 households had received the first installment (NPR 50,000) by the end of FY 2073/74. During the same time, 52,166 individuals had received a second installment (NPR 150k) and 2,734 beneficiaries had received their third installment (NPR 50k).

33 *Post Disaster Need Assessment, page IV, Kathmandu, Nepal (2015)*
34 *Annual Progress Report of National Reconstruction Authority, 2073/74*

### *Preparing Human Resource for the Reconstruction*

Discussion regarding the preparation for an impending earthquake was not new in Nepal. This had motivated some engineering schools to prepare human resource for such an emergency situation that could happen at any time. Around 2002, the Institute of Engineering in Lalitpur had started a course called Seismic Residence Design. Khwopa Engineering College in Bhaktapur also had a course on Earthquake Engineering. Thapathali Campus, Kathmandu had started a course on Earthquake Engineering *circa* 2014.

Even before the reconstruction began, the shortage of qualified human resource had been felt. The first survey of earthquake victims was concluded within a year of the earthquake. To conduct the damage assessment of houses, the NRA needed engineers and geologists. However, when the NRA published a vacancy announcement for geologists, there were less than twenty applicants. One of the NRA executive committee members had to make a personal request to Thapathali Engineering Campus to publish result of exams earlier, so that the students could qualify for the positions.

For reconstruction purposes, each village development committee in the worst hit districts (14 districts in total) had two engineers, one sub engineer, and one assistant sub engineer (a total of 1,346 engineers, 21 sub engineers, 575 engineers hired by the end of 2073/74FY). These were hired by MoUD. (MoUD).

### *Many CLPIUs and Their Integration*

Before the earthquake, a number of separate CLPIUs had existed, usually set up in their respective ministries, for example, the Education CLPIU in the Ministry of Education and the Building CLPIU in the Ministry of Urban Development. They were brought under the direct oversight of the NRA during the tenure of former NRA CEO Mr. Yuvaraj Bhusal. This greatly improved the efficiency of the NRA's work.

### *Issues of Land Allocation*

Two important issues associated with land allocation arose as the reconstruction gained momentum. First, there were many victims who did not own land. These landless people nevertheless had suffered like other earthquake victims. The government provided subsidies for building new houses, but without land, the landless could not build a house and even if built, they would not have a title for their house. This problem was addressed by the announcement of NPR 2 lakh subsidy for purchasing land. In rural areas, the amount of subsidy was sufficient to enable landless people to buy up to four or five ropani of land, but in urban areas, it was negligible. It is clear that subsidy announcement needs to differentiate between urban and rural areas.

Another issue was associated with the households in Gorkha and Dhading regions. Households were being displaced and resettled because of the Budhigandaki Hydropower project.

Recognizing these difficulties, the following regulations were designed with regard to land ownership of earthquake victims: Directives for Land Acquisition for Reconstruction of Earthquake Affected Structures (2072); Directive to provide land for rehabilitations and resettlement of earthquake affected individuals (2073); Directive for Registering land for earthquake-affected individuals (2073); Directive for the Resettlement and Rehabilitation of Hazardous Settlements (2073); Standard for Purchasing Livable Land for Earthquake Victims (2074) etc.

### *Use of International Assistance*

While the bulk of the reconstruction would eventually be carried out with the government's own resources and loans it borrowed from international organizations, international assistance was useful in several steps of reconstruction. For example, UNOPS, with DFID funding, assisted in the initial housing survey. Standard government procurement systems are slow and rigid. For example, the World Bank noted that there were too few tablets with the surveyors, and it was causing a backlog. Rapid procurement was not possible under the NRA's normal procurement process. Even in the cases where emergency procurement was merited, the NRA reverted to reliance on fell back on normal, cumbersome procurement processes. Therefore, the World Bank stepped in, using of its off-budget resources and own procurement process to help expedite this process. Examples of such assistance illustrate the usefulness of international assistance.

### *Inclusiveness of Reconstruction*

Both the PDNA and PDRF had admirably covered gender issues. Organizations like UN Women were actively involved in making sure that gender issues were not given short shrift in those important documents. The

CEOs of the NRA - all male - hired gender advisors to ensure incorporation of a gender perspective into the reconstruction process. The NRA has included gender and social inclusion aspects in all of its policies. Datasets are diversified to include gender, but disability is addressed to a lesser extent and LGBTQ not at all.

According to a report by Common Feedback Program (CFP) and Women for Human Rights (WHR), many women suffered because they did not have citizenship certificates or because they were pregnant and thus unable to compete in getting benefits distributed by the government. The government did not have a preexisting mapping of vulnerable groups at any local level and hence targeting their needs was not possible. This should be a part of the future disaster preparedness. Mainstreaming of programmes in risk-informed development programming, to address gender disparities and the distinct needs of vulnerable groups, can provide a solid foundation for relevant disaster preparedness measures.

## 4.3 Summary of the Official Reports of NRA on Task Completions

The reconstruction process of Nepal was not free from challenges. During the days of reconstruction, at different times, NRA faced several external challenges, including political instability, economic blockade, shortage of financial and human resources, geographical inaccessibility, transition to federal governance structure, and the disturbances during the local government election (NRA press release, 2078). The impact of COVID-19 also affected the pace of reconstruction. Likewise, NRA also faced some internal challenges in addition to the external challenges. Frequent changes of the CEO and secretaries of NRA, a cumbersome bureaucratic process in accessing support from the government agencies, political pressure regarding the verification of earthquake-affected families, formulating a number of legal instruments, and so on.

Nepal adopted an 'owner-driven reconstruction' framework for housing reconstruction. Owner-driven reconstruction in the context of developing countries has been proved to be the most effective in terms of its achievements with regard to home owner satisfaction and disaster risk reduction (Rawal et.al., 2021). Otherwise, multi-partner initiatives have characterized recovery. To expedite the reconstruction of the schools, NRA has adopted a policy of getting the reconstruction done through different institutions, like the school management committees, donor-driven contracts with private contractors and building support through NGOs. Reconstruction of archaeological and cultural heritage sites is being carried out in collaboration with the DoA, cultural heritage management groups, temple and Gumba management committees and local municipalities. The progress of reconstruction of cultural heritage sites is comparatively slow because the first priority of the NRA was to support the construction of private houses and schools.

Despite many internal and external challenges, the NRA was successful in achieving most of its established targets, but the degree of achievement was not uniform across all sectors. Accomplishments in reconstruction of public buildings and private housing have been higher than in other areas of reconstruction. The reconstruction of national heritage was found to be the most challenging and took relatively more time to start.

A considerable chunk of reconstruction fund was invested in housing reconstruction. The housing reconstruction received special attention of the government since the very beginning. The status of private housing reconstruction by the end of fiscal year 2020/21 is given in Table 4.3.

### Table 4.3: Status of Private Housing Reconstruction

| S.N. | Description | FY 2020/21 | |
|---|---|---|---|
| | | Number | Percentage |
| 1 | Total Beneficiary | 866160 | |
| 2 | Number of HH concluding Grant Agreement out of total beneficiary | 829667 | 95.79 |
| 3 | Number of HH receiving First tranche out of HH concluding Grant Agreement | 828763 | 99.89 |
| 4 | Number of HH starting construction out of HH receiving first tranche | 758793 | 91.56 |
| 5 | Number of HH receiving second tranche out of HH concluding Grant Agreement | 750459 | 90.45 |
| 6 | Number of HH receiving third tranche out of HH concluding Grant Agreement | 703307 | 84.77 |
| | **Retrofitting** | | |
| 1 | Total Beneficiary | 47827 | |
| 2 | Number HH concluding Grant Agreement | 35222 | 73.64 |
| 3 | Number of HH receiving first tranche out of HH concluding Grant Agreement | 35027 | 99.45 |
| 4 | Number of HH receiving second tranche out of HH concluding Grant Agreement | 2035 | 5.78 |

By the end of fiscal year 2020/21, the number of total beneficiaries reached 866160. Out of them, as many as 95.79 percent concluded grant agreement. Out of those who concluded grant agreement 84.77 percent completed house reconstruction (Table 4.3). The progress in retrofitting is not satisfactory, as most of the affected households were not interested in retrofitting. The lack of awareness about the benefits of retrofitting of the households was the main reason behind the low interest in it. Table 4.4 below presents the status of reconstruction by sector, against initial targets.

## Table 4.4: Progress in Reconstruction Sectors and Year

| S. No. | Description | Target | 2072/73 | 2073/74 | 2074.75 | 2075/76 | 2076/77 | 2077/78 | Total2077/78 | Under Construction |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Number of HH having grant agreement | 829667 | 0 | 44927 | 204166 | 169671 | 89377 | 195166 | 703307 | 55486 |
| | Progress in percentage | | 0 | 5.42 | 24.61 | 20.45 | 10.77 | 23.52 | 84.77 | 6.69 |
| 2 | Public Buildings | 414 | 0 | 182 | 66 | 55 | 50 | 35 | 388 | 20 |
| | Progress in percentage | | 0 | 43.86 | 15.9 | 13.25 | 12.05 | 8.43 | 93.49 | 4.83 |
| 3 | Schools | 7583 | 0 | 2456 | 1360 | 1247 | 995 | 589 | 6647 | 936 |
| | Progress in percentage | | 0 | 32.39 | 17.93 | 16.44 | 13.12 | 7.77 | 87.66 | 12.34 |
| 4 | Health Institutions | 1164 | 83 | 296 | 264 | 22 | 33 | 53 | 751 | 354 |
| | Progress in percentage | | 7.13 | 25.43 | 22.68 | 1.89 | 2.84 | 4.55 | 64.52 | 30.41 |
| 5 | Heritage | 920 | 0 | 56 | 129 | 195 | 73 | 133 | 586 | 195 |
| | Progress in Percentage | | 0 | 6.09 | 14.02 | 21.20 | 7.93 | 14.46 | 63.70 | 21.20 |
| 6 | Buildings of security forces | 216 | 0 | 18 | 75 | 90 | 24 | 9 | 216 | 0 |
| | Progress in percentage | | 0 | 8.33 | 34.72 | 41.67 | 11.11 | 4.17 | 100.00 | |
| 7 | Integrated settlement | 106 | | | | | | | 62 | 44 |
| | Progress in percentage | | | | | | | | 31.25 | |
| 6 | Beneficiaries of resettlement | 4720 | | | | | | | 3462 | |
| | Progress in percentage | | | | | | | | 73.35 | |
| 8 | Gumba (Monastry) | 1297 | | | | | | | 373 | 114 |
| | Progress in percentage | | | | | | | | 28.75 | |
| 9 | Road Km. | 764 | | | | | | | 657 | 107 |
| | Progress in percentage | | | | | | | | 85.99 | |
| 10 | Road bridges | 15 | | | | | | | 9 | 6 |
| | Progress in percentage | | | | | | | | 60.00 | |

Source: Six Years Since Earthquake and Reconstruction, NRA, April 2021 and Presentations Made, Punarnirman Ashad/Shrawan 2078, An NRA publication.

The reconstruction targets were revised on several occasions based on the results of different surveys. The target figures outlined in the third column of Table 4.4 reflect the latest revisions made by NRA, with the approval of its Steering Committee. The timeline of achievements ends in FY 2077/78, but reconstruction work has continued in FY 2078/79. This report does not take into account this last year.

By the end of 2077/78, NRA has successfully accomplished the reconstruction of 703307 houses, achieving 84.77 beneficiary households having grant agreement with NRA. If the households which have received first and second tranches of reconstruction grants were able to reconstruct their houses, there would be 91.46 percent achievement in the housing sector (Table 4.4).

As depicted in Table 4.4, progress in the reconstruction of public buildings, school buildings, health institutions, and the buildings of security forces stand at 93.49 percent, 87.66 percent, 64.52 percent and 100 percent of targets respectively. But if we consider the ongoing reconstruction activities, it is expected that the school sector will meet 100 percent of its target, public building 98.32 percent, and health institutions 94.93 percent. The heritage sector has met only 63.70 percent of the target so far, which is the lowest, compared to other sectors. However, as and when ongoing construction is completed, the percentage will reach 84.9 (Table 4.4). Though the final progress of reconstruction activities is encouraging, annual progress has been uneven. For instance, in the case of private housing, only 5.42 percent of the target was met in the first two years. In the next two years, almost half (45.06 %) of the total target was accomplished and the remaining 34.29 % of the target was met in the following two years. The main reasons for the acceleration of the construction during

the later years can be attributed to factors such as the delay in the formation of NRA; delay in formulation of procedural documents; time required to establish a transparent mechanism for distribution of grants; shortage of technical support and supply of construction materials; information gaps at the grass roots level about the government support; and frequent changes in the leadership of NRA. The absence of local government administrations also impeded and delayed overall coordination at the local level.

In the public building sector, 43.86 percent of progress was made in the first two years. Subsequently, the rate of progress rate has been below 16 percent in each financial year. The reason for the rapid start but slow progress later is that the government had given priority to the construction of public buildings during the initial years.

The school sector observed 50 percent of its progress in the first two years and then the progress rate fell to 17 percent. As the construction of schools was agency- and community-driven and construction was not impeded by the need to go through the cumbersome process of obtaining loans reconstruction in this sector was quite fast. Development partner interest in the sector also facilitated school reconstruction.

Compared to private housing especially, progress in the reconstruction of health institutions was commendable in the first three years: the progress rate was 54 percent against targets. But the pace declined to 2 to 3 percent in the following two years. It is expected that about one-fourth of the target will be met during the last year of NRA's reconstruction mandate.

Reconstruction in the cultural heritage domain witnessed the least progress, as only 6 percent of the target was met in the first two years. The delay in heritage reconstruction was primarily due to the lack of a clear and well-supported policy for heritage reconstruction; conflict about the use of reconstruction material; modes of contract for reconstruction; limited governance capacity; lack of manpower for traditional artwork; and the lack of a framework to support local community-driven rebuilding initiatives (KC, Sharma & Pokharel, 2019). The pace of heritage reconstruction has gradually picked up in recent years.

The Government of Nepal introduced the concept of integrated settlements for the earthquake-affected population displaced from their original habitat due to the alarming risk of geo-hazards in their land. By the end of FY 2077/78, only 31.25 percent of the target of such reconstruction was met, primarily due to the fact that the Integrated Settlement Procedure was issued only in 2075; thus, the construction of these settlements started later than reconstruction in the sectors. Challenges in identifying land for resettlement, convincing households to relocate and the arrangement of funding also delayed start of reconstruction.

In addition to all these reconstruction activities, a significant level of livelihood and employment activities has been created in the process of housing reconstruction and other construction activities. Studies have shown that a total of 407.5 million workdays were generated during the reconstruction period (Reconstruction Newsletter May- June 2021).

### 4.3.1 Review of Inputs for Reconstruction

**Financial Inputs**

The financing needed for reconstruction, as estimated by PDNA 2015 was NPR 669,505 million (US $ 6.695 billion). Later, the PDRF carried out a detailed calculation of the financing need and came out with a figure of NPR 837,742 million (US $ 8.377 billion)[35]. However, the real expenditure made by the end of FY 2077/78 is NPR 585,315 million[36], which is 69.86 of PDRF's budget estimate. There are three reasons for under-spending of allocated budgets:

i. The process of releasing the government budget was time-consuming.
ii. As the budget is spent through the existing government agencies, the expenditure pattern is no different from that of other government agencies.
iii. The components of the budget sourced from bilateral or multilateral development partners were sometimes not immediately available to expend, due to stringent conditions attached.

35 *The latest revision of PDRF budget was Rs.488 billion. The Donor summit held immediately after the outbreak of earthquake pledged Rs. 410 billion, out of which Rs. 67 billion was spent for search & rescue and other programs, and another Rs. 49 billion related to Indian Exim bank was source- transferred by government. So only Rs. 294 billion of total pledged amount remained for reconstruction (Punarnirman, Baishakh, 2078).*

36 *This does not include Rs. 285,575 million invested by households themselves to construct their houses.*

Therefore, there is a need to dive deeper, before questioning the implementation capacity of an executing agency, simply by comparing the amount of allocated budget and the amount of expenditure realized. To illustrate this: the initial budget allocation was NPR 141 billion in FY 2076/77, which decreased to NPR 139.80 billion after the surrender of a part of the Nepal Government-sourced budget. Furthermore, if the unsure part of the externally assisted budget (supported by India Exim Bank, OPEC Fund for International Development (OFID) and DRM SIA component of IDA) is deducted, the budget is further reduced to NPR 103.25 billion. Out of this, NPR 52.49 billion was the real expenditure (NRA Annual Report 2076/77, 2077). This example clearly illustrates both the government's low budgetary commitment and the NRA's low absorption capacity. The case of budget surrender and implementation of 42.35% of source guaranteed budget (NPR 56.78 billion) for the reconstruction of private housing show the implementation capacity deficit of NRA whereas the allocation of NRP 36.55 billion uncertain budget for NRA is evidence of low-level commitment of the GoN.

The NRA Steering Committee, led by the Prime Minister, time and again revised the estimated figure of financial requirement, which was reduced to NPR 488 billion, as proposed by its 7-member Task Force constituted in 2076/9/8. The cut was made on the pretext that some of the tasks originally under the purview of NRA will be carried out by the concerned government agencies. The 44 percent downward revision of the original reconstruction budget can be interpreted in the following ways:

i. The government intention to cover more than 90 percent of public sector expenditure from the external funds, as pledged in the International Conference on Nepal's Reconstruction (ICNR) 2015 (US $ 4.1 billion).
ii. Government agencies' interest to get reconstruction budget expended through them rather than through NRA.
iii. The government gives priority to other matters than to reconstruction.

The government had initially envisioned a Reconstruction Fund (Article 15 of the Act) managed by the Reconstruction Authority and allocation of funds through a fast-track mechanism. But the construction fund was not created, while the establishment of the authority itself was delayed by eight months after the earthquake, due to political wrangling. Donors were already signing agreements with the Finance Ministry and the implementing agencies had already been selected by the time that the Authority was established. During the key informant survey, the study team was informed that the government did not activate the Reconstruction Fund because those funds by mandate could be mobilized by the Executive Committee (which is headed by the CEO). The Finance Ministry did not want to lose its control over the budget. The non-activation of the Reconstruction Fund crippled the financial autonomy of the NRA and turned NRA into a regular government agency dependent on the Ministry of Finance. The KII with the NRA Executive Director revealed that NRA suffered from under budgeting and external (MOF) control of the release of funds. It must also be said that the lack of special, accelerated financial provisions for the management and release of emergency funding/ post-earthquake reconstruction funding also constrained timely action. Post-disaster operations, both short and longer-term, require the government to develop and adopt special emergency measures – for financial management, procurement and deployment of human resources, for example - to facilitate timely disaster response and recovery. In FY 20777/78 too, the financial progress was 75 percent of the allocated budget (NPR 70,358,751,321).

**Human Resource Input (technical)**

In post-earthquake Nepal, 27 different development partners were found to be active in providing different types and durations of skill development training for reconstruction. As a result, 59,555 skilled and semi-skilled workers were trained, out of the total planned target of 80,119 workers during the 2016-17 two year period. Masonry activities represented 84.4 percent of the total occupational output, followed by other occupations related to the construction sector. Out of the total trained 50,330 masons, 69 percent (34,871) underwent short-term training, 29 percent (14,613) under 50-day training. The on-the-job training category followed, with 2 percent (846) under new mason training. (Hada, 2018).

## Table 4.5: List of Different Training for Reconstruction

| S. No. | Type of training | Duration | Planned | Trained | Trained as % of planned |
|---|---|---|---|---|---|
| 1 | Short-term Mason training (curriculum prescribed by DUDBC, others and ToT) | 7-10 days | 40213 | 34871 | 58.55% |
| 2 | Mason Training including OJT (curriculum prescribed by CTEVT L-1) | 50 days | 27260 | 14613 | 24.54% |
| 3 | New Mason training (curriculums prescribed by CSIDB) | up to 45 days | 1390 | 846 | 1.42% |
| 4 | Short-term Carpentry training | up to 25 days | 1537 | 927 | 1.56% |
| 5 | Carpentry Training (curriculum prescribed by CTEVT L-1) | 50 days | 1218 | 1086 | 2.04% |
| 6 | #REF! | 25days | 197 | 159 | 0.27% |
| 7 | Electrical Training (curriculum prescribed by CTEVT L-1) | 50 days | 290 | 278 | 0.49% |
| 8 | Short-term Plumbing training | | 161 | 77 | 0.27% |
| 9 | Plumbing Training (curriculum prescribed by CTEVT L-1) | 50 days | 82 | 82 | 0.14% |
| 10 | Social Mobilization Training | | 184 | 89 | 0.15% |
| 11 | Basic Engineers Training (curriculum prescribed by DUDBC) | 7 days | 2372 | 1726 | 2.90% |
| 12 | Other Training (awareness, refresher etc.) | | 5215 | 4801 | 8.06% |
| | **Total:** | | **80119** | **59555** | **100%** |

Source: HRRP 2018 (Hada, 2018)

There are approximately 7,500 technical personnel (engineers, sub-engineers, asst. sub-engineers), 236 social mobilisers and 774 mobile masons engaged in the reconstruction during 2020/21. The distribution of social mobilisers and mobile masons in 14 earthquake- affected districts is presented in Table 4.6.

## Table 4.6: Number of SM and MM mobilized in 14 EQ Affected Districts

| SN | Districts | No. of SM | No. of MM | SN | Districts | No. of SM | No. of MM |
|---|---|---|---|---|---|---|---|
| 1 | Okhaldhunga | 19 | 52 | 8 | Kathmandu | 32 | 63 |
| 2 | Sindhuli | 16 | 71 | 9 | Lalitpur | 15 | 53 |
| 3 | Dolakha | 18 | 74 | 10 | Makwanpur | 22 | 105 |
| 4 | Ramechhap | 15 | 60 | 11 | Rasuwa | 5 | 17 |
| 5 | Sindhupalchowk | 15 | 49 | 12 | Nuwakot | 14 | 51 |
| 6 | Kavrepalanchowk | 31 | 62 | 13 | Dhading | 21 | 64 |
| 7 | Bhaktapur | 7 | 37 | 14 | Gorkha | 6 | 16 |
| | | | | | **Total** | **236** | **774** |

Source: CLPIU-Building

### 4.3.2 Review of Financial and Human Resource Inputs

In principle, all the Governments formed during the reconstruction period showed their commitment to avail necessary resources and support to the NRA, but in practice, the NRA faced a shortage of resources at different times, with which to implement its projects in a timely fashion. For instance, the conversation with the NRA officials revealed that the *Ghantaghar*-related reconstruction project would have been completed, were the resources available.

Due to the lack of policy-related preparedness, housing grants, additional financial assistance to vulnerable groups and concessional loans could not reach the target earthquake victim sufficiently rapidly. This shows that the provision of inputs does not guarantee the use of those inputs by the target households, unless the policies and delivery mechanisms are in place.

The government experienced an acute shortage of technical manpower when it had to carry out damage assessments. It had to send engineering students to the field, with only short-term training. This alternative arrangement had certain implications for the quality of damage assessment and the supervision of housing reconstruction. Furthermore, the high turnover of technical personnel working in the field also to affected the speed of the reconstruction process.

As reconstruction progressed, the demand for labor—both trained masons and unskilled laborers—dramatically increased, with resultant shortfalls in many areas. This led to further increases in wages for construction laborers (TAF, Independent Impacts and Recovery Monitoring Phase 4 Qualitative Field Monitoring: April 2017).

# Chapter 5

# RECONSTRUCTION AND SOCIO-ECONOMIC IMPACT

Given the vast time and resources NRA, other government agencies, development partners, INGOs and NGOs have expended in reconstruction and livelihood enhancement programmes, there are bound to have positive socio-economic impact on the households. This chapter captures those socio-economic effect of reconstruction of houses, schools, health infrastructure and cultural heritages. The analysis of impact of reconstruction activities on socio-economic variables in divided into three sections. First, in part 5.1, descriptive statistics are presented in terms of graphs showing how socioeconomic indicators of interest have evolved for different years of housing reconstruction. Part 5.2 presents the results of actual regression, with causal interpretation. Part 5.3 presents the broader intangible socio-economic impacts in the households which were not captured in the survey questionnaire.

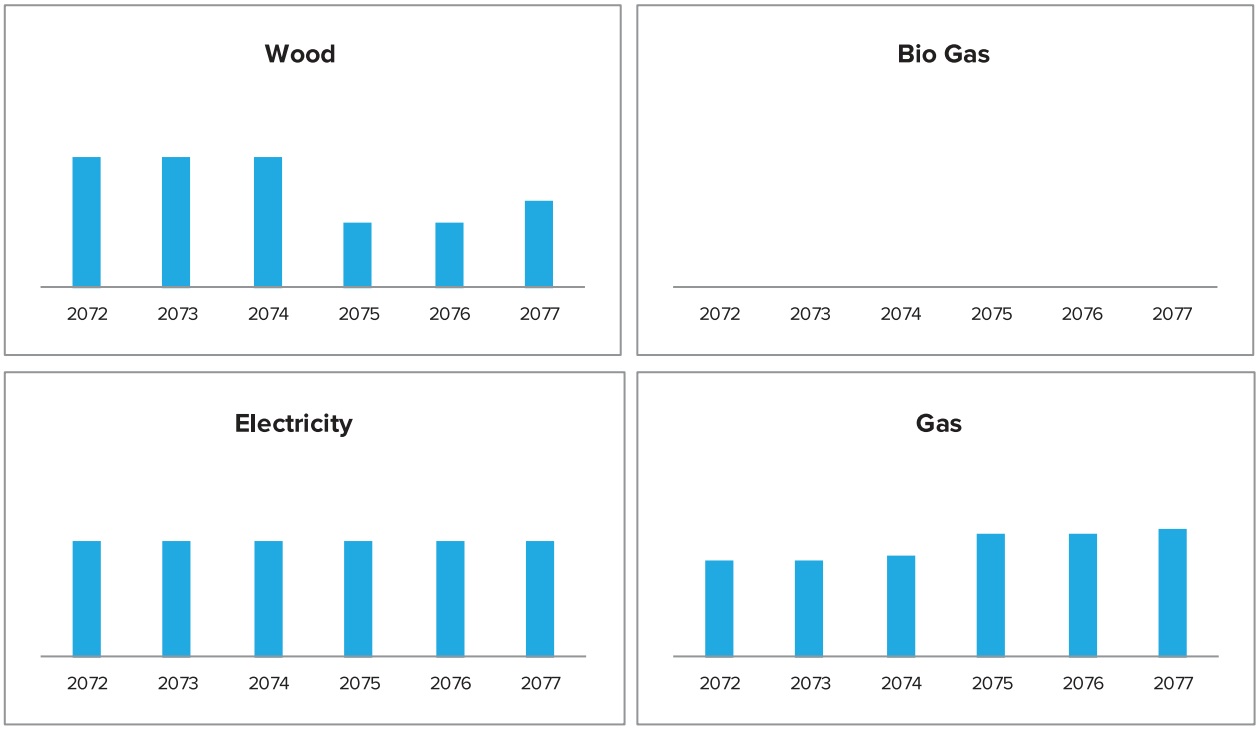
## 5.1 Descriptive Statistics

In this part, trends in socio-economic indicators such as energy for cooking source, drinking water source, share of children attending school, institutional delivery, availing post-natal care facilities, expenditure along with house construction year from 2072 to 2077 is presented in order to see the preliminary direction of the impact of reconstruction on the various in socio-economic indicators. In all the Graphs under the description statistics, the y axis represents level/share of households. The quantification of the impact and the possible channel for these changes is presented in the regression analysis in part 5.2 of this chapter.

***Household Energy Source for Cooking***

**House Construction Completion Year: 2072**

Graph 5.1: Household Energy Source for Cooking: House Construction Completion Year 2072




In the case of households whose house construction was completed in 2072, there was no significant difference in the use of firewood for cooking until 2074. The share of households using wood for cooking decreased in 2075 and remained the same in 2076. In 2077, there was a slight increase in the number of households using firewood for cooking, but this was still lower than the baseline share.

No households that completed their house construction in 2072, were using biogas as their source of energy for cooking in any of the following years. There was no change in the share of households using electricity as their energy source for cooking.

No substantial change was observed in the proportion of households that completed their houses in 2072, that used gas as their energy source for cooking until 2074. There was a slight increase in 2075 and the proportion remained constant until 2077.

**House Construction Completion Year: 2073**

In the case of sample households that completed their house construction in 2073, there was a decreasing trend in the use of wood as their energy source for cooking. Although the share of households using biogas for cooking decreased in 2073 and 2074, the share of households jumped back to the baseline share of 2072.

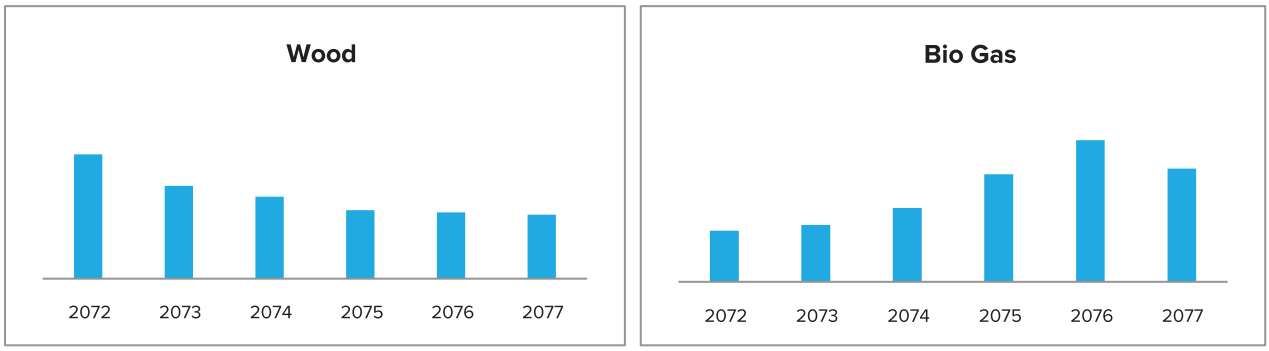
In the case of electricity as an energy source for cooking, there was an increase in the share of households from 2075 onwards. There was no change in the share of households that completed their house construction in 2073, using electricity as their energy source for cooking.

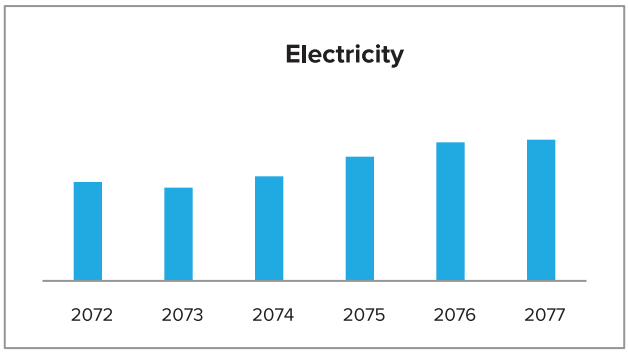
Graph 5.2: Household Energy Source for Cooking: House Construction Completion Year 2073

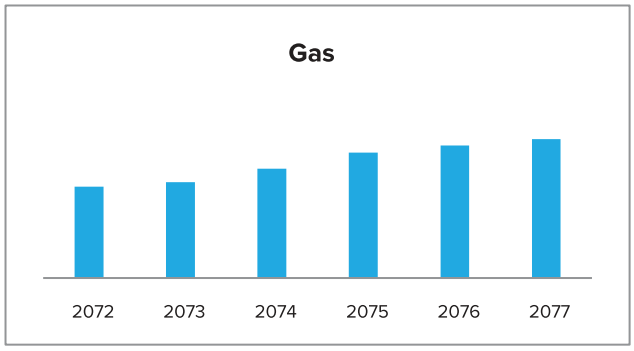
**House Construction Completion Year: 2074**

For households that completed their house construction in 2074, there is a slight decrease in the use of wood as the energy source for cooking. With regard to the share of households using biogas as an energy source for cooking, there was an increase in the share of households from 2074 to 2076, although there was a slight decrease in the number of households using biogas for cooking in 2077. Overall, the share of households in 2077 is higher than the share of households than 2074. As regards the use of electricity and gas as energy for cooking, there was an increase in the share of households from 2075, after the completion of house construction.

Graph 5.3: Household Energy Source for Cooking: House Construction Completion Year 2074





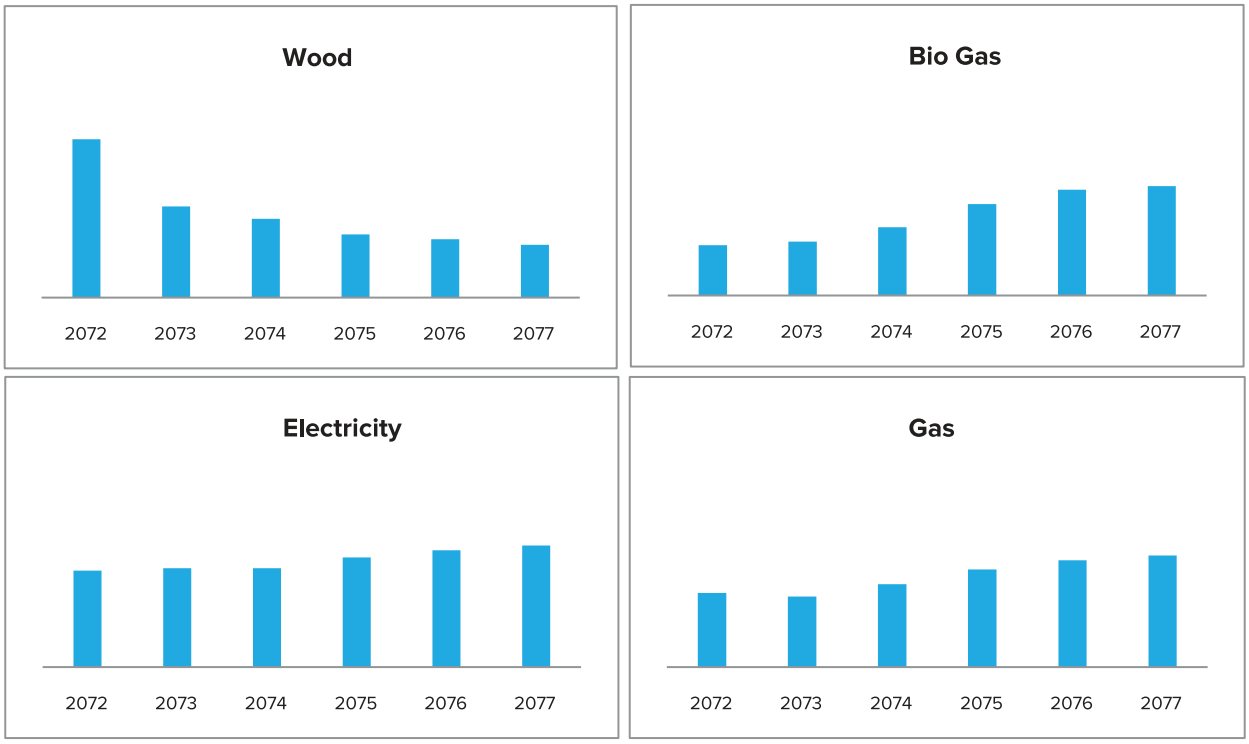




**House Construction Completion Year: 2075**

In households that completed their house construction in 2075, there was a slight decrease in the share of households using wood as their energy source for cooking. However, these are also households who were seeing such decreases in the year 2072-75 as well.

In contrast, there was an increase in the share of households that used biogas, electricity, and cooking gas as the energy source for cooking.

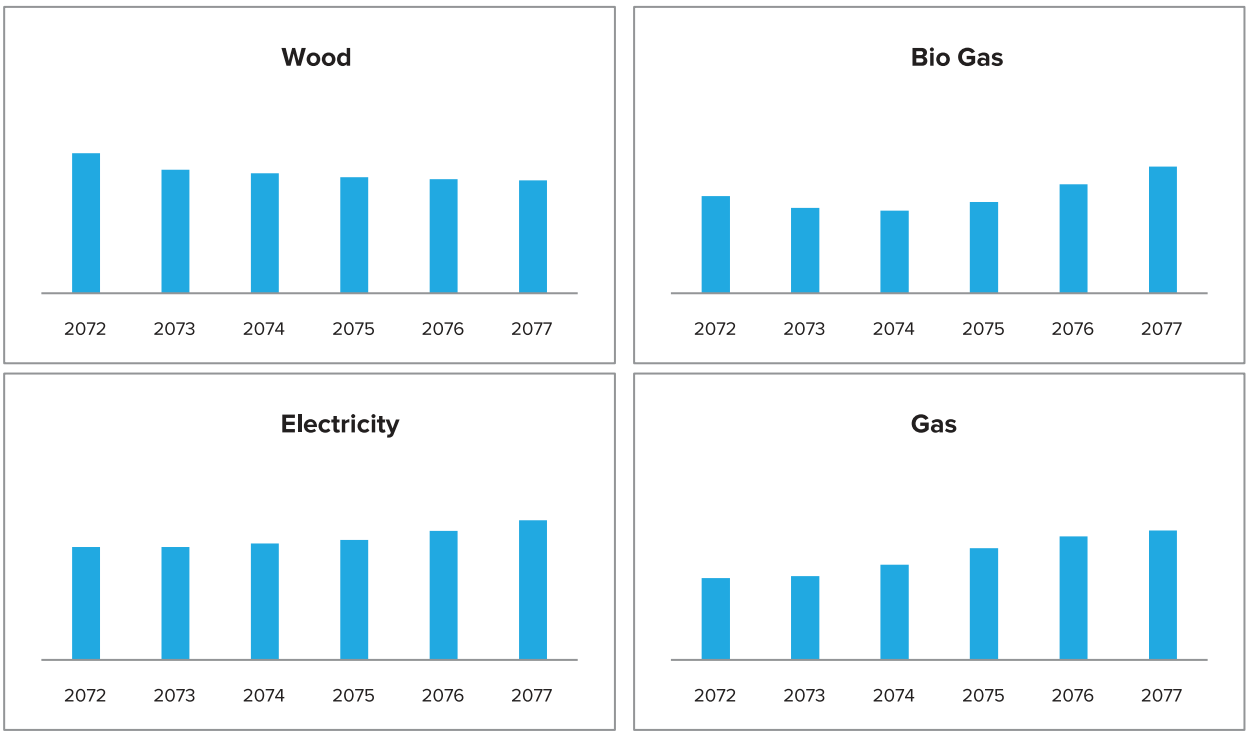
Graph 5.4: Household Energy Source for Cooking: House Construction Completion Year 2075




**House Construction Completion Year: 2076**

There was a slight decrease in the share of households using wood as their energy source for cooking for the households that had completed their house construction in 2076. In contrast, there was an increase in the share of households that used biogas, electricity, and cooking gas as the energy source for cooking. The highest increase was observed in the biogas users.

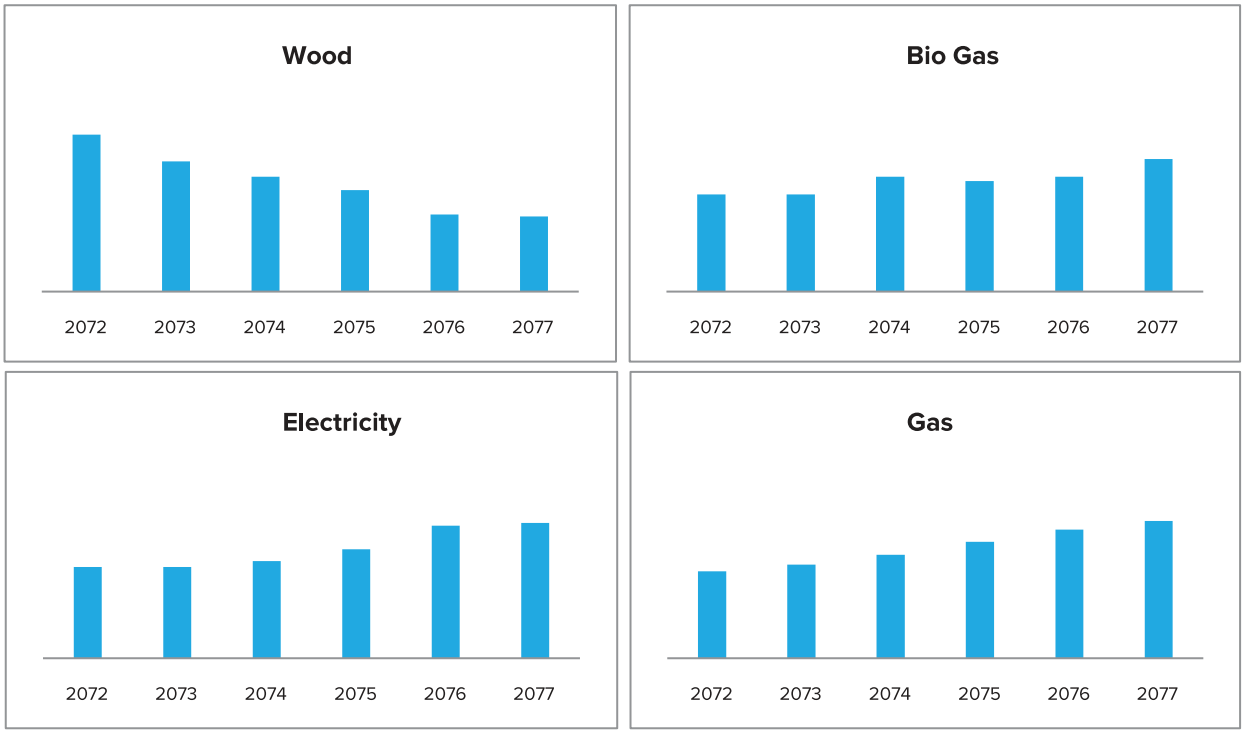
Graph 5.5: Household Energy Source for Cooking: House Construction Completion Year 2076




**House Construction Completion Year: 2077**

There was no change in the share of households using wood as their energy source for cooking who completed the construction of house in 2077. In contrast, there was an increase in the share of households that used biogas, electricity and cooking gas as the energy source for cooking in 2077. The highest increase was observed in the biogas users.

Graph 5.6: Household Energy Source for Cooking: House Construction Completion Year 2077




***Drinking Water Source***

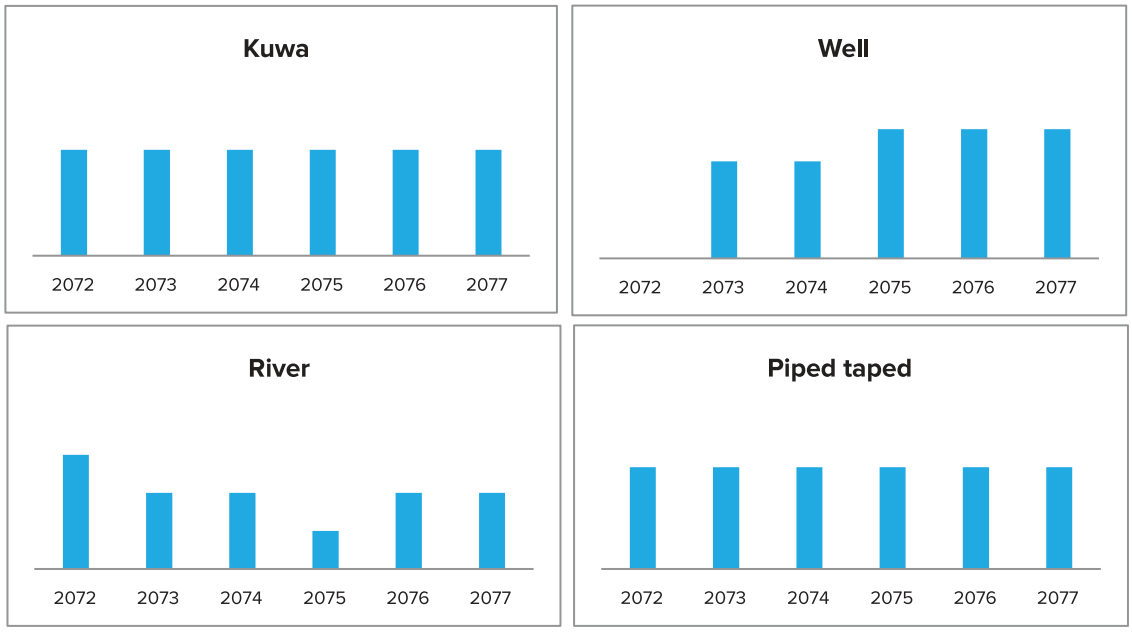
**House Construction Completion Year:: 2072**

There was no change in the share of households whose construction of housing was completed in 2077, using kuwa and piped tap water as their drinking water source until 2077.

For the households which completed the reconstruction of houses in 2072, there was a drastic increase in the share of the household using kuwa and piped tap water as their drinking water source in 2073. While the share of households was constant in 2074, the share of households increased in 2075 and remained constant until 2077.

There was a significant decrease in the share of the households using rivers as their drinking water source in 2073. This remained constant in 2074. Although the share of households using rivers as their drinking source further decreased in 2075, the share bounced back to the level of 2074 the next year (2076) and remained constant in 2077.

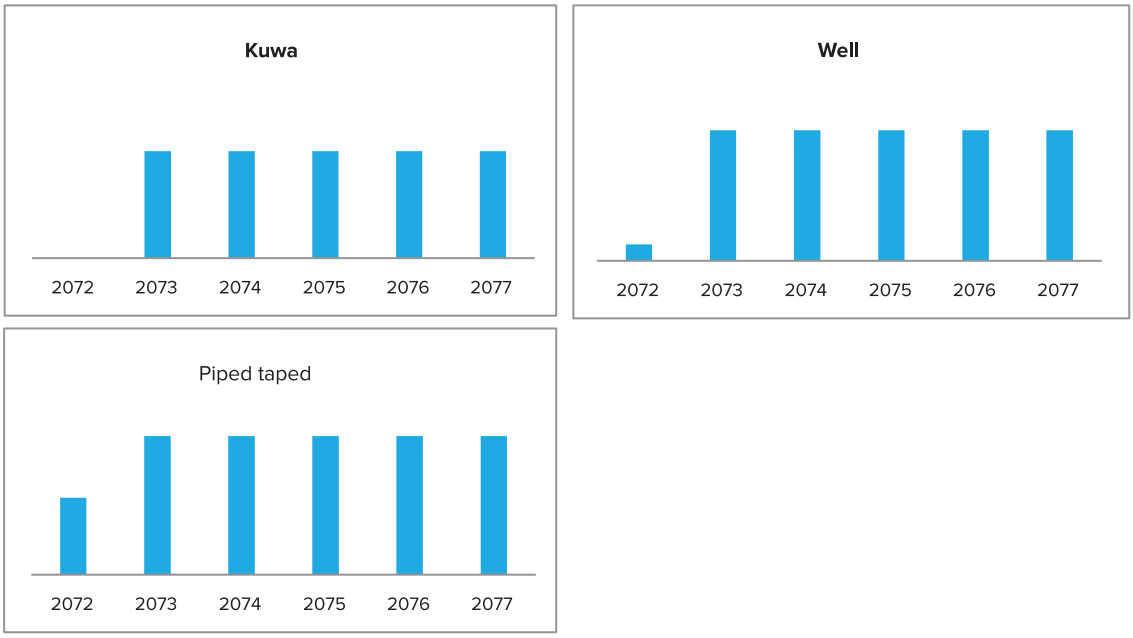
Graph 5.7: Drinking Water Source: House Construction Completion Year 2072




**House Construction Completion Year:: 2073**

In case of households whose reconstruction of houses was completed in 2073, there was a significant increase in the share of the households using kuwa, wells, and piped tap water as their drinking water source from 2073 itself. The share then remains constant until 2077.

Graph 5.8: Drinking Water Source: House Construction Completion Year 2073

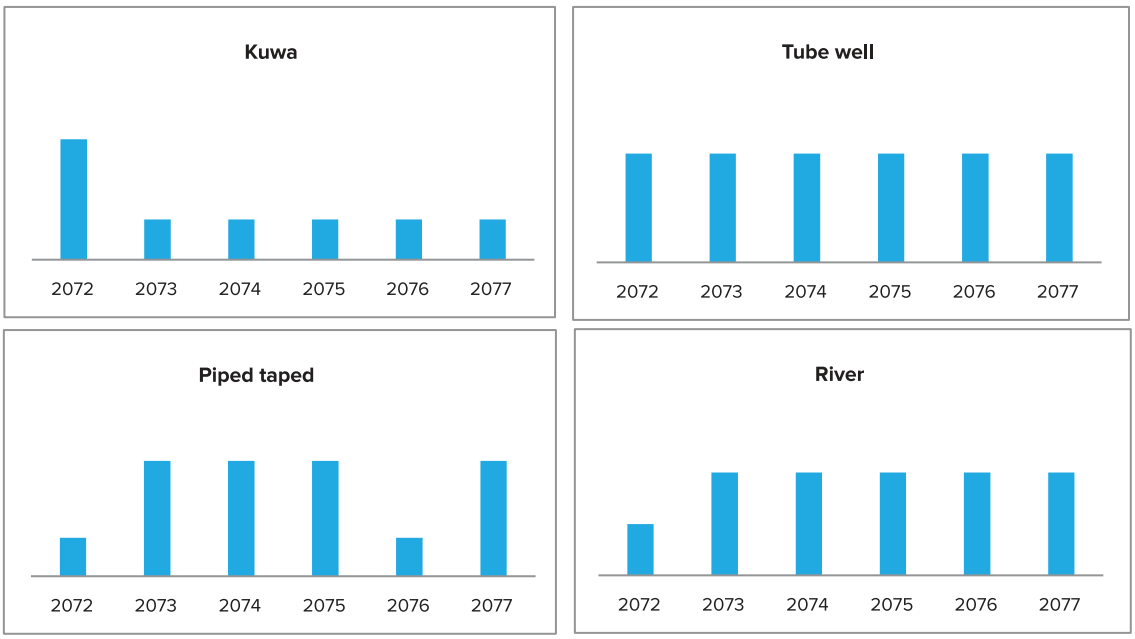


**House Construction Completion Year: 2074**

In the case of households whose reconstruction of houses was completed in 2074, there was a marginal increase in the share of the households using kuwa as their drinking water source in 2073; this remained constant until 2077.

For the households completing construction in 2074, there was no change in the share of households using tubewells as their drinking water source, before or after the construction of the houses.

Graph 5.9: Drinking Water Source: House Construction Completion Year 2074

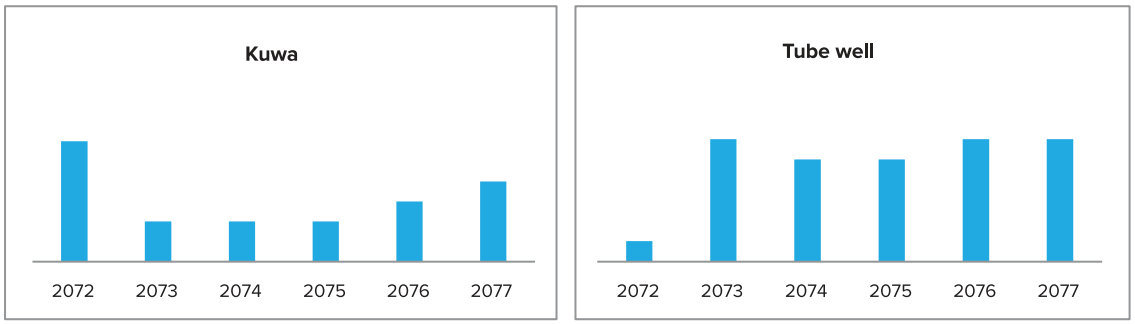


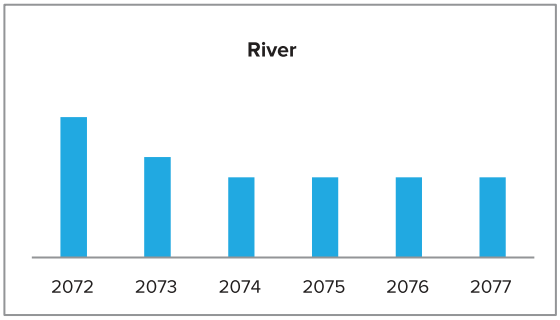

The share of the households using piped tap water as their drinking water source was constant in 2073, 2074 and 2075, even after the completion of the construction of the houses in 2074. Furthermore, the share of households using piped tap water as the source of drinking water decreased in 2076 but increased again in 2077.

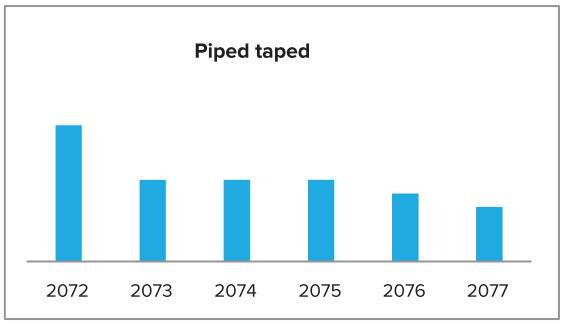
There was no change in the share of households who use rivers as a source of drinking water, even after the construction of the houses in 2074. The share of households using rivers as the water source remains constant from 2073 to 2077.

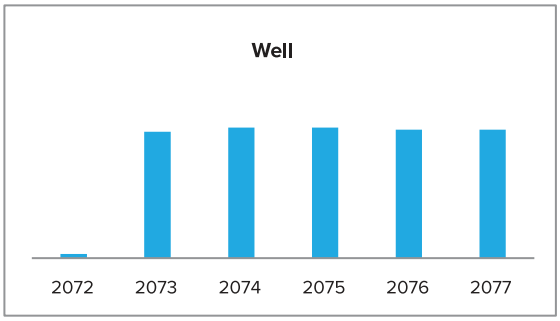
**House Construction Completion Year: 2075**

Graph 5.10: Drinking Water Source: House Construction Completion Year 2075






In the case of households whose construction of houses was completed in 2075, there was an increase in the share of the household using kuwa as their drinking water source in 2076 and 2077. But the share of the households using kuwa as their drinking water source in 2077 is less than that of 2072.

The share of households using rivers as their drinking water source was highest in 2072. The share of households decreased in 2073 and 2074 and then remained constant until 2077. Houses constructed in 2075 had no impact on the share of households using rivers as their drinking water source.
The share of households using wells as their drinking water source increased dramatically in 2073, but remained constant after that, until 2077. Even after the construction of houses in 2075, the share of households using wells as their drinking water source did not change.

In case of households whose construction of houses was completed in 2075, there was an increase in the share of the households using tube wells as their drinking water source in 2076 and it remained constant in 2077. The share of households using wells as their drinking water source was lowest in 2072, while in 2073, there was a dramatic increase in households with tube wells.

In the case of households whose construction of houses was completed in 2075, there was a decrease in the share of households using piped tap water as their drinking water source in 2076 and 2077. The share of households using piped tap water as their drinking water source was actually highest in 2072 and constant from 2073 to 2075.

**House Construction Completion Year:: 2076**
In case of households whose construction of houses was completed in 2076, there was a decrease in the share of households using kuwa as their drinking water source in from 2073 onwards. The construction of houses in 2076 did not change the share of households using kuwa as their drinking water source.

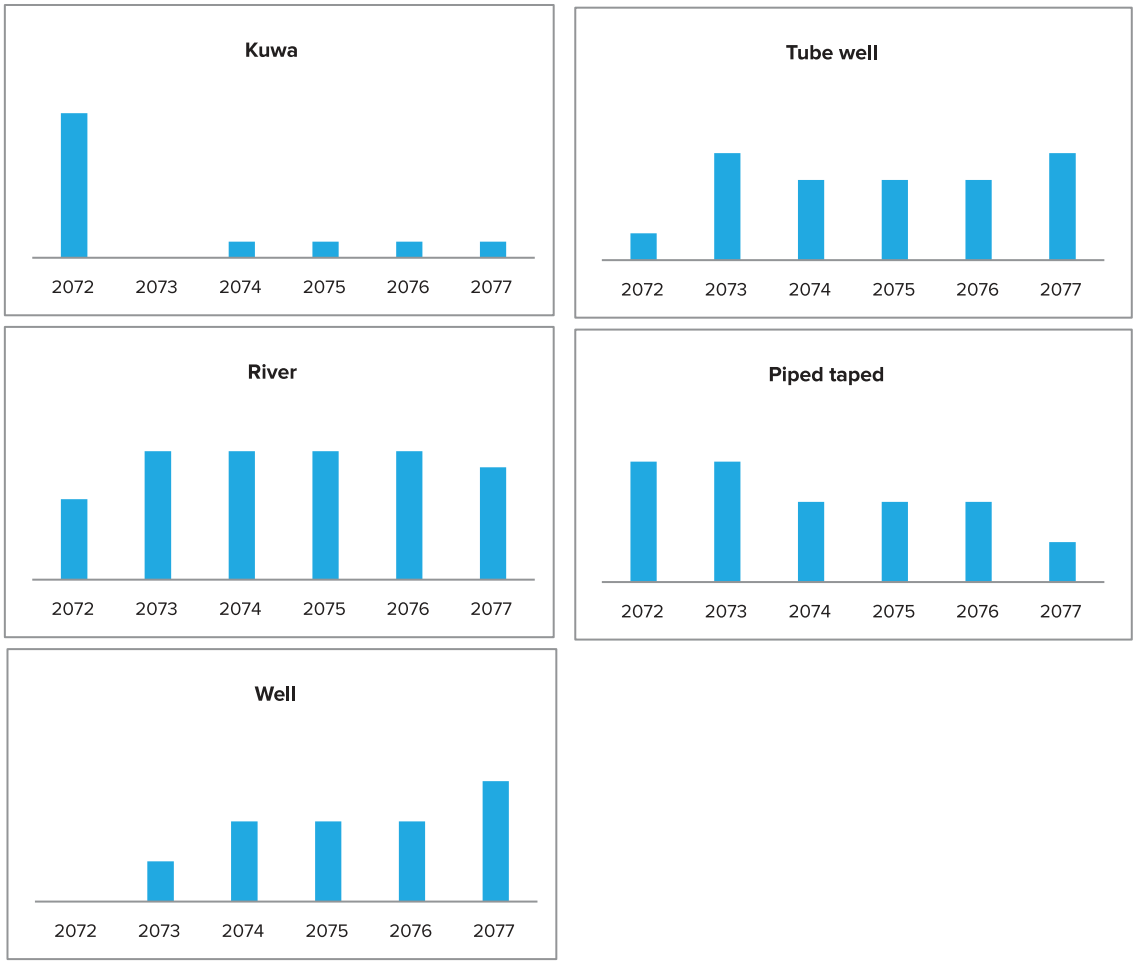
The share of households using rivers as their drinking water source increased in 2073 and was constant till 2076. The construction of houses in 2075 decreased the share of households using rivers as their drinking water source.

The share of households using wells as their drinking water source increased, compared with 2073. After the construction of houses in 2076, the share of households using wells as their drinking water source increased in 2077.

In the case of households whose construction of houses was completed in 2076, there was an increase in the share of the households using tube wells as their drinking water source in 2077. The share of households using wells as their drinking water source was lowest in 2072. In 2073, there was a drastic increase in households with tube wells.

In the case of households whose construction of houses was completed in 2076, there was a decrease in the share of the households using piped tap water as their drinking water source in 2077. The share of households using piped tap water as their drinking water source was actually highest in 2072 and 2073, which decreased in 2074 and was constant till 2076.

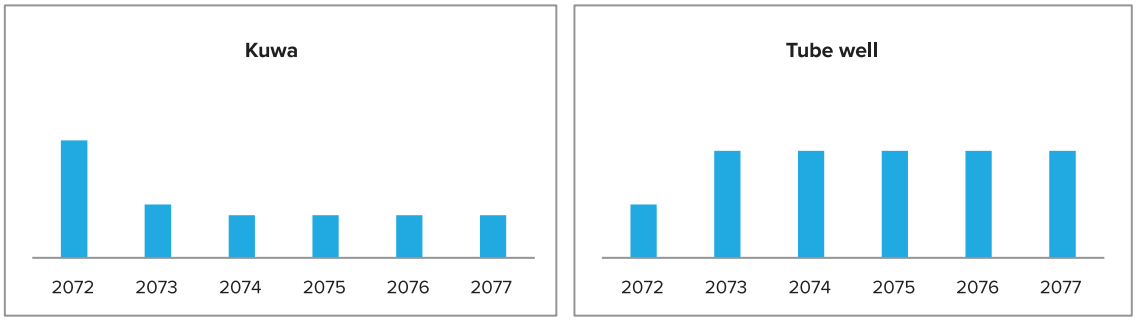
Graph 5.11: Drinking Water Source: House Construction Completion Year 2076

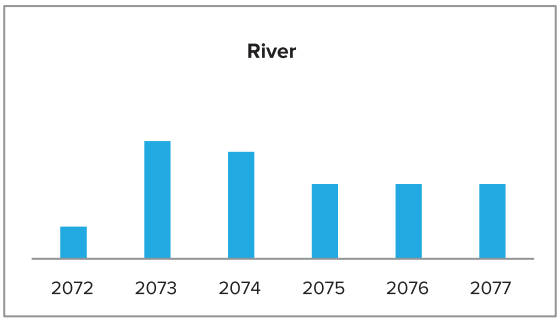


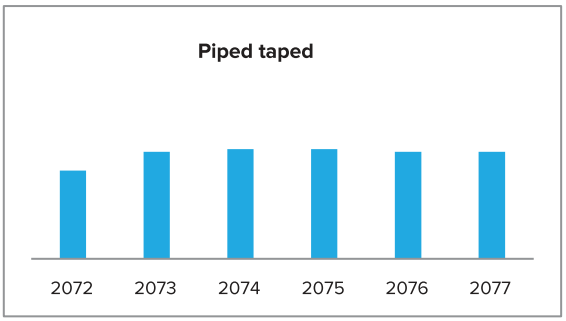

**House Construction Completion Year:: 2077**

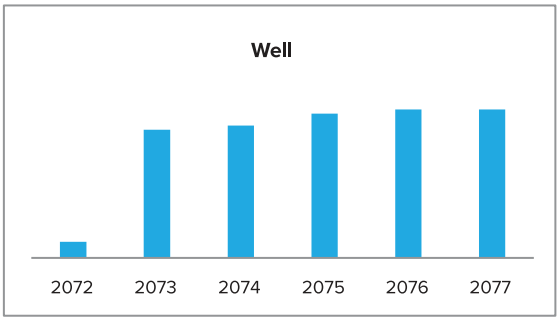
In case of households whose construction of houses was completed in 2077, there was no change in the share of the households using kuwa, rivers, wells, tube wells or piped tap water as their drinking water source in 2077.

Graph 5.12: Drinking Water Source: House Construction Completion Year 2077






***Total Expenditures***

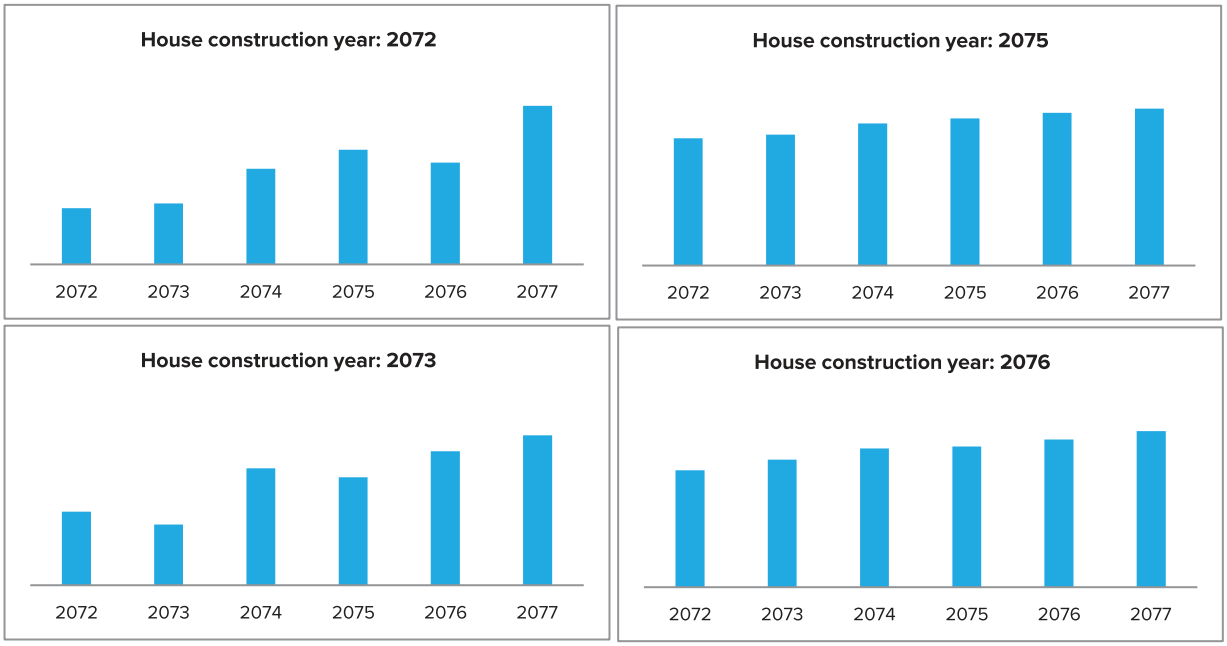
In general, there is an increase in the total expenditures of households that completed the construction of houses, irrespective of the completion year.

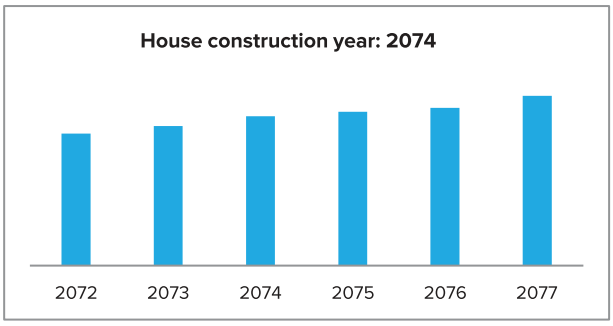
For the households whose house was constructed in 2072, their total expenditures remained constant in 2073. From 2074 onwards, there was an increase in the annual expenditures of the households, except for the year 2076.

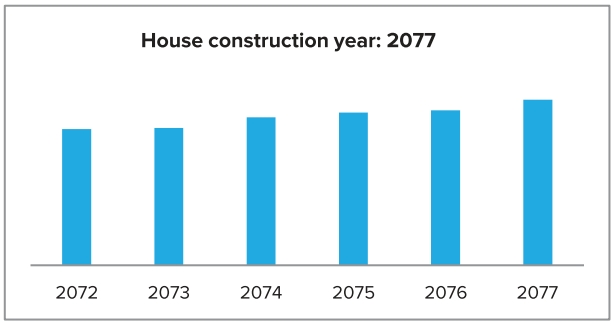
For households that completed the reconstruction of houses in 2073, there was a significant increase in the total expenditures of such households in 2074. While there was a dip in the total expenditures in 2075, expenditures increased again in 2076 and 2077.

In case of households whose reconstruction of houses was completed in 2074, 2075, and 2076, there was a marginal increase in total household expenditures in the subsequent years following the completion of the construction.

Graph 5.13: Total Expenditures: House Construction Completion Year 2072-2077






***Food Expenditures***

For the households whose house was constructed in 2072, the total expenditures on food were constant from 2073 to 2077, except for the year 2076, which shows a significantly lower expenditure on food.

In the case of households who completed their reconstruction of houses in 2073, there was an increase in household food expenditures in all subsequent years after the completion of house construction except for 2076; similar to households whose construction was completed in 2072, there is a substantial decrease in the expenditure on food in that year.

For the households where reconstruction of houses was completed in 2074, food expenditures were constant for the years 2075 and 2076, with a slight increase in expenditure in 2077.

For the households whose reconstruction of houses was completed in 2075, food expenditures were constant in 2076, with a slight increase in 2077.

For the households whose reconstruction of houses was completed in 2076, expenditures on food saw an increase in 2077.

Graph 5.14: Food Expenditures: House Construction Completion Year 2072-2077

***School Going Girls in Households***

In general, there is an increase in the number of school-going girls in households that completed the construction of their house construction irrespective of the completion year.

In the case of households whose houses were constructed in 2072, the average number of girls going to school in 2073 remained the same, while the numbers increase the following year 2074. While the average number of school-going girls remained constant for the next two years (2075 and 2076), it increased again in 2077.

For households whose houses were constructed in 2073, the average number of school-going girls increased every subsequent year except for 2076 (where it remained constant). For households whose house was completed in 2074, the average number of girls going to school increased in 2075 and remained constant in 2076. The average number of school-going girls increased again in 2077.

In case of households whose house was constructed in 2075, the average number of girls going to school remained constant in 2076 and increased in 2077. For households for which construction was completed in 2076, the average number of girls going to school increased in 2077.

Graph 5.15: School Going Girls in Households: House Construction Completion Year 2072-2077

Percentage of households with members in secondary school

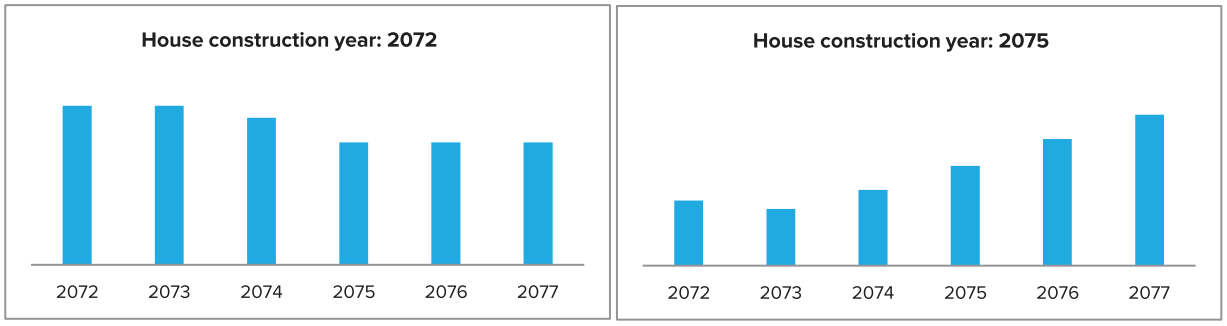
Graph 5.16: Percentage of Households with Members in Secondary School: House Construction Completion Year 2072-2077

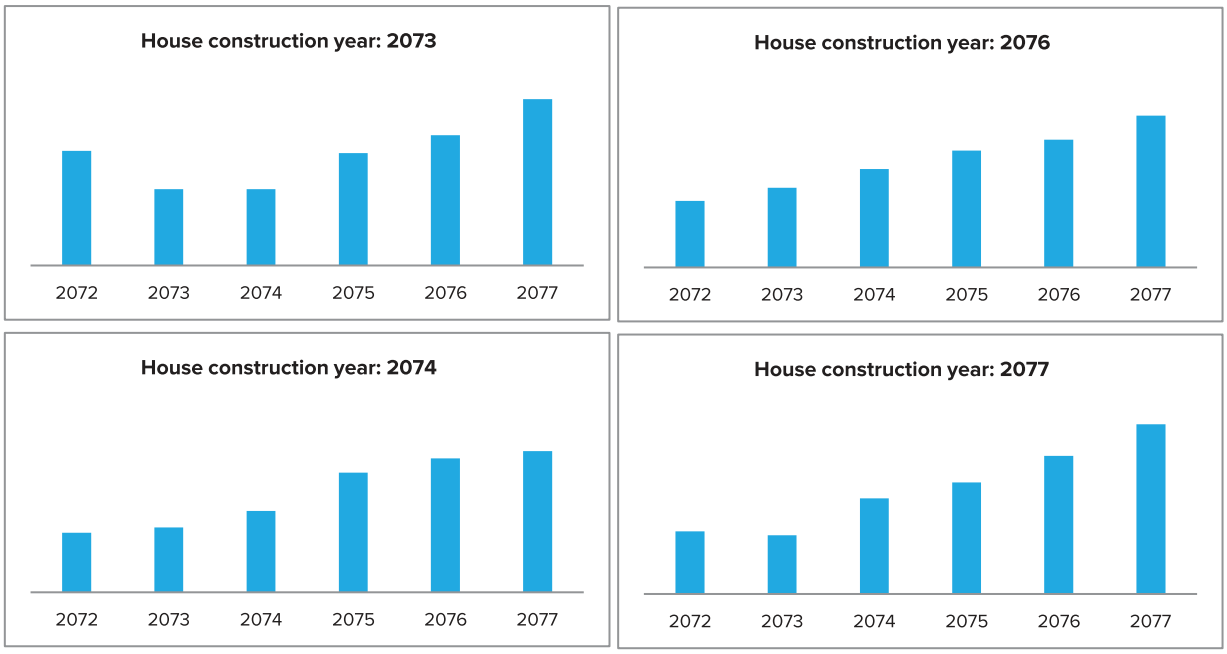
For the households who completed the construction of their houses in 2072, the percentage of household members in secondary school was constant, similar to 2072 in 2073. However, since 2074, there was a decrease in the percentage of households with members in secondary school.

For all other households whose house construction was completed from 2073 to 2076, the percentages of households with members in secondary school increased every subsequent year.

**Institutional Delivery**

Graph 5.17: Institutional Delivery: House Construction Completion Year 2072-2077






Institutional delivery refers to giving birth to a child in a medical institution under the overall supervision of trained health personal. For the households whose house construction was completed in 2072, the share of households with institutional deliveries decreased substantially in 2073. While the share of institutional deliveries increased in 2074, the share of households with institutional deliveries decreased in 2075 and 2076. In 2077, the share of households with institutional deliveries increased again and was on par with the share of 2074.

Similarly for the households whose house construction was completed in 2073, the share of households with institutional deliveries decreased in 2074. While the share of households with institutional deliveries increased in 2075 and 2076, the share decreased marginally in 2077.

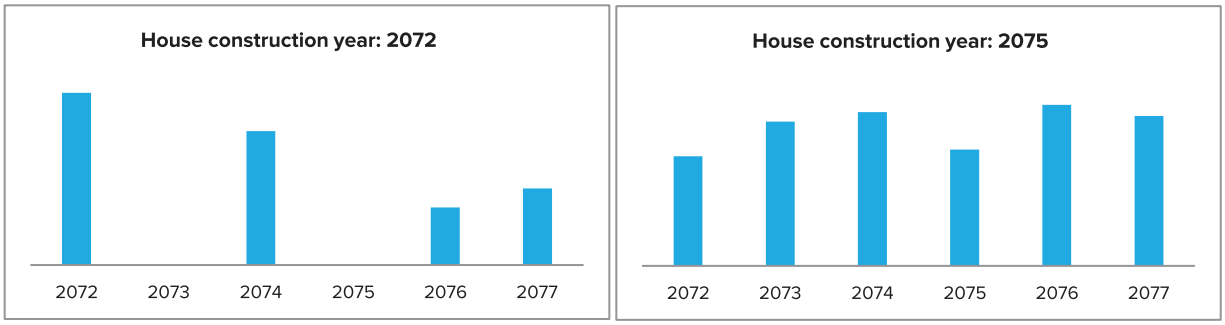
In case of households whose house construction was completed in 2074, the share of households with institutional deliveries increased in 2075 and 2076. The share of households decreased in 2077 and was equal to the share of households in 2074.

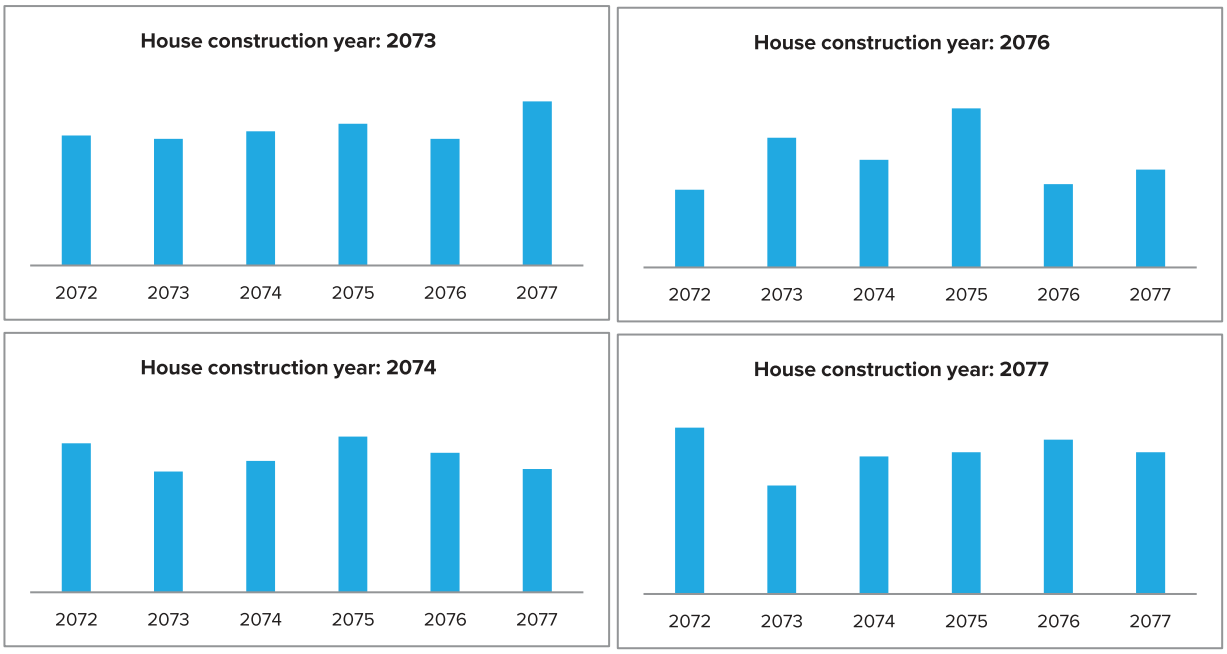
For households whose house construction was completed in 2075, the share of households with institutional deliveries increased in 2076 and 2077. The share of households with institutional deliveries was constant in 2076 and 2077 for those households whose house construction was completed in 2076.

***Attended Postnatal Care (PNC)***

In the case of households whose house construction was completed in 2072, the share of households attending PNC has a decreasing trend. The share of households attending PNC in 2073 and 2075 was zero. The share of households attending PNC was highest in 2074, 2077 and 2076.

Graph 5.18: Attended Postnatal Care: House Construction Completion Year 2072-2077






In case of households whose house construction was completed in 2073, the share of households attending PNC had an increasing trend. Although in 2076 the share of households attending PNC marginally decreased, the share of households rebounded in 2077 and was higher than all other years.

For households whose house construction was completed in 2074, the share of households with institutional delivery in 2075. The share of households attending PNC decreased in the next two years (2076 and 2077) and the share of households attending PNC was equal to that of the year 2074.

In case of households whose house construction was completed in 2075, the share of households attending PNC shows an increasing trend. The share of households attending PNC was higher in both 2076 and 2077 in comparison to 2075, but the share of households decreases marginally in 2077 in comparison to 2076. For households whose house construction was completed in 2076, the share of households attending PNC increased the following year in 2077.

## 5.2 Regression Analysis

**Household income, Expenditure and Debt**

Reconstruction of housing had a positive and significant impact on agricultural income and total income of beneficiary households. However, it had a negative impact on total debt and nonagricultural income. The signs of these results are same for both low and high impact districts. Surprisingly, we see the impact on agricultural income increasing, as compared to non-agricultural income. Total debts have decreased in low impact districts more to a greater extent than in high impact districts. On average, the reconstruction of a house was associated with a loss of NPR 6,590 annually in nonagricultural income for beneficiary when compared with non-beneficiary but contributed to the increase of NPR 10,310 in agricultural income in high impact areas for beneficiary as compared to non-beneficiary. In low-income areas, nonagricultural income was reduced by NPR 33,800.

The impacts of reconstruction on health and livelihood expenditure are mixed. In high impact districts, compared to non-beneficiary both health and livelihood expenditures have increased for beneficiary households, even when total household expenditures have decreased. On the other hand, in low impact districts, the impacts are insignificant (Annex 3). On average, for example, a household in the high impact district spent NPR 2,430 per year in health expenditure, even as total expenditure decreased.

In Annex 4 and 5, we find that reconstruction increased education and food expenditure in high impact districts in beneficiary households compared to non-beneficiary households. In the low impact districts the impact was insignificant. This variance across districts shows the important contribution of reconstruction. Reconstruction led to higher-level changes in the status quo in the high impact districts. Hence the significant impact on education and food expenditures there shows the rise in standards of living of beneficiary households as compared to non-beneficiaries.

**Source of Drinking Water and Source for Washing**

As Annex 6 shows, in the high impact districts, reconstruction decreased the probability of beneficiary households obtaining drinking water from rivers, streams and wells, but increased the use of tap water by one percent. In low impact districts also, we see similar small impacts. The significant difference is in the use of water from wells, which decreased significantly in the high impact districts in beneficiary households compared to the low impact districts.

The result is similar when it comes to the source of water for washing. The use of piped tap water has increased in both high impact and low impact districts significantly while the use of well water, Kuwa water or surface (river and stream) water has decreased in the beneficiary households compared to non-beneficiary households even though the significance is small in some of these cases. In low impact districts for beneficiary households, the use of tap water increased by 4 percent after the housing reconstruction compared to non-beneficiary households (Annex 7). Results indicate that irrespective of households in high impact and low impact district, construction of houses has decreased the use of unsafe water such as well, kuwa and river and stream and households have switched to tap water. Therefore, for future reconstruction programmes, WASH stakeholders should be an equally involved in such reconstruction programmes given the effectiveness of adoption of clean water sources in all sample districts.

**Source of light**

The reconstruction of houses was also associated with the increased adoption of biogas and solar as the source of light in high impact districts among beneficiary households when compared to non-beneficiary households which is an encouraging result (Annex 8). Off-grid electricity use has decreased, although insignificantly, whereas the use of kerosene as a source of light has also decreased significantly compared to non-beneficiary households in high impact districts. The increased availability of greener sources of light on the scale of districts may have contributed to the increased adoption of biogas and solar as the source of light in high impact districts. Therefore, in future reconstruction programmes should promote and focus on the adaptation of such green technologies.

Among the low impact districts, the adoption of biogas, solar and kerosene as the light source is insignificant. The beneficiary households in low impact districts are also six percent more likely to use non-grid electricity than before (Annex 8). Non-grid electricity's increase in popularity in low impact districts is a surprise but it is also likely that those districts were not in the critical path of expansion of grid electricity sources by Nepal Electricity Authority.

**Hospital Visits**

As results in Annex 9 show, both hospital visits and post-natal care have increased significantly in beneficiary households compared to non-beneficiary in high impact districts. While there is a small but significant (1.4 percent) increase in hospital visits in beneficiary households of high impact districts, a huge 44 percent increase has been seen in post-natal care in beneficiary households compared to non-beneficiary households. We also see a 6.2 percent increase in hospital visits among beneficiary households in low impact districts, and the impact of housing reconstruction on PNC is high but insignificant. The reasons behind these impacts is not clear due to limited questions in survey. It is likely that increased income contributed to these effects. It is also likely that access to newly constructed hospital contributed to the increased use of these facilities.

**Ownership of Modern Household Appliances**

Housing reconstruction also affected the ownership of modern household appliances. Our data indicate that reconstruction increased the possession of TV and mobile phones among the beneficiary households in comparison with non-beneficiary households in high impact districts. On average, 3.5 percent more households owned TV and 2.6 percent more beneficiary households owned mobile phone sets in the high impact districts whereas 4.9 percent more beneficiary households owned TV and 3.4 percent more beneficiary households owned mobile phones in low impact districts. The impact on the possession of landlines (telephone) was insignificant among both types of districts (Annex 10 and 11). Increased income and increased access to sources of modern energy in the reconstructed houses (as described above) might have contributed to this change.

Similarly, the impact of reconstruction on the possession of other household appliances such as refrigerators, computers and internet were different from the adoption of TV or mobile. For example, there was no impact on adoption of refrigerators and computers among beneficiary households compared to non-beneficiary households in high impact districts whereas internet adoption was slightly lower. Similarly, a very small increase (0.4 percent increase) in possession of refrigerators is observed among beneficiary as compared to non-beneficiary households in low impact districts. In those districts, the impact on the adoption of computers and internet is insignificant. There are two plausible reasons for the case of refrigerators. First, while TV and

mobile phones are often preferred and exclusively used by male, refrigerators make the life of a woman inside the house easier. Adoption of refrigerators therefore is a function of intrahousehold power and women may not have the power to force the household head to purchase it. Second, a refrigerator on average is more expensive than mobile or TV. These two factors jointly contributed to the lower adoption of refrigerators. Computers and internet, on the other hand, are more sophisticated and expensive and their low adoption rate may have been a function of many other factors. For example, the increased use of mobile phones may have negated the use of computers for many.

We also find insignificant impact on the possession on two wheelers, micro-ovens and washing machines among beneficiary households when compared to non-beneficiary households in high impact districts as well as low impact districts (Annex 12).

**Type of House**

Use of concrete pillars and earthen joints have increased significantly after the reconstruction in both high impact and low impact districts among beneficiary households in comparison to non-beneficiary households. The use of cement joints has significantly increased high impact districts. However, in low impact districts such adoption is small. It may be the result of many factors. First, most of the houses that were destroyed by the earthquake were old houses or temporary houses. Therefore, after living the devastating effect of the earthquake, households were more likely to build permanent houses as they were aware of the benefits of these methods. Next, the NRA had mandated households that received the grant to reconstruct houses following earthquake-resilient guidelines. And third, increased availability of such construction material and the increased income may have contributed to the increased adoption (Annex 13).

Furthermore, we find that housing reconstruction contributed to the increased adoption of earthen joined brick and stone walls among beneficiary households in high impact districts when compared to non-beneficiary households. It also increased more cement joint in high impact districts. However, among beneficiary households in low impact districts, reconstruction contributed to the increased use of cement joints only when compared to non-beneficiary. The impact on adoption of wooden joined wall is insignificant (Annex 14). This reflects that during future reconstruction projects, permanent earthquake-resilient buildings can be constructed if similar a reconstruction strategy, communication of the reconstruction strategy and availability of materials are ensured.

**Educational Attainment**

The study also estimated the impact of school reconstruction on different educational attainment related indicators. The enrollment of household members in primary schools and colleges has increased in high impact districts (Annex 15) though the impacts are insignificant across all variables in both the high impact districts and low impact districts (except for the impact of enrollment of households in colleges). These is because the impact of building schools on enrollment is not immediately realizable. Similar results are seen on the impact of school reconstruction on the percent of school going boys and girls. Furthermore, these results are insignificant for both the high impact and low impact districts (Annex 16).

**Hospital Visits, Maternal Mortality and Institutional Delivery**

The impact of hospital reconstruction on hospital visits, maternal mortality and institutional delivery are also positive but insignificant (Annex 17). Again, the results may be due to the fact that it is too early for these impacts to be realized and measured. In Annex 18, we show that post-natal care visits have also not been significantly affected by the health post and hospital reconstructions, although we see a rise in total births in high impact districts. We also see rise in total births for women belonging to 14-49 years age group.

**Tourism Business**

In the case of heritage reconstruction, we find that the number of family members of beneficiary households in the tourism business in high impact districts has increased due to heritage reconstruction in high impact districts. The impact of heritage reconstruction on tourism income and on the number of family members in tourism-related businesses is positive but insignificant (except for number of family members in tourism business in high impact districts) for beneficiary households of high impact districts and low impact districts when compared to non-beneficiary households (Annex 19).

## 5.3 Broader Socio-economic Impact of Reconstruction

In addition to the tangible output of the post-earthquake reconstruction, the reconstruction approach and policies have generated huge socioeconomic impacts in earthquake-affected areas. This part presents such major socio-economic impacts which were not captured in the survey questionnaire. Such major impacts include the deepening and widening of financial inclusion in the rural area, injection of hundreds of billions of reconstruction funds in the rural economy, increase in the capacity building of youth and women, enhanced and strengthened social cohesion, economic empowerment of women and improved rural infrastructures with better services. The study also revealed several positive impacts of the post-earthquake reconstruction work like increased awareness, skill development, piloting of integrated resettlement centers, youth & community mobilization and employment generation (TI Nepal, 2020). These impacts have had transformative power. However, these impacts need necessary support from the local governments in order to sustain them in the long run. Local governments can further link the current skill sets to the job market, through employment service centers and provide skill development training focusing on bankable livelihood opportunities. They can also assist particularly poor households, single women, differently able citizens and families in settling bank loans to enhance their livelihoods. The local government can play an instrumental role in linking families with enterprise and access to credit and markets. Local governments, with support from the provincial and federal governments, is capable of equipping schools and health institutions with necessary logistics and human resources, so that investment made in physical infrastructure generates quality services to the people.

### 5.3.1 Practical Standard Operating Procedures and Effective Delivery Mechanisms: Institutional Innovation for Inclusive and Resilient Reconstruction

The 2015 earthquake allowed Nepal to access the existing DRR framework and corresponding preparedness mechanisms designed to heighten the effectiveness of national readiness and response. However, in addition to existing useful disaster-related legislation, frameworks and organizations the government, by itself and through the NRA, issued further acts, regulations, a number of SOPs, guidelines and bylaws to address practical issues related to policy, institutional requirements and delivery mechanisms required for inclusive and resilient reconstruction. For example, the elaboration of operating procedures that provided land for reconstruction of housing for the landless and displaced people are especially noteworthy, as they successfully addressed the long-standing issue of land ownership for such groups. These documents will be instrumental in addressing the issues of future post-disaster reconstruction.

### 5.3.2 Deepening Financial Inclusion in Rural Areas

In order to maintain compliance and transparency, the government adopted a policy of distributing housing grants in three tranches through the banking channel. For this to work effectively, it was essential for earthquake-affected households to have access to banking institutions. As there were few or no banking facilities in the affected areas, the government instructed banks - mainly Nepal Rastra Bank, Nepal Bank Limited and Agricultural Development Bank Ltd - to open new branches in the earthquake-affected areas. Private banks were also encouraged to do so. This policy arrangement helped to expand and deepen financial inclusion in rural areas, which was one of the NRB strategies. The housing reconstruction program has been able to significantly contribute in promoting financial inclusion for women. Earthquake Housing Damage Characteristics Survey reveals that only 21% of 1,036,478 households surveyed had bank accounts, of which 5% bank accounts belonged to women. The provision of transfer of housing grants directly into beneficiary accounts, introduced by the program, has facilitated opening of bank account for 100% of participating households, of which around 30% bank accounts belong to women. The newly-opened banks have been providing services to both earthquake-affected and unaffected households equally and have been encouraging banking practices among the population. Citizens' bank accounts help to maintain transparency, lessen the risk of leakages in the distribution of social security allowances and provide opportunities for people to access loans from formal financial institutions at reasonable rates.

### 5.3.3 Financialization of the Rural Economy

Financialization is the increase in size and importance of Nepal's financial sector, relative to its overall economy. One of the transformative impacts of the reconstruction is further financialization of the rural economy, caused by a number of factors: the massive influx of foreign capital tied to earthquake response and reconstruction (e.g., grants and loans, as well as increased remittances); channeling of a significant portion of reconstruction funds through household-level reconstruction; the growth of financial and lending organizations and relations (e.g., bank branches, financial cooperatives, private lenders); and a move away from voluntary labor exchange towards cash-based wage labor and market exchange (Le Billon, et al, 2021.).

While the role of the financial market and financial institutions is not new to Nepal, financing for reconstruction facilitated an acceleration and, in some cases, a transition to more financialized practices (Paudel et.al., 2020). Financialization is in evidence in the engagement of many affected people in new entrepreneurship schemes through market centers, loan provisions, and most importantly, the transitioning of mostly subsistence farmers into skilled laborers (Epstein et al., 2018; Limbu et al., 2019; Suji et. al., 2020).

Government, development partners, civil society organizations and households invested a huge amount of money in the reconstruction of earthquake-affected structures, capacity-building and livelihood programs. The money so invested created employment opportunities, promoted local business, linked areas to the supply chain, and contributed to further monetization of the rural economy. The economy-wide effects of the investment have been reflected in its contribution to GDP.

On the other hand, cooperative behaviours, mutual self-help and community voluntary labor exchange traditions need to be protected and encouraged. Actors introducing cash for work programs and reconstruction programs reliant on cash transfers need to be diligent in understanding local self-help practices, to ensure that they are not displaced completely by financialization and the cash economy.

### 5.3.4 Capacity Building of Rural Youth and Entrepreneurship Development

During the course of post-earthquake reconstruction, training programs were run by the government and other partners in two major areas - reconstruction technology and livelihood promotion activities. Youth were provided various training opportunities designed to produce skilled manpower – for example, masons, carpenters, plumbers and electricians - for resilient reconstruction. As mentioned above, 59,555 skilled and semi-skilled workers were trained for reconstruction. Similarly, fresh engineering graduates were trained to conduct surveys of affected households, assess the damages resulting from the earthquake, and to conduct compliance auditing of building construction. Various I/NGOs and government agencies provided livelihood-related training, covering a wide range of sectors, from agriculture and livestock to business and enterprise development. About 100 thousand of skilled construction workers have contributed to the national reconstruction of Nepal.[37]

The capacity and confidence of earthquake victims in dealing with different parties has increased, as a result of their participation in local level planning, decision-making and negotiating with the government, NRA or other parties liable to provide support and services to them. The skills, knowledge and experience gained during the course of reconstruction will be a valuable long-term asset.

### 5.3.5 Diffusion of Resilient Technology

One of the immediate and most consequential impacts of reconstruction is the diffusion of resilient housing construction technology in earthquake-affected districts. Traditional masons and even young civil and architecture engineers had the opportunity to gain experience in resilient housing technology, through various training courses and field observation. The national building code 105 was developed and brought into operation. Retrofitting technology was developed even for those houses, which were constructed with local materials. The diffusion of the technology crossed the administrative borders of municipalizes and has trickled down to the periphery. The principles and techniques of resilient technology have been internalized by the concerned government agencies, such as the Department of Building, which will utilize it to lead house construction for poor people. Moreover, NDRRMA will utilize this approach and technology in future post-disaster reconstruction as well. In this way, the technology is being gradually diffused throughout Nepal, through a variety of different channels.

Prior to the 2015 earthquake, most rural infrastructure - principally housing and cultural monuments - was designed traditionally and constructed with traditional skills and local materials. This resulted in a diversity of designs and strength of materials. On the one hand, this gave a special character to many communities and highlighted their cultural diversity, which has economic as well as social importance also, for example for the tourism industry. On the other hand, inherent design weaknesses existed in rural settings with regard to seismic resilience, while many schools and health institutions did not have adequate space, furnishing and resilience.

After the earthquake, the reconstruction of structures was based on engineering knowledge, modern construction materials, and skilled masons. This has created a measure of uniformity in design, construction and outlook of reconstructed infrastructures. Where a large number of houses were rebuilt, settlements acquired a new look. In future reconstruction, it is important to find an appropriate balance between culturally-relevant traditional building techniques on the one hand and modern, seismically-resilient designs and construction techniques that improve the well-being of community members.

37 *CEO Sushil Gyawali in NRA publication " Punarnirman" June, 2021.*

### 5.3.6 Social Cohesion and Community Development

The April 25 earthquake and deadly aftershocks reminded everyone that all people are equal. People came out of their homes, talked with their neighboring communities, charted out survival strategies together and generously shared the little they had. These warm relations prevailed during the search and rescue period as well. During the reconstruction period, the community members were actively involved in policy debates and implementation of the reconstruction program. Together, the people in their communities voiced their opinions to ensure that they received the best possible support from the Government and other stakeholders. Ordinary farmers revived the *Aarma Parma* farming process of labor exchange, which was found especially instrumental in ensuring that the houses of the most vulnerable people (the elderly and those with disabilities, for example) were also reconstructed. This significantly increased social cohesion among neighbors. Social cohesion and intra-community solidarity at the local, especially in rural areas, remained strong or even increased after the earthquake (TAF, 2015).

### 5.3.7 Economic Empowerment of Women

Most of the development partners, UN agencies, and INGOs adopted the Gender Equality and Social Inclusion (GESI) approach in designing programs and to enhance women's participation in both reconstruction and livelihood programs. Women and vulnerable communities were given special priority in capacity-building training and employment opportunities. In Nepal's post-earthquake reconstruction, trained women masons broke the gender barrier. More than ten thousand women masons who successfully worked in housing reconstruction will continue to be engaged in the same profession. Prior to the 2015 earthquake, apart from engineering, women's participation in the construction sector was limited. Now, trained masons, both men and women, are already working in close coordination with the concerned local levels. Employment Service Centers at each local level can facilitate women's linkages with employment opportunities, or use their skills. Further, NRA procedure[38] made it mandatory to register land for residence in the name of both husband and wife, while purchasing land for landless or vulnerable people. This has helped promote shared ownership on land and empowered women.

### 5.3.8 Impact of Reconstruction on the Nepalese Economy

Reconstruction activities have created notable, positive change in the national economy, making a significant contribution to GDP, GNDI, GFCF, employment, and household consumption. As the volume of expenditure on reconstruction activities changes, the contribution of reconstruction on macroeconomic indicators moves in the same direction. It is apparent from the analysis that there is a direct relationship between reconstruction activities and the sectoral and overall performance of the economy, in terms of economic growth and its structure. Hence, construction and reconstruction activities play a significant role in the overall enhancement of the economy and will have a positive impact on the economic development of the country overall.

38 *भूकम्प पिडितलाई बसोबास योग्य जग्गा खरीद सम्बन्धी मापदण्ड -२०७४*

# CHAPTER 6

# LIVELIHOODS FOR EARTHQUAKE-AFFECTED FAMILIES

## 6.1 Impact of the Earthquake on Livelihoods

The 2015 earthquake not only affected housing and other physical infrastructure, but also affected the livelihoods of the people. It is estimated that the livelihoods of some 2.29 million households and 5.6 million workers were affected in 32 earthquake-affected districts. In terms of employment, approximately 94 million working days were lost (PDNA, 2016).

## 6.2 Livelihood Strategy and Objectives

The PDRF, a five-year plan based on the PDNA, set out five strategic recovery objectives, one of which is related to livelihood. It reads: "Develop and restore economic opportunities and livelihoods and re-establish productive sectors" (NRA, 2016a:9). The vision of the livelihood program is the establishment of a revitalized & robust (strengthened) livelihood support system. Its mission is to inspire, encourage and provide leadership in rebuilding the livelihood support system, through multi-stakeholder engagement.
The major objectives of the livelihood component of PDRF were the following:

- Revive and restore people's livelihood activities to the pre-earthquake state
- Diversify options & opportunities for income-generating activities
- Integrate livelihood issues into all components of the reconstruction process
- Support gender equality and social exclusion
- Provide special support to vulnerable groups affected by the earthquake.

## 6.3 Concept of Livelihood Recovery

Livelihoods in rural areas are complex and dynamic; global change has further accelerated this ever-evolving complexity, from which there is no escape for rural societies. A large number of rural livelihoods are directly related to natural resource availability (Scooner, 1998). Most rural households rely on multiple income sources and adopt a wide range of livelihood strategies for food security, due to inadequate income from any single occupation (Banskota & Pradhan, 2007). Various non-farm and off-farm activities for earning income are also important in rural areas for food and income security. Diversified livelihood systems are less vulnerable than undiversified ones (Ellis, 1998).

An ICIMOD publication "Strategic Framework for Resilient Livelihoods in Earthquake-Affected Areas of Nepal' 2015, states that the strategy for sustainable livelihood recovery needs to grasp emerging opportunities, engage local people and raw materials, be innovative, and take into account the local context. Sequentially, the immediate focus should be on helping local people seize available new employment opportunities in areas like clearing rubble, reconstruction of houses and infrastructure, and road-building, to provide immediate income. From the very beginning, local people's skills and capacities need to be enhanced for reconstruction work, as well as in agriculture and other vocational areas, to make their livelihoods more resilient. At the same time, farmers and micro-, small, and medium-sized enterprises (MSMEs) need to be supported with the supply of critical inputs like seeds, tools and credit, to enable them to restore their livelihoods and hopefully, upgrade or diversify them.

The damages to socioeconomic services caused by the earthquake and their combined impacts on livelihood and economic activities were huge (NPC, PDNA 2015a). For instance, the livelihoods of 2.29 million households and 5.6 million workers across 31 districts were severely affected, resulting in losses amounting to 94 million workdays and NPR 17 billion of personal income in FY 2015-2016. From the livelihood perspective, the most affected sector was agriculture, which lost 49 percent of its workdays, followed by tourism with 31 percent, industry with 12 percent and commerce with 8 percent. NPC (PDNA 2015a) has provided a picture of the losses of workdays and income for 14 highly-affected districts. Furthermore, the PDNA estimated that about 74,500 home-based workplaces were lost.

## 6.4 Employment Generation from Reconstruction

Several interventions have been made for the recovery of the livelihoods of victims of the earthquake, through livelihood programs. Government, Development Partners and INGOs provided an amount equivalent to NPR. 53,492 million (Table 6.1) through different livelihood support programs, to restore adequate living conditions of earthquake-affected households. Ten government ministries and dozens of departments, as well as 47 partner organizations, were engaged in the interventions through various activities, such as material distribution, skill training, and other targeted interventions. An NRA study on livelihoods[39] shows that 165.8 million workdays have been generated through several reconstruction activities – construction of private housing, roads and monasteries, buildings, schools, drinking water sources, access roads to factories, heritage reconstruction, as well as other all kinds of construction.

### Table 6.1: Employment Generated from Housing Reconstruction

| Area | No. of carpenter days | No. of mason days | No. of labor days | Total work-days |
|---|---|---|---|---|
| Rural | 4766771 | 5499081 | 7145933 | 17411785 |
| Urban | 1810467 | 2575233 | 3051484 | 7437184 |
| Total | 6577238 | 8074314 | 10197417 | 24848969 |

Source: SEIA survey (weighted)

Private housing construction has created considerable employment opportunities and income for supporting livelihoods. It generated 24,848,969 workdays of employment in the construction of private houses (Table 6.1).

## 6.5 Livelihood Projects

NRA identified 56 livelihood projects with a total value of NPR 88.8 billion, consisting of a range of support programs; skill development; capacity-building and training; developing marketing networks; support to specific activities; resilience-building; employment programs; replacement packages and others (business, food storage, animal sheds, materials, psycho-social counseling).

During the past four and a half years, the NRA, with the strong support of 10 government ministries and over 47 partner organizations, has initiated several approaches and actions to support the livelihoods of people in the earthquake-affected area, which are briefly summarized below:

**Joint activities for livelihood promotion:** The NRA, through line ministries such as Ministry of Agriculture and Livestock, Ministry of Industry and Commerce, Ministry of Tourism and Civil Aviation, has invested around NPR 1.5 billion in different activities in the earthquake-affected districts. It provided funds to the concerned ministries. These ministries, in turn, implemented livelihood programs in the field. Provision was made to provide subsidized business loans to the earthquake victims, while various livelihood related programs were conducted through non-government organizations and local communities (Source, in Nepali: Four Years of Reconstruction, NRA)

**Demand - based activities for livelihood promotion:** The NRA has spent approximately NPR 70 million in collaboration with partner organizations on these activities. Examples of are summarized below.

**Tripartite livelihood program:** Such programs were run by the NRA in collaboration with two other groups of partners, the concerned line ministries and the implementing NGOs. Under this program, some NPR 18 billion was spent in the field. According to the records of the NRA NGO section, 241 NGOs are engaged in reconstruction activities. They are mostly engaged in housing, education, health care and restoration of monuments and have conducted activities related to livelihoods as well. 47 NGOs have undertaken livelihood activities alone.

## 6.6 Approaches and Initiatives of INGOs and NGOs

The Association of International NGOs (AIN) has published a document of good practices in livelihood improvement during the reconstruction, a compilation of selected good practices experienced by its member organizations in Nepal.

39 *NRA (2021), The Rehabilitation of the Debris NRA's Efforts on Livelihood Interventions*

Action Aid Nepal launched its Community-Led Reconstruction Programme (CLRP), a three-year program, in November 2015, to address the physical and social damages of earthquakes and to build resilience within communities. This program covered six of the most affected districts: Sindupalchowk, Rasuwa, Kavrepalanchowk, Makwanpur, Dolakha and the Kathmandu Valley. The CLRP thematic areas were women's rights, livelihoods, land rights, building resilient communities and education.

The program claims that some 8 Climate Resilient Sustainable Agriculture models were tested; 64 women's groups and 38 Land Rights Forums were formed and mobilized; 53 landless farmers received land; 120 couples were awarded land ownership certificates; 9 alliances of land right movements were formed for policy advocacy; 10 capacity development sessions were provided to Land Rights Forums; 48 mitigation activities implemented and 48 micro-infrastructures repaired, reconstructed and maintained. All together, the program directly reached about 10,000 beneficiaries through livelihood interventions.

Practical Action undertook interventions to restore and promote livelihoods with the intended objectives of: a) Increasing access to alternative construction materials for affordable housing; b) Increasing access to technology for earthquake-resilient and affordable housing; c) Employment generation through establishment of rural micro-enterprises. The local enterprises were identified based on a feasibility assessment. Practical Action introduced technology to expedite the production of local materials and introduced simple technologies to ensure the quality of construction materials. The project supported enterprises like compressed stabilized earth bricks; stone cutting machines; mini-aggregate crushers; and timber treatment technology.

The project also identified, trained and mobilized micro-contractors operating at the local level in the project working districts. These micro-contractors have been provided with detailed contractors' training, were formally registered with district authorities and supported to build their capacity. The project facilitated the linkage of these micro-contractors to large contractors operating in their respective districts, so that they have access to capital to be able to undertake more contracts at one time. The outcomes of the project can be listed as follows:

- A total of 182 enterprises had been developed across the seven working districts by the projects. Among them, 101 are CSEB enterprises, 60 are stone-cutting enterprises, 12 timber treatment plants and 9 mini aggregate crusher enterprises.
- Over the duration of the projects, a total of 54 demand aggregation centers were developed. These centers rendered their services and availed quality construction material to approximately 12,800 households in rural areas.
- Through the enterprise development works and demand aggregation centers, 547 direct employment opportunities and 2,701 indirect employment opportunities have been created.
- A total of 483 masons were trained and linked to various contractors for the construction of houses. As all of this training was on the job training, a total of 57 model houses were constructed during the training.
- The project identified 22 micro contractors (already present and working at the local level) and provided detailed contractors' training to them.

Mercy Corps, as a humanitarian agency, reached over 23,500 households in the worst- affected communities with consolidated non-food items (NFI), unconditional cash transfers and WASH interventions and transitioned to earthquake recovery work that supported about 17,000 households to rebuild their homes, restore livelihoods and market systems through an integrated approach targeting disaster risk reduction and preparedness, access to financial services and livelihood opportunities, market system development and youth engagement components in six districts - Sindhupalchowk, Kavreplanchowk, Dolakha, Sindhuli, Makawanpur and Nuwakot.

The Mennonite Central Committee (MCC) and its partners selected the most affected poor and marginalized families, as the livelihoods of these people were obliterated by the earthquake. The activities included goat-raising training and goat support, goat-shed management, vegetable production training, commercial crop productions, cash-crop production training, market-linkage, off-farm income-generating skills, such as mobile-repairing, sewing and tailoring, chicken-raising and other activities.

CARE Nepal undertook an approach responsive to the needs of the extremely poor, to provide recovery support and to meet the needs of extremely poor households who are often left behind. In close coordination with local governments, households were also facilitated to prepare Livelihood Improvement Plans and were provided with startup support. Mobilizing program management committees at the ward level proved very effective for ensuring the best use of support. Households were given opportunities to select livelihood options based on their capability, endowment, interest and market possibility, which resulted in a high diversity

of livelihood engagements. According to the outcome monitoring report, extremely poor households have shown significant improvement in various dimensions of livelihoods, building economic and physical assets. Government and development agencies are recommended to apply this model in their disaster recovery and development work, in order to reduce the vulnerability of the extreme poor.

Caritas Nepal carried out interventions that included: (a) cash for work for the restoration of community infrastructure, (b) livelihood group formation and livelihood grant support (NPR. 22,000-35,000), (c) specialized on-and off-farm training, such as integrated pest management and pickle-making and (d) provision of soft loans to strengthen cooperatives. The results of the intervention are as follow:

a) Cash for work activities facilitated the implementation of the program and have met local needs for important infrastructure developments that helped the overall socio-economic development of the villages.
b) The livelihood training, extension and grant support package has helped households to pursue livelihood recovery and work together to access resources and market produce.
c) Strengthening of cooperatives has provided micro-finance services to a large number of vulnerable households
d) Specialized training and off-farm training has animated people to invest in and expand livelihood opportunities.

Catholic Relief Services (CRS) also provided key livelihood support services that included: distribution of an improved variety of seeds for paddy, maize, wheat; training programs on improved agricultural practices for paddy, maize and potatoes, with focus on production and seed storage; cash transfers for reconstructing goat shelters; goat breed improvement; training on improved goat management practices; cash for work to repair productive community infrastructure; training of off-season vegetable cultivation; and promotion of cardamom cultivation. While all the afore-mentioned interventions were well-received by communities, cash transfers for goat shelters were most appreciated by poor households and local stakeholders for the effectiveness of the intervention.

Christian Aid, with the objective of supporting the most affected communities and to build resilience in terms of livelihoods and agricultural capacity, supported the communities by providing seeds, agricultural tools, and livestock support. Christian Aid supported more than 5,000 individuals, focusing mostly on livelihood interventions to respond to the needs of earthquake survivors.

DEPROSC-Nepal in coordination with OXFAM implemented recovery and reconstruction programs with the purpose of increasing people's resilience. Initially, the intervention was based on provision of food vouchers, but gradually progressed towards capacity building, entrepreneurship development (micro-enterprises, cottage industry, small industry, home-based enterprises, small trades), infrastructure development (irrigation, processing plants, drinking water, roads, seed banks), technology transfer, market linkages (roads, collection centers, transport system, supply chain, processing, value-chain) and building institutional linkages with financial institutions.

## 6.7 Summary of Livelihood Approach and Interventions

The final draft of the compendium article "The Rehabilitation of Debris: NRA's Efforts on Livelihood Interventions" written by Bishnu Bhandari, Executive Member of NRA, provides the summary of livelihood-related activities, both of line agencies and partner organizations in five major groups of activities that contribute to the local economy. The article presents the summary of major livelihood activities carried out by the 10 most relevant government agencies and 23 key development partners.

### 6.7.1 Employment Generation

In terms of employment generation, the data show that 166 million workdays of employment have been generated during the reconstruction and recovery period (2072-2077). In other words, some 691,666 persons would have been employed for one year.

**Training of masons and semi-skilled manpower**

The second important output of the NRA during the past 5 years is the skill transfer to some 76,523 individuals. A total of 182 partner organizations were involved in providing training to masons in the field. The organizations include government agencies, donors, IGOs, INGOs, national NGOs, private organizations, and professional organizations. Out of the 50,880 masons, 11% were females who received mason training in different fields.

**Cash-for-work**

*Direct cash*: Cash was given directly to those victims who needed cash in hand to cope with the difficulties arising out of the earthquake. The Nepal Red Cross Society distributed NPR 5000 to 5,100 families, to enable them to purchase their agricultural tools, seeds, pesticides, sprayers and other materials. Another direct cash scheme was to give wages in cash to those who were in need of money through work programs such as road repair, repair and maintenance of irrigation canals, clearing debris, foot trails, or community infrastructure repair and maintenance. The Red Cross alone spent Rs. 1 billion under this scheme in the earthquake-affected areas. The type of work was mostly decided by the community, in consultation with local leaders and the participating NGOs. Other partners providing cash transfers were CARE Nepal, Caritas, CRS, Oxfam, DEPROSC, Handicap Nepal.

*Conditional cash scheme*: Commonly known as conditional grant support, this was given to those victims who took training organized by the participating NGOs. At the end of the training, they were expected to prepare a business plan. The participating NGOs like CARE Nepal gave the first tranche to the victims based on their business plans. The second tranche was given after the verification of the completion of the work by the participating NGOs.

*Seed money*: Another modality of cash for work was provision of seed money to support small savings and credit cycles. Beneficiaries formed groups and started depositing regular savings in a fund, which was used to provide credit to group members. Some partners such as Handicap International, INF and MCC provided cash as seed money for promoting income-generating activities and livelihood activities.

### 6.7.2 Material Support

Another form of livelihood intervention is the material support scheme, where materials were directly given to the victims. Beneficiaries use a voucher system, whereby the beneficiaries picked up the materials from designated points. The materials included seeds, agricultural tools, materials for building goat sheds, veterinary medicines, drip irrigation, plastic sheets for tunnel farming, plastic sheets for ponds, for example. Line ministries provided material support such as threshers, mini-tillers, corn shellers, hermetic bags, seeds, hybrid goats, chilling vats, fodder and grass species, machinery and tools.

### 6.7.3 Direct Intervention

Direct interventions included: (1) target-oriented interventions addressing people living with disability, single women, elderly, orphans, (2) productive sectors like agriculture, livestock-rearing, commercial farming, industrial plants and (3) site-based restoration aimed at revival or revitalization of lost means of livelihood, especially community and social infrastructure. Restoration sites were identified by community members. Victims working at such sites received cash for work.

## 6.8 Overall Assessment of Livelihood Program

Despite being one of the major components of the recovery and reconstruction strategy, the livelihood dimension did not receive the necessary attention from the side of the government. Government line agencies extended some of their ongoing programs in the affected areas. The NRA formulated a livelihood strategy and identified some project areas, but did not develop a livelihood program as such to implement in the earthquake-affected districts. Some INGOs and NGOs designed projects in isolation and implemented them in the areas they considered appropriate. As a result of this, affected people were treated differently in different areas.

Most of the capacity-building programs were aligned with the skills needed for housing reconstruction. People trained in these programs may face difficulty in finding jobs in the post-reconstruction era. Furthermore, longer-term employment opportunities for trained graduates is also lacking. Projects supporting the agriculture and livestock program may continue, but still need the supply of inputs, including credit, in the long run. Once the projects are over, people might have difficulty sustaining their livelihoods. Given the weakness of the NRA livelihood component, it is likely to have had a limited impact on helping a majority of earthquake-affected families to avoid falling into the debt trap.

Furthermore, the replication of good examples and cases has been infrequent, while linkages to market and market forces have not been strongly reinforced. Similarly, the outcome of interventions has not been followed up or monitored and provision of livelihood opportunities in integrated settlements has also been missing[40].

40 *Presentation on Livelihoods and Economic Recovery by Dr. Bishnu Bhandari in NRA Compendium Web-based Seminar dated November 28, 2020 NRA).*

# CHAPTER 7

# ANALYSIS OF THE MACROECONOMIC ENVIRONMENT

## 7.1 Overall Situation of the Economy: Pre and Post-Earthquake Period

Comparing the overall economic situation between the pre- and post-earthquake period, comparative growth in different sectors in pre-earthquake (2011-2015) and post-earthquake (2016-2021) periods is presented in Table 7.1. The year 2015-16 is taken as mid or common year for devising the analysis between two periods. The average economic growth of the last ten years from 2011 to 2020 is estimated to be 4.1 percent. The average growth rates of agriculture and the non-agriculture sector in the same period are 3.2 percent and 4.95 percent respectively. The average economic growth of the period before the earthquake (2011-2015) is found to be 3.39 percent and the same for the period after the earthquake (2016-2020) is 5.00 percent.

### Table 7.1: Gross Value Added by Industrial Division

**Average Annual Growth Rate**

| NSIC | Industrial Classification | Average annual growth rate 2011-2016 | Average annual growth rate 2016-2021 | Average annual growth rate 2011-2021 |
|---|---|---|---|---|
| A | Agriculture, forestry and fishing | 2.44 | 3.55 | 2.99 |
| B | Mining and quarrying | 4.35 | 9.16 | 6.44 |
| C | Manufacturing | 2.92 | 5.23 | 3.03 |
| D | Electricity, gas, steam and air conditioning supply | 3.92 | 14.99 | 8.34 |
| E | Water supply; sewerage, waste management and remediation activities | 7.70 | 2.51 | 5.82 |
| F | Construction | 2.87 | 7.48 | 5.16 |
| G | Wholesale and retail trade; repair of motor vehicles and motorcycles | 3.13 | 5.70 | 4.14 |
| H | Transportation and storage | 5.45 | 3.12 | 4.29 |
| I | Accommodation and food service activities | 3.99 | -0.40 | 0.93 |
| J | Information and communication | 14.47 | 5.22 | 9.93 |
| K | Financial and insurance activities | 3.39 | 7.21 | 6.19 |
| L | Real estate activities | 1.28 | 2.87 | 2.11 |
| M | Professional, scientific and technical activities | 4.79 | 4.52 | 4.86 |
| N | Administrative and support service activities | 9.84 | 8.91 | 10.62 |
| O | Public administration and defense; compulsory social security | 4.29 | 5.45 | 5.08 |
| P | Education | 4.35 | 5.15 | 5.48 |
| Q | Human health and social work activities | 4.31 | 6.33 | 5.67 |
| R, S, T, U | Other Services | 4.05 | 4.01 | 4.49 |
| | Agriculture, Forestry and Fishing | 2.44 | 3.55 | 2.99 |
| | Non-Agriculture | 3.85 | 5.32 | 4.59 |
| | Gross Domestic Product (GDP) | 3.57 | 4.96 | 4.31 |

*Source: National Accounts of Nepal, Central Bureau of Statistics (CBS).*

In most economic sectors, the average annual growth rates are higher in the post-earthquake period in comparison to the pre-earthquake period. For example, the 10 years average annual growth rate of GVA of the construction sector is 5.16 percent. While bifurcating the growth rate to pre- and post-earthquake periods, the numbers are 2.87 percent and 7.87 percent respectively.

There have been remarkable upward changes in the average annual growth rates in in the post-earthquake period, in sectors like electricity, gas, steam and air conditioning supply; manufacturing; wholesale and retail trade; repair of motor vehicles and motorcycles; finance and insurance activities; real estate activities; education; human health; and social work activities.

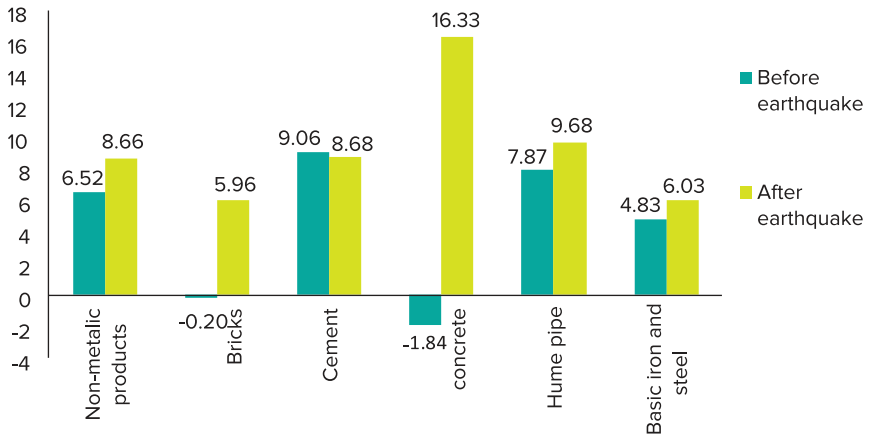
## Table 7.2: Summary of Macro Economic Indicators

| Macroeconomic indicators | Rs. millions | | | Percent | | |
|---|---|---|---|---|---|---|
| | 2010/11 | 2015/16 | 2020/21 | Average annual growth rate 2011-2016 | Average annual growth rate 2016-2021 | Average annual growth rate 2011-2021 |
| GDP at basic price(constant) in million Rs. | 1436073 | 1700448 | 2146824 | 3.44 | 4.77 | 4.10 |
| Primary Sector | 488851 | 551564 | 660491 | 2.47 | 3.67 | 3.05 |
| Secondary Sector | 200309 | 228514 | 319425 | 3.55 | 6.93 | 4.78 |
| Tertiary Sector | 746913 | 920370 | 1166908 | 4.02 | 4.86 | 4.56 |
| Final Consumption Expenditure | 1448115 | 1673400 | 2141781 | 2.40 | 5.06 | 3.99 |
| Gross Fixed Capital Formation | 373939 | 570679 | 815592 | 7.48 | 7.40 | 8.11 |
| Actual final consumption expenditure of household | 1369728 | 1586872 | 2023587 | 2.33 | 4.98 | 3.98 |
| Imports | 444232 | 714626 | 979293 | 9.29 | 6.50 | 8.23 |
| Exports | 121715 | 164739 | 130131 | 10.36 | -4.61 | 0.67 |
| Compensation of Employees at current prices | 578879 | 1072003 | 1616197 | 11.81 | 8.56 | 10.81 |
| Gross National Disposable Income at current prices | 1878089 | 3420376 | 5323554 | 11.02 | 9.25 | 10.98 |
| Per capita GDP at constant price (NRs.) | 58851 | 66018 | 78646 | 2.51 | 3.56 | 2.94 |
| Construction Deflator | 100.00 | 142.01 | 138.33 | 5.31 | -0.52 | 3.30 |
| Implicit GDP Deflator | 100.24 | 137.69 | 173.90 | 5.11 | 4.78 | 4.90. |

Source: Central Bureau of Statistics and Author's calculation

The average annual growth rate of GVA has increased in the post-earthquake period in all broad sectors: primary, secondary, and tertiary. But the change in the average growth rate of GVA in the secondary sector, of which the construction sector is a major component, is the highest (7.48 percent). Similarly, notable positive changes have been observed in the annual average growth rates in GFCF), actual final consumption, GNDI, and real per capita income, especially during the review period[41].

Graph 7.1: Average Growth Rate of Production of Construction Materials (%)




The average annual real per capita income has increased from 2.51 percent in the pre-earthquake period to 3.56 percent in the post-earthquake period (Table 7.2). The average rate of inflation during the review period is estimated to be 5.97 percent. The same for the pre- and post-earthquake period is observed to be 5.11 percent and 4.78 percent respectively. The overall inflation rate is found to be lower in the later period compared to the earlier one. The annual average growth rates in prices of the construction goods and services have decreased in the later period, compared to the same in the earlier period i.e., 5.11 percent during the period 2011-2016. The average annual increase in price is estimated to be 4.78 percent during the period 2016-2021. The decrease in the price level has had a positive impact on the real production and consumption of construction goods and services.

41 *Review period is the last 10 years (from 2011 to 2021).*

### Table 7.3: Annual Growth Rate of GDP by Economic Activities

*In percentage*

| | Industrial Classification | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
|---|---|---|---|---|---|---|---|
| A | Agriculture, forestry and fishing | -0.08 | 5.17 | 2.61 | 5.16 | 2.23 | 2.64 |
| B | Mining and quarrying | -2.69 | 14.60 | 9.40 | 17.62 | -2.23 | 7.49 |
| C | Manufacturing | -9.51 | 16.83 | 9.21 | 6.52 | -8.57 | 3.85 |
| D | Electricity, gas, steam and air conditioning supply | -8.61 | 22.84 | 10.38 | 9.61 | 25.58 | 7.74 |
| E | Water supply; sewerage, waste management and remediation activities | 7.33 | 3.03 | 4.57 | 1.22 | 2.15 | 1.61 |
| F | Construction | 0.12 | 18.68 | 12.10 | 7.48 | -4.99 | 5.56 |
| G | Wholesale and retail trade; repair of motor vehicles and motorcycles | -2.56 | 10.71 | 17.23 | 8.11 | -10.69 | 5.27 |
| H | Transportation and storage | 0.17 | 4.41 | 11.68 | 8.77 | -13.37 | 6.12 |
| I | Accommodation and food service activities | -7.98 | 13.39 | 12.21 | 9.92 | -36.97 | 11.20 |
| J | Information and communication | 1.69 | 13.65 | 2.14 | 7.05 | 2.30 | 1.45 |
| K | Financial and insurance activities | 8.90 | 9.80 | 9.43 | 6.35 | 4.75 | 5.82 |
| L | Real estate activities | 0.39 | 4.05 | 1.56 | 3.75 | 2.37 | 2.64 |
| M | Professional, scientific and technical activities | 1.93 | 8.71 | 4.95 | 5.61 | 1.20 | 2.32 |
| N | Administrative and support service activities | 11.96 | 16.28 | 18.62 | 6.44 | 2.15 | 2.17 |
| O | Public administration and defense; compulsory social security | 2.05 | 8.03 | 4.71 | 5.12 | 5.98 | 3.49 |
| P | Education | 7.15 | 7.21 | 5.83 | 5.98 | 3.20 | 3.60 |
| Q | Human health and social work activities | 3.34 | 7.40 | 5.87 | 6.69 | 5.20 | 6.53 |
| R, S, T, U | Arts, entertainment and recreation; Other service activities; and Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use | 4.52 | 4.69 | 4.63 | 5.92 | 1.77 | 3.09 |
| | Gross Domestic Product (GDP) | 0.43 | 8.98 | 7.62 | 6.66 | -2.09 | 4.01 |

Source: Central Bureau of Statistics

In 2015, negative economic growth in most of the sectors is observed. For instance, in agriculture forestry and fishing -0.08 percent, mining and quarrying -2.69 percent, wholesale and retail trade 2.56 percent, manufacturing -9.51 percent, electricity gas steam and air conditioning supply -8.61 percent, wholesale and retail trade repair of motor vehicles and motorcycles -2.56 percent, accommodation and food service activities -7.98 percent. The economy rebounded in the following years with an overall growth of 8.98 percent in 2016/17, 7.62 percent in 2017/18, and 6.66 percent in 2018/19. The economy was hardest hit again in 2019/20 by the COVID-19 pandemic resulting in overall -2.09 percent negative growth with double-digit decline in some major economic sectors such as accommodation and food service activities -36.97 percent; transportation and storage -13.37 percent; wholesale and retail trade -10.69 percent; repair of motor vehicle -10.69 percent; and manufacturing -8.57 percent (Table 7.3).

## 7.2 Funding Structure of Reconstruction

The total expenditure estimates in PDRF were further divided into different sectors of reconstruction and rehabilitation. The government, development partners, international and national non-government organizations, and households themselves took part in rescue, relief, recovery. and reconstruction stages.

### Table 7.4: Estimated and Actual Sectoral Expenditure for Reconstruction

| Source: | PDNA estimates 2015 | PDRF estimates 2016 | Actual Expenditure 2015/16-2020/21 | Actual expenditure/ PDRF estimates (percent) |
|---|---|---|---|---|
| | NPR millions | NPR Millions | NPR millions | Percent |
| Agriculture livestock and irrigation | 15561 | 26894 | 2571 | 9.56 |
| Commerce and industry | 27408 | 11000 | | |
| Communications | 4939 | 4939 | | |
| Community infrastructure | 4450 | | 12720 | |
| Cultural and heritage | 20553 | 33800 | 2189 | 6.48 |
| Disaster risk management | 8204 | 4248 | 1147 | 27.00 |
| Education | 39761 | 180628 | 94571 | 52.36 |
| Electricity and renewable energy | 18586 | 15028 | | |

| Source: | PDNA estimates 2015 | PDRF estimates 2016 | Actual Expenditure 2015/16-2020/21 | Actual expenditure/ PDRF estimates (percent) |
|---|---|---|---|---|
| | NPR millions | NPR Millions | NPR millions | Percent |
| Employment and livelihood | 12547 | 5878 | 53492 | 910.04 |
| Environment and forestry | 25197 | 28451 | 891 | 3.13 |
| Financial sector | 33472 | 33472 | 1 | |
| Gender and social inclusion | 1086 | 4642 | 4 | 0.09 |
| Governance | 18442 | 3065 | 1031 | |
| Government building | | 29778 | 29469 | 98.96 |
| Health | 14690 | 17493 | 10522 | 60.15 |
| Private Housing | 327762 | 376119 | 269684 | 71.70 |
| Nutrition | 5036 | 7461 | | |
| Social protection | 6398 | 7758 | | |
| Tourism | 38710 | 917 | | |
| Transport | 28185 | 24924 | 14671 | 58.86 |
| Water and sanitation | 18106 | 21247 | 7841 | 36.90 |
| Others* | | | 84512 | |
| Sub total | 669505 | 816495 | 585316 | 71.69 |
| Own account housing reconstruction** | | | 282575 | |
| **Total** | | | **867891** | |

*Note: Miscellaneous, rescue recovery and rehabilitation including cash and in-kind transfers to households outside the PDNA and PDRF.

** Not included in PDNA and PDRF estimates.

Sources:

- PDRF sector reports
- Nepal PDNA report 2015
- National Reconstruction Authority (NRA, CLPIU) database
- Ministry of Finance, post-earthquake assistance portal
- Ministry of Finance, budget details (Red Book)
- Ministry of Finance, Development Cooperation Nepal 2015-2020
- Socioeconomic Impact Assessment Survey 2021

If we compare with the PDRF estimates, funding gaps are observed in many sectors. In some sectors, the actual expenditure was less than 50 percent e.g., agriculture livestock and irrigation (9.56 percent), culture and heritage (6.48 percent), disaster risk management (27.0 percent), environment and forestry (3.13 percent), gender and social inclusion (0.09 percent), water and sanitation (36.09 percent) (Table 7.4). The rate of expenditure is above 50 percent in some sectors such as government building (98.96 percent), private housing (71.70 percent), health (60.15 percent), transport (58.86 percent) and education (52.36 percent).

## 7.3 Impact of Reconstruction on Domestic Industrial Goods Production.

Due to the reconstruction activities, and livelihood and employment promotion activities, a significant positive change has been observed in the domestic production of construction materials – cement, bricks, iron rods, wood, corrugated sheets etc. (Graph 7.1.1).

It is evident from graph 7.1.1 that the growth rates in the production of construction materials have increased significantly in the post-earthquake period as compared to the pre-earthquake period. There are remarkable upward changes in the annual production rate of non-metallic products (8.66 percent), bricks (5.96 percent), concrete (16.33 percent), home pipes (9.68 percent), and basic iron and steel (6.03 percent). The increase in the demand for such goods and services clearly indicates the positive impact on generating value addition in other sectors of the economy.

## 7.4 National and International Financing

PDRF had identified several projects for relief, recovery, and reconstruction. The government -funded the majority of these activities with the support of international development partners, national and international non-government organizations, and the private sector.

In the International Conference on Nepal's Reconstruction (ICNR 2015) was held in Kathmandu on 25 June 2015, the international community pledged NPR 410 billion.

The commitment of aid realized from the beginning of the relief, recovery, and reconstruction processes is shown below. However, the real commitment was only 321 billion[42]. Finally, NRA was successful to conclude agreement for NPR 313 billion (97.5 % of the real commitment) with the donors by the end of Fiscal Year 2020/21.

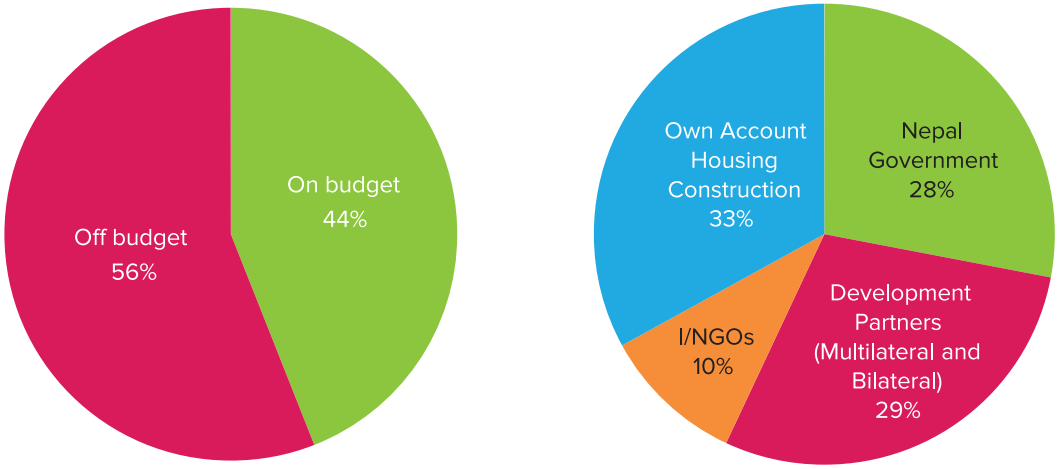
## Table 7.5: Financing for Reconstruction by Funding Agencies

(At current prices) NPR millions

| Funding agencies | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Total | (Percent) |
|---|---|---|---|---|---|---|---|---|
| On budget | 22447 | 49674 | 114749 | 89521 | 52480 | 52972 | 381844 | 44.00 |
| Nepal Government | 20515 | 30277 | 65947 | 57920 | 32700 | 31875 | 239234 | 27.56 |
| DPs Grants | 127 | 4948 | 8517 | 630 | 18 | 1965 | 16205 | 1.87 |
| DPs loan | 1805 | 14449 | 40285 | 30971 | 19762 | 19132 | 126404 | 14.56 |
| Off budget | 49195 | 108145 | 134868 | 102596 | 58548 | 36841 | 486046 | 56.00 |
| DPs direct grants | 26345 | 39479 | 36915 | 5863 | 2930 | 1758 | 113290 | 13.05 |
| I/NGO grants | 13589 | 38358 | 25035 | 13744 | 3481 | 121 | 90181 | 10.39 |
| Own-account housing construction | 9261 | 30308 | 72918 | 82989 | 52137 | 34962 | 282575 | 32.56 |
| **Total** | **71641** | **157820** | **249617** | **192118** | **111029** | **85666** | **867891** | **100.00** |

Sources:
a. National Reconstruction Authority (NRA, CLPIU) database
b. Ministry of Finance, post-earthquake- assistance-portal
c. Ministry of Finance, budget details (red book)
ministry of Finance, Development Cooperation Nepal 2015-2020
socioeconomic Impact Assessment Survey 2021

Graph 7.2 A: Financing for Reconstruction & Graph 7.2 B: Financing for Reconstruction




The Government of Nepal financed the rescue, relief, recovery, and reconstruction activities through on-budget annual programs. Out of the total expenditure, including own account construction, the government spent 28 percent from domestic sources (revenue and internal borrowing). Similarly, the development partners, multilateral and bilateral agencies, contributed 29 percent through on-and off-budget; and international and national non-governmental agencies expended 10 percent in different activities related to reconstruction. Under the off-budget programs, the Development Partners and I/NGOs carried out reconstruction programs and activities based on the guideline framework provided by the NRA. Moreover, households made a complementary but significant investment in house reconstruction as the amount of housing grants provided by the government was not sufficient. It is estimated that NPR 282.6 billion, which is 33 percent of the total reconstruction expenditure, was contributed by the households themselves (Table 7.5).

42 *Out of the total pledged figure Rs. 410 billion, the share of Government of India was Rs. 140 billion. But the real commitment of the Government of India stood only Rs. 100 billion. Out of this Rs. 100 billion, Government of Nepal source transferred Rs. 49 billion to other infrastructure sectors and so the Reconstruction sector received Indian commitment of only Rs. 51 billion.*

## 7.5 Current and Capital Expenditure

The total expenditure on reconstruction can be divided broadly into two categories: capital expenditure and current expenditure. The capital expenditure is directly related to reconstruction of capital goods and services. This includes expenditure on the reconstruction of private housing, education buildings, government building, health institutions, road construction, community infrastructure, research and development, water and sanitation, cultural heritage reconstruction, integrated settlement, environment and land conservation, land improvement and development, and so on. Expenditure made on these categories of reconstruction is defined as capital expenditure and part of total gross fixed capital formation.

Current expenditure encompasses rescue and relief, livelihood support, miscellaneous administrative expenses, education and health support, cash and kind transfers, finance sector reform, and advocacy awareness.

Both types of expenditures are considered equally important in the total process of reconstruction work.

### Table 7.6: Capital and Recurrent Expenditure on Reconstruction

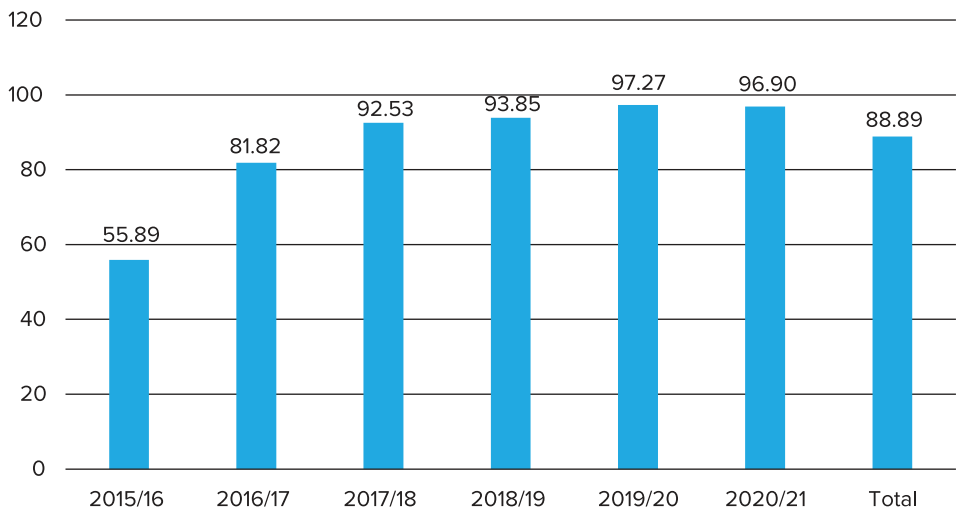
Rs. Millions

| Type of expenditure | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Total |
|---|---|---|---|---|---|---|---|
| Capital expenditure | 40040 | 129130 | 230973 | 180303 | 108000 | 83008 | 771455 |
| Recurrent expenditure | 31601 | 28690 | 18644 | 11815 | 3029 | 2658 | 96436 |
| Capital expenditure as (percent) of total expenditure | 55.89 | 81.82 | 92.53 | 93.85 | 97.27 | 96.90 | 88.89 |

Sources:
*a. National Reconstruction Authority (NRA, CLPIU) database*
*b. Ministry of Finance, post-earthquake- assistance-portal*
*c. Ministry of Finance., Development Cooperation Nepal 2015-2020*
*d. Socioeconomic Impact Assessment Survey (SEIA) 2021*

Graph 7.3 shows that the share of capital expenditure in the total reconstruction expenditure was low (55.89 percent) in the first year of the reconstruction as compared to the following years. This is because in the year 2015/16 there was a maximum flow of recurrent expenses in rescue, relief and recovery. The capital expenditure increases in the subsequent years, as reconstruction of housing and other structures start and gain momentum. Capital expenditure is found to be highest (97.37 percent) in 2018/19. The share of capital expenditure is estimated to be 88.89 percent on average.

Graph 7.3: Capital Expenditure as % of Total Expenditure




Capital expenditure contributes directly to gross capital formation; hence the estimates of capital formation are based on the capital expenditure during the reconstruction process. The total expenditure (recurrent and capital) is the main basis for estimating macroeconomic indicators such as GVA, GFCF, GDI, and CE. These indicators are analyzed in order to assess the impact of reconstruction on the national economy.

## 7.6 Reconstruction Expenditure by Sectors

The structure of expenditure in different sectors, following the format of PDRF and based on the availability of data, is broken down into reconstruction expenditure by category in Table 7.7 below.

### Table 7.7: Expenditure by Sectors and Years of Reconstruction

NPR Millions

| Sector | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | Total | percent |
|---|---|---|---|---|---|---|---|---|
| Agriculture livestock and forestry | 105 | 49 | 26 | 0 | 0 | 2391 | 2571 | 0.296 |
| Religious and Cultural Heritage | 13 | 255 | 457 | 326 | 1138 | 0 | 2189 | 0.252 |
| Education building reconstruction | 568 | 9896 | 15865 | 21499 | 16857 | 19382 | 84068 | 9.686 |
| Education support | 785 | 2481 | 2734 | 2646 | 1856 | 0 | 10503 | 1.210 |
| Health building reconstruction | 363 | 744 | 185 | 677 | 1884 | 1717 | 5569 | 0.642 |
| Health support program | 586 | 2043 | 802 | 829 | 694 | 0 | 4954 | 0.571 |
| Employment and livelihood | 9670 | 23652 | 13262 | 6640 | 269 | 0 | 53492 | 6.163 |
| Government and financial sector reform | 379 | 336 | 316 | 0 | 0 | 0 | 1031 | 0.119 |
| Private housing | 7360 | 54058 | 106624 | 53776 | 24396 | 23470 | 269684 | 31.074 |
| Water and sanitation | 1072 | 4534 | 2221 | 14 | 0 | 0 | 7841 | 0.903 |
| Integrated settlement | 744 | 62 | 843 | 0 | 0 | 0 | 1649 | 0.190 |
| land improvement and development | 0 | 12 | 16 | 0 | 0 | 0 | 28 | 0.003 |
| Other public construction | 5785 | 905 | 817 | 3547 | 27 | 610 | 11690 | 1.347 |
| Rescue and recovery | 9269 | 13222 | 15151 | 354 | 452 | 0 | 38449 | 4.430 |
| Disaster risk reduction | 138 | 173 | 573 | 160 | 103 | 0 | 1147 | 0.132 |
| Shelter | 590 | 6011 | 4039 | 3131 | 1932 | 86 | 15789 | 1.819 |
| Research and development | 3418 | 1996 | 314 | 0 | 8 | 0 | 5736 | 0.661 |
| Cash and kind transfers | 7206 | 0 | 2 | 2 | 0 | 0 | 7210 | 0.831 |
| Gender based violence | 0 | 4 | 0 | 0 | 0 | 0 | 4 | 0.000 |
| Other government building | 1151 | 5369 | 6492 | 7750 | 5926 | 2782 | 29469 | 3.395 |
| Finance sector reform | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0.000 |
| Environment and land conservation | 210 | 182 | 499 | 0 | 0 | 0 | 891 | 0.103 |
| Road and transport | 97 | 1393 | 3960 | 6080 | 3140 | 0 | 14671 | 1.690 |
| Machinery and equipment | 0 | 9 | 0 | 0 | 0 | 0 | 9 | 0.001 |
| Advocacy and awareness | 0 | 55 | 1492 | 1492 | 0 | 0 | 3040 | 0.350 |
| Miscellaneous administrative expenditure | 12870 | 70 | 9 | 205 | 210 | 266 | 13630 | 1.570 |
| Sub-total | 62380 | 127512 | 176699 | 109129 | 58892 | 50704 | 585316 | 67.441 |
| Own account housing reconstruction | 9261 | 30308 | 72918 | 82989 | 52137 | 34962 | 282575 | 32.559 |
| **Total** | **71641** | **157820** | **249617** | **192118** | **111029** | **85666** | **867891** | **100.000** |
| Capital expenditure | 40040 | 129130 | 230973 | 180303 | 108000 | 83008 | 771455 | 88.888 |
| Recurrent expenditure | 31601 | 28690 | 18644 | 11815 | 3029 | 2658 | 96436 | 11.112 |
| Capital expenditure (percent) | 55.89 | 81.82 | 92.53 | 93.85 | 97.27 | 96.90 | 88.89 | |

Source:
a. National Reconstruction Authority (NRA, CLPIU) database
b. Ministry of Finance, post-earthquake- assistance-portal
c. Ministry of Finance, budget details (red book)
d. Ministry of Finance, Development Cooperation Nepal 2015-2020
e. Socioeconomic Impact Assessment Survey 2021

The total cost of reconstruction activities, including own-account housing reconstruction, is estimated to be NPR 867.89 billion. Out of the total public expenditure, the share of private housing construction is 31.0 percent) followed by educational building construction (9.69 percent) employment and livelihood promotion (6.16 percent), rescue, relief and recovery operations (4.43 percent) and government buildings construction (3.34 percent).

## 7.7 Private Housing Reconstruction Cost

As shown in Table 7.8 below, as per the survey estimates, the average cost of reconstructed house (owner occupied buildings) for rural and urban areas is estimated as NPR 800,729 and NPR 1,117,409 respectively.

### Table 7.8: Private Housing Reconstruction Cost

| | | Cost of house |
|---|---|---|
| | | Average |
| Cost of housing reconstruction | Rural | 800729 |
| | Urban | 1117409 |
| | Kathmandu (Kathmandu Lalitpur Bhaktapur) | 1683821 |
| | **Total** | **907647** |

Source: SEIA Survey 2021

The country average is NPR 907,647. It clearly indicates that the grant fund NPR 300,000 provided to the households was insufficient. It is also evident that households have financed their housing construction through their own savings or borrowing.

Table 7.9 shows the total volume of expenses made for housing reconstruction by households in different years. The own-account total expenditure for housing reconstruction has increased as the number of private housing reconstruction increases. The sum of the own-account reconstruction expenditure has gone up to NPR 81.78 billion in the year 2018/19.

### Table 7.9: Own Account Housing Construction

NPR Millions

| Area | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
|---|---|---|---|---|---|---|
| Rural | 5051 | 20283 | 41597 | 46246 | 30821 | 20861 |
| Urban | 4325 | 10677 | 31911 | 35535 | 21383 | 13782 |
| Total | 9376 | 30960 | 73508 | 81780 | 52204 | 34643 |

*Weighted
Source: SEIA Survey 2021

The average cost breakdown of housing construction cost is estimated by construction cost components as shown in Table 7.10 below. As per the estimates, the cost ratio of private building construction materials is found to be highest (49.67 percent), followed by wage and salaries (40.09 percent), transportation (5.27 percent), and furnishing (4.98 percent). For other types of construction, the ratio of wage and salaries is estimated at 34.95 percent of the total value of construction.

### Table 7.10: Average cost structure of housing reconstruction

| Cost components of Housing construction | Cost ratio | Average cost NPR |
|---|---|---|
| Average wage cost | 0.4009 | 363876 |
| Construction Material | 0.4967 | 450828 |
| Transportation | 0.0527 | 47833 |
| Furnishing | 0.0498 | 45201 |
| Average cost value of completed houses | 1.0000 | 907647 |
| Average wage cost(other construction) | 0.3495 | |

Source:
a. Estimated based on the survey conducted by WB, Report on Housing Reconstruction A Stimulus of Nepal's Economy 2020.
b. CBS, Supply and Use tables (SUT)

## 7.8 Loans and Interest Rates

Despite all these employment generation activities through reconstruction and livelihood support programs by government, DPs and I/NGOS, one third of households (31.5 percent) used loans to cope with their fund needs for reconstruction activities and to supplement livelihood needs.

## Table 7.11 A: Households with loans (Percent)

| | Loan | No loan | Total |
|---|---|---|---|
| Rural | 30.8 | 69.2 | 100.0 |
| Urban | 32.3 | 67.7 | 100.0 |
| Total | 31.5 | 68.5 | 100.0 |

## Table 7.11 B: Loan Agencies and interest rates (%)

| Source of loan | Average interest rate |
|---|---|
| Cooperatives | 14.36 |
| Relatives | 16.17 |
| Finance | 15.54 |
| Bank | 11.92 |
| Bank and others | 13.22 |
| Cooperatives and others | 15.14 |
| Friends | 16.97 |
| Landlord | 19.66 |
| Landlord and others | 19.11 |
| Others (charity and religious organizations) | 8.58 |
| **Total** | **14.61** |

Source: SEIA Survey 2021

It is apparent from the analysis of the survey data that the housing reconstruction grant provided by the government was insufficient. To supplement the grants provided, affected households took loans from different agencies or individuals to complete the construction of houses. It is found that about one-third (31.5 percent) of households took loans from different formal and informal sources.

Households borrowed money from one or multiple sources. The data show that they borrowed mostly from landlords, relatives, banks, finance companies etc. While the share of households taking loans from the banks has increased to some extent over the years, the trend of taking loans from the informal channels – relatives, friends, landlords - has continued over the period of reconstruction. The average interest rate charged for loans by landlords was found to be highest (19.66 percent). Charity and religious organizations charged the lowest average interest rate at 8.58 percent. The average interest rate of bank loans is estimated to be 11.92 percent. In total, the average interest rate paid for the loans by the house holds is estimated to be 14.61 percent.

## Table 7.12: Household loans by lending sources

**In percent**

| Sources of loans | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
|---|---|---|---|---|---|---|
| Cooperatives | 33.77 | 22.55 | 30.62 | 32.18 | 29.43 | 34.82 |
| Relatives | 16.67 | 22.83 | 16.89 | 18.18 | 17.52 | 17.94 |
| Finance companies | 3.41 | 1.30 | 2.42 | 3.19 | 3.75 | 3.50 |
| Bank | 4.47 | 18.91 | 14.23 | 17.58 | 20.63 | 11.03 |
| Bank and others | 13.94 | 12.15 | 11.24 | 8.21 | 5.93 | 12.17 |
| Cooperatives and others | 2.82 | 7.59 | 5.03 | 6.07 | 6.86 | 3.20 |
| Friends | 0.38 | 3.90 | 8.04 | 3.36 | 6.46 | 5.40 |
| Landlord | 15.87 | 8.51 | 8.89 | 7.35 | 4.22 | 9.68 |
| Landlord and others | 6.87 | 2.08 | 2.34 | 3.24 | 4.52 | 2.25 |
| Others | 1.80 | 0.19 | 0.29 | 0.64 | 0.67 | 0.00 |
| **Total (percent)** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** |
| In NPR Millions (weighted) | 13622 | 33284 | 48839 | 38412 | 27251 | 21930 |

Source: SEIA Survey 2021

Cooperatives are found to be the most frequent lender to earthquake-affected households, followed by relatives and banks. Informal sources of finance like landlords, friends, and relatives still play a significant role in financing loans to households, although they charge relatively high interest rates (Table 7.11 B).

## Table 7.13 Indebtedness of households by sectors

Loan for household activities NPR millions

| Activities | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Total | (percent) |
|---|---|---|---|---|---|---|---|---|
| Agriculture and livestock | 155 | 1205 | 2632 | 1432 | 1600 | 1182 | 8207 | 4.48 |
| Agriculture and others | 0 | 0 | 0 | 0 | 0 | 32 | 32 | 0.02 |
| Social activities (festivals) | 32 | 119 | 11 | 17 | 53 | 42 | 273 | 0.15 |
| Land purchase | 443 | 209 | 59 | 176 | 72 | 29 | 989 | 0.54 |
| Land purchase and others | 0 | 156 | 299 | 0 | 233 | 0 | 688 | 0.38 |
| Reconstruction | 5950 | 16978 | 29322 | 20100 | 15938 | 12745 | 101034 | 55.11 |
| Reconstruction and others | 3574 | 6446 | 7563 | 9415 | 4784 | 3880 | 35662 | 19.45 |
| Trade and business | 429 | 3027 | 1163 | 1692 | 970 | 1691 | 8973 | 4.89 |
| Trade business and others | 0 | 1 | 0 | 111 | 189 | 0 | 302 | 0.16 |
| Education | 235 | 1558 | 297 | 63 | 446 | 0 | 2599 | 1.42 |
| Education and others | 0 | 0 | 616 | 115 | 228 | 93 | 1053 | 0.57 |
| Household social activities | 268 | 156 | 222 | 793 | 45 | 134 | 1617 | 0.88 |
| Health | 760 | 1715 | 2621 | 2701 | 1429 | 645 | 9870 | 5.38 |
| Health and others | 985 | 733 | 3371 | 948 | 585 | 1323 | 7944 | 4.33 |
| Others | 792 | 981 | 664 | 847 | 679 | 135 | 4097 | 2.23 |
| Total | 13622 | 33284 | 48839 | 38412 | 27251 | 21930 | 183338 | 100.00 |

Source: SEIA Survey; (weighted) *Includes some non-housing reconstruction expenses as latent error

Housing reconstruction has been the major component of household loans. Over the years, the loan amount has changed with the demand for housing reconstruction (Table 7.13). This indicates a significant level of indebtedness among the earthquake-affected households. In addition to housing reconstruction, loans were availed in health and related expenditures, trade and business, education, and also in agriculture. Similarly, some loans taken for social activities like celebrating festivals and rituals.

The share of housing reconstruction loan to total reconstruction cost is found highest (57.30 percent) in 2015/16 and 20 to 30 percent in following years (Graph 7.1.4). Similarly, housing reconstruction loan of households also indicates a significant contribution in the change of total sectors of the economy, government borrowing and also external borrowing (Table 7.14).

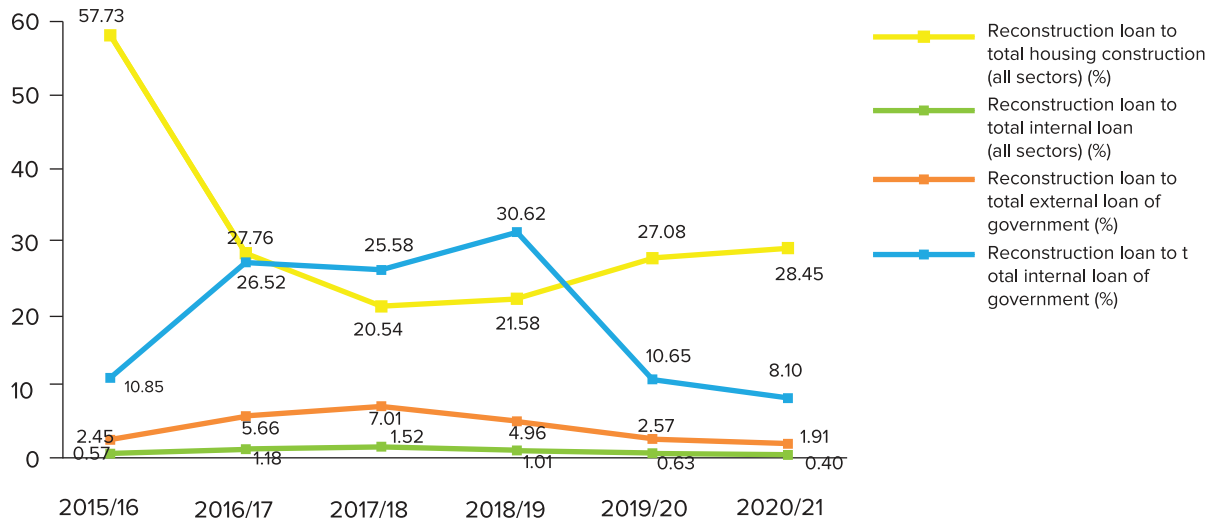
## Table 7.14: Reconstruction loans of households and government borrowing

(NPR Million)

| Particulars | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Total |
|---|---|---|---|---|---|---|---|
| Internal borrowing of government | 87775 | 88338 | 144751 | 96382 | 194642 | 205195 | 817083 |
| Net outstanding foreign debt | 388763 | 413979 | 526154 | 594926 | 806141 | 871951 | 3601914 |
| Total housing reconstruction loan of households * | 9524 | 23424 | 36885 | 29515 | 20722 | 16625 | 136695 |
| Total housing reconstruction expenditure | 16620 | 84366 | 179542 | 136765 | 76534 | 58432 | 552260 |
| Total domestic loan from bank and financial institutions all sectors (Rs. Millions) | 1681852 | 1986224 | 2422779 | 2911897 | 3266012 | 4172785 | 16441549 |
| Reconstruction loan to total internal loan of government (%) | 10.85 | 26.52 | 25.48 | 30.62 | 10.65 | 8.10 | 16.73 |
| Reconstruction loan to total external loan of government (%) | 2.45 | 5.66 | 7.01 | 4.96 | 2.57 | 1.91 | 3.80 |
| Reconstruction loan to total internal loan (all sectors) (%) | 0.57 | 1.18 | 1.52 | 1.01 | 0.63 | 0.40 | 0.83 |
| Reconstruction loan to total housing reconstruction (%) | 57.30 | 27.76 | 20.54 | 21.58 | 27.08 | 28.45 | 24.75 |

*Note: A small amount of non-reconstruction types could not be segregated from housing reconstruction loan because of data reporting issue in the survey.
Source: (a) Nepal Rastra Bank
(b) SEIA survey 2021
(C) FCGO office, Ministry of Finance

Graph 7.4: Contribution of Housing Reconstruction to Total Loan




## 7.9 Focus Area

This part of the report primarily focuses on thematic areas and seeks answers to some of the questions associated with the relation of reconstruction to macroeconomic effects.

### 7.9.1 Impact of Reconstruction on Gross Value Added (GVA)

at is the impact of reconstruction expenditure on national GDP? Here the report examines and assesses the reconstruction expenditure in detail by sector and estimates the value-added mainly from the construction sector and the total economy. The basis of estimation is the total expenditure made by different agents/ stakeholders of the reconstruction process who took part in the earthquake reconstruction activities - the government, development partners (multilateral and bilateral), international and national non-government organizations, and private households themselves.

### 7.9.2 Impact of Reconstruction on Gross Fixed Capital Formation (GFCF)

How has reconstruction expenditure affected total capital formation or net increase in fixed capital? Here, the report makes estimates of total capital expenditure made in the course of reconstruction work, through the reviewed period of 2015/16 to 2020/21. The report analyzes the contribution of reconstruction-related capital formation to the gross fixed capital formation of the country as a whole and the construction sector in particular. Estimates of capital formation in reconstruction are made on an annual basis.

### 7.9.3 Impact of Reconstruction on Employment and Compensation of Employees

What are the ongoing impacts of reconstruction work on employment and generation of income through wages and salaries? The report estimates and analyzes this question to ascertain the impact of reconstruction on livelihoods and the value of contributions to national compensation of employees (CE).

### 7.9.4 Impact of Reconstruction on Household Consumption and Government Consumption

What has been the impact of reconstruction on household consumption and government consumption? The report provides some insights based on the analysis of the component of household disposable income and its disposition on household consumption. The component of government expenditure as a current transfer to households is also examined.

### 7.9.5 Impact of Reconstruction on Household Income (Disposable Income)

What is the impact of reconstruction on the disposable income of households? Recurrent types of expenditure (except capital) made by the government and other institutions and individuals are segregated and analyzed as a part of household disposable income which is available to households for their consumption or saving. The report examines the incomes received by households as recipients of reconstruction-related current transfer earnings.

# 7.10 Contribution of Reconstruction on National Economy

## 7.10.1 Impact of Reconstruction on Gross Value Added (GVA)

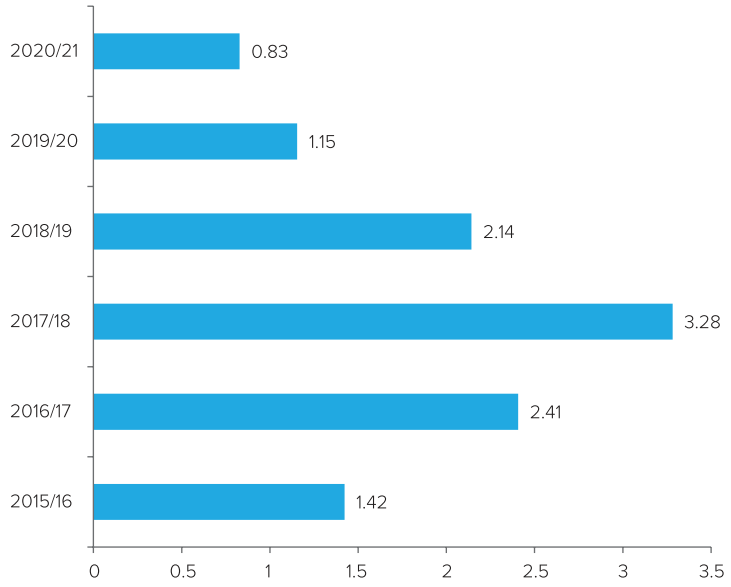
The total volume of reconstruction expenditure is derived from the administrative records and reports available in the NRA / CLPIU. The expenditure made outside the NRA/ CLPIU system is captured through the records and reports of respective organizations[43]. Reconstruction program expenditures are compiled to come up with the total amount spent during the reconstruction period from 2015/16 to 2020/21. The Supply and Use Table of Nepal framework are used to derive gross value added from the total reconstruction expenditure made in different sectors.

### Table: 7.15: Contribution of Reconstruction to GDP

NPR millions

| Particular | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
|---|---|---|---|---|---|---|
| Gross Domestic Product (GDP) at current prices | 2608184 | 3077145 | 3455949 | 3858930 | 3914701 | 4266321 |
| GDP at current basic prices | 2341402 | 2720563 | 3011022 | 3342481 | 3454140 | 3733274 |
| Gross Domestic Product (GDP) at constant basic prices | 1700448 | 1846506 | 1982653 | 2109263 | 2064600 | 2146824 |
| Gross Domestic Product (GDP) at constant 2015/16prices | 2608184 | 2875759 | 3133378 | 3353060 | 3221864 | 3378102 |
| Change in GDP | 13038 | 267575 | 257619 | 219683 | -131196 | 156238 |
| GVA- Reconstruction at current prices | 33307 | 65468 | 98809 | 71572 | 39881 | 30911 |
| Total GVA -Reconstruction at 2015/16 prices | 33307 | 63628 | 91408 | 65920 | 39818 | 31375 |
| Contribution of reconstruction GVA to total GDP | 1.42 | 2.41 | 3.28 | 2.14 | 1.15 | 0.83 |
| Contribution of reconstruction on GDP growth rate (percentage point) | 0.13 | 2.13 | 2.70 | 2.00 | 0.63 | 0.80 |
| GDP growth rate (without reconstruction) (percentage point) | 0.30 | 6.84 | 4.92 | 4.66 | -2.72 | 3.20 |
| Total GDP growth rate (percent) | 0.43 | 8.98 | 7.62 | 6.66 | -2.09 | 4.01 |

Graph 7.5: Contribution of Construction to GDP (%)




The contribution of reconstruction activities to the total economy changes according to reconstruction expenditures in different years of recovery and reconstruction. In the first year (2015/16), the rescue, relief, recovery and reconstruction activities contributed 1.42 percent to the total GDP. In the subsequent years 2016/17, 2017/18, 1018/19, and 2019/20, the contribution of reconstruction to the economy is 2.41 percent, 3.28 percent, 2.14 percent and 1.5 percent respectively. It is apparent that the share of GVA in the construction sector and total GDP is allied to reconstruction activities, as well as to volume of expenditure. As a result, the peak year of reconstruction 2017/18, with the highest volume of expenditure, has the highest contribution in the value-added generation, in both the construction sector and the total economy.

The contribution of reconstruction to the growth rate of GDP is estimated for the period 2015/16-2020/21. The share of reconstruction GVA in the year 2015/16 is found to be 0.13 percent, out of the total GDP growth rate of 0.43 percent. In the following years, the contribution to the growth rate is estimated to be 2.13 percent (2016/17), 2.70 percent (2017/18), 2.00 percent (2018/19), 0.63 percent (2019/20), 0.80 percent (2020/21) respectively. It is evident from the figure that the share of reconstruction GVA has a direct relationship with total GDP growth.

43 *CBS (2010/11), Supply and Use Table of Nepal*

### 7.10.2 Impact of Reconstruction on Gross Fixed Capital Formation (GFCF)

The value of the output of the construction sector is considered as GFCF. The activity of gross fixed capital formation is the value of acquisitions less disposals of fixed assets, ie., net investment, or net increase in fixed capital. Fixed assets are produced assets (mostly machinery, equipment, buildings, or other structures but also some intangible assets) which are used repeatedly or continuously in production over several accounting periods (SNA, 1993)[44].There is substantial diversity in different types of GFCF that include acquisition less disposals of new or existing tangible assets[45] and intangible fixed assets[46].

In the case of reconstruction activities carried out by the NRA and other partner agencies, the expenditures made in different reconstruction activities are considered as capital expenditures – i. e. construction of religious and cultural heritage; education building reconstruction; health building reconstruction; private housing; water and sanitation infrastructure; integrated settlements; land improvement and development; other public construction; rescue and recovery; disaster risk reduction; shelter; research and development; government buildings; environment and land conservation; roads and transport; and machinery and equipment.

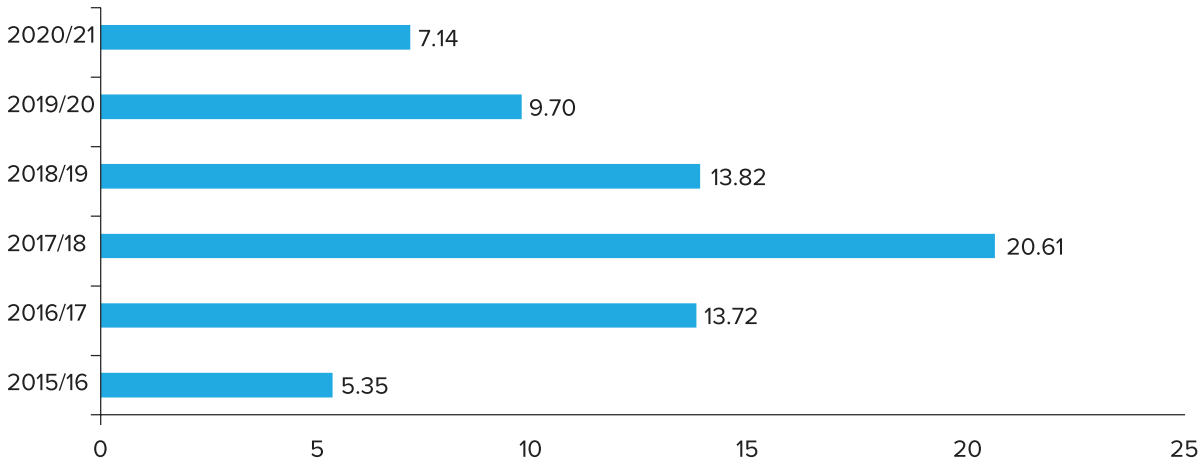
### Table 7.16: Reconstruction Capital Expenditure

**Rs. millions**

| Reconstruction Expenditure | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Total |
|---|---|---|---|---|---|---|---|
| Housing construction Total (a+b) | 16620 | 84366 | 179542 | 136765 | 76534 | 58432 | 552259 |
| a) Housing Construction – institutional support | 7360 | 54058 | 106624 | 53776 | 24396 | 23470 | 269684 |
| b) Housing construction- own account | 9261 | 30308 | 72918 | 82989 | 52137 | 34962 | 282575 |
| Other construction | 23419 | 44764 | 51431 | 43538 | 31466 | 24576 | 219194 |
| **Total Capital expenditure** | **40040** | **129130** | **230973** | **180303** | **108000** | **83008** | **771454** |

The classification of reconstruction activities is mainly based on the PDRF classification. The total value of GFCF in the reconstruction work is estimated to NPR 771 454 million. During the years of reconstruction, the volume of reconstruction output (capital formation) is estimated at NPR 40,040 million in the year 2015/16, NPR 129,130 million in 2016/17, NPR 230,973 million in 2017/18, NPR 180,303 million in 2018/19, NPR 108,000 million in 2019/20 and NPR 83,008 in the year 2020/21. The growth of GFCF had increased continuously up to year 2017/18 and then declined in 2018/19 and 2019/20. GFCF is also proportional to the volume of expenditures made in reconstruction activities. The total capital expenditure made in different years provides the basis for the estimation of GFCF and estimation of its contribution to national GFCF.

Graph 7.6: Contribution of Reconstruction to Total GFCF



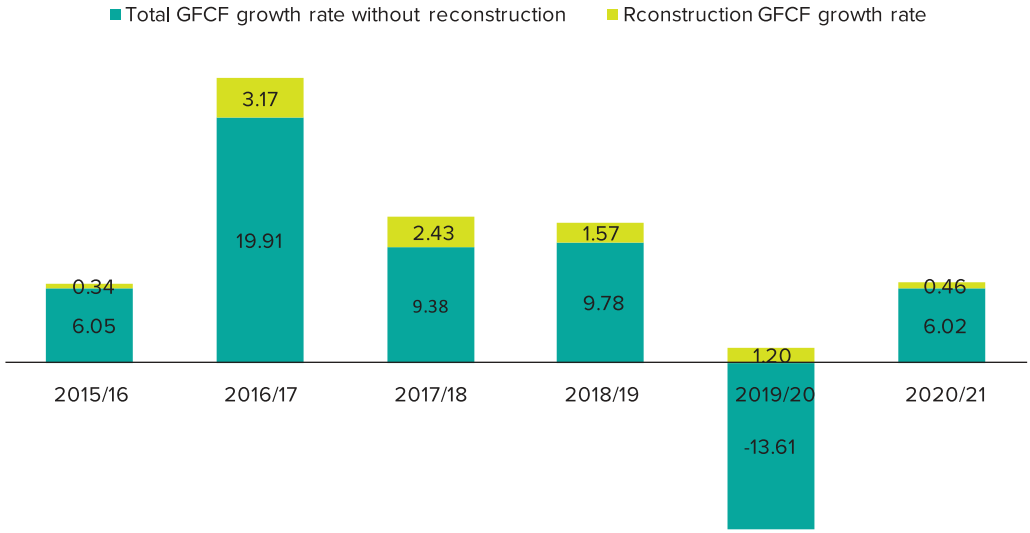

The contribution of reconstruction on GFCF has been estimated for the period of 2015/16 to 2020/21. With the increase in the volume of expenditure on reconstruction activities, the total value of GFCF, as well as its share to total GFCF, has also increased. The contribution of GFCF from reconstruction to total GFCF has increased significantly and has recorded a maximum of 20.61 percent in 2017/18. This implies that reconstruction expenditure has a direct positive impact on gross fixed capital formation.

44 *EU,IMF,OECD,UN,WB (2008), System of National Accounts 2008*

45 *Tangible assets: dwellings, other building and structures, machinery and equipment, cultivated assets – trees and livestock that are used as assets*

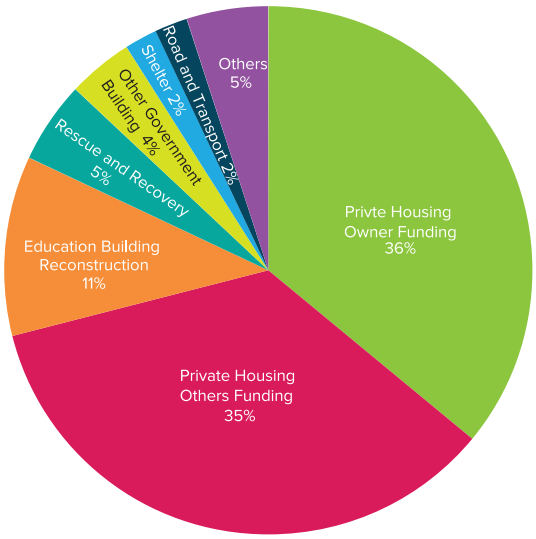
46 *Intangible assets: mineral exploration, computer software, entertainment, literary or artistic originals,major improvements to tangible non-produced assets including andcosts associated with the transfers of ownership of non-produced assets*

Graph 7.7: Contribution of Reconstruction of Total GFCF Growth




The GFCF growth is found to be uneven in the post-earthquake period. The contribution of reconstruction to total GFCF growth rate in the first year (2015/16) of reconstruction is found nominal (0.34 percent), but the following year 2016/17 has the highest contribution to growth, with 3.17 percent. The share of reconstruction in total construction sector GFCF growth is estimated at 2.43 percent and 1.57 percent for the years 2017/18 and 2018/19 respectively. The growth of GFCF in the year 2019/20 has gone down with negative (-12.41 percent) because of the COVID pandemic. However, there is some positive contribution (1.20 percent) from reconstruction to total GFCF.

Graph 7.8: Capital Formation by Major Sectors of Reconstruction




Investment in private housing reconstruction through grants and own-account funding occupies highest weight (71 percent) in capital formation followed by the reconstruction in other sectors such as education (11 percent), government buildings (4 percent), transport and road construction (2 percent) and others (5 percent) (Graph 7.8).

### 7.10.3 Impact of Reconstruction on Employment and Compensation of Employees.

The estimates of employment person-days are made on the basis of the Economic Impact Assessment Survey (EIAS) (Table 7.10). In all types of construction work, the major portion of the output and valued- added is occupied by the value of workers contributions i.e., compensation of employees. From the results of SEIA, it is evident that about 40 percent of the output (total construction cost) is spent to pay for the services of workers and employees engaged in the reconstruction work (Table 7.17).

## Table 7.17: Estimates of Compensation of Employees in Reconstruction

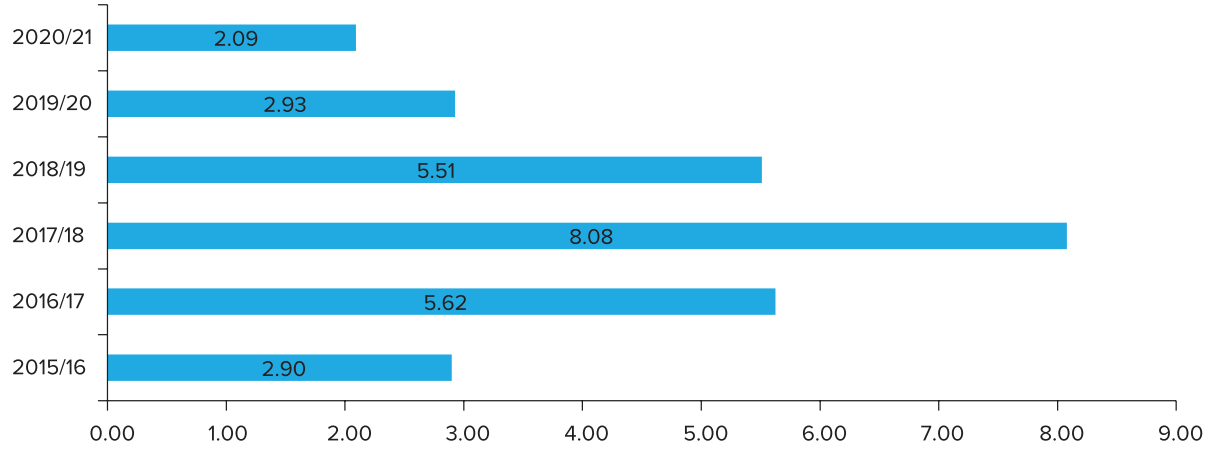
**Rs. millions**

| | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
|---|---|---|---|---|---|---|
| National compensation of employees at current price | 1072003 | 1226772 | 1302767 | 1423500 | 1557945 | 1616197 |
| National compensation of employees at constant (2015/16) prices | 1072003 | 1146485 | 1181169 | 1236892 | 1282215 | 1279716 |
| Change in compensation of employees | -11144 | 74482 | 34684 | 55723 | 45323 | -2499 |
| CE growth rate (percent) | -1.03 | 6.95 | 3.03 | 4.72 | 3.66 | -0.19 |
| National CE output ratio | 0.43 | 0.44 | 0.42 | 0.41 | 0.41 | 0.39 |
| Compensation of employees in construction sector | 172988 | 210190 | 240114 | 265241 | 238268 | 236430 |
| Total reconstruction output (Rs. millions) | 71641 | 157820 | 249617 | 192118 | 111029 | 85666 |
| Total reconstruction compensation of employees at current prices | 31070 | 69006 | 105255 | 78422 | 45604 | 33818 |
| Total reconstruction compensation of employees at constant 2015/16 prices | 31070 | 64490 | 95431 | 68141 | 37533 | 26778 |
| Contribution of reconstruction on total compensation of employees | 2.90 | 5.62 | 8.08 | 5.51 | 2.93 | 2.09 |

Source:
a. CBS (2021), National Accounts of Nepal
b. SEIA Survey 2021,
c. WB, Housing Reconstruction: A Stimulus for Nepal's Economy.

The ratio of compensation of employees (labor or CE) is estimated based on the national accounts statistics of Nepal (CBS). The national CE/output ratio is estimated for the review period 2015-16 to 2020/21 and applied to derive the total value of compensation of employees from reconstruction activities.

Graph 7.9: Contribution of Reconstruction on Total Compensation of Employees (%)




The contribution of reconstruction to total employees' income (CE) engaged in reconstruction work is estimated for the period of reconstruction 2015/16 to 2020/21. The share of CE to total is found to be highest (8.08 percent) in the year 2017/18, the year in which employment of construction workers in private housing reconstruction was at its highest level. The rate of contribution declines in the following years 2018/19 (5.51 percent), 2019/20 (2.93 percent) and 2020/21 (2.09). The volume of CE is determined by the amount of total reconstruction and employment generated by those activities. The share of reconstruction CE is directly relative to the total volume of reconstruction expenditure i.e., reconstruction work performed.

### 7.10.4 Impact of Reconstruction on Disposable Income and Consumption

Consumption of households is mainly determined by the income received through their employment (CE), operating surplus, mixed-income and transfer income. In addition to household income, the consumption goods acquired by households in cash and kind - as a transfer from government agencies and other Non-Profit Institutions Serving Households (NPISHs) and from individuals - are included to derive the total disposable income of households.

In the process of reconstruction, the consumption of households is mainly affected by two main factors: a) the value added generated through reconstruction activities as the major part i.e., compensation of employees, and b) transfer income received from government, NGOs (NPISH) and the household itself.

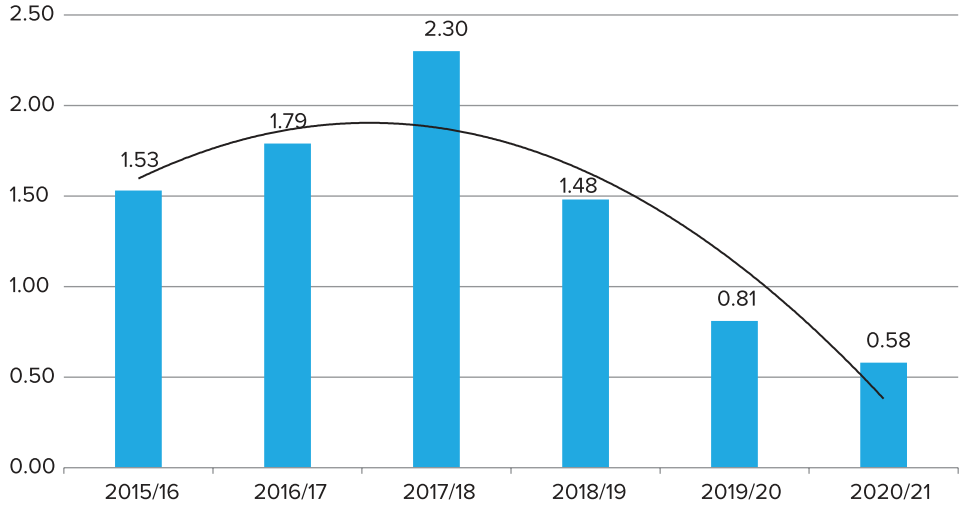
## Table 7.18: Gross Disposable Income

| | | | | | | |
|---|---|---|---|---|---|---|
| Gross national disposable income at current prices | 3420376 | 4059941 | 4343235 | 4893631 | 4943024 | 5323554 |
| Gross national disposable income at constant prices | 3662418 | 3794236 | 3937846 | 4252121 | 4068191 | 4215226 |
| Annual change in GNDI | 119528 | 131818 | 143610 | 314275 | -183931 | 147036 |
| GNDI growth rate | 3.37 | 3.60 | 3.78 | 7.98 | -4.33 | 3.61 |
| Reconstruction related transfers (cash and kind) to households from government, DPs, I/NGOs and individuals | 19179 | 7207 | 1194 | 694 | 300 | 200 |
| Disposable income for consumption at current prices | 52486 | 72675 | 100003 | 72266 | 40181 | 31111 |
| Disposable income for consumption at constant prices | 52486 | 67918 | 90669 | 62792 | 33069 | 24634 |
| Contribution of reconstruction GDI to total GNDI | 1.53 | 1.79 | 2.30 | 1.48 | 0.81 | 0.58 |
| Contribution of reconstruction GDI to total GNDI growth rate | 1.48 | 1.85 | 2.39 | 1.59 | 0.78 | 0.61 |

Source:
a.CBS (2021), National Accounts of Nepal
b. SEIA Survey 2021
c. National Reconstruction Authority (NRA, CLPIU) database

Reconstruction-related transfers (cash and kind) provided to households from institutions and individuals during rescue, relief, recovery and reconstruction constitute a component that makes changes in the consumption capacity of households through the change in their disposable income. The amount of such current transfers is found to be the highest in the earlier years as compared to the later years of the review period (Table 7.17). The reason for high transfers to households is the rescue and relief fund (cash and kind) provided in the initial years. Transfer payments are found to be highest, at NPR 19.18 billion in 2015/16, followed by NPR 7.21 billion in the year 2016/17. The current transfers to households are less in later years, because of the focus on capital transfers (reconstruction) compared to previous years' priority allocations to rescue, relief and recovery.

Graph 7.10: Contribution of Reconstruction GDI to Total GNDI (%)

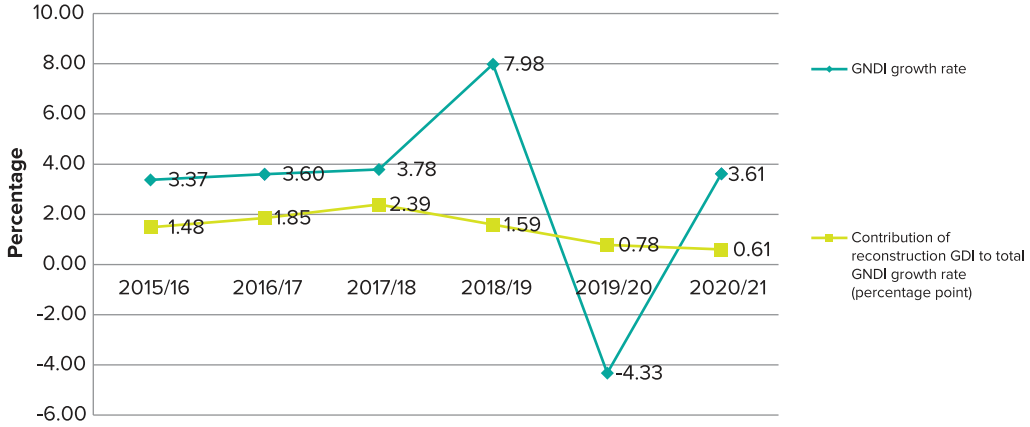



The contribution to GDI from reconstruction activities is presented in Graph 7.10. As the transfer income increases, the capacity of their consumption also increases. The disposable income received by the beneficiary households has also contributed to gross national disposable income, at its highest (2.30 percent) in 2017/18, followed by other years: 2016/17 (1.79 percent), 2015/16 (1.53 percent), 2018/19 (1.48 percent), 2019/20 (0.81 percent) and 2021 (0.58 percent).

### 7.10.5 Impact of Reconstruction on Household Disposable Income

Table 7.17 shows the receipt (income) and expenditure (consumption) of the beneficiary households. To arrive at the actual final consumption expenditure of households, the transfer amount (grants in cash and kind excluding reconstruction capital) contributed by the government to households is also added.

Graph 7.11: Contribution of Reconstruction on Gross National Disposable Income




The contribution of the reconstruction-related gross disposable income to total gross national disposable income is shown in Graph 7.11. The overall growth rate of GNDI is found to be uneven. However, the contribution of reconstruction GDI to total GNDI follows a steady pattern with respect to the expenditure on transfers provided to earthquake beneficiary households.

### 7.10.6 Impact of Reconstruction on Household Consumption

The disposable income of households is a measure of income that is used for final consumption or saving. The total value of household income earned through their work (economic activities) and also grants and transfers received from outside the household is accounted as disposable income. In the case of reconstruction-related income or transfer payments the GVA generated through reconstruction activities and also grants and those current transfers received by the households from the government and NPISH are accounted to derive the estimates of disposable income of households.

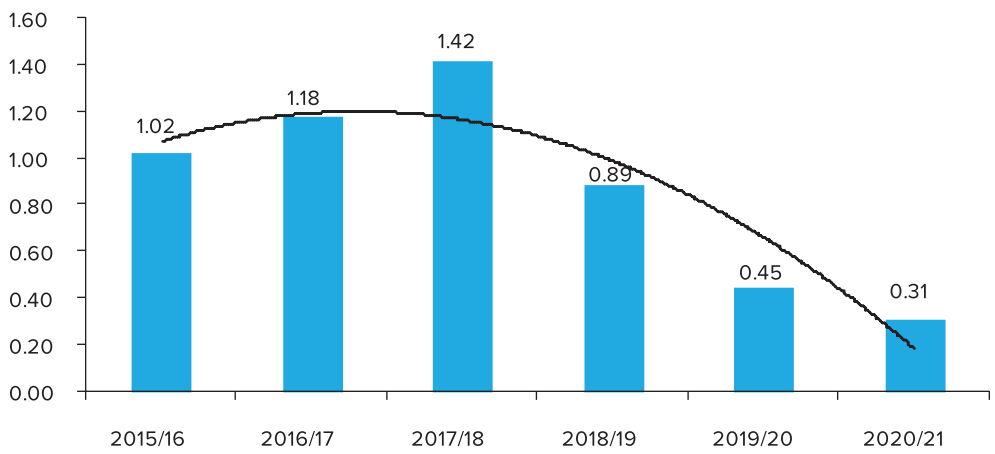
Table 7.19: Contribution of Reconstruction to Total Private Consumption

**Rs. millions**

| Particulars | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
|---|---|---|---|---|---|---|
| Household consumption by reconstruction activities at current prices | 23188 | 27919 | 37197 | 25759 | 14684 | 11162 |
| Household consumption by reconstruction activities at constant 2015/16 prices | 23188 | 26092 | 33725 | 22382 | 12085 | 8838 |
| Contribution of reconstruction to total private consumption (percent) | 1.53 | 1.84 | 2.30 | 1.48 | 0.81 | 0.58 |

Source:
a. CBS (2021), National Accounts of Nepal
b. SEIA Survey 2021
c. National Reconstruction Authority (NRA, CLPIU) database

Graph 7.12: Contribution of Reconstruction on Total Private Consumption (%)



The transfer of funds in cash and kind to the households has been estimated from the government expenditure details. Grants provided by other agencies to households are also analyzed using their financial reports. Disposable income of the household is also derived by including remittance (current transfers) type of income received by households. The contribution of reconstruction activities to total private household consumption is estimated in Table 7.18 which is by and large proportional to the volume of disposable income generated in households during the reconstruction period from the year 2015/16 to 2020/21) (Graph 7.12).

# CHAPTER 8

# MAINTAINING THE GAINS OF RECONSTRUCTION AND NRA LEARNINGS

## 8.1 Sustain and Build on the Gains of Reconstruction

The post-earthquake reconstruction has been led by the Government of Nepal, with support from bilateral development partners, UN agencies, DFIs, private sector, INGOs, NGOs and even individual households. The supporting agencies and institutions have contributed significant resources and have made huge and untiring efforts to make reconstruction a success. Despite daunting challenges, significant progress has been made in rebuilding infrastructure. Tens of thousands of people have been trained to build resilient infrastructure and to use resilient infrastructure- building technology. More women have occupied spaces in male-dominated technical professions, thereby breaking the gender barrier. Despite inadequate living space, the living conditions of households have improved. Disaster - resilient building technology has been widely adopted and is being practiced even in non-earthquake affected districts. A number of livelihood support programs are being tested. Behind all these results and positive outcomes, various incentives and support have been offered. Some concerns have been highlighted regarding the fate of the pace of the ongoing reconstruction process, after the closure of the NRA. Moreover, a major concern is whether the positive outcomes that have been appearing in the reconstruction area will or will not be sustained after the withdrawal of support.

The NRA has made efforts on its part to institutionalize its resources (for example, data, information, documents, human resources ), transfer its expertise, maintain international contacts and linkages, and incorporate its policy and operational innovations into the national and global knowledge depositary through national and international seminars and conferences. Specifically, the NRA has carried out the following activities in its disengagement process, to ensure continued sustained services to the people, even after its closure:

- Shared and transferred its knowledge, information, skills and experience gained during the course of reconstruction to all three layers of governments, as per its constitutional and legal mandate
- Strengthened coordination and collaboration with the NDRRMA at the federal level
- Documented all procedures and sectoral experiences of the reconstruction process
- Conducted international conferences, to disseminate the experience of the reconstruction of Nepal
- Plans to share the information system of NRA to all layers of Government
- Encouraged risk- sensitive mapping of each local level and its use as a basis for preparing land use planning and the building code.

Nepal's current reconstruction capacity, which is appreciated by the global community, may not remain intact unless Government focuses on a few critical aspects, such as strengthening preparedness of local government institutions; endowing local governments with the legal mandate, quality human resources and necessary resource envelope; supporting and capacitating the private sectors and households to build a resilient Nepal; and supporting research and innovation to develop appropriate, cost-effective, affordable solutions. The government should further complement the efforts of the NRA by considering the following situations:

- Despite the focus of the PDNA and PDRF, the livelihood promotion program remained weak. If the government does not put forward an appropriate livelihood promotion program, the risk of the affected and especially displaced and other highly-vulnerable communities falling under the poverty line is high.
- A large number of people will become immediately unemployed when the reconstruction program is over. Lack of cash income may erode the debt servicing capacity of the households and they may fall into the debt trap.
- The capacity gained through training and field level experience may erode if people are not provided with new working opportunities at the earliest.

## 8.2 Optimum closure of NRA for wider replication of NRA Learnings[47]

The National Reconstruction Authority was established in December 2015 under a sun set law, with a provision of a 5-year term and a one-year extension if required. The NRA is scheduled to be phased out at the end of 2021 and therefore NRA has to design and implement the disengagement process before the end of its term. The national resilience-building program is a continuous process that needs nurturing and facilitation by a permanent body with an appropriate mandate. In this regard, the NRA has to transfer its responsibilities partially to concerned government agencies and primarily to the National Disaster Risk Reduction Management Authority. NDRRMA can be considered as the main successor of NRA, therefore, NRA's disengagement plan has been prepared to ensure the successful transition to NDRRMA and other government agencies, including local governments. NDRRMA is also collaborating with NRA and leading its efforts to build disaster- resilient communities. Being conscious of the legal provisions, NRA in its sixth year has initiated discussions at different forums on its optimum closure options[48].

### 8.2.1 Identification of Prospective Successor Organization Based on Its Broader Mandate

There is a consensus as of today, among all stakeholders, that the NDRRMA be entrusted with the responsibility of being the institutional successor to NRA. NRA is gradually handing over its data, information, knowledge, experience, learnings and institutional memory to NDRRMA, to strengthen its capacity and enable it to take forward the long-term disaster risk reduction and management activities.

The Disaster Risk Reduction and Management (DRRM) Act, 2074 led to the establishment of the National Disaster Risk Reduction and Management Authority (NDRRMA), to be responsible for coordinating and implementing DRRM-related functions in the country. The DRRM Regulation 2076 further elaborated the functions of different decision-making government mechanisms in line with provisions of the DRRM Act. The GoN has endorsed a National DRRM Policy 2075 and Disaster Risk Reduction National Strategic Action Plan 2018-2030, which provides a comprehensive planning framework for disaster risk reduction and management in Nepal, encompassing different priority areas and guiding government actors and stakeholders to achieve targets by adopting appropriate processes (Bhandari et al., 2020).

### 8.2.2 Disengagement of NRA and Engagement of NDRMMA

In the above context, the NRA has jointly organized the following activities with NDRRMA:

- Together with NDRRMA, NRA has provided orientation training on disaster risk resilient development to more than 1000 peoples' representatives and local government staff
- NRA and NDRRMA are formulating Nepal Disaster Resilient Framework (NDRF) covering the period 2021-2030.
- NRA and NDRRMA are jointly charting out a proposal for a Long-term Urban Recovery Program, to be implemented from FY 2021/2022. This program includes the reconstruction of earthquake-devastated urban structures and the framework for the reconstruction of private houses, public buildings, cultural heritage and infrastructure that are at risk of being damaged by earthquakes or other disaster events in the future.
- NRA will hand over the disaster risk reduction and management related policies, technical assistance, and institutional memory of NRA to NDRRMA.

By the end of August 2021, the NRA has been released from reconstruction responsibilities and its mandates have been handed over to the partner government agencies. The agencies that worked previously under the guidance and facilitation of the NRA will independently implement the programmes. The 20th Meeting of the NRA Steering Committee has made the following arrangements with respect to the ongoing division of reconstruction tasks[49]:

- The Department of Urban Development and Building Construction under the MoUD will take care of the financial and technical management of the remaining tasks of private housing reconstruction. In addition to this, it will bear the responsibility for completing remaining reconstruction tasks related

47 *Why optimum closure of NRA is necessary*
- *Continue efforts for Resilient Nepal*
- *Disseminate/replicate/ develop knowledge, skill and experience*
- *Maintain and expand network and partnership reconstruction/transformation*
- *Prepare for future disaster risk reduction*

48 *By optimum closure, NRA meant finding appropriate organization to carry out its unfinished task and continue to work to achieve its vision that is a resilient Nepal.*

49 *Punarnirman Update (2078/1/10), NRA*

to health institutions, public buildings, and integrated settlement development, that were within the mandate of the Central Level Project Implementation Unit (CLPIU, Building ).

- The NDRRMA will assume responsibility for disaster risk reduction and management, monitoring and the institutional memory management of NRA, together with the coordination and facilitation of the remaining reconstruction tasks
- The Ministry of Education, Science and Technology will take up the responsibility of completing the reconstruction of the educational institutions.
- The DoA under the Ministry of Culture, Tourism & Civil Aviation (MoTCA), will take care of the management of heritage sites and structures and *Gumbas* that are more than 100 years old.
- Reconstruction of roads and other *Gumbas* will be administered by the Department of Local Infrastructure Development and Agricultural Roads, under the Ministry of Federal Affairs and General Administration, in coordination with the Gumba Management Committee.
- The NRA, within its tenure, will look after the remaining tasks of reconstruction of Singh Durbar, Rani Pokhari, Dharahara, the palace Ranoddip Singh and the final auditing of these tasks. Similarly, it will facilitate the tasks of transferring of responsibility, auditing of NRA, and organizing ICNR to share the experience of Nepal

### 8.2.3 Critical Review NDRRMA in Terms of Its Status, Legal Mandate, Financial and HR Autonomy

Though the mandates of the NRA will be shared by many government agencies, the NDRRMA will be the main successor to the NRA. In addition to the generic responsibility for disaster risk reduction and management, the NDRRMA will have the additional responsibilities of working as a r epository of institutional memory, data, information, knowledge, management skills and contacts of NRA. Most importantly, NDRRMA will lead the campaign for a resilient Nepal.

Over time, new challenges will come to the surface. At present, the following are the key responsibilities that NDRRMA has to undertake:

- Formulation of the National Vision of Disaster Risk Reduction and Management
- Development, implementation and facilitation of the NDRF (2021-2030)
- Preparation of Multi- Hazard Risk Assessment Mapping and Multi- Hazard Risk- Sensitive Land Use Planning;
- Installation of risk assessment map- based early warning system
- National capacity building on risk- sensitive land use planning
- Preparation of infrastructure code
- Structural Integrity Assessment of public buildings (Schools, health institutions and other government buildings)
- Design and Implementation of urban regeneration programs decided by the Steering Committee of the NRA
- Development of Disaster Financing Mechanism

In order to carry out these and other mandated responsibilities, the NDRRMA needs l egal, financial and human resource autonomy. The next section analyses the mandate of NDRRMA with regards to these matters.

***Status of NDRRMA***

The NDRRMA, at present, is under the MoHA. MoHA forms the Expert Committee for NDRRMA and the Secretary of the MoHA is the coordinator of the Recommendation Committee for the appointment of Executive Chief (EC). The Authority has a Disaster Risk Reduction and Management Council (DRRMC), headed by the Prime Minister at its apex, and is followed by the Executive Committee chaired by the Home Minister. NDRRMA works as a secretariat to both mechanisms and its EC works as Member Secretary. The EC, the administrative head of the NDRRMA, works under the direct control of the Executive Committee. While the superstructures of the NDRRMA are represented well and are led by powerful personalities, the implementing body led by EC has been given a limited role of drafting plans, implementing the decisions of Council and Executive Committee, monitoring the decisions, and monitoring inter-ministerial compliance of the decisions of Executive Committee and reporting.

***Legal Mandate***

The Executive Committee and Disaster Management Provincial Executive Committee can bring necessary procedures as well as standard documents (as per article 47 of the Act) in conformity with the NDRRMA Act and Regulation.

***Financial Mandate***

Under article 22 of the Act, there is a provision for the Central Disaster Management Fund, comprised of the money received from the Government of Nepal; gifts and giving from associations or individuals; grants and loans from foreign governments, foreigners, and international agencies; or from other sources. As per section 10 of the Regulation, decisions of EC can mobilize the fund. Similarly, as per section 11 of the Regulation, the district- level Disaster Management Fund, comprising the money received from the federal and provincial governments, NDRRMA, and Nepali institutions or individuals, will be operated as per the decision of the District Level Disaster Management Committee.

***HR Autonomy***

There is no provision for staff recruitment or outsourcing in both the Act and Regulation of the NDRMMA. Only during the time of a disaster, can the NDRMMA demand human resources from relevant government agencies, including security agencies.

The above discussion helps us to conclude that despite some superstructures, the NDRRMA operates under the MoHA. Under these arrangements, The status of the NDRRMA does not meet the requirements of its functions. It cannot deliver efficiently unless its status is raised to a level that endows it with the authority to obtain the support of all concerned ministries . With regards to the legal mandate, the EC has the right to formulate guidelines and standards. This will help to resolve operational issues. On financial autonomy, the fund can be operated by the decision of EC. If adequate funds are available, the mandate can be exercised. The weakest aspect is HR autonomy. There is no provision for recruitment or outsourcing of staff. This leaves the CEO in a difficult position.

### 8.2.4 Review of Coordination Mechanisms and Partnership Network

Indeed, strengthening coordination among the various levels of government, sectors, and stakeholders is a challenge that many countries face, especially in light of concurrent disasters with cascading impacts. One of the key functions of the NDRRMA is to coordinate all three levels of governance for ensuring a whole-of-government approach to effectively reduce disaster risks, build resilience, and manage complex responses.

By May 2021, there are three policy and legal documents related to the NDRRMA. They are i) Disaster Risk Reduction National Policy 2075; ii) Disaster Risk Reduction and Management Act 2074; and iii) Disaster Risk Reduction and Management Regulation 2076. As per these policy and legal documents, the NDRRMA has to carry out its functions in direct or indirect coordination, communication and networking with the following agencies, institutions and sectors:

a. Federal Ministries, departments and all three security agencies of the government
b. Provincial Ministries and offices
c. District level disaster management committees
d. Local level disaster management committees
e. Development partners
f. INGOS/NGOS
g. Private sector

## 8.3 Suggestions for Strengthening the NDRRMA to Become a Successful Successor

Realizing the wider scope of work and challenging responsibilities of the NDRRMA, the DRRM council recently decided to review its legal and institutional structure. It is high time to make the necessary amendments in its legal and institutional structure to make it able to discharge its responsibility in coordination and cooperation with a large number of governmental as well as non-governmental agencies. By and large, there is consensus on the need for strengthening the NDRRMA, and various interaction programs and studies have suggested some recommendations. As a successor to the NRA, its legal mandates and freedom should be at least at par with those of the NRA . Some key suggestions are as follows:

a. Under the current status, the NDRRMA may find it difficult to interact with the high officials of other ministries without the support of Ministers and Secretaries of MoHA, signifying it needs help from the Chairperson and Members of the Executive Committee. So, in order to ensure its independent functioning, the status of the NDRRMA and the position of Chief Executive need to be strengthened. The NDRRMA should be brought under the Prime Ministers' Office and the Chief Executive should be given at least the status of

a secretary by the Government of Nepal. The role of the Chief Executive needs further detailing in the Regulation.

b. The Executive Committee should delegate all its executive roles to the Authority and it should look after only approval of rules and standards, planning, programming, budgeting, fund management, monitoring and high-level coordination and facilitation.
c. Article 47 of the Act should be brought into practice and necessary rules and standards should be introduced.
d. The Disaster Management Fund should be adequately resourced and operated by the Authority, with approval from the Executive Committee.
e. The NDRRMA is mandated to work as a Central Resource Centre for disaster risk reduction and management. Therefore, it needs some resource persons with diverse expertise. For this, it has to be entrusted with the power to recruit, contract, and outsource human resources when needed, based on the formally- approved guidelines. A five-member Expert Committee, which is provisioned in the Act, is appropriate, but there should be a team of experts and technical specialists to work under their guidance and supervision.
f. The NDRRMA should be a lean organization, working through well-established institutional linkages with all three layers of governments, the private sector, academia and research centers, professional organizations, development partners and civil society organizations.
g. In fact, the NDRRMA should autonomous as NRA and the top level structure should be similar to NDRRMA should look like the organogram of NRA. A proposed organizational structure of NDRRMA is given in Annex
h. Lastly, the NDRRMA should not have a lesser mandate or less freedom than currently enjoyed by NRA. This naturally demands amendment to the act, regulation, organizational status, and structure.

The NDRRMA has an enormous opportunity to translate the lessons of the NRA into future actions. Lessons can be recorded, learned and applied. But time will show whether NDRRMA just records the lessons, or learns lessons from the NRA or applies them . History is our witness that the transition does not happen automatically.

# CHAPTER 9
# LESSONS LEARNED

In the course of addressing the devastating 2015 Nepal earthquake, Nepal has learned several lessons which can be useful for responding to all kinds of major disasters that destroy the lives and livelihoods of the people. Nepal was quite aware of the likelihood of an earthquake, and so had prepared policies and legal frameworks, and institutional mechanisms from the center to the local level. But this level of preparedness appeared grossly inadequate at all stages of response - from search and rescue to the reconstruction. The dedicated institutions faced an acute shortage of search and rescue equipment, materials for temporary shelter, information about casualties and injuries, and loss and damage, technical manpower for damage survey and technical assistance to reconstruction of houses, the problem of access, lack of practical policies and SOPs to avail financial support, reconstruct houses and heritage and resettle households from risk-prone areas. However, with the untiring efforts of the institutions and persons involved in the various stages and levels of operation, Nepal was successful in achieving its rehabilitation and reconstruction targets to a great extent in most of the areas and within the stipulated time. Lessons from 2015 Nepal Earthquake have been shared primarily by NRA, by organizing a number of national and international seminars and workshops (NRA compendium web-based seminar, November 2020). Various institutions and authors have also recorded lessons in their reports and articles (Molden, D., Sharma, E., & Acharya, G. (2016), Sanderson, D., & Ramalingam, B. (2015) & Stephension Maggie (2020). following are the major lessons learned:

## 9.1 Reconstruction Governance

i. There should be a dedicated authority to implement reconstruction and associated programs. Such a Special Purpose Vehicle (SPV) should be immediately established and must have adequate legal, HR and financial mandates. There should be all-party consensus on the functions and mandates of the designated authority for reconstruction.

ii. The experience of NRA showed that mission-oriented task of government will be successful through SPV approach of execution mechanism.

iii. The reconstruction plan should be fact- based, norms and standards- based, well-consulted, resource-backed, adequately staffed, well-coordinated, containing a time-bound blueprint with some flexibility for necessary adjustment.

iv. In the case of a SPV like NRA, the division of labor between the politically- appointed authority and the government bureaucrats must be outlined in the Reconstruction Act.

v. There should be special procurement policy, land administration policy and budget approval and implementation procedures to facilitate accelerated decision-making and action and to rapidly avail quality services from the suppliers.

vi. Construction and reconstruction activities need to be carried out through a standard framework and guidelines for the sustainable development of the country. The guidelines and framework prepared so far during the reconstruction stage can be utilized, with necessary amendments for the construction/ reconstruction works in the coming days.

vii. Reconstruction can be politicized at any level, at any time, by any event and by any political parties. Transparent policies, institutional framework for their engagement in the decision-making process and fact-based decisions can help prevent unwanted political interference

viii. The reconstruction process should be country- led, consultative, socially and culturally acceptable from the very beginning. Any assistance from any donor should be need - based and demand- driven.

ix. People and support agencies (national/international) should trust - and help to reinforce, when necessary, reconstruction governance, for which rule- based decisions, predictable policies, open management information systems, trustworthy channels for grant distribution and fund disbursement, timely auditing of expenses, a system of grievances hearing and public hearing, and publication of program inputs and outputs are essential .

## 9.2 SAR Operation

i. A preparedness deficit not only delays the SAR but also makes it less efficient. In the case of Nepal, better preparedness would have saved numerous human lives and property. Preparedness should cover a wide range of areas, including scenario planning, trained personnel, equipment, mandate, data/information network coordination and communication and means of access.
ii. The coordinated response mechanism should be strengthened at local level and made immediately active, when necessary, even at ward level. Local government should be made responsible for first response.
iii. There should be helipads in every ward of each municipality and helicopter in provincial headquarters, under the command of the armed forces and NDRRMA.
iv. Each municipality should maintain minimum food storage capacity for emergencies, especially in those areas where road access is non-existent or of poor quality.

## 9.3 Housing Reconstruction

i. The Department of Urban Development and Building Construction (DUDBC) the Government agency, should develop a design catalogue for ecologically- fit and locally-appropriate resilient housing and share with local governments, which can be immediately made available to the disaster-affected households.
ii. Local governments should prepare and annually update a data base of housing and archeological monuments within their jurisdiction and share it with the relevant federal agency. In case of disaster, the local government should collect the information in prescribed format and share immediately with concerned agencies of federal and provincial governments.
iii. Cash grants alone are insufficient as a housing recovery financial strategy. Additional measures are needed to address the matter of affordability. In the future, it is necessary to reduce construction costs, as well as develop ways of expanding housing financial services and access to credit on reasonable terms, to increase the ability of households to meet the costs of construction.
iv. Housing Grant distribution through registered financial institutions is time-consuming and especially challenging for remote communities. But it is fair and transparent. It does, however, require fine-tuning to increase ease of access for all.
v. Retrofitting has great potential to maintain vernacular design with resiliency, and economize resources for reconstruction.
vi. The policy and program of the government should focus on the development of safe, integrated settlements. The overall settlement pattern of Nepal is very much unorganized and disorganized. In order to make human settlements more resilient and sustainable, emphasis should be given to develop integrated settlements, through geological research and surveys
vii. The construction of integrated settlements, with multiple choices of resettlement, has helped villagers gain access to many facilities and change their lifestyles, but they need new income and employment opportunities to sustainably enjoy all these facilities.

## 9.4 Heritage Reconstruction

i. It is very important to understand that heritage reconstruction is not simply a construction assignment, but rather, an exercise in conservation. Modern technology can be applied, but without compromising the heritage attributes.
ii. Community participation is at the core of heritage reconstruction. The c community must be involved from the outset in consultation, planning and wherever possible, in implementation.
iii. For creating and enlarging a sufficient cadre of skilled artisans for stone, wood carving and masonry works, conscious efforts are required for imparting traditional technology to the future generation.
iv. Conservation guidelines are essential to immediately address restoration and conservation of heritage monuments, to maintain records of the design and artistry, to facilitate rapid decision-making for reconstruction and to minimize disputes.
v. The Public Procurement Act needs to be harmonized with the requirements of heritage procurement of quality inputs - technical and material - for reconstruction of cultural heritage requires that lowest cost is not always the final arbiter.
vi. Structural Integrity Assessment of all heritage monuments should be carried out and a systematic program should be designed and implemented.

## 9.5 Livelihood Promotion

Livelihoods should be an integral part of any post-disaster reconstruction process, because an earthquake, or other disaster event, not only damages housing and other infrastructure but also impacts the livelihoods of affected people. Livelihood options need to be diversified with the introduction of simple technologies that can be handled by ordinary affected people, with just a few days of training.

## 9.6 Inclusiveness

i. Landless and marginalized groups including single women, senior citizens, people of low income and low caste groups should receive special consideration from the government, so that a large number of people is not left behind in the process of reconstruction.
ii. Differentiated grants and fiscal incentive policies and programs need to be put in place to include the landless and marginalized groups in the reconstruction process. National development policies, strategies and programs targeted at the most vulnerable can form a basis for rapidly implementing such disaster recovery programs for the most disadvantaged. There should be constant monitoring of such policies , to see whether the policy in question did benefit the target group or not. If not, further simplification of policies and delivery mechanisms would be required.
iii. The local government, following approved criteria, should maintain updated data about vulnerable households, so that there is no need for further verification at the time of recovery and reconstruction.
iv. Political inclusiveness in the structure and decision-making system starting from federal to district and local is vital. There were arrangements of Advisory Council, Steering Committee, District and Local Coordination Committee at different triers of government.

# CHAPTER 10
# FINDINGS AND RECOMMENDATIONS

## 10.1 Findings

i. Despite various constraints and obstacles, the NRA has been successful in achieving its targets in most reconstruction sectors. By the end of 2077/78, NRA accomplished 84.77 percent of the private housing reconstruction target. Similarly, the progress in the reconstruction of public buildings, school buildings, health institutions, heritage, and the buildings of security forces stood at 93.49 percent, 87.66 percent, 64.52 percent, 63.70 percent and 100 percent of targets respectively. However, in the areas of skill training, and livelihood promotion, the level of progress was relatively low.

ii. Rule-based decision- making and proper communication with stakeholders helped the NRA to maintain transparency, therefore, protecting the NRA from allegations of corruption.

iii. Although the disaster-related framework and acts were in place, the disaster preparedness of the country was found to be rather poor at the time of initial search and rescue operations. The national search and rescue team lacked equipment and logistics and the SAR needs were not properly communicated to the international SAR team. Some relief materials remained undistributed and the coordination at the field level was poor, as there was no elected local government to support operations.

iv. The reconstruction was slow in the initial years as it had to simultaneously identify the problems, explore the solutions and arrange legal instruments to solve identified problems. Later, with policies and systems in place, the pace of reconstruction increased. To enhance operational effectiveness, the NRA brought out into effect 22 procedures, guidelines and bylaws addressing various critical issues, in addition to the Act and Regulation.

v. There has been a major shift in housing typologies, from stone and mud-based masonry to cement-based construction, in earthquake-affected districts.

vi. Housing reconstruction, which utilized 46.07 percent of the public portion of reconstruction expenditure and 63.63 percent of total reconstruction expenditure (including household expenditure), is the most successful reconstruction activity, as it will achieve 91.46 percent of the reconstruction target.

vii. The reconstruction of individual houses was owner-driven. However, as the average cost of rebuilding a private house is estimated to be Rs. 907,647, well above the government grant amount,. households used their own funds (loan or saving) equivalent to Rs. 282.6 billion (32.6 percent) of the total amount of reconstruction spending.

viii. Household indebtedness has increased due to the acute need for funds for housing reconstruction. About one-third of the households (31.5 percent) have borrowed from banking and non-banking sources, to raise the funding required to meet their house reconstruction costs and other household consumption needs and affairs.

ix. Insufficient housing grants for affected families and unavailability of the interest- subsidized loans to the poor and disadvantaged households likely pushed many of them into the debt-trap. Unless this problem is addressed in a timely manner , many families might be compelled to sell their land assets to settle their house reconstruction loans.

x. The livelihood component of PDRF did not receive the required attention of the NRA and was left to the purview of INGOs and NGOs. Various models were tested in limited areas. Some models were successful but were not replicated in other areas. Continuity of livelihood activities was not supported and livelihood opportunities in the integrated settlement are still lacking.

xi. School and health infrastructures are yet to provide better services to the people in the spirit of building back better.

xii. The reconstruction of archaeological heritage sites and monuments was found to be comparatively more challenging than other areas of reconstruction . Heritage reconstruction was delayed due to the lack of a clear and well-supported policy; lack of proper inventory of previous historical records, conflicts about construction materials to be used; mode of contracts for reconstruction; lack of skilled manpower for traditional artwork; and the lack of a framework to support local community-driven rebuilding initiatives.

xiii. International funding has played a vital role in the whole reconstruction work. From the very beginning of the earthquake outbreak, international agencies (bilateral and multilateral), as well as non-government organizations, were involved in diverse areas of rescue, relief, recovery and reconstruction works. Out

of the total reconstruction expenditure of Rs.867890 million, the shares of government, development partners, INGOs and NGOs, and households stand at 28, 29, 10, and 33 percent respectively.

xiv. The overall economic situation of the country has improved in the post-earthquake period. The average annual GDP growth is higher, at 5.26 percent, in the post-earthquake period, compared to 3.57 percent in the pre-earthquake period.

xv. Reconstruction activities have created notable positive change in the national economy, with a significant contribution to GDP, GNDI, GFCF, employment and household consumption. As the volume of expenditures on reconstruction activities rises , the contribution of reconstruction on macroeconomic indicators moves in the same direction.

xvi. A large number of trained masons and carpenters are losing employment opportunities with the completion of reconstruction activities.

## 10.2 Recommendations

i. As per the constitutional mandate and provisions of the acts, regulations and frameworks, all tiers of governments must have, in advance of the onset of any disaster events, intact institutions, capacity, and the equipment to create awareness, and to conduct rescue and relief operations. Agencies responsible for rescue and relief should be at a high state of readiness, efficient and there should be no resource scarcity.

ii. Any relocation/resettlement must be community-initiated, community-driven and community-controlled, with the appropriate support from the state, and specific human rights protections against forced evictions should be in place.

iii. A uniform/blanket policy for the reconstruction across all the affected districts/municipalities for all communities seems a logical approach and one which would facilitate monitoring. However, special focus should be given to those households headed by single women, child-headed households, households headed by disabled persons, households headed by senior citizens, Dalit households, and to the poorest and most vulnerable affected households in remote areas.

iv. A national construction policy and guidelines are essential for all types of construction, including private housing construction, traditional and urban-specific designs and building materials . Resilient and sustainable construction activities need to be continued in the days to come, in accordance with national construction frameworks and guidelines.

v. Sustainable construction plans and programs are required for the recovery and expansion of livelihoods, to reduce the incidence of household debt. Given that household debt has increased substantially in the process of house reconstruction, income-generating activities for households are imperative, to assist them to overcome the burden of loans .

vi. The Government of Nepal should simultaneously come up with programs in the earthquake-affected areas to address the critical issues of livelihoods, unemployment, and indebtedness along with reconstruction during future natural disasters, and should focus on different livelihood and income opportunities available at the community level and on reinforcing matching skill sets.

vii. The Ministry of Agriculture and Livestock Development should encourage people in disaster- affected areas to diversify farmers' livelihoods options and to create alternative income- generating activities through sustainable production methods, value addition, and marketing-based sales of traditional crops and commodities.

viii. The concerned federal ministries and local governments should provide financial and human resources (including laboratory and other required equipment, together with trained staff) to schools and health institutions, to equip them to provide the best services. This will increase the socio-economic impact of the investment made in such social infrastructure .

ix. There should be an exception in procurement policy/procedures to modify the requirement to accept the lowest cost bidders, especially in the case of archaeological and cultural heritage reconstruction, considering their unique importance and the specialized knowledge and technical skills required for reconstruction in the field of cultural heritage. Likewise, reconstruction of archaeological and heritage infrastructure should be allowed adequate time, considering their archaeological value and given the time-consuming nature of such construction.

x. The establishment of a Nepal Disaster Land Bank (NDLB) could facilitate disaster-affected landless households to secure access to land in the event of disasters.

xi. The Department of Archeology, Government of Nepal, should take the lead in establishing preparedness measures for renovation and reconstruction of key national heritage sites, through discussion with concerned international institutions, subject experts, academia and more importantly, with the associated communities in order the resolve beforehand multidimensional issues related, for example, to design, construction materials and techniques, technology, artisans and other skilled workers, as well as policies. It

is necessary to strengthen the Department of Archeology and amend the Ancient Monuments Preservation Act 2013.

xii. As per the decisions of the government to launch a 'Nepal Disaster Resilient Framework (NDRF)" needs to be charted out with informed integrated planning, resource-backed multilayered collaborative implementation mechanisms and strengthened institutional capabilities, to ensure sustainable outcomes. This task should be led by NDRRMA and approved through NDRRMA executive decision-making and governance channels .

xiii. With regards to the NDRRMA, upgrading of its status, appropriate positioning, and more autonomy in legal, disaster management policy, human resource and finance-related mandates should be provided through the amendment of the NDRRMA Act and Regulation.

xiv. In order to make informed policy decisions and equip policymakers on critical issues of sustainable reconstruction, resettlement and financing solutions, future research should be geared towards Multi-Hazard Risk Assessment Mapping and Multi-Hazard Risk Sensitive Land Use Planning; an Urban Regeneration program to address the issues of urban reconstruction and recovery; low-cost earthquake-resilient housing and climate-compatible infrastructure development.

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# ANNEXES

## Annex 1: Lists of NRA Acts Guidelines, and Procedures

1. Act on Reconstruction of Earthquake Affected Structures (2072)
2. Regulation on Reconstruction of Earthquake Affected Structures (2072)
3. Land registration procedure in the name of the earthquake affected individual (2072)
4. Land acquisition procedure for reconstruction of earthquake affected structures (2072)
5. Procedure for Environmental Impact Assessment of earthquake affected structures (2072)
6. Public procurement procedure for reconstruction of earthquake affected structures (2072)
7. Grant distribution procedure for reconstruction of earthquake affected private houses (2073)
8. Procedural guidelines for concessional loans (2074)
9. Guidelines on Consolidated procedures for concessional loans (2074/75)
10. NRA related Acts, Regulations and Procedural Guidelines (Part-II)
11. Guidelines on community committee for reconstruction 2073
12. Guidelines for Beneficiary selection for post-earthquake reconstruction of private houses 2074
13. Guidelines for mobilization of NGOs for reconstruction and rehabilitation 2072 (Second amendment) 2074
14. Procedure for relocation & resettlement of beneficiaries from risky areas (2073)
15. NRA procedure for appellant (Punarabedan) (2073)
16. Working procedure for school reconstruction (2073)
17. Training and management guidelines 2073
18. Procedure for Grievances redressed – Gunaso Byabathapan (2074)
19. भूकम्प पिडितलाई बसोबास योग्य जग्गा खरीद सम्बन्धी मापदण्ड -२०७४
20. Procedure for Identification of earthquake affected risky groups (2074)
21. Integrated settlement development guidelines 2075 (43 sites approved)
22. Procedural guidelines for Reconstruction / Renovation of earthquake affected Gumba /Monasteries/ Stupas (2075)
23. Guidelines on re-survey and inclusion of the missed ones (2075)
24. Technical supervision guidelines (First amendment) 2075
25. Guidelines for providing grant support to households who constructed their houses prior to deployment of technicians (2076)
26. Working procedure for reconstruction of individually-owned or collectively owned houses remained under Heritage Sites (2076)
27. Guidelines for timber production and supply to earthquake affected households 2072

## Annex 2: List of key Informants Interviewed

| Name of organization | Name of Respondent | Date of KII |
|---|---|---|
| DFID | Radha+Kamala | 12-Mar-21 |
| World Bank | Sulochana Nepali | 1-Apr-21 |
| EU | Adi Walker | 25-Mar-21 |
| UNDP | Pragya+UNDP Team | 1-Apr-21 |
| UN-Women | | |
| JICA | Ram Prasad Bhandari+Naomi+Ayuko | 26-Mar-21 |
| China Foundation | Zou | 1-Apr-21 |
| NSET | Surya Narayan Shrestha+Ranjan Dhungel | 4-Mar-21 |
| NRA Executive Committee Members | Chandra Bahadur Shrestha | 13-Mar-21 |
| NRA Executive Committee Members | Dhruva Sharma | 7-May-21 |
| NRA Executive Committee Members | Hari Ram Parajuli | |
| CEO | Anil Pokhrel | 8-Apr-21 |
| MOUD | Kishor Thapa | 13-Apr-21 |
| KII with USAID | Sushil Poudel | 21 April 2022 |
| KII with ADB | Naresh Giri | 22 April 2021 |
| KII with WFP/Ratindra Khatri | Ratindra Khatri | 22-Apr-22 |
| KII with ACT Alliance | Bidyanath+Gopal Dahal | 23 April 2021 |
| Ex-NRA CEO | Govind Pokharel | 23-May-21 |
| Ex- Rtd Home Secretary | Laxmi Dhakal | 23-May-21 |
| NGO Federation Chief | Jit Ram Lama | 20-May-21 |
| Red Cross | Umesh Dhakal | 25-May-21 |
| Ex-NRA CEO | Yubaraj Bhusal | 6-Jun-21 |
| NRA Exec Comm Member | Bishnu Bhandari | 10-Jun-21 |

## Annex 3: Impact of Reconstruction on Income, Expenditure and Debt

| Variables | Ag Income | Total Debt | Total Income | Non Agri Income |
|---|---|---|---|---|
| High Impact Districts | 10.31*** (6.52) | -15.2* (-1.85) | 0.42** (2.15) | -6.59*** (-3.35) |
| Low Impact Districts | 5.28 (0.83) | -62.2* (-1.87) | 0.045 (0.06) | -33.8*** (-4.25) |
| Year Dummy | | Yes | | |
| District dummy | | Yes | | |
| Other Control variables | | Yes | | |
| F-Stat | 65.75 | 144.5 | 41.09 | 481.8 |
| Adj Rsqr | 0.074 | 0.148 | 0.047 | 0.38 |
| Observations | 28944 | 28944 | 28944 | 28944 |

Note: Dependent variable are in NRS thousand

## Annex 4: Impact of Reconstruction on Expenditure

| Variables | Total Expenditure | Health Expenditure | Livelihood expenditure |
|---|---|---|---|
| High Impact Districts | -3.52** (-2.41) | 2.43*** (5.2) | 0.86** (2.6) |
| Low Impact Districts | -10.2*** (4.16) | 2.42 (-2.38) | 0.8 (0.6) |
| Year Dummy | | Yes | |
| District dummy | | Yes | |
| Other Control variables | | Yes | |
| F-Stat | 3324.5 | 364.2 | 2102.2 |
| Adj Rsqr | 0.81 | 0.31 | 0.73 |
| Observations | 28944 | 28944 | 28944 |

Note: Dependent variable are in NRS thousand

## Annex 5: Impact of Reconstruction on Expenditure

| Variables | Food Expenditure | Education Expenditure | Other expenditure |
|---|---|---|---|
| High Impact Districts | 1.08** (-2.83) | 1.12** (3.12) | -2.61* (-4.31) |
| Low Impact Districts | -0.32 (0.21) | 0.47 (0.33) | -0.85 (-0.56) |
| Year Dummy | | Yes | |
| District dummy | | Yes | |
| Other Control variables | | Yes | |
| F-Stat | 3324.5 | 3970.12 | 198.4 |
| Adj Rsqr | 0.81 | 0.83 | 0.21 |
| Observations | 28944 | 28944 | 28944 |

Note: Dependent variable are in NRS thousand

## Annex 6: Impact of Reconstruction on Drinking Water Source

| Variables | River Stream | Well | Tap |
|---|---|---|---|
| High Impact Districts | -0.004*** (-2.81) | -0.005* (-1.92) | 0.01** (1.99) |
| Low Impact Districts | -0.011** (-1.97) | 0.002 (0.17) | 0.013* (1.87) |
| Year Dummy | Yes | | |
| District dummy | Yes | | |
| Other Control variables | Yes | | |
| F-Stat | 55.06 | 17.19 | 28.53 |
| Adj Rsqr | 0.069 | 0.24 | 0.29 |
| Observations | 28944 | 28944 | 28944 |

Note:

## Annex 7:Impact of Reconstruction on Wash Water Source

| Variables | Tap | Well | Kuwa | River & stream |
|---|---|---|---|---|
| High Impact Districts | 0.021*** (4.28) | -0.017* (-2.75) | -0.01** (-2.18) | -0.001 (-0.09) |
| Low Impact Districts | 0.039** (1.97) | -0.01 (-.07) | -0.07** (4.11) | -0.028** (-1.92) |
| Year Dummy | | Yes | | |
| District dummy | | Yes | | |
| Other Control variables | | Yes | | |
| F-Stat | 74.93 | 105.1 | 61.61 | 61.61 |
| Adj Rsqr | 0.096 | 0.12 | 0.08 | 0.032 |
| Observations | 28944 | 28944 | 28944 | 28944 |

*Note:*

## Annex 8: Impact of Reconstruction on Light Source

| Variables | Non grid electricity | Biogas | Solar | Kerosene |
|---|---|---|---|---|
| High Impact Districts | -0.002 (-0.53) | 0.01*** (6.09) | 0.033*** (6.86) | -0.008*** (3.8) |
| Low Impact Districts | 0.06*** (3.59) | 0.003 (0.5) | 0.0035 (0.18) | -0.002 (0.75) |
| Year Dummy | | Yes | | |
| District dummy | | Yes | | |
| Other Control variables | | Yes | | |
| Adj R Sqr | 0.086 | 0.067 | 0.072 | 0.075 |
| F-Stat | 60.25 | 45.58 | 49.95 | 49.95 |
| Observations | 28944 | 28944 | 28944 | 28944 |

Note:

## Annex 9: Impact of Reconstruction on Health Related Indicators

| Variables | Hospital Visit | Attended PNCs |
|---|---|---|
| High Impact Districts | 0.014***<br>(3.52) | 0.44**<br>(2.28) |
| Low Impact Districts | 0.0621***<br>(3.59) | 0.34<br>(0.44) |
| Year Dummy | | |
| District dummy | | |
| Other Control variables | | |
| F-Stat | 0.086 | 0.035 |
| Adj Rsqr | 60.25 | |
| Observations | 28944 | 28944 |

Note:

## Annex 10: Impact of Reconstruction on Possession of Household Appliances

| Variables | TV | Mobile | Telephone |
|---|---|---|---|
| High Impact Districts | 0.035***<br>(9.07) | 0.026***<br>(6.62) | 0.03<br>(1.53) |
| Low Impact Districts | 0.049*<br>(1.69) | 0.034**<br>(2.35) | 0.01<br>(1.37) |
| Year Dummy | | | |
| District dummy | | | |
| Other Control variables | | | |
| F-Stat | | | |
| Adj Rsqr | 0.23 | 0.06 | 0.26 |
| Observations | 28944 | 28944 | 28944 |

Note:

## Annex 11: Impact of Reconstruction on Possession of Household Appliances

| Variables | Fridge | Computer | Internet |
|---|---|---|---|
| High Impact Districts | 0.0035<br>(1.5) | -0.002<br>(-1.24) | -0.01***<br>(-4.3) |
| Low Impact Districts | 0.004*<br>(0.48) | -0.003<br>(-0.46) | -0.009<br>(-1.14) |
| Year Dummy | | | |
| District dummy | | | |
| Other Control variables | | | |
| F-Stat | | | |
| Adj Rsqr | 0.46 | 0.06 | 0.43 |
| Observations | 28944 | 28944 | 28944 |

Note:

## Annex 12: Impact of Impact of Reconstruction on Possession of Household Appliances

| Variables | Two wheeler | Micro oven | Washing Machine |
|---|---|---|---|
| High Impact Districts | 0.002<br>(0.99) | -0.004<br>(-1.4) | -0.0013<br>(-1.5) |
| Low Impact Districts | 0.009<br>(1.07) | 0.003<br>(-0.28) | -0.0037<br>(-1.13) |
| Year Dummy | | Yes | |
| District dummy | | Yes | |
| Other Control variables | | Yes | |
| F-Stat | | | |
| Adj Rsqr | 0.23 | 0.094 | 0.05 |
| Observations | 28944 | 28944 | 28944 |

Note:

## Annex 13: Impact of Reconstruction on Foundation of the House

| Variables | Concrete pillar | Earthen | Cement joint |
|---|---|---|---|
| High impact Districts | 0.108***<br>(8.02) | 0.37***<br>(19.7) | 0.048***<br>(2.97) |
| Low Impact Districts | 0.159***<br>(1.07) | 0.43***<br>(6.3) | -0.0017<br>(-0.03) |
| Year Dummy | | Yes | |
| District dummy | | Yes | |
| Other Control variables | | Yes | |
| F-Stat | 47.2 | 105.1 | 445.9 |
| Adj Rsqr | 0.12 | 0.11 | 0.45 |
| Observations | 28944 | 28944 | 28944 |

Note:

## Annex 14: Impact of Reconstruction on Wall of the House

| Variables | Wooden joined | Earthen joined brick & Stone | Cement joint |
|---|---|---|---|
| High impact Districts | -0.006<br>(-0.61) | 0.04***<br>(3.4) | 0.06***<br>(3.73) |
| Low Impact Districts | -0.007<br>(-0.24) | -0.019<br>(-0.47) | 0.15***<br>(3.11) |
| Year Dummy | | Yes | |
| District dummy | | Yes | |
| Other Control variables | | Yes | |
| F-Stat | 411.2 | 106.1 | 597.3 |
| Adj Rsqr | 0.43 | 0.66 | 0.52 |
| Observations | 28944 | 28944 | 28944 |

## Annex 15: Impact of School Reconstruction on Education Related Indicators

| Variables | HH in Primary | HH in Secondary | HH in College |
|---|---|---|---|
| High impact*School reconstruction | 0.012<br>(1.39) | -0.0064<br>(-0.65) | 0.0188***<br>(2.96) |
| (1-High impact) * School reconstruction | -0.051<br>(-0.97) | -0.031<br>(-0.52) | -0.040<br>(-1.07) |
| Year Dummy | Yes | | |
| District dummy | Yes | | |
| Other Control variables | Yes | | |
| Wald Chi (2) | 65.62 | 41.09 | 498.6 |
| Adj Rsqr | 0.023 | 0.047 | 0.017 |
| Observations | 28944 | 28944 | 28944 |

## Annex 16: Impact of School Reconstruction on Education Related Indicators

| Variables | % of school going boys | % of School going girls | Education exp |
|---|---|---|---|
| High impact*School reconstruction | -0.02<br>(1.04) | 0.30<br>(0.67) | 0.62<br>(1.04) |
| (1-High impact) * School reconstruction | -0.4<br>(-0.41) | -0.26<br>(-0.10) | -16.5***<br>(-4.61) |
| Year Dummy | | Yes | |
| District dummy | | Yes | |
| Other Control variables | | Yes | |
| Wald Chi (2) | 189.5 | 658.8 | 13507.5 |
| Adj Rsqr | 0.022 | 0.023 | 0.014 |
| Observations | 28944 | 28944 | 28944 |

Note: Education expenditure is in Rupees thousand

## Annex 17: Impact of Health Post & Hospital Reconstruction on Health Related Indicators

| Variables | Hospital visit | Maternal mortality | Institutional delivery |
|---|---|---|---|
| High impact*School reconstruction | 0.03<br>(0.85) | 0.001<br>(0.002) | 0.002<br>(1.14) |
| (1-High impact) * School reconstruction | 0.10<br>(0.61) | 0.002<br>(0.002) | -0.01<br>(-0.84) |
| Year Dummy | | Yes | |
| District dummy | | Yes | |
| Other Control variables | | Yes | |
| Wald Chi (2) | 88.5 | 27.16 | 52.1 |
| Adj Rsqr | 0.00 | 0.00 | 0.00 |
| Observations | 28944 | 28944 | 28944 |

Notes: Hospital visit is in number of times. And maternal mortality & institutional delivery is in number of cases.

## Annex 18: Impact of Health Post & Hospital Reconstruction on Health Related Indicators

| Variables | Attended PNCs | Total Birth | Birth per 14-49 yrs |
|---|---|---|---|
| High impact*School reconstruction | -0.18<br>(-1.14) | 0.006**<br>(2.15) | 0.004*<br>(1.95) |
| (1-High impact) * School reconstruction | 0.109<br>(0.15) | 0.0015<br>(0.12) | 0.003<br>(0.3) |
| Year Dummy | | Yes | |
| District dummy | | Yes | |
| Other Control variables | | Yes | |
| Wald Chi (2) | 116.7 | 50.12 | 54.76 |
| Adj Rsqr | 0.00 | 0.00 | 0.00 |
| Observations | 28944 | 28944 | 28944 |

Notes: Attended PNCs is in number of times. And total birth&birth per 14-49 yrs is in number.

## Annex 19: Impact of Heritage Reconstruction on Tourism Business

| Variables | Tourism Income | Family members in Tourism Business |
|---|---|---|
| High impact*School reconstruction | 0.012<br>(8.31) | 0.013***<br>(8.19) |
| (1-High impact) * School reconstruction | 0.007<br>(1.05) | 0.007<br>(1.01) |
| Year Dummy | Yes | |
| District dummy | Yes | |
| Other Control variables | Yes | |
| Wald Chi (2) | 422.7 | 479.56 |
| Adj Rsqr | 0.014 | 0.016 |
| Observations | 28944 | 28944 |

Note: Tourism income is in rupees thousand and family member represents number of family members.

## Annex 20: Reconstruction and Macroeconomic Aggregates- Sequence of Accounts

Rs. million

| Reconstruction expenditure | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
|---|---|---|---|---|---|---|
| Capital expenditure | 40040 | 129130 | 230973 | 180303 | 108000 | 83008 |
| Housing construction | 16620 | 84366 | 179542 | 136765 | 76534 | 58432 |
| Housing construction- institutional | 7360 | 54058 | 106624 | 53776 | 24396 | 23470 |
| Housing construction- own account | 9261 | 30308 | 72918 | 82989 | 52137 | 34962 |
| Other construction | 23419 | 44764 | 51431 | 43538 | 31466 | 24576 |
| Current expenditure | 31601 | 28690 | 18644 | 11815 | 3029 | 2658 |
| Total reconstruction output | 71641 | 157820 | 249617 | 192118 | 111029 | 85666 |
| Reconstruction and GDP | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
| Gross Output at basic prices | 4094046 | 4783724 | 5347875 | 6011711 | 6012751 | 6489261 |
| Intermediate Consumption at purchasers' prices | 1752644 | 2063161 | 2336853 | 2669231 | 2558611 | 2755987 |
| GDP at current basic prices | 2341402 | 2720563 | 3011022 | 3342481 | 3454140 | 3733274 |
| Gross Domestic Product (GDP) at current prices | 2608184 | 3077145 | 3455949 | 3858930 | 3914701 | 4266321 |
| Gross Domestic Product (GDP) at constant basic prices | 1700448 | 1846506 | 1982653 | 2109263 | 2064600 | 2146824 |
| Gross Domestic Product (GDP) at constant 2010/11 prices | 1870424 | 2038337 | 2193706 | 2339743 | 2290880 | 2382708 |
| Gross Domestic Product (GDP) at constant 2015/16 prices | 2608184 | 2875759 | 3133378 | 3353060 | 3221864 | 3378102 |
| Change in GDP | 13038 | 267575 | 257619 | 219683 | -131196 | 156238 |
| Contribution of reconstruction on GDP growth | 0.13 | 2.13 | 2.70 | 2.00 | 0.63 | 0.80 |
| Contribution of reconstruction GVA to total GDP | 1.42 | 2.41 | 3.28 | 2.14 | 1.15 | 0.83 |
| GDP growth rate | 0.43 | 8.98 | 7.62 | 6.66 | -2.09 | 4.01 |
| GDP growth rate (without reconstruction) | 0.30 | 6.84 | 4.92 | 4.66 | -2.72 | 3.20 |
| GDP/output ratio | 0.57 | 0.569 | 0.563 | 0.556 | 0.574 | 0.575 |
| Reconstruction and construction sector | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
| Construction output | 398869 | 480714 | 569440 | 649787 | 580089 | 598910 |
| Construction intermediate consumption | 247109 | 297738 | 351716 | 415527 | 375228 | 386916 |
| Construction sector GVA at current prices | 151760 | 182976 | 217723 | 234260 | 204862 | 211994 |
| Construction sector GVA at constant (2015/16) prices | 151760 | 180103 | 201892 | 216996 | 206178 | 217638 |
| Construction sector GVA growth rate | 0.12 | 18.68 | 12.10 | 7.48 | -4.99 | 5.56 |
| Construction sector GVA output ratio | 0.38 | 0.38 | 0.38 | 0.36 | 0.35 | 0.35 |
| Construction sector GVA growth rate without reconstruction | 0.12 | 12.08 | 6.62 | 5.21 | -5.95 | 4.76 |
| Contribution of reconstruction on construction growth rate | 0.003 | 6.60 | 5.48 | 2.27 | 0.96 | 0.80 |
| Reconstruction | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
| GVA Reconstruction (capital) | 15234 | 49151 | 88312 | 65003 | 38141 | 29382 |
| GVA Reconstruction (current) | 18073 | 16316 | 10497 | 6569 | 1740 | 1529 |
| GVA- Reconstruction (total) | 33307 | 65468 | 98809 | 71572 | 39881 | 30911 |
| GVA -Reconstruction at 2015/16 prices (Capital) | 15234 | 48379 | 81890 | 60212 | 38386 | 30164 |
| GVA -Reconstruction at 2015/16 prices (Current) | 18073 | 15248 | 9517 | 5708 | 1432 | 1211 |
| Total GVA -Reconstruction at 2015/16 prices | 33307 | 63628 | 91408 | 65920 | 39818 | 31375 |
| Contribution of reconstruction on construction sector GVA | 21.95 | 35.78 | 45.38 | 30.55 | 19.47 | 14.58 |
| Contribution of reconstruction on construction growth rate | 0.003 | 6.60 | 5.48 | 2.27 | 0.96 | 0.80 |
| Construction sector GVA growth rate | 0.12 | 18.68 | 12.10 | 7.48 | -4.99 | 5.56 |
| Construction sector GVA growth rate without reconstruction | 0.12 | 12.08 | 6.62 | 5.21 | -5.95 | 4.76 |
| Gross Fixed Capital Formation (GFCF) | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
| Reconstruction GFCF at current prices | 40040 | 129130 | 230973 | 180303 | 108000 | 83008 |
| Reconstruction GFCF at constant 2015/16 prices | 40040 | 126475 | 212320 | 158519 | 97517 | 76366 |
| GFCF- national at current prices | 748685 | 940850 | 1120864 | 1304902 | 1112901 | 1163057 |
| GFCF- national at constant 2015/16 prices | 748685 | 921502 | 1030343 | 1147247 | 1004874 | 1069990 |
| Change GFCF | 44950 | 172817 | 108842 | 116904 | -142373 | 65116 |
| GFCF growth rate | 6.39 | 23.08 | 11.81 | 11.35 | -12.41 | 6.48 |
| Contribution of reconstruction GFCF to total GFCF | 5.35 | 13.72 | 20.61 | 13.82 | 9.70 | 7.14 |
| Contribution of reconstruction GFCF to total GFCF growth rate | 0.34 | 3.17 | 2.43 | 1.57 | -1.20 | 0.46 |
| Total GFCF growth rate without reconstruction | 6.05 | 19.91 | 9.38 | 9.78 | -13.61 | 6.02 |
| Reconstruction GFCF growth rate | 0.34 | 3.17 | 2.43 | 1.57 | 1.20 | 0.46 |

| Reconstruction expenditure | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
|---|---|---|---|---|---|---|
| Gross Disposable Income | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
| Gross national disposable income at current prices | 3420376 | 4059941 | 4343235 | 4893631 | 4943024 | 5323554 |
| Gross national disposable income at constant prices | 3662418 | 3794236 | 3937846 | 4252121 | 4068191 | 4215226 |
| Annual change in GDI | 119528 | 131818 | 143610 | 314275 | -183931 | 147036 |
| GNDI growth rate | 3.37 | 3.60 | 3.78 | 7.98 | -4.33 | 3.61 |
| Transfers to households reconstruction related | 19179 | 7207 | 1194 | 694 | 300 | 200 |
| Disposable income for consumption at current prices | 52486 | 72675 | 100003 | 72266 | 40181 | 31111 |
| Disposable income for consumption at constant prices | 52486 | 67918 | 90669 | 62792 | 33069 | 24634 |
| Contribution of reconstruction GDI to total GNDI | 1.53 | 1.79 | 2.30 | 1.48 | 0.81 | 0.58 |
| Contribution of reconstruction GDI to total GNDI growth rate | 1.48 | 1.85 | 2.39 | 1.59 | 0.78 | 0.61 |
| GNDI growth rate | 3.37 | 3.60 | 3.78 | 7.98 | -4.33 | 3.61 |
| Compensation of Employees | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
| National compensation of employees at current price | 1072003 | 1226772 | 1302767 | 1423500 | 1557945 | 1616197 |
| National compensation of employees at constant(2015/16) prices | 1072003 | 1146485 | 1181169 | 1236892 | 1282215 | 1279716 |
| Change in compensation of employees | -11144 | 74482 | 34684 | 55723 | 45323 | -2499 |
| CE growth rate | -1.03 | 6.95 | 3.03 | 4.72 | 3.66 | -0.19 |
| National CE and output ratio | 0.43 | 0.44 | 0.42 | 0.41 | 0.41 | 0.39 |
| Compensation of employees in construction sector | 172988 | 210190 | 240114 | 265241 | 238268 | 236430 |
| Total reconstruction output (Rs. millions) | 71641 | 157820 | 249617 | 192118 | 111029 | 85666 |
| Total reconstruction compensation of employees at current prices | 31070 | 69006 | 105255 | 78422 | 45604 | 33818 |
| Total reconstruction compensation of employees at constant 2015/16 prices | 31070 | 64490 | 95431 | 68141 | 37533 | 26778 |
| Contribution of reconstruction on total compensation of employees | 2.90 | 5.62 | 8.08 | 5.51 | 2.93 | 2.09 |
| Contribution of reconstruction on construction sector CE growth rate | 2.87 | 6.02 | 8.32 | 5.77 | 3.03 | 2.09 |
| Socioeconomic indicators | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
| Overall Implicit GDP Deflator (2010/11 prices) | 137.69 | 147.34 | 151.87 | 158.47 | 167.30 | 173.90 |
| Overall Implicit GDP Deflator (2015/16 prices) | 1.00 | 1.07 | 1.10 | 1.15 | 1.22 | 1.26 |
| Construction deflator (2010/11) prices | 142.01 | 144.28 | 153.15 | 153.31 | 141.11 | 138.33 |
| Construction deflator (2015/16) prices | 1.00 | 1.02 | 1.08 | 1.08 | 0.99 | 0.97 |
| Exchange rate (US$: NRs) | 106.35 | 106.21 | 104.37 | 112.88 | 116.31 | 118.22 |
| Population (millions) | 28.331826 | 28.714305 | 29.101948 | 29.494825 | 29.893005 | 30.296560 |
| GFCF implicit deflator 2010/11=100 | 1.312 | 1.339 | 1.427 | 1.492 | 1.453 | 1.426 |
| GFCF implicit deflator 2015/16=100 | 1.000 | 1.021 | 1.088 | 1.137 | 1.108 | 1.087 |
| Estimates of household consumption | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
| Transfers to households reconstruction related | 19179 | 7207 | 1194 | 694 | 300 | 200 |
| Disposable income for consumption at current prices | 52486 | 72675 | 100003 | 72266 | 40181 | 31111 |
| Disposable income for consumption at constant prices | 52486 | 67918 | 90669 | 62792 | 33069 | 24634 |
| Estimated household consumption contributed by reconstruction work at current prices | 23188 | 27919 | 37197 | 25759 | 14684 | 11162 |
| Estimated household consumption contributed by reconstruction work at current prices at constant 2015/16 prices | 23188 | 26092 | 33725 | 22382 | 12085 | 8838 |
| Ratio of disposable income and household consumption | 0.442 | 0.384 | 0.372 | 0.356 | 0.365 | 0.359 |
| Total private consumption at current prices | 1511106 | 1521254 | 1615490 | 1744320 | 1806374 | 1910005 |
| Total private consumption at constant 2015/16 prices | 1511106 | 1489969 | 1485024 | 1533576 | 1631032 | 1757168 |
| Contribution of reconstruction on total private consumption | 1.53 | 1.84 | 2.30 | 1.48 | 0.81 | 0.58 |
| Contribution of reconstruction on total private consumption | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
| Household consumption by reconstruction activities at current prices | 23188 | 27919 | 37197 | 25759 | 14684 | 11162 |
| Household consumption by reconstruction activities at constant 2015/16 prices | 23188 | 26092 | 33725 | 22382 | 12085 | 8838 |
| Contribution of reconstruction on total private consumption | 1.53 | 1.84 | 2.30 | 1.48 | 0.81 | 0.58 |

## Annex 21: Reconstruction Expenditure by Years of Reconstruction and Sector (On Budget)

| | | Rupees in thousands | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Years of reconstruction | | | | | | |
| | | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Six years |
| Arghakhachi | Agriculture livestock forestry and irrigation | 300 | 63 | 508 | | | | 871 |
| | Education building reconstruction | | 18010 | 40878 | | 260031 | 314535 | 633454 |
| | Health building reconstruction | | 1124 | | | | | 1124 |
| | Employment and livelihood | | 12122 | 7364 | | | | 19486 |
| | Environment and land conservation | 2000 | 1000 | 127 | | | | 3127 |
| | Private housing | | 29712 | 68918 | 71769 | 82251 | 75396 | 328046 |
| | Road and transport | | | 79615 | 341009 | 75018 | | 495642 |
| | Water and sanitation | 4871 | 4046 | 6516 | | | | 15433 |
| | Other public construction | | 230 | | 191343 | | | 191573 |
| | Miscellaneous administrative expenses | | | 300 | 200 | | 15699 | 16199 |
| | **Total** | **7171** | **66307** | **204226** | **604321** | **417300** | **405630** | **1704955** |
| Baglung | Agriculture livestock forestry and irrigation | 899 | 91 | 830 | | | | 1820 |
| | Religious and cultural heritage | | | | | | 3771 | 3771 |
| | Education building reconstruction | | 39397 | 43716 | | 315788 | 320121 | 719022 |
| | Health building reconstruction | | 2314 | 1261 | | | 26049 | 29624 |
| | Employment and livelihood | | 16551 | 9650 | | | | 26201 |
| | Environment and land conservation | 4589 | 3199 | 1243 | | | | 9031 |
| | Other government building | | 10389 | 27836 | 52900 | 29273 | | 120398 |
| | Private housing | | 55700 | 132314 | 204873 | 167380 | 173025 | 733292 |
| | Road and transport | | 14363 | 43309 | 86906 | 67406 | | 211984 |
| | Water and sanitation | 6795 | 2778 | 2095 | | | | 11668 |
| | Other public construction | | 230 | 694 | 219487 | | 768 | 221179 |
| | Miscellaneous administrative expenses | | | 300 | 200 | 234 | 28901 | 29635 |
| | **Total** | **12283** | **145012** | **263248** | **564366** | **580081** | **552635** | **2117625** |
| Bhaktapur | Agriculture livestock forestry and irrigation | 1750 | 95 | 579 | | | | 2424 |
| | Education building reconstruction | 61880 | 18873 | 89709 | 143876 | 213351 | 176634 | 704323 |
| | Health building reconstruction | | | 11243 | | | 70 | 11313 |
| | Employment and livelihood | | 26068 | 3351 | | | | 29419 |
| | Environment and land conservation | 5689 | 13968 | 51663 | | | | 71320 |
| | Other government building | 20300 | 26783 | 30179 | 27033 | 139598 | 31875 | 275768 |
| | Private housing | 201 | 1073185 | 1320291 | 1040381 | 718641 | 578640 | 4731339 |
| | Road and transport | 30572 | 111526 | 254132 | 29399 | 216 | | 425845 |
| | Water and sanitation | 20264 | 11195 | 9978 | | | | 41437 |
| | Other public construction | | 230 | 189 | 992 | | 1121 | 2532 |
| | Miscellaneous administrative expenses | | | 300 | 370 | 338 | 63565 | 64573 |
| | **Total** | **140656** | **1281923** | **1771614** | **1242051** | **1072144** | **851905** | **6360293** |
| Bhojpur | Agriculture livestock forestry and irrigation | 2600 | 95 | | | | | 2695 |
| | Education building reconstruction | | 19543 | 23302 | | 248881 | 299013 | 590739 |
| | Health building reconstruction | | 602 | | | | | 602 |
| | Employment and livelihood | | 11812 | 6979 | | | | 18791 |
| | Environment and land conservation | 1992 | 1500 | 821 | | | | 4313 |
| | Other government building | | 15811 | 32120 | 25497 | | | 73428 |
| | Private housing | | 109006 | 378689 | 563066 | 504417 | 165937 | 1721115 |
| | Road and transport | | | | | 3966 | | 3966 |
| | Water and sanitation | 10211 | 5649 | 4570 | | | | 20430 |
| | Other public construction | | 230 | | 172709 | | | 172939 |
| | Miscellaneous administrative expenses | | | 300 | 200 | 250 | 16545 | 17295 |
| | **Total** | **14803** | **164248** | **446781** | **761472** | **757514** | **481495** | **2626313** |

| | | Rupees in thousands | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Years of reconstruction | | | | | | |
| | | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Six years |
| Chitwan | Agriculture livestock forestry and irrigation | 3388 | 95 | 581 | | | | 4064 |
| | Education building reconstruction | | 21790 | 34951 | 274629 | 291932 | 404629 | 1027931 |
| | Religious and cultural heritage | | | | | | 14911 | 14911 |
| | Health building reconstruction | | 1353 | 361 | | | 146550 | 148264 |
| | Employment and livelihood | | 20299 | 3649 | | | | 23948 |
| | Environment and land conservation | 6664 | | | | | | 6664 |
| | Other government building | 6403 | 27096 | 32124 | 68347 | 89556 | 29919 | 253445 |
| | Private housing | 264 | 75215 | 635550 | 618981 | 678871 | 374121 | 2383002 |
| | Road and transport | 300 | 27298 | 112687 | 216700 | 98833 | | 455818 |
| | Water and sanitation | 25526 | | | | | | 25526 |
| | Other public construction | | 230 | 4755 | 378 | | | 5363 |
| | Miscellaneous administrative expenses | | | 280 | 200 | 250 | 36797 | 37527 |
| | **Total** | **42545** | **173376** | **824938** | **1179235** | **1159442** | **1006927** | **4386463** |
| Dhading | Agriculture livestock forestry and irrigation | 4992 | 84 | | | | | 5076 |
| | Education building reconstruction | 325 | 128498 | 459916 | 532302 | 416976 | 380350 | 1918367 |
| | Religious and cultural heritage | | | | | | 8722 | 8722 |
| | Health building reconstruction | | 7448 | 27329 | | | 140022 | 174799 |
| | Employment and livelihood | | 39528 | 12933 | | | | 52461 |
| | Environment and land conservation | 6937 | 5430 | 14428 | | | | 26795 |
| | Other government building | 50974 | 297656 | 424717 | 384404 | 204555 | 15494 | 1377800 |
| | Private housing | 144003 | 3685374 | 10598042 | 5071674 | 1866656 | 1922300 | 23288049 |
| | Road and transport | 1131 | 54419 | 105930 | 104021 | 200092 | | 465593 |
| | Water and sanitation | 12283 | | | | | | 12283 |
| | Other public construction | | 224 | 243 | 50345 | | 144952 | 195764 |
| | Miscellaneous administrative expenses | | | 300 | 370 | 378 | | 1048 |
| | **Total** | **220645** | **4218661** | **11643838** | **6143116** | **2688657** | **2611840** | **27526757** |
| Dhankuta | Agriculture livestock forestry and irrigation | 300 | | | | | | 300 |
| | Education building reconstruction | | 4261 | 13267 | | 224585 | 281204 | 523317 |
| | Religious and cultural heritage | | | | | | 33969 | 33969 |
| | Health building reconstruction | | 5996 | | | | 126526 | 132522 |
| | Employment and livelihood | | 11901 | 7203 | | | | 19104 |
| | Environment and land conservation | 216 | 1477 | 1149 | | | | 2842 |
| | Other government building | | 10089 | 24935 | 50650 | 103849 | | 189523 |
| | Private housing | | 103514 | 173465 | 225262 | 216395 | 233532 | 952168 |
| | Road and transport | | | 8139 | 125824 | 10947 | | 144910 |
| | Water and sanitation | 13573 | 6911 | 1387 | | | | 21871 |
| | Other public construction | | | 221 | 142109 | | | 142330 |
| | Miscellaneous administrative expenses | | | 300 | 196 | 250 | 34697 | 35443 |
| | **Total** | **14089** | **144149** | **230066** | **544041** | **556026** | **709928** | **2198299** |
| Dolakha | Agriculture livestock forestry and irrigation | 4698 | 95 | 1660 | | | | 6453 |
| | Education building reconstruction | 345 | 171248 | 449354 | 470420 | 343519 | 329200 | 1764086 |
| | Religious and cultural heritage | | | | | | 40267 | 40267 |
| | Health building reconstruction | | 5098 | | | | 79391 | 84489 |
| | Employment and livelihood | | 43670 | 7477 | | | | 51147 |
| | Environment and land conservation | 16367 | 46291 | 152689 | | | | 215347 |
| | Other government building | 27128 | 134936 | 199147 | 349919 | 177883 | 1312 | 890325 |
| | Private housing | 421739 | 3250016 | 9626691 | 4030924 | 1420268 | 1165507 | 19915145 |
| | Road and transport | 515 | 157002 | 367676 | 402773 | 210322 | | 1138288 |
| | Water and sanitation | 13117 | 26412 | 10326 | | | | 49855 |
| | Other public construction | | 1491 | 1381 | 284 | | 26114 | 29270 |
| | Miscellaneous administrative expenses | | | 300 | 370 | 120 | 110357 | 111147 |
| | **Total** | **483909** | **3836259** | **10816701** | **5254690** | **2152112** | **1752148** | **24295819** |

| | | Rupees in thousands | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Years of reconstruction | | | | | | |
| | | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Six years |
| Gorkha | Agriculture livestock forestry and irrigation | 4935 | 94 | 1660 | | | | 6689 |
| | Education building reconstruction | 325 | 190027 | 679839 | 663026 | 385035 | 426222 | 2344474 |
| | Religious and cultural heritage | | | | | | 35335 | 35335 |
| | Health building reconstruction | | 7950 | | | | 59563 | 67513 |
| | Employment and livelihood | | 24271 | 12153 | | | | 36424 |
| | Environment and land conservation | 9903 | 5021 | 20584 | | | | 35508 |
| | Other government building | 21849 | 148728 | 338841 | 523787 | 398281 | 10471 | 1441957 |
| | Private housing | 880693 | 2819184 | 9438948 | 4275242 | 958784 | 1466698 | 19839549 |
| | Road and transport | 300 | 167313 | 304253 | 620216 | 188593 | | 1280675 |
| | Water and sanitation | 42984 | 41043 | 26188 | | | | 110215 |
| | Other public construction | | 1710 | 1634 | 300 | | 124853 | 128497 |
| | Miscellaneous administrative expenses | | | 300 | 370 | 250 | 120884 | 121804 |
| | **Total** | **960989** | **3405341** | **10824400** | **6082941** | **1930943** | **2244026** | **25448640** |
| Gulmi | Agriculture livestock forestry and irrigation | 2127 | 84 | 581 | | | | 2792 |
| | Education building reconstruction | | 31388 | 52972 | | 329610 | 375206 | 789176 |
| | Employment and livelihood | | 13099 | 8922 | | | | 22021 |
| | Environment and land conservation | 3316 | 1446 | 1222 | | | | 5984 |
| | Other government building | | 4209 | | | | | 4209 |
| | Private housing | | 110867 | 346301 | 305608 | 255458 | 215687 | 1233921 |
| | Road and transport | | | 41251 | 93979 | 33615 | | 168845 |
| | Water and sanitation | | 6650 | 2700 | | | | 9350 |
| | Other public construction | | 229 | 225 | 218333 | | | 218787 |
| | Miscellaneous administrative expenses | | | 224 | 87 | 136 | 18431 | 18878 |
| | **Total** | **5443** | **167972** | **454398** | **618007** | **618819** | **609324** | **2473963** |
| Kaski | Agriculture livestock forestry and irrigation | 1090 | 2884 | 2320 | | | | 6294 |
| | Education building reconstruction | | 23680 | 18060 | | 435139 | 451853 | 928732 |
| | Religious and cultural heritage | | | | | | 7682 | 7682 |
| | Health building reconstruction | | | | | | 86070 | 86070 |
| | Employment and livelihood | | 13352 | 3501 | | | | 16853 |
| | Environment and land conservation | 9200 | 12000 | 2027 | | | | 23227 |
| | Other government building | 11707 | 43321 | 75978 | 99523 | 111313 | 39951 | 381793 |
| | Private housing | | 88952 | 291361 | 420870 | 449325 | 214505 | 1465013 |
| | Road and transport | | | 72235 | 193482 | 116133 | | 381850 |
| | Water and sanitation | 6583 | 3192 | 1998 | | | | 11773 |
| | Other public construction | | 1817 | 14126 | 204916 | | 12268 | 233127 |
| | Miscellaneous administrative expenses | | | 288 | 200 | 249 | 53890 | 54627 |
| | **Total** | **28580** | **189198** | **481894** | **918991** | **1112159** | **866219** | **3597041** |
| Kathmandu | Agriculture livestock forestry and irrigation | 25793 | 424 | 4829 | | | | 31046 |
| | Religious and cultural heritage | 13161 | 76667 | 205951 | 185014 | 1031774 | 1820464 | 3333031 |
| | Education building reconstruction | 52211 | 3387752 | 8208483 | 14839559 | 8226947 | 9353796 | 44068748 |
| | Health building reconstruction | | 2147 | 18483 | | | 69456 | 90086 |
| | Employment and livelihood | | 38841 | 47883 | | | | 86724 |
| | Environment and land conservation | 7057 | 4823 | 13524 | | | | 25404 |
| | Other government building | 716089 | 3145802 | 2920968 | 3699220 | 2261624 | 2258720 | 15002423 |
| | Finance sector reform | | | | | | 845 | 845 |
| | Private housing | 191 | 1902221 | 2415777 | 2106476 | 1046683 | 1830169 | 9301517 |
| | Road and transport | 26503 | 341641 | 1052017 | 1426892 | 623449 | | 3470502 |
| | Water and sanitation | 45557 | 20670 | 26379 | | | | 92606 |
| | Other public construction | 5390000 | 3198 | 235694 | 1354166 | | 7367 | 6990425 |
| | Machinery and equipment | | 9057 | | | | | 9057 |
| | Miscellaneous administrative expenses | 470000 | 70223 | 300 | 69066 | 21674 | 672555 | 1303818 |
| | Not classified | 12400000 | | | 128284 | 180517 | | 12708801 |
| | **Total** | **19146562** | **9003466** | **15150288** | **23808677** | **13392668** | **16013372** | **96515033** |

| | | Rupees in thousands | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Years of reconstruction | | | | | | |
| | | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Six years |
| Kavrepalanchok | Agriculture livestock forestry and irrigation | 4210 | 95 | 581 | | | | 4886 |
| | Education building reconstruction | 345 | 158992 | 324504 | 424188 | 300210 | 328942 | 1537181 |
| | Religious and cultural heritage | | | | | | 24790 | 24790 |
| | Health building reconstruction | | 30845 | 12359 | | | 44996 | 88200 |
| | Employment and livelihood | | 23464 | 4273 | | | | 27737 |
| | Environment and land conservation | 8212 | 5698 | 13649 | | | | 27559 |
| | Other government building | 59576 | 75578 | 198296 | 176052 | 300175 | 31119 | 840796 |
| | Private housing | 56799 | 3903574 | 6719334 | 4925573 | 2622539 | 1919099 | 20146918 |
| | Road and transport | 300 | 95041 | 397792 | 295918 | 96137 | | 885188 |
| | Water and sanitation | 12408 | 29118 | 19034 | | | | 60560 |
| | Other public construction | | 230 | 363 | 297 | | 14327 | 15217 |
| | Miscellaneous administrative expenses | | | 300 | 370 | 400 | 155544 | 156614 |
| | **Total** | **141850** | **4322635** | **7690485** | **5822398** | **3319461** | **2518817** | **23815646** |
| Khotang | Agriculture livestock forestry and irrigation | 3799 | 95 | | | | | 3894 |
| | Education building reconstruction | | 23606 | 28271 | 237382 | 317198 | 325871 | 932328 |
| | Religious and cultural heritage | | | | | | 7160 | 7160 |
| | Health building reconstruction | | 4195 | | | | | 4195 |
| | Employment and livelihood | | 26755 | 7769 | | | | 34524 |
| | Environment and land conservation | 3699 | 2316 | 198 | | | | 6213 |
| | Other government building | 5250 | 7805 | 15572 | 14625 | 12928 | | 56180 |
| | Private housing | | 360377 | 409772 | 1018155 | 568007 | 414311 | 2770622 |
| | Road and transport | | | 504 | 76567 | 19674 | | 96745 |
| | Water and sanitation | 14838 | 6722 | 2547 | | | | 24107 |
| | Other public construction | | 230 | 795 | 997 | | | 2022 |
| | Miscellaneous administrative expenses | | | 300 | 200 | 250 | 22732 | 23482 |
| | **Total** | **27586** | **432101** | **465728** | **1347926** | **918057** | **770074** | **3961472** |
| Lalitpur | Agriculture livestock forestry and irrigation | 2828 | | 97 | | | | 2925 |
| | Education building reconstruction | 331 | 69537 | 177833 | 209867 | 227882 | 238141 | 923591 |
| | Religious and cultural heritage | | | | | | 163464 | 163464 |
| | Health building reconstruction | | 9479 | 2357 | | | 40406 | 52242 |
| | Employment and livelihood | | 38208 | 3968 | | | | 42176 |
| | Environment and land conservation | 4950 | 2951 | 4260 | | | | 12161 |
| | Other government building | 13504 | 177294 | 337700 | 44066 | 333221 | 113607 | 1019392 |
| | Private housing | 48774 | 1188802 | 1763286 | 1210251 | 769048 | 938821 | 5918982 |
| | Road and transport | 12432 | 73855 | 233805 | 344249 | 176809 | | 841150 |
| | Water and sanitation | 13518 | 11567 | 9710 | | | | 34795 |
| | Other public construction | | 679 | 3291 | 188579 | | | 192549 |
| | Miscellaneous administrative expenses | | | 299 | 370 | 352 | 167770 | 168791 |
| | **Total** | **96337** | **1572372** | **2536606** | **1997382** | **1507312** | **1662209** | **9372218** |
| Lamjung | Agriculture livestock forestry and irrigation | 3333 | | | | | | 3333 |
| | Education building reconstruction | | 22477 | 25484 | | 349264 | 411859 | 809084 |
| | Religious and cultural heritage | | | | | | 5738 | 5738 |
| | Health building reconstruction | | 918 | 1982 | | | 65330 | 68230 |
| | Employment and livelihood | | 19703 | 7026 | | | | 26729 |
| | Environment and land conservation | 6911 | 5496 | 22424 | | | | 34831 |
| | Other government building | 4237 | 50170 | 100174 | 111712 | 72823 | | 339116 |
| | Private housing | 199 | 216412 | 1089425 | 1084150 | 728066 | 489714 | 3607966 |
| | Road and transport | 300 | 18890 | 103626 | 156220 | 26778 | | 305814 |
| | Water and sanitation | 19151 | 8921 | 4500 | | | | 32572 |
| | Other public construction | | | 534 | 145167 | | 4616 | 150317 |
| | Miscellaneous administrative expenses | | | 251 | 172 | 119 | 33995 | 34537 |
| | **Total** | **34131** | **342987** | **1355426** | **1497421** | **1177050** | **1011252** | **5418267** |

| | | Rupees in thousands | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Years of reconstruction | | | | | | |
| | | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Six years |
| Makawanpur | Agriculture livestock forestry and irrigation | 4984 | 95 | | | | | 5079 |
| | Education building reconstruction | 345 | 113680 | 336564 | 468521 | 327572 | | 1246682 |
| | Religious and cultural heritage | | | | | | 33329 | 33329 |
| | Health building reconstruction | | 1589 | 1374 | | | 72503 | 75466 |
| | Employment and livelihood | | 23452 | 6336 | | | | 29788 |
| | Environment and land conservation | 8445 | 5052 | 16715 | | | | 30212 |
| | Other government building | 40535 | 95457 | 143600 | 146948 | 182547 | 3881 | 612968 |
| | Private housing | 3500 | 1269861 | 3018535 | 2039880 | 1551744 | 1385694 | 9269214 |
| | Road and transport | | 18834 | 3248 | 125465 | 133296 | | 280843 |
| | Water and sanitation | 17837 | 13839 | 5596 | | | | 37272 |
| | Other public construction | | 230 | 5020 | 276 | | 11928 | 17454 |
| | Miscellaneous administrative expenses | | | 300 | 369 | 106 | 19811 | 20586 |
| | **Total** | **75646** | **1542089** | **3537288** | **2781459** | **2195265** | **1527146** | **11658893** |
| Myagdi | Agriculture livestock forestry and irrigation | 600 | | | | | | 600 |
| | Education building reconstruction | | 8706 | 22559 | | 250113 | 248844 | 530222 |
| | Health building reconstruction | | 185 | | | | | 185 |
| | Employment and livelihood | | 8206 | 4295 | | | | 12501 |
| | Environment and land conservation | 4978 | 2655 | 1653 | | | | 9286 |
| | Finance sector reform | | | 530 | | | | 530 |
| | Other government building | | 326 | | | | | 326 |
| | Private housing | | 32408 | 48765 | 66912 | 79906 | 104553 | 332544 |
| | Road and transport | | | | 89821 | 59478 | | 149299 |
| | Water and sanitation | 9077 | 4030 | 3000 | | | | 16107 |
| | Other public construction | | | | 93999 | | | 93999 |
| | Miscellaneous administrative expenses | | | 300 | 200 | 247 | 15047 | 15794 |
| | **Total** | **14655** | **56516** | **81102** | **250932** | **389744** | **368444** | **1161393** |
| Nawalparasi | Agriculture livestock forestry and irrigation | 300 | 95 | 509 | | | | 904 |
| | Education building reconstruction | | 26931 | 22173 | | | | 49104 |
| | Religious and cultural heritage | | | | | | | 0 |
| | Health building reconstruction | | | 1505 | | | | 1505 |
| | Employment and livelihood | | 9835 | 2330 | | | | 12165 |
| | Environment and land conservation | 5261 | 1939 | 1243 | | | | 8443 |
| | Other government building | | 2831 | 3368 | | | | 6199 |
| | Private housing | | 25843 | 101587 | | | | 127430 |
| | Water and sanitation | 5042 | 4487 | 2736 | | | | 12265 |
| | Other public construction | | 230 | 10736 | | | | 10966 |
| | Miscellaneous administrative expenses | | | 300 | | | | 300 |
| | **Total** | | | | | | **0** | **0** |
| Nawalparasi East | Education building reconstruction | | | | | 273125 | 346019 | 619144 |
| | Religious and cultural heritage | | | | | | 1137 | 1137 |
| | Private housing | | | | 125663 | 50934 | 89822 | 266419 |
| | Road and transport | | | | | 5207 | | 5207 |
| | Other public construction | | | | 210535 | | | 210535 |
| | Miscellaneous administrative expenses | | | | 200 | | 14995 | 15195 |
| | **Total** | **0** | **0** | **0** | **336398** | **329266** | **451973** | **1117637** |

| | | Rupees in thousands | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Years of reconstruction | | | | | | |
| | | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Six years |
| Nuwakot | Agriculture livestock forestry and irrigation | 4993 | 95 | 580 | | | | 5668 |
| | Education building reconstruction | 345 | 210139 | 463083 | 525566 | 389734 | 269772 | 1858639 |
| | Religious and cultural heritage | | | | | | 7943 | 7943 |
| | Health building reconstruction | | 2029 | 5913 | | | 110965 | 118907 |
| | Employment and livelihood | | 56444 | 8865 | | | | 65309 |
| | Environment and land conservation | 20431 | 20998 | 103231 | | | | 144660 |
| | Other government building | 37797 | 305644 | 371809 | 352486 | 133403 | 6322 | 1207461 |
| | Private housing | 102981 | 3984943 | 9299889 | 4787962 | 1945755 | 1508473 | 21630003 |
| | Road and transport | 25970 | 35757 | 31576 | 96547 | 104324 | | 294174 |
| | Water and sanitation | 26350 | 44710 | 24425 | | | | 95485 |
| | Other public construction | | 224 | | 287 | | 61901 | 62412 |
| | Miscellaneous administrative expenses | | | 300 | 370 | 285 | 127429 | 128384 |
| | **Total** | **218867** | **4660983** | **10309671** | **5763218** | **2573501** | **2092805** | **25619045** |
| Okhaldhunga | Agriculture livestock forestry and irrigation | 1856 | 95 | 581 | | | | 2532 |
| | Education building reconstruction | 345 | 54388 | 186881 | 358576 | 280720 | 305283 | 1186193 |
| | Religious and cultural heritage | | | | | | 10942 | 10942 |
| | Health building reconstruction | | 17875 | | | | 241030 | 258905 |
| | Employment and livelihood | | 23225 | 8197 | | | | 31422 |
| | Environment and land conservation | 8044 | 6869 | 21149 | | | | 36062 |
| | Other government building | 6447 | 120526 | 186597 | 313955 | 305838 | 54008 | 987371 |
| | Private housing | 28998 | 1382423 | 3169789 | 1136521 | 658046 | 1052085 | 7427862 |
| | Road and transport | 300 | 35335 | 150369 | 258334 | 164205 | | 608543 |
| | Water and sanitation | 34789 | 10425 | 3097 | | | | 48311 |
| | Other public construction | | 230 | | 292 | | 1269 | 1791 |
| | Miscellaneous administrative expenses | | | 229 | 370 | 399 | 125784 | 126782 |
| | **Total** | **80779** | **1651391** | **3726889** | **2068048** | **1409208** | **1790401** | **10726716** |
| Palpa | Agriculture livestock forestry and irrigation | 2900 | 95 | | | | | 2995 |
| | Education building reconstruction | | 34260 | 35998 | | 385730 | 474625 | 930613 |
| | Health building reconstruction | | 1644 | | | | 92833 | 94477 |
| | Employment and livelihood | | 10783 | 2205 | | | | 12988 |
| | Environment and land conservation | 1846 | 1458 | 1115 | | | | 4419 |
| | Other government building | | 2749 | 21784 | 62112 | 84658 | 15073 | 186376 |
| | Private housing | | 80498 | 312004 | 306698 | 223878 | 336721 | 1259799 |
| | Road and transport | | | | 299 | 43267 | | 43566 |
| | Water and sanitation | 7050 | 3236 | 3298 | | | | 13584 |
| | Other public construction | | 230 | | 179982 | | 38348 | 218560 |
| | Miscellaneous administrative expenses | | | 268 | | 250 | 45223 | 45741 |
| | **Total** | **11796** | **134953** | **376672** | **549091** | **737783** | **1002823** | **2813118** |
| Parbat | Agriculture livestock forestry and irrigation | 900 | 67 | 581 | | | | 1548 |
| | Education building reconstruction | | 19440 | 11923 | 132497 | 264274 | 368075 | 796209 |
| | Health building reconstruction | | 5561 | | | | | 5561 |
| | Employment and livelihood | | 11953 | 6123 | | | | 18076 |
| | Environment and land conservation | 6976 | 1999 | 1660 | | | | 10635 |
| | Other government building | | 1160 | 2051 | | | | 3211 |
| | Private housing | | 203766 | 194889 | 355601 | 399621 | 369629 | 1523506 |
| | Road and transport | | | 51499 | 75496 | 82730 | | 209725 |
| | Water and sanitation | 14640 | 6503 | 2157 | | | | 23300 |
| | Other public construction | | 230 | | 977 | | | 1207 |
| | Miscellaneous administrative expenses | | | 300 | 200 | 250 | 24171 | 24921 |
| | **Total** | **22516** | **250679** | **271183** | **564771** | **746875** | **761875** | **2617899** |

| | | Rupees in thousands | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Years of reconstruction | | | | | | |
| | | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Six years |
| Ramechhap | Agriculture livestock forestry and irrigation | 4686 | 95 | 581 | | | | 5362 |
| | Education building reconstruction | 340 | 106376 | 364887 | 436812 | 339951 | 349050 | 1597416 |
| | Religious and cultural heritage | | | | | | 16191 | 16191 |
| | Health building reconstruction | | 15677 | | | | 114880 | 130557 |
| | Employment and livelihood | | 32889 | 5567 | | | | 38456 |
| | Environment and land conservation | 7144 | 3761 | 7947 | | | | 18852 |
| | Other government building | 24335 | 150613 | 169201 | 274430 | 137719 | 10084 | 766382 |
| | Private housing | 55603 | 2740048 | 6611929 | 2928538 | 1123022 | 1744157 | 15203297 |
| | Road and transport | 300 | 53044 | 196507 | 338765 | 196576 | | 785192 |
| | Water and sanitation | 42271 | 44693 | 35999 | | | | 122963 |
| | Other public construction | | 230 | 1189 | 4022 | | 18468 | 23909 |
| | Miscellaneous administrative expenses | | | 290 | 370 | 400 | 104427 | 105487 |
| | **Total** | **134679** | **3147426** | **7394097** | **3982937** | **1797668** | **2357257** | **18814064** |
| Rasuwa | Agriculture livestock forestry and irrigation | 2235 | 291 | 2763 | | | | 5289 |
| | Education building reconstruction | 345 | 46522 | 80202 | 62001 | 136340 | 131424 | 456834 |
| | Religious and cultural heritage | | | | | | 13724 | 13724 |
| | Health building reconstruction | | 1953 | | | | 55457 | 57410 |
| | Employment and livelihood | | 31109 | 9087 | | | | 40196 |
| | Environment and land conservation | 10603 | 3948 | 8839 | | | | 23390 |
| | Other government building | 27327 | 81834 | 118177 | 249663 | 155003 | 7048 | 639052 |
| | Private housing | 31741 | 545094 | 1997082 | 589935 | 183992 | 353997 | 3701841 |
| | Road and transport | | 15411 | 145 | 59145 | 72127 | | 146828 |
| | Water and sanitation | 13853 | 8557 | 4877 | | | | 27287 |
| | Other public construction | | 248 | 1889 | 2592 | | 45771 | 50500 |
| | Miscellaneous administrative expenses | | | 300 | 370 | 400 | 51505 | 52575 |
| | **Total** | **86104** | **734967** | **2223361** | **963706** | **547862** | **658926** | **5214926** |
| Sankhuwasabha | Agriculture livestock forestry and irrigation | 600 | 193 | 3010 | | | | 3803 |
| | Education building reconstruction | | 14684 | 36277 | | 245156 | 290424 | 586541 |
| | Religious and cultural heritage | | | | | | 12075 | 12075 |
| | Health building reconstruction | | 817 | | | | | 817 |
| | Employment and livelihood | | 9602 | 5320 | | | | 14922 |
| | Environment and land conservation | 5236 | 1800 | 1162 | | | | 8198 |
| | Other government building | | 7702 | 13037 | 11333 | 11335 | 7173 | 50580 |
| | Private housing | | 60291 | 79084 | 152919 | 202027 | 113730 | 608051 |
| | Road and transport | | | | 39524 | 41587 | | 81111 |
| | Water and sanitation | 10714 | 2840 | 3283 | | | | 16837 |
| | Other public construction | | 1287 | 2583 | 155691 | | | 159561 |
| | Miscellaneous administrative expenses | | | 298 | 200 | 250 | 14495 | 15243 |
| | **Total** | **16550** | **99216** | **144054** | **359667** | **500355** | **437897** | **1557739** |
| Sindhuli | Agriculture livestock forestry and irrigation | 1800 | 95 | 581 | | | | 2476 |
| | Education building reconstruction | 345 | 138243 | 410515 | 389047 | 340985 | 370827 | 1649962 |
| | Religious and cultural heritage | | | | | | 15756 | 15756 |
| | Health building reconstruction | | 16319 | | | | 30759 | 47078 |
| | Employment and livelihood | | 27473 | 11953 | | | | 39426 |
| | Environment and land conservation | 5158 | 3966 | 8169 | | | | 17293 |
| | Other government building | 32820 | 147819 | 229217 | 247999 | 161512 | 1094 | 820461 |
| | Private housing | 59319 | 1726801 | 4319644 | 2097886 | 1639549 | 1386961 | 11230160 |
| | Road and transport | 300 | 68939 | 140547 | 202629 | 29604 | | 442019 |
| | Water and sanitation | 11769 | 5903 | 3457 | | | | 21129 |
| | Other public construction | | 230 | 389 | 2223 | | | 2842 |
| | Miscellaneous administrative expenses | | | 300 | 325 | 399 | 111960 | 112984 |
| | **Total** | **111511** | **2135788** | **5124772** | **2940109** | **2172049** | **1917357** | **14401586** |

| | | Rupees in thousands | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Years of reconstruction | | | | | | |
| | | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | Six years |
| Sindhupalchok | Agriculture livestock forestry and irrigation | 2785 | 87 | | | | | 2872 |
| | Education building reconstruction | 341 | 220129 | 671022 | 518618 | 262877 | 300950 | 1973937 |
| | Health building reconstruction | | | 9545 | | | 113929 | 123474 |
| | Employment and livelihood | | 38085 | 11118 | | | | 49203 |
| | Environment and land conservation | 13441 | 6172 | 22821 | | | | 42434 |
| | Other government building | 33015 | 257321 | 442630 | 436585 | 482659 | 18804 | 1671014 |
| | Private housing | 161237 | 4264944 | 12677276 | 4999687 | 1406480 | 1031758 | 24541382 |
| | Road and transport | | 13479 | | 301 | 28663 | | 42443 |
| | Water and sanitation | 30447 | 97925 | 29893 | | | | 158265 |
| | Other public construction | | 203 | 237 | 2666 | | 233949 | 237055 |
| | Miscellaneous administrative expenses | | | 300 | 370 | 330 | 121128 | 122128 |
| | **Total** | **241266** | **4898345** | **13864842** | **5958227** | **2181009** | **1820518** | **28964207** |
| Solukhumbu | Agriculture livestock forestry and irrigation | 3800 | 95 | 1411 | | | | 5306 |
| | Education building reconstruction | | 6907 | 30832 | 153189 | 218087 | 331882 | 740897 |
| | Religious and cultural heritage | | | | | | 13499 | 13499 |
| | Health building reconstruction | | 6565 | | | | | 6565 |
| | Employment and livelihood | | 24844 | 6474 | | | | 31318 |
| | Environment and land conservation | 2139 | 1982 | | | | | 4121 |
| | Other government building | | 13595 | 24980 | 26389 | 36252 | | 101216 |
| | Private housing | 255 | 265342 | 579583 | 1582735 | 950302 | 325746 | 3703963 |
| | Road and transport | 299 | 92130 | 137583 | 115383 | 63328 | | 408723 |
| | Water and sanitation | 6243 | 5058 | 5644 | | | | 16945 |
| | Other public construction | | 230 | 664 | 593 | | | 1487 |
| | Miscellaneous administrative expenses | | | 300 | 200 | 250 | 25050 | 25800 |
| | **Total** | **12736** | **416748** | **787471** | **1878489** | **1268219** | **696177** | **5059840** |
| Syangja | Agriculture livestock forestry and irrigation | 2700 | 95 | 493 | | | | 3288 |
| | Education building reconstruction | | 37252 | 62967 | 290475 | 397153 | 333320 | 1121167 |
| | Religious and cultural heritage | | | | | | 7352 | 7352 |
| | Employment and livelihood | | 15421 | 9270 | | | | 24691 |
| | Environment and land conservation | 3897 | 1798 | 1634 | | | | 7329 |
| | Other government building | | 2120 | | | | | 2120 |
| | Private housing | | 155841 | 464378 | 614385 | 556039 | 518531 | 2309174 |
| | Road and transport | | | 26790 | 76580 | 103405 | | 206775 |
| | Water and sanitation | | 9095 | 4443 | | | | 13538 |
| | Other public construction | | 230 | 1302 | 1000 | | | 2532 |
| | Miscellaneous administrative expenses | | | 300 | 200 | 250 | 20699 | 21449 |
| | **Total** | **6597** | **221852** | **571577** | **982640** | **1056847** | **879902** | **3719415** |
| Tanahu | Agriculture livestock forestry and irrigation | 3061 | 95 | 581 | | | | 3737 |
| | Education building reconstruction | | 22459 | 48875 | 310630 | 415103 | 356121 | 1153188 |
| | Religious and cultural heritage | | | | | | 4546 | 4546 |
| | Health building reconstruction | | 1289 | | | | | 1289 |
| | Employment and livelihood | | 25065 | 10076 | | | | 35141 |
| | Environment and land conservation | 2757 | 4905 | 2044 | | | | 9706 |
| | Other government building | 8276 | 4120 | 6525 | | | | 18921 |
| | Private housing | | 118242 | 904836 | 1351006 | 729033 | 936573 | 4039690 |
| | Road and transport | | 2397 | 50214 | 91851 | 68596 | | 213058 |
| | Water and sanitation | 10619 | 6396 | 4300 | | | | 21315 |
| | Other public construction | | 230 | 1028 | 995 | | | 2253 |
| | Miscellaneous administrative expenses | | | 298 | 200 | 184 | 20430 | 21112 |
| | **Total** | **24713** | **185198** | **1028777** | **1754682** | **1212916** | **1317670** | **5523956** |
| | **Grand total** | **22435994** | **49602158** | **114602393** | **89521409** | **52751437** | **52494991** | 381408382 |
| | **[1] NRA executed programmes** | | | | | | | |

Source: Derived from NRA, CLPIU database (On budget programmes)

## Annex 22 A: Summary Supply and Use Table (SUT)-A

**Supply table**
Sector: construction
Reference Year: 2010/11

| Construction sector summary | | Total Domestic Output | Total Supply at basic prices | TAXES LESS SUBSIDIES ON PRODUCTS | | TOTAL SUPPLY |
|---|---|---|---|---|---|---|
| Description | 41-43 | | | TAXES ON PRODUCTS | TOTAL TAXES (NET OF SUBSIDIES) | |
| | Construction output | | | | | |
| Constructions and construction services (Rs. Millions) | 171910 | 172032 | 172032 | 9657 | 9657 | 181689 |
| Supply ratio | 0.9462 | 0.9469 | 0.9469 | 0.0531 | 0.0531 | 1.000 |

Source : Supply and use table, Central Bureau of Statistics

## Annex 22 B: Summary Supply and Use Table (SUT) - B

**Use table**
Sector: construction
Reference Year: 2010/11
Construction sector summary

| | | | | | Total Intermediate Use | GROSS CAPITAL FORMATION | TOTAL USE AT PURCHASER'S PRICE |
|---|---|---|---|---|---|---|---|
| Code | Description | 32-33 | 41-43 | 68 | | | |
| | | Ratio estimates | Construction (Rs. Millions) | Real estate and rental activities | | FIXED CAPITAL FORMATION | |
| 1 | Ores and minerals; electricity, gas and water | 0.060 | 10843 | | | | |
| 3 | Other transportable goods, except metal products, machinery and equipment | 0.240 | 43647 | | | | |
| 4 | Metal products, machinery and equipment | 0.192 | 34907 | | | | |
| 5 | Constructions and construction services (Rs. millions) | 0.000 | 0 | 20486 | 21196 | 160493 | 181689 |
| | Ratio estimates | 0.000 | | 0.1128 | 0.1167 | 0.8833 | 1.00 |
| 7 | Financial and related services; real estate services; and rental and leasing services | 0.009 | 1641 | | | | |
| 8 | Business and production services | 0.011 | 2061 | | | | |
| 9 | Community, social and personal services | 0.001 | 161 | | | | |

Source : Supply and use table, Central Bureau of Statistics

## Annex 23 A: Age and Sex of Household Members

| | Sex of the household members | | | | | |
|---|---|---|---|---|---|---|
| | Male | | Female | | Total | |
| | Count | Column N % | Count | Column N % | Count | Column N % |
| Agriculture and forestry | 3993 | 50.7% | 4714 | 62.4% | 8707 | 56.4% |
| Mining and quarrying | 7 | .1% | 2 | .0% | 9 | .1% |
| Non government organization | 105 | 1.3% | 62 | .8% | 167 | 1.1% |
| Real estate and rental | 14 | .2% | 2 | .0% | 16 | .1% |
| Wholesale and retail trade | 67 | .9% | 65 | .9% | 132 | .9% |
| Wage and salary | 558 | 7.1% | 265 | 3.5% | 823 | 5.3% |
| Construction | 74 | .9% | 6 | .1% | 80 | .5% |
| Job in private sector | 375 | 4.8% | 197 | 2.6% | 572 | 3.7% |
| Private sector | 12 | .2% | 3 | .0% | 15 | .1% |
| Foreign employment | 434 | 5.5% | 89 | 1.2% | 523 | 3.4% |
| Transport and communication | 133 | 1.7% | 5 | .1% | 138 | .9% |
| Financial intermediation | 12 | .2% | 16 | .2% | 28 | .2% |
| Business | 425 | 5.4% | 296 | 3.9% | 721 | 4.7% |
| Education | 651 | 8.3% | 612 | 8.1% | 1263 | 8.2% |
| Pulic administration | 340 | 4.3% | 104 | 1.4% | 444 | 2.9% |
| Health and social work | 38 | .5% | 49 | .6% | 87 | .6% |
| Non response | 633 | 8.0% | 1067 | 14.1% | 1700 | 11.0% |
| **Total** | **7871** | **100.0%** | **7554** | **100.0%** | **15425** | **100.0%** |

## Annex 23 B: Relationship with Household Head

| | Sex of the household members | | | | | |
|---|---|---|---|---|---|---|
| | Male | | Female | | Total | |
| | Count | Column N % | Count | Column N % | Count | Column N % |
| Household head | 1698 | 16.2% | 494 | 5.1% | 2192 | 10.9% |
| Husband/wife | 422 | 4.0% | 2650 | 27.2% | 3072 | 15.2% |
| Son/daughter in law | 101 | 1.0% | 1794 | 18.4% | 1895 | 9.4% |
| Daughter/ son in law | 5310 | 50.7% | 2561 | 26.3% | 7871 | 39.0% |
| Father/mother | 1650 | 15.8% | 1122 | 11.5% | 2772 | 13.7% |
| Father/ mother in law | 6 | .1% | 30 | .3% | 36 | .2% |
| Brother/sister | 26 | .2% | 32 | .3% | 58 | .3% |
| Grand son/daughter | 965 | 9.2% | 774 | 8.0% | 1739 | 8.6% |
| Other relatives | 104 | 1.0% | 105 | 1.1% | 209 | 1.0% |
| Domestic worker | 0 | 0.0% | 1 | .0% | 1 | .0% |
| No relation | 127 | 1.2% | 152 | 1.6% | 279 | 1.4% |
| Non response | 56 | .5% | 20 | .2% | 76 | .4% |
| **Total** | **10465** | **100.0%** | **9735** | **100.0%** | **20200** | **100.0%** |

## Annex 23 C: Age and Sex Composition of Household Members

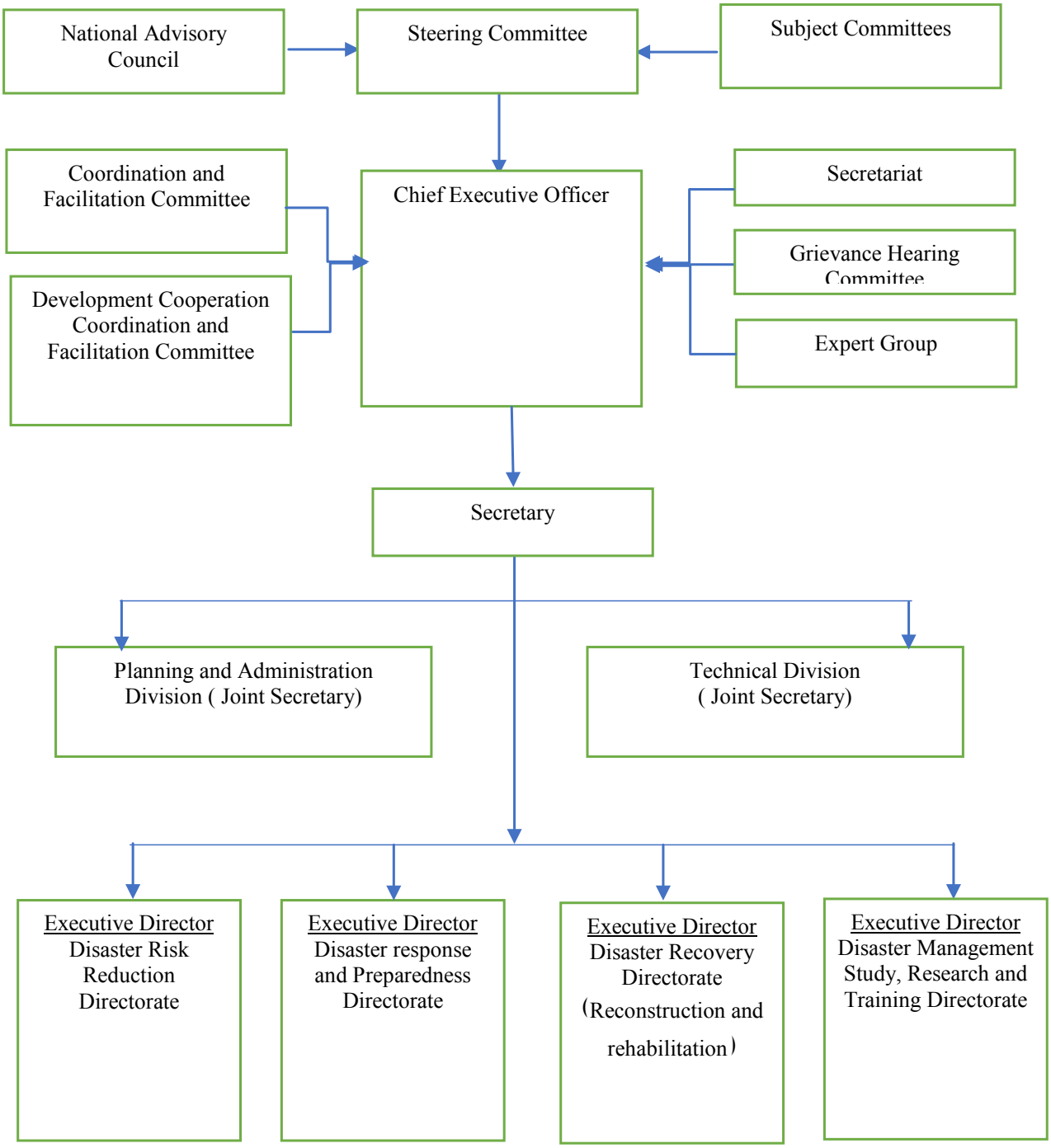
| | Sex of the household members | | | | | |
|---|---|---|---|---|---|---|
| | Male | | Female | | Total | |
| | Count | Column N % | Count | Column N % | Count | Column N % |
| 0-4 yrs | 473 | 4.5% | 384 | 3.9% | 857 | 4.2% |
| 5-9 yrs | 698 | 6.7% | 588 | 6.0% | 1286 | 6.4% |
| 10-14 yrs | 887 | 8.5% | 741 | 7.6% | 1628 | 8.1% |
| 15-19 yrs | 1066 | 10.2% | 916 | 9.4% | 1982 | 9.8% |
| 20-24 yrs | 1064 | 10.2% | 1005 | 10.3% | 2069 | 10.2% |
| 25-29 yrs | 1131 | 10.8% | 975 | 10.0% | 2106 | 10.4% |
| 30-34 yrs | 929 | 8.9% | 807 | 8.3% | 1736 | 8.6% |
| 35-39 yrs | 782 | 7.5% | 804 | 8.3% | 1586 | 7.9% |
| 40-45 yrs | 690 | 6.6% | 659 | 6.8% | 1349 | 6.7% |
| 45-49 yrs | 582 | 5.6% | 677 | 7.0% | 1259 | 6.2% |
| 50-54 yrs | 508 | 4.9% | 544 | 5.6% | 1052 | 5.2% |
| 55-59 yrs | 520 | 5.0% | 480 | 4.9% | 1000 | 5.0% |
| 60-64 yrs | 375 | 3.6% | 374 | 3.8% | 749 | 3.7% |
| 65-69 yrs | 302 | 2.9% | 249 | 2.6% | 551 | 2.7% |
| 70-74 yrs | 187 | 1.8% | 249 | 2.6% | 436 | 2.2% |
| 75-79 yrs | 127 | 1.2% | 123 | 1.3% | 250 | 1.2% |
| 80 and over | 145 | 1.4% | 159 | 1.6% | 304 | 1.5% |
| **Total** | **10466** | **100.0%** | **9734** | **100.0%** | **20200** | **100.0%** |

## Annex 23 D: Education Status of Household by Sex

| | Sex of the household members | | | | | |
|---|---|---|---|---|---|---|
| | Male | | Female | | Total | |
| | Count | Column N % | Count | Column N % | Count | Column N % |
| Can not read and write-Illiterate | 1336 | 13.8% | 2237 | 24.5% | 3573 | 19.0% |
| Can read and write-literate | 2308 | 23.8% | 2315 | 25.4% | 4623 | 24.6% |
| Basic education upto 8 class | 2187 | 22.6% | 1684 | 18.5% | 3871 | 20.6% |
| Secondary (9-10 class) | 1710 | 17.7% | 1176 | 12.9% | 2886 | 15.3% |
| Higher education | 2144 | 22.1% | 1706 | 18.7% | 3850 | 20.5% |
| **Total** | **9685** | **100.0%** | **9118** | **100.0%** | **18803** | **100.0%** |

Source: SEIA Survey 2021

## Annex 24: Proposed Organogram of NDRRMA




Source: Copied from राष्ट्रिय विपद् जोखिम न्यूनिकरण तथा व्यवस्थापन प्राधिकरणलाई थप स्वायत्त र प्रभावकारी बनाउने सम्बन्धी
Prepared by high level committee.

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