

Research Paper

# Assessment of Recovery and Resilience Livelihoods after Earthquake in Gorkha District, Gandaki Province, Nepal

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## ARTICLE INFORMATION

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## ABSTRACT

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The study aims to assess the recovery and resilient livelihoods in the earthquake affected population of Gorkha district. The participatory learning and action methods were adopted while conducted the field study. The large majority of the respondents (92 %) have rated happy with the program. The overall changes have found from 1.4 to 08, 4.25 to 8.25 and 0.66 to 5.3 mean score out of ten in shelter, WASH and livelihoods recovery components respectively during before and after situation mapping of earthquake affected survivors. This is considered as significant contribution of recovery and resilient livelihoods program to make a difference in the life of earthquake affected survivors in Gorkha district. There have been completed around 79.76 per cent private houses until the end of September 2019 in Gorkha district whereas only 45.24 per cent private houses have been reconstructed in the overall highly affected areas (14 districts) of Nepal. In the study areas, the participation of women in the humanitarian support process has increased particularly in decision-making process at households, community and Rural Municipality level. There has been increased women participation in development works and division of work between women and men. There has been increased demand by local representatives to increase linkage and coordination with municipalities from the very beginning.

## 1. Introduction

According to UNDP (2009), Nepal is considered to be the 11thmost earthquake prone country in the world. It has experienced a major earthquake in every few generations. The first recorded earthquake of 1255 AD killed one-third of the population of the Kathmandu Valley. After that numbers of great earthquakes occurred in Nepal in 1934, 1980, 1988 and 2011 respectively, which resulted in severe human and physical casualties in different parts of the country including Kathmandu valley. The most recent major earthquake was of 7.6 magnitudes as recorded by Nepal's National

Seismological Centre (NSC) and struck the Central and Western region of Nepal on 25th April 2015. Its aftermath resulted in over 8,790 human casualties and 22,300 injuries. About half a million of houses were destroyed. Out of 75 districts, 31 districts were severely affected by this catastrophic earthquake among which 14 were declared 'crisis-hit' districts. This declaration was made for the purpose of prioritizing rescue and relief operation as the destruction was wide-spread (NPC, 2015). Besides this, the catastrophic event has exposed and exacerbated pre-existing inequities and vulnerabilities along lines of gender, caste/ethnicity, poverty, class, age, physical and mental ability and other social diversities,

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adversely and disproportionately affecting the most excluded, marginalized and vulnerable. More women and girl children lost their lives in the Gorkha Earthquake than male because of the gendered responsibility that disproportionately assign indoor chores (OCHA and UN Women, 2016). Similarly, the earthquake has affected women more than men partly due to women's increased burden of household chores, their limited access to resources, information and decision making and increased risks of gender based violence. About 135, 000 pregnant and lactating women were also affected in this disastrous earthquake (NPC, 2015). According to the Central Bureau of Statistics, only about 25.7% households are headed by female. The numbers of female headed household has increased which has been stated as a reason due to the migration of male members (CBS, 2014). Similarly, the CBS report about social demography of Nepal shows that women engaged in self-employment activities or unpaid family labour is high (64%) than in non-agricultural activities. Only 12.4% of women have however migrated overseas for employment opportunities (CBS, 2014). This study is important to map out the recovery and resilient livelihoods works after Gorkha earthquake. The study covers shelter, WASH and livelihoods recovery. Gorkha Municipality and former 13 Village Development Committees have been covered in Gorkha District, Gandaki province, Nepal.

The following objectives were set to carry out the study:

- a. Analyze the level of progress made by the program and find out the significant changes to make a difference in the life of earthquake survivors in the study areas;
- b. Assess the project effectiveness and its sustainability of the program activities in earthquake affected areas.

## **2. Methodology**

The study team followed a participatory approaches and methods by involving the project stakeholders primarily the direct right holders in general using a combination of qualitative and quantitative tools for data collection. A greater focus however was put on the qualitative methods like focus group discussion, key informant interview, direct observation, case study and score ranking regarding primary data collection. The gender equality and social inclusion was also taken into account while carrying out the evaluation study. Appreciative inquiry was also adopted while discussing with marginalized people to dig out the positive and areas for improvement aspects of the project's outputs,

outcome, impact and social status and position of marginalized group of the people in the society. The triangulation methods have been used to verify the information. The enabling environment was created in the community while discussing during interview that was non-threatening to the target groups. The information has been analyzed based on trend over time and pattern over space. The study team visited some sample program sites only due to limited time and resources. The review of existing documents, focus group discussion, key informant interview, score ranking, happiness mapping tools were used during the data collection in the field.

## **3. Analysis of data**

The quantitative data collected from the field was grouped into different categories and tabulated. The descriptive statistics like frequency distribution, per cent; mean was adopted for analysis point of view. The qualitative data collected, using field information through focus group discussion, key informant interview and observations were made ready in word processor. All the information related to each heading reviewed critically and findings are presented in the report systematically. The standard presentation reporting guidelines have been followed and information has been presented in sequential order. The tables, graphs, case studies etc have been used into the report as evidence. The people perceptions have been map out using perception mapping tool in order to figure out the significant difference in the life and livelihoods of the primary right holders because of project interventions over a certain period of time. The gender equality and social inclusion perspective has been taken into account while analysis of the information.

## **4. Results and Discussions**

The study is focused in the Program's outputs, outcomes and impact at different level. The program progress analysis and assessment of various activities on the basis of target, achievements, review of literatures, program progress reports, happiness mapping, score ranking, direct observations, focus group discussion, interview with key informants etc. have been presented below. The study has focused on trend over time and pattern over space in order to map out the changes over the period.

#### 4.1 Effectiveness and impact

The recovery and resilient program has been implemented in the earthquake affected areas. This program has brought positive changes in the lives of women, men, children, Dalits, ethnic groups, youths of the earthquake affected communities. This project is being studied for the last two years. The program has three components that include shelters, WASH and livelihoods recovery. Around 79.76 per cent private house construction have been completed until the end of September 2019 in Gorkha district whereas only 45.24 per cent private houses have been reconstructed in the overall affected areas (14 districts) of Nepal ([www.nra.gov.np](http://www.nra.gov.np) accessed on 7 Oct 2019). In Gorkha district, many civil society organizations have been engaged in humanitarian response programming

##### 4.1.1 Happiness Mapping of Rightholders' Perception towards the Program

When asked about the perception towards the performance of GRR program, the respondents have scored 1218 (64%), 539 (28%) and 98 (5%), 12 (1%) and 32 (2%) for very happy, happy and unhappy, don't know and no response parameter respectively. The large majority of the respondents (92%) have rated very happy and happy with the project because of the distribution of relief materials, reconstruction of shelters, water, sanitation and hygiene and resilient livelihoods support to the earthquake survivors. Some respondents (5%) rated the unhappy for not getting quality and direct tangible benefits. The happiness mapping tool was used to map out the perceptions of the earthquake survivors towards GRRP (**Table 1**).

##### 4.1.2 Score Ranking of Shelter Component

The score ranking tool was used with the participation of four types of respondents that include community women, men, government staff and NGO's staffs to measure the effectiveness of key program activities of GRRP in the communities (**Table 2**). When asked on which key project activity is most popular in the community that the respondents ranked first for demonstration house, ranked second for 50 days mason training, ranked third for door to door technical assistance, ranked fourth for ten Key messages for building construction, ranked fifth for 7-days skilled mason training, and ranked sixth for demonstration of toilet for earthquake survivors according to the direct observation, experience and judgment made by the respondents based on the effectiveness and positive impacts in the community.

The seven days skilled mason and 50 days unskilled mason training to earthquake survivors have been popular in the earthquake affected rural areas that has created local employment and developed the trained construction human resources. The trained masons are always demanding job in rural as well as urban areas as well.

##### 4.1.3 Before and After Situation mapping of Shelter Construction

The score ranking tool was used with the participation of community women and men respondents to measure the before and after situation mapping of shelter component of GRRP in the communities. There has been found positive trend as compared to previous one in the project areas due to organized skilled mason trainings and 50 days unskilled mason trainings, orientations, demonstration house construction, door to door technical support to earthquake survivors etc. (**Table 3**). The GRR program has adopted the existing local community-based organizations and government structures while humanitarian support to earthquake survivors that leads to sustainability of the program to some extent. The overall changes in shelter component have found from 1.4 to 08 mean score out of ten during before and after situation mapping among earthquake affected survivors. There has been found significant humanitarian contribution of GRRP to make a difference in the earthquake resistant shelter construction in the earthquake affected areas. A total of 9 key informants (women and men) were participated in the exercise.

##### 4.1.4 Outcome and Impact of Shelters in the community

###### A. 7 days skilled mason trainings

· A total of 1426 (men: 1,368 and women: 58) masons received 7 days skilled mason trainings which enabled them to construct EQ resistant houses in their communities. They have transferred their skills to other masons as well.

###### B. 50 days Unskilled Mason trainings

· A total of 924 (men: 683 and women: 241) unskilled human resources received 50 days mason training that enabled them to become skilled human resources who contributed to construct EQ resilient houses in their communities.

###### C. Demonstration houses with latrines

· A total of 68 demo houses completed out of 91 and 33 houses handed over to the community.  
 · Demo house tied up with 50 days unskilled mason training have helped communities to refer and replicate to construct the earthquake resistant houses.

**Table 1.** Happiness Mapping of Stakeholders towards overall GRR Program

Parameters	Frequency	Percent
Very Happy	1218	64
Happy	540	28
Unhappy	98	05
Don't Know	12	01
No Response	32	02
<b>Total</b>	<b>1899</b>	<b>100</b>

Source: Field Study, 2018

**Table 2.** Score Ranking of Key Activities of Shelter Component

Key Activities	Women	Man	I/NGOs Staff	Government Staff	Total	Mean	Rank
7-days Skilled Mason training	70	70	49	20	209	9.09	5
50 days Mason training	70	70	53	21	214	9.30	2
Demonstration House	70	70	56	24	220	9.57	1
Demonstration Toilet	70	70	54	14	208	9.04	6
Door To Door Technical Assistance	70	70	52	21	213	9.26	3
10 Key messages	70	70	52	20	212	9.22	4
<b>Total</b>	<b>420</b>	<b>420</b>	<b>316</b>	<b>120</b>	<b>1276</b>	<b>9.25</b>	<b>-</b>

Source: Field Study, 2018

**Table 3.** Before and present situation mapping of Shelter component

Key Activities	Before (July, 2016)			After (Dec, 2018)			Remarks
	Total Score	No. of Respondents	Mean	Total Score	No. of Respondents	Mean	
7 Days skilled mason training	12	9	1.33	49	9	5.44	
50 Days unskilled mason training	19	9	2.11	80	9	8.89	
Demonstration House- Demonstration toilet	00	9	00	80	9	8.89	
Door to Door Technical Support	34	9	3.78	65	9	7.22	
<b>Total</b>	00	9	00	83	9	9.22	
<b>Mean Score</b>	<b>65</b>	<b>-</b>	<b>7</b>	<b>357</b>	<b>-</b>	<b>40</b>	
	<b>-</b>	<b>-</b>	<b>1.4</b>	<b>-</b>	<b>-</b>	<b>8.0</b>	

Source: Field Study, 2018

· Houses are being utilized/used as/ for forest user groups, community groups, women user groups, rural municipality ward offices, health centers and other community purposes.

#### D. Door to door technical assistance

· A total of 10,000 HHs have received door to door technical assistance from CRS's engineers. It has helped HHs to receive technical assistance at their door steps so that they can build EQ resistant houses which will meet the compliance of government norms and that helped them to receive housing grants provided by Government of Nepal.

#### 4.1.5 Before and Now Situation Mapping of WASH in the community

The score ranking tool was used with the participation of community women and men respondents to measure the before and after situation mapping of WASH component of GRRP in the communities. There has been found positive trend as compared to previous one in the project areas due to organized supported in drinking water supply, toilet construction, supported to Drinking water users' committees and hygiene promotion. The overall changes in WASH component have found from 4.25 to 8.25 mean score out of ten during before and after situation mapping with earthquake affected survivors. There has been found significant humanitarian contribution of GRRP to make a difference in the access to safe drinking water among the earthquake survivors.

A total of 8 women and men respondents have participated in the exercise (**Table 4**).

#### 4.1.6 Outcome and Impact of WASH in the community

##### A. Water supply schemes

· A total of 24 different water supply schemes were repaired/newly constructed as prioritized by communities to fulfill their drinking water needs and helped them save time for fetching water, so, they could utilize their valuable time in other productive works.

##### B. Hygiene promotion

· A total of 1,457 Beneficiaries/HHs (Man: 947, women: 510) received orientation on hygiene knowledge and practiced in their community which has helped in raising awareness and behavior change for personal hygiene.

##### C. Orientation on maintenance plan of water supply schemes

· A total of 24 water supply user committees were oriented on maintenance plan of water supply schemes for sustainability. It also helped the groups and users to take ownerships of these schemes.

#### 4.1.7 Outcome and Impact of WASH in the community

The score ranking tool was used with the participation of community women and men respondents to measure the before and after situation mapping of key livelihoods component of GRRP in the communities (**Table 5**). There has been found positive trend as compared to previous one in the project areas due to organized farmers field school, seed distribution, goat rearing, off-season vegetable farming, cash for work etc. The cardamom plantation is newly introduced enterprise in GRRP. The overall changes in livelihoods component have found from 0.66 to 5.3 mean score out of ten during before and after situation mapping among earthquake survivors. There has been found significant humanitarian contribution of livelihoods component of GRRP to make a difference in the lives of earthquake survivors. The community perception was map out based on the judgment of the respondents. This was measured in relative terms.

#### 4.1.8 Outcome and Impact of Livelihood Component

· A total of 18,000 HHs received seeds (improved

**Table 4.** Before and After Situation Mapping on WASH Component

Key Activities	Before (July, 2016)			After (Dec, 2018)			Remarks
	Total Score	No. of Respondents	Mean	Total Score	No. of Respondents	Mean	
Drinking water schemes	35	8	4.38	64	8	8.00	10 corn seeds
Latrine Construction	37	8	4.63	73	8	9.13	
HygienePromotion	40	8	5.00	71	8	8.88	
Drinking Water User committee Support	25	8	3.13	53	8	6.63	
<b>Total</b>	<b>137</b>	<b>-</b>	<b>17</b>	<b>261</b>	<b>-</b>	<b>33</b>	
<b>Mean Score</b>	<b>-</b>	<b>-</b>	<b>4.25</b>	<b>-</b>	<b>-</b>	<b>8.25</b>	

Source: Field Study, 2018

**Table 5.** Before and After Situation Mapping of Livelihoods Component

Key Activities	Before (July, 2016)			After (Dec, 2018)			Remarks
	Total Score	No. of Respondents	Mean Score	Total Score	No. of Respondents	Mean Score	
Farmer's Field School	00	5	00	34	5	6.80	-
Seed Distribution	4	5	0.80	43	5	8.60	Rice, maize
Goat Rearing	8	5	1.60	28	5	5.60	Improved Breeding Buck distribution
Off-season Vegetable Farming	7	5	1.40	22	5	4.40	cauliflower
Cardamom Farming	00	5	00	7	5	1.40	Not in harvesting stage
Cash for Work	1	5	0.20	25	5	5.00	-
<b>Total</b>	<b>20</b>	<b>-</b>	<b>04</b>	<b>159</b>	<b>-</b>	<b>31.8</b>	<b>-</b>
<b>Mean Score</b>	<b>-</b>	<b>-</b>	<b>0.66</b>	<b>-</b>	<b>-</b>	<b>5.3</b>	<b>-</b>

Source: Field Study, 2018

maize, paddy, cauliflower, cardamom saplings) in which 32.5% increased crop yield for Maize and Paddy as compared to local variety that contributed 2 months additional food security.

- A total of 14,000 HHs received paddy, maize, cauliflower, goat rearing FFS (Farmer field school) which increased ability to take decision to adopt improved technology.

- A total 606 demonstration of seed storage were established to showcase improve paddy and maize hermetic storage practice through farmers field session thus helping to reduce 2% cereals crops loss. A total of 1481 HHs received goat shed support that improved goat health and the same goat shelters have been extensively replicated by other community people.

- A total of 56 HHs (lead farmers) received improved breeding buck (boer cross, Barbari, Beetle, Jamunapari) that provided breeding service to 14 does on average per buck and its earned on an average NPR 1,330 and spent of NPR 1,004 (net profit NPR 326).

- Started insurance by lead farmers due to farmers orientation (FFS)

- Lead farmers started keeping profit loss calculation which helps to develop business plan due to FFS on off-season cauliflower and average income generated of NPR 7,827 from 10 gram seeds.

- Survival rate of cardamom has found 85-95% which has shown good result. This indicates that these areas have high potential to support the scale up the cardamom farming.

- A total of 83 CFW schemes were completed, 3,033 individuals earned cash average NPRs 12,000 per person/month. A total of 1,231 women and 1,802 man and reported as repaired and maintenance of infrastructural projects.

- The communities have spent their income on food, livelihood activities, and shelter repairs, medical and educational purpose.

#### 4.2 Sustainability

Sustainability is a major issue of the most of the humanitarian response projects in Nepal due to high incidence of poverty, weak management capacity, less coordination with local level government and poor governance system. CRS and implementing partner organizations have used existing local structures and maintained linkage and coordination with Government mechanisms during project implementation that leads to sustainability to some extent. It needs to be strengthening in the future from the very beginning of planning to monitoring and evaluation of the program. CRS developed Community Reconstruction Committees

(CRCs) that are involved at different stages of the projects and for all facilities constructed in the communities, CRCs are held responsible for future operation and maintenance. Local skilled labors are trained around EQ-Safe construction elements, which will ensure compliance to safety standards in the future construction activities.

#### 4.3 Coordination, Compliance and Transparency

Implementing agency has worked with community partner and government agencies from local to district and central levels in program planning, implementation and monitoring. Field project office has maintained coordination with district level government line agencies. Project implementations has been done under the linkage and coordination with local level authorities and partners on the ground whereas central level project steering committee and project executive committee provides policy guidance and support with strategic direction in implementations. The civil society organizations have organized the public hearing event in order to promote the transparency and good governance in the project areas.

#### 4.4 Social Mobilization and Governance

A total of 61 Social Mobilizer [Man-33 (54%) and women-28 (46%)] have been locally hired and working in the field for social mobilization process in GRRP. CRS and its implementing partners are working through existing local structures like users' groups and local level Government structures like Rural Municipalities and District line agencies as well. The display boards, wall painting, posters etc. have been used to provide more information about shelters, water, sanitation, hygiene and resilience livelihoods components in order to aware and organize the earthquake survivors in the project areas. However, there is a need of capacity development of Social Mobilizer and community based organizations and partner organizations to improve the quality of humanitarian programming in the future.

#### 4.5 Gender Equality and Social Inclusion (GESI)

The implementing agencies have developed GESI policy and strategy and practiced in the areas. The program facilitated an equal access to and control over resources, participatory decision making and reducing social discrimination in the project areas. There has been changed in the traditional gender roles of men and women where women farmers participate in the community meeting, trainings etc. At present, this has

been a normal phenomenon in the society. The gender issue has been taken into account in the implementation and monitoring of GRR program. The caste-based discrimination has also been weakened at the community level due to inclusion of Dalits women in the women farmer's groups. The practice of untouchability is weakening in the society. The morale of Dalits community seems to be high as compared to previous one because of increased participation of Dalits women in the project. However, it is yet to be done in the days to come to reduce caste-based discrimination in the community.

In the study areas, the involvement of women in the humanitarian response has significantly increased particularly in decision making process at households, community and Municipality level. There has been narrowing down the gap in traditional gender roles and division of work in women and men. However, women have still more engaged in domestic chores whereas men have focused more in seasonal migration and plough the land. In case of access to and control over resources, women have also increasing greater influence within household and even in the community level resources due to the positive impacts of the project and democratic nature of state mechanisms.

The program has greater roles to increase women awareness and organizing in the groups. There has been comparatively reduced gender-based violence in the community due to empowerment of women against discrimination. The work load of the women has found 15 hours per day. This is regarded as low as compared to two years back due to access to water and sanitation, road transportation facility and increased gender awareness etc. However, the patriarchal social structure is still dominating in the society. The promoting gender equality and social inclusion in real sense is challenging work for civil society organisations at the community.

#### 4.6 Gaps

The following gaps have been identified during the study:

- Innovative designs like bamboo construction technologies were developed but could not be materialized at community level due to lack of adoption by the earthquake survivors.
- Agroforestry activity could not be launched along with goat rearing that has negative impacted in an environment due to over pressure in the existing forest for goat feeding.
- The ultra-poor particularly landless and vulnerable groups of people still excluded from the recovery and reconstruction support.

- Weak integration of climate change adaptation issue in life and livelihoods of the earthquake survivors.

- Lack of participation of journalists in joint field monitoring during humanitarian response programming that has found the gap.

#### 4.7 Challenges

The following challenges have been identified in GRR program implementation to have larger impact in the lives of earthquake survivors:

- Landless and ultra-poor families still excluded in the Reconstruction and Livelihoods Recovery Programs.
- Inadequate field monitoring and evaluation from stakeholders in the reconstruction sites.
- Inadequate linkage and coordination with central Government, and Local level Government (Municipalities).
- There has been remained conflict on use of water source in the different locations that hampered the smooth running of water schemes in the community. Also newly formed government on transition phase creates dilemma for getting water right certificate.
- Poor access to loan among the poor and vulnerable families for livelihoods recovery.
- Inadequate supply of labor in the reconstruction sites due to high demand in the reconstruction sites.
- Poor Management of Debris Materials-created Environmental problems in the reconstruction sites.

#### 4.8 Overall Learning

The following lessons learnt have been drawn during the study:

- The cash for work activity has found useful among the earthquake survivors. The skilled/unskilled workers on an average NPR 12,000/month cash generated through cash for work schemes. They spent that cash on food items, daily consumption needs and shelter repairs as well as medical and educational purposes.
- By water schemes construction, increased the accessibility of drinking water that reduced the water fetching time so that they can use that time in the livelihood activities.
- Community based demonstration houses have been replicated by earthquake survivors in their community that has increased earthquake resistance buildings. Mainly stone – mud - masonry (SMM) building which is found popular in earthquake affected rural areas. This model is cheaper and can be built with locally available materials like stone, timber and mud etc.
- Door to door technical support to earthquake survivors has found effective to transfer the skills to local

communities in their own houses that resulted earthquake resistant shelter construction by earthquake survivors in short period and helped them to get Government reconstruction installments on time.

- A total of 50 days long mason training provided to local unskilled labors that generated local employment and upgraded their skills that improved the lives and livelihoods of the earthquake survivors.

- The improved seed distribution of maize, paddy and cauliflower increased yield by 32.5 per cent that contributed additional two months household food security among earthquake survivors.

## 5. Conclusions

The overwhelming majority of the respondents have rated happy towards the program because the recovery and resilience of shelters, water, sanitation, hygiene promotion and livelihood recovery of the earthquake survivors. The fifty days long unskilled laborers training and demonstration house construction, drinking water and sanitation, support to water user groups, cash for works, breeding buck distribution for crossing, seed distribution, off-season vegetable farming, and farmers' field school activities have found popular among the earthquake survivors to make a difference in their lives. The Sustainability is a major issue in most of the humanitarian response programs due to high incidence of poverty, weak management capacity, lack of viability gap funding from government or donors, poor follow-up, not sufficient budget and poor governance system. There is a need of viability gap funding from the Government of Nepal for the long term sustainability of the program in the remote areas of Gorkha. There is need of strong coordination and collaboration with local level Rural Municipalities and Municipalities in order to sustain the program. The civil society organizations have organized the public hearing event to promote the transparency and good governance in the areas. There has been changed in the traditional gender roles of men and women where women farmers participate in the community meeting, trainings etc.

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GESI Gender Equality and Social Inclusion

GRR Depth of footing

GRRP Gorkha Recovery Resilience Program

GRR Gorkha Recovery and Resilience

HHs House Holds

NGO Non-Governmental Organization

NPC National Planning Commission

NSC National Seismological Centre

OCHA Organization Centre for Humanitarian Assistant

SMM Stone-mud-masonry

UN United Nations

UNDP United Nations Development Programme

WASH Water, sanitation and hygiene

### **Symbols and abbreviations**

CBS Central Bureau of Statistics

CFW Cash for work

CRS Catholic Relief Service

EQ Earthquake

GRRP Pile tip diameter