**Shelter Cluster Nepal**
ShelterCluster.org
Coordinating Humanitarian Shelter

# SHELTER AND SETTLEMENTS VULNERABILITY ASSESSMENT

## Nepal 25 April/12 May Earthquakes Response

## Nepal
**JUNE 2015**

## EXECUTIVE SUMMARY AND RECOMMENDATIONS

On 25 April 2015, a 7.8 magnitude earthquake struck Nepal with its epicentre in Lamjung District, approximately 81km northwest of the country capital, Kathmandu. Intense tremors, and subsequent aftershocks, landslides, and avalanches caused widespread damage to homes, infrastructure, and livelihoods, affecting millions of people across 39 out of 75 districts. The Nepalese government categorized 14 of these districts as severely affected: Dhading, Gorkha, Rasuwa, Kavrepalanchok, Nuwakot, Dolakha, Sindhupalchok, Kathmandu, Ramechhap, Bhaktapur, Lalitpur, Makawanpur, Sindhuli and Okhaldhunga. Combined, these districts contain over 2 million people.

Amid ongoing recovery efforts following the earthquake of 25 April 2015, Nepal was struck by a second earthquake on 12 May 2015, with a magnitude of 7.4. The epicentre of the second earthquake was located further east than the first, close to the border between the Sindupalchok and Dolakha districts, causing further damage in areas that had already been affected, whilst causing new devastation in areas which had previously experienced limited damage.

According to government estimates, the earthquakes combined caused over 8,790 casualties and 22,300 injuries, and left over 500,000 houses and hundreds of historical and cultural monuments destroyed.[1] It is estimated that the earthquakes affected the lives of approximately eight million people, constituting almost one-third of the population of Nepal.[2]

REACH was deployed to Nepal in the framework of its partnership with the Global Shelter Cluster on 27 April 2015 to participate in the implementation of a detailed inter-agency shelter and settlements vulnerability assessment. The assessment sought to: verify emergency shelter & NFI coverage assumptions and conduct gap analysis; enable the shelter cluster to define a comprehensive shelter & settlements recovery strategy; and establish a baseline and method for longitudinal study of recovery.

Primary data collection was conducted across 14 districts between 16 May and 3 June 2015. The districts were selected based on their classification as prioritized earthquake-affected districts by the Government of Nepal. The assessed households account for a representative sample of households in accessible parts of these priority districts.

Key findings from this assessment are presented below, including recommendations defined by the cluster:

**Displacement:** Across all priority districts, 79% of all assessed households reported that they had moved from their pre-crisis home, although most were staying in the same community, either adjacent or very close to their pre-crisis shelter. Accordingly, the median travel time of displaced households to their damaged homes was 2 minutes. When asked about their intentions within the 7 days following the assessment, 83% of displaced households expressed their intention to stay on site. Similarly, when asked about their intentions within the 30 days following the assessment, the proportion of households who planned to stay on site decreased to 55%, while the proportion of households who intended to return to their original house increased to 19%. Primary reasons for displacement were housing damage, cited by 86% of all displaced households, as well as fear of aftershocks (72%), and general fears regarding the structural safety of their home (41%).

**Recommendation:**

- **Shelter packages should be sufficient to support household for 12-18 months or more, until such time as they feel safe to return.** This depends on the pace of housing repairs or reconstruction, but resources should be planned accordingly to last 12-18 months, since it is unlikely that all households will be able to rebuild at the same pace.

**Land Tenure:** 91% of all respondents reported to own the land on which they are residing, with 8% responding that they rented their property, and under 1% reporting to rent for free with or without consent. The highest percentage of

[1] Government of Nepal - National Planning Commission, "Nepal Earthquake 2015 - Post Disaster Needs Assessment (PDNA): Executive Summary" p. 5, 2015.
[2] Ibid.

renters were found in the urbanized Kathmandu Valley, particularly in the Bhaktapur and Kathmandu districts where 13% and 17% of respondents respectively reported to be renters.

**Recommendation:**

- **Avoid using land title as a condition for emergency / self-recovery shelter assistance.** While land ownership was reported as high, other secondary data suggests that official recognition of ownership and land title certification remains a challenge, thus using land tenure as a criteria for receiving shelter assistance may exclude households without official documentation as tenants. Agencies can refer to regulatory barriers to providing emergency and transitional shelter after disasters, country case study: Nepal – available on the Shelter Cluster website.
- **Specific assistance packages should be developed for renters and landlords in more densely populated urban environments**

**Shelter Damage:** 55% of households in the accessible areas of the assessed districts reported that their homes were heavily damaged or totally destroyed because of the earthquakes. The predominant pre-crisis housing typology, mud-bonded brick and stone walls in combination with either CGI or slate roofing, was heavily affected by the earthquake: 71% of housing comprised of mud-bonded brick and stone walls in combination with either CGI or slate roofing as their pre-crisis housing typology were reported as either heavily or completely destroyed.

**Recommendations:**

- The vast majority of destroyed and heavily damaged homes were constructed from mud and stone as these are the most commonly available building materials and vernacular housing style in the remote districts close to the earthquake's epicentre. **The visible damage to stone mud housing has left many households to blame material technology or fate for housing failure, rather than what could have been poor construction and a lack of earthquake resistant features such as tiestones and banding. There is now a danger that communities may rush to adopt new material technologies that they do not properly understand which could be built poorly leaving them at similar or greater risk from future seismic events.**
- It is important for shelter cluster partners to actively disseminate information on why stone and mud houses fell down and how they can be reconstructed safely, as well as to encourage households to get training and technical advice prior to commencing reconstruction.

**Shelter Recovery:** 37% of all households with damaged housing reported that they are able to recover debris to repair or rebuild their homes, while 76% of all households with damaged housing reported that they need some form of debris removal assistance, predominantly light equipment in the form of labour and tools. When asked what type of shelter assistance was needed to repair or rebuild their homes, households predominantly cited financial assistance (65%), durable construction materials like CGI roofing (52%) and cement (45%), as well as labour (43%).

**Recommendations:**

- **Communities should be supported with information about how to safely remove, store and re-use debris**. More vulnerable households may also need to be supported with financial assistance and/or equipment and labour where necessary to enable this to occur expeditiously.
- **Although cash transfer has been identified as the preferred modality for assisting affected families to procure CGI, careful analysis of local markets should be undertaken to ensure that materials are available in sufficient quantity and quality for the cash transfer amount to achieve agreed minimum cluster standards. Where this is not possible and market restrictions can not be addressed then direct distributions may be preferable.**
- Consultation with communities is required to determine more effective communication methods on safe construction practices than have been used in the past.

**Capacity for Self Recovery:** Assessed households exhibited a high capactiy for self-recovery, with 60% of households with damaged shelters reporting to have begun the construction of a transitional shelter by the time of assessment, including significant proportions of households who reported that they had not received any shelter assistance. Despite this, a much smaller proportion of all households with shelter damage (14%) reported having begun

to repair or reconstuct their home, suggesting that additional barriers need to be overcome to facilitate permanent reconstruction, such as the need to remove debris and improve access to materials.

**Recommendations:**

- **Emphasis should be placed on self-recovery support** through provision of supplementary materials and technical support and training for owner-driven reconstruction.
- **Such assistance needs to be fast-tracked** to ensure support reaches households already rebuilding in a timely manner.

**Vulnerability:** Households with lower socioeconomic status, including those with lower incomes and rurally-based livelihoods, were found to be disproportionately affected by the earthquakes. These households were more likely to be living in more vulnerable housing typologies—including mud-bonded masonry, for which 86% were reported to be heavily or totally destroyed—and more likely to have been displaced from their pre-crisis home. Female-headed households were also found to be more vulnerable than male-headed households across several indicators, with female-headed households more likely to report feeling unsafe in their current shelter, less likely to report that their shelter was prepared for the forthcoming monsoon or winter seasons, and less likely to have begun repair or reconstruction of their shelters.

**Recomendations:**

- **Shelter assistance should be prioritised according to Shelter Cluster vulnerability criteria guidelines, including targeting households with a lower socioeconomic status, female-headed households, and those living in hard-to-reach rural areas.**
- **There is a need to develop a supplementary package of assistance for winterisation**, which should be included in agency and donor operational and resource allocation in the coming months. Winterisations assistance should be prioritised to northen districts.
- **Approaches for assessments in hard to reach areas should be developed further** to ensure the accurate assessment of needs in these areas, particulaly in relation to winterisation.

**Shelter Assistance:** Across all priority districts, 57% of all households with housing damage reported having received some form of shelter assistance in response to the crisis. In line with the short-term, life-saving shelter objectives set out by the Shelter Cluster[3], tarpaulins were the predominant form of emergency shelter assistance (94%), followed by blankets (24%) and kitchen sets (13%). However, discrepancies were found between reported levels of assistance and whether households perceived that the received shelter assistance was sufficient; only 17% of households who had incurred housing damage after either the second or both earthquakes, and had subsequently received assistance, reported that they had received enough support.

**Priority Needs:** CGI roofing was reported as the priority shelter need by 39% of all households, and by over two thirds of households in Ramechhap and Okhaldhunga districts. A significant proportion of households reported that while they needed CGI roofing, they had no access at all to this material, although this varied considerably by district, from 55% in Rasuwa and 3% in Bhaktapur.

Sleeping mats were identified as the priority NFI need by the majority of respondents. However, a considerable proportion of respondents (23%) said they had no immediate NFI needs at all.

**Recommendation:**

- **Further analysis is needed to determine the impact of the recommended Shelter Cluster emergency assistance package** including the extent to which it was followed by agencies, targeting for different items and its adequacy for the situation.

**Water and Sanitation**: The percentage of flush toilets - public or private septic tank – across all assessed districts was found to have dropped from 81% to 70% following the earthquakes. At the same time, the percentage of households without access to a toilet more than tripled, from 3% to 11%. In addition, 10% of respondents reported that they were

[3] Nepal Shelter Cluster, "Nepal Shelter Strategic Directions", p.1, 19 May 2015

sharing latrines before the crisis; after the crisis, this number increased to 22%. The decrease in sanitary standards has particularly affected the displaced population.

**Recommendation:**

- Where possible, agencies delivering shelter packages should look to partner with agencies delivering WASH support. Given the emphasis prior to the earthquake on non-subsidised approaches to sanitation, in particular CLTS, large scale construction of latrines and toilets is not recommended, however the WASH cluster has provided guidelines on supporting reconstruction in an appropriate manner. The WASH cluster has also prepared guidelines on how to support households who did not have a latrine / toilet prior to the earthquake.

**Health**: 28% of respondents said they had developed a medical condition since the earthquakes, with diarrhea being the most commonly identified affliction among the assessed population (12%). Access to health facilities was also affected by the earthquake, with the districts of Sindhupalchok, Dolakha and Gorkha particularly affected, where over 30% of households reported no access to health services due the destruction of facilities.

**Recommendation:**

- Where possible, agencies delivering shelter packages should look to partner with agencies conducting WASH activities that include a public health component. Agencies interested in supporting the reconstruction of health facilities should refer to the Health Cluster and Government of Nepal guidelines.

## ACKNOWLEDGMENTS

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## GEOGRAPHICAL CLASSIFICATIONS

| | |
|---|---|
| **District** | The administrative units that make up administrative zones; Nepal contains 75 districts, 14 of which were categorized as Priority Districts by the Nepali government after the earthquakes. |
| **Municipality/Village Development Committee (VDC)** | Lower administrative units that make up districts. A municipality can include multiple VDCs, and is defined based on population numbers and infrastructure criteria. |
| **Ward** | The lowest political-administrative unit. Each VDC contains 9 wards. |
| **Town/Village** | The lowest administrative units |

## LIST OF ABBREVIATIONS

| | |
|---|---|
| **CGI** | Corrugated Galvanised Iron |
| **RCC** | Reinforced Concrete Cement |
| **VDC** | Village Development Committee |

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Cover photo: ©REACH, June 2015

# METHODOLOGY

## OBJECTIVES

The overall objectives of this assessment were to inform the operational and strategic planning for life saving and recovery activities regarding shelter and to provide a shelter baseline assessment for a longitudinal analysis of the recovery process of those affected by the earthquakes. The specific objectives of the assessment were to:

1. Verify emergency shelter & NFI coverage assumptions and gap analysis
2. Support the shelter cluster to define a comprehensive shelter & settlements recovery strategy
3. Establish a baseline and method for longitudinal study of recovery

## ASSESSMENT METHODOLOGY

Due to the severe topographical terrain of Nepal, the assessment was conducted in two sectors: a) accessible, and b) hard to reach areas. Different assessment methodologies were used in each sector.

### *Accessible Areas: Randomly Sampled Household Survey*

14 districts in the central region of Nepal were assessed based on their categorization by the Government of Nepal as Priority Districts that were heavily affected by the 25 April earthquake. These districts included Dhading, Gorkha, Rasuwa, Kavrepalanchok, Nuwakot, Dolakha, Sindupalchok, Kathmandu, Ramechhap, Bhaktapur, Lalitpur, Makwanpur, Sindhuli and Okhaldhunga.

Based on data of the 2011 National Population and Housing Census of Nepal, sub-district level Village Development Committees (VDCs) within each district were weighted and randomly sampled with a minimum of 10 households per VDC. As such, up to 12 VDCs were sampled per District. It should be noted that the selection of VDCs was constrained by levels of accessibility as determined by the Logistics Cluster; i.e. VDCs categorized as inaccessible by 4x4 vehicles were excluded from the sample area. All sampled household-level findings are therefore representative of accessible areas in these districts.

Inside each sampled VDC, a random Ward was assessed, in which enumerators randomly selected the first house by pen toss, after which every 3rd household was interviewed. If a VDC was not accessible, a new VDC was sampled and provided to the enumerators. If a Ward was not accessible, the nearest Ward was sampled.

In total, 1,776 households were assessed, which comprised the target sample of 1,680 households as well as a 10% buffer to allow for data cleaning and quality assurance. As such, the findings of the assessment are representative of households living in accessible areas in each district to a 95% confidence level and 10% margin of error. *See Annex I for Sample Map*.

**Table 1: Assessed households by district**

| District | Number of interviews |
|---|---|
| Bhaktapur | 122 |
| Dhading | 124 |
| Dolakha | 126 |
| Gorkha | 122 |
| Kathmandu | 168 |
| Kavrepalanchok | 129 |
| Lalitpur | 126 |
| Makwanpur | 122 |
| Nuwakot | 121 |
| Okhaldhunga | 137 |
| Ramechhap | 114 |
| Rasuwa | 124 |
| Sindhuli | 120 |
| Sindupalchok | 121 |
| **TOTAL** | 1776 |

## *Hard-to-Reach Areas: Valley Key Informant Interviews and Participatory Mapping*

Key informant interviews and participatory mapping were used to provide complementary data on hard-to-reach areas as determined by the Logistics Cluster. The core criteria for hard-to-reach areas was their reported inaccessibility by 4x4 vehicles, due to the particularly challenging terrain in Nepal, which presents specific challenges to the provision of assistance and assessment teams alike. As such, key informant interviews were conducted in seven difficult to access valleys in four of the Northern priority districts: Rasuwa, Gorkha, Sindupalchok, and Dolakha. In each of these valleys, enumerators used helicopters to conduct key informant interviews and participatory mapping sessions in order to conduct the shelter assessment in addition to access mapping.

**Map 1: Assessed valleys in hard-to-reach areas of the Northern Priority Districts**

## DATA COLLECTION

For the household survey, primary data was collected from a statistically representative sample of households across 14 affected districts. Data collection was conducted between 16 May and 4 June 2015 by gender-balanced teams of trained enumerators. All enumerators were final-year civil engineering students at the Institute of Engineering, Tribhuvan University of Nepal. Enumerators were trained by REACH assessments specialists for 4 days. Additional staff was seconded from International Medical Corps, People in Need, and Plan International. Seconded staff were provided with in-office, and field training to support the data collection process and subsequently embedded into experienced field teams who provided additional in-field training and conducted data quality monitoring exercises.

Responses from participating households were recorded on an Open Data Kit based data collection tool, deployed on Android smart-phones. The questionnaire was provided in English; no need for translation was identified due to the particularly high levels of English language fluency among all enumerator staff as evidenced during training sessions and daily debriefings.

On a daily basis, enumerator team leaders were required to forward data from the field by email to the REACH assessment team, after which REACH Assessment Specialists verified the data set using Excel and ArcGIS, and followed up on potential concerns. In addition, daily debriefings were conducted with enumerator team leaders, either in person or by phone, to ensure all questions and queries from field teams and REACH Assessment Specialists were addressed.

For the assessments of hard-to-reach areas, data collection was conducted through key informant interviews and participatory mapping. Two data collection methodologies were used due to significant topographical constraints in some districts. In Rasuwa and Gorkha, assessment teams were dropped by helicopter at the Northern-most populated location in the valley. The teams subsequently hiked down the valley for several days to a defined helicopter pick-up point, conducting key informant interviews in all major communities along a predetermined path. Due to the danger presented by landslides and broken bridges, field teams in Dolakha and Sindupalchok were unable to walk down valleys; instead, these teams were dropped at mid- and end-line points in each valley to conduct key informant interviews and participatory mapping. Additional interviews were subsequently held by phone to contextualize information gathered on-site.

Key informants were selected based on their area of knowledge, with preference given to those that had recently returned from affected areas in the assessed valley. All data collected was transcribed on paper forms, and subsequently digitized and stored. After each round of key information interviews, debriefing sessions were held with the enumerators to review the reported findings and incorporate their observations.

All valley assessments were conducted by REACH staff, except in Gorkha, where the shelter cluster assessment was integrated into a government led multi-cluster joint assessment facilitated by the Gorkha district authorities and coordinated by OCHA. The Gorkha assessment was conducted between 1 – 8 June, during which key informant interviews were conducted in 13 communities in 7 VDCs. The enumerators for the Gorkha assessment were seconded by People in Need and Manaslu Conservation Area Project, and led by government representatives from the Ministry of Education. All enumerators involved in the Gorkha assessment were trained on-site on the shelter cluster assessment tool, as well as participatory mapping techniques by a REACH Assessment Specialist. Both teams were comprehensively debriefed upon their return.

## CHALLENGES AND LIMITATIONS

### *Operational Challenges*

- In the hard-to-reach areas, several valleys were considered too dangerous to move through on foot, due to landslides and broken bridges. In these cases, the initial methodology of assessing communities along a predetermined trail was altered to enumerator teams visiting two locations per valley by helicopter drop and pick-up from the same location.

*Methodological Limitations*

- The overall confidence level of 95% and the margin of error of 10% correspond to indicators, which are calculated from the full sample at the accessible district level. Any findings that have been calculated based on specific sub-sets of the population (for example vulnerabilities, availability of reported material, equipment, or support needs for shelter recovery) invariably have a lower confidence level. As such, findings calculated on this basis should only be considered as indicative.
- The assessment sample and methodology was calculated to be representative of geographic areas, rather than of all population groups assessed. As a result, detailed discussion of vulnerabilities by caste was not possible to report with any statistical significance.
- Due to the challenging geographical terrain, household-level sampling was only feasible in areas accessible by 4x4 vehicles. Sampled data collected in the accessible areas, as determined by accessibility data provided by the Logistics Cluster, is therefore only representative of these areas. However, in order to provide further context, additional data was collected on hard-to-reach areas through Key Informant Interviews conducted by helicopter.
- Data collection was conducted over the span of two weeks in the emergency relief phase of the disaster. This time-span could have led to a bias regarding the recorded extent of recovery between districts. The prioritization by the Humanitarian Coordination Team of the delivery of humanitarian assistance over needs assessment, prevented data collection from beginning earlier.
- While respondents were told that their answers would not affect their likelihood of receiving assistance, potential response bias could have been incurred due to data collection being conducted in several areas where humanitarian aid delivery was ongoing and other assessments were ongoing.
- Due to legal concerns, bias could also have occurred when respondents were asked whether they were residing on rented land without consent. Since assessment teams did not ask to see proof of ownership or tenure, answers to this question are likely to have been given based on perceived ownership.
- Bias could have occurred when respondents stated their caste, in particular among the Dalit caste. As caste still plays a determining role in contemporary Nepal, and considering the potential disadvantaged socio-economic status of Dalit communities in Nepal, the Dalit caste might have been underreported during the data collection process.

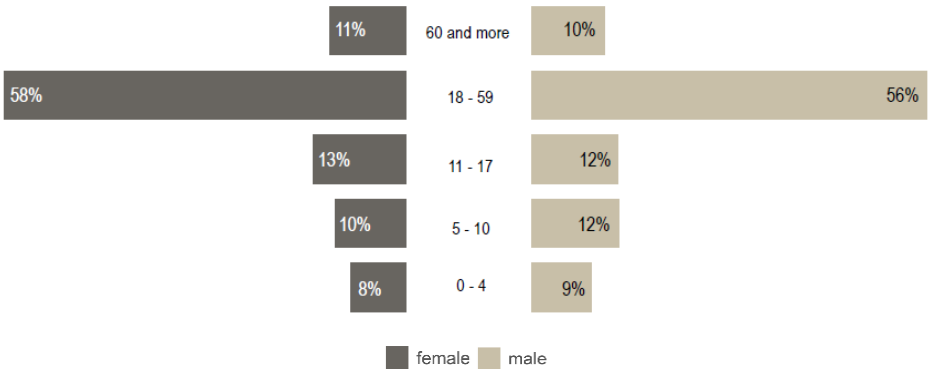
# ASSESSMENT RESULTS

This section of the report presents findings from household level data collection conducted between 16 May 2015 and 4 June 2015. Analysis has been presented in sub sections which detail findings regarding demographics, displacement, pre-crisis shelter situation, land tenure, shelter damage, shelter recovery, capacity for self-recovery, non-food items, water and sanitation, livelihoods, mass communications, and assistance. Where possible, results have been disaggregated by vulnerable group.

## DEMOGRAPHIC CHARACTERISTICS

Field assessment teams assessed a total number of 1,776 households, representing around 11,151 individuals. The average household size was 6 people. An equal gender split was identified across the affected area, with the assessed population found to be 50% male and 49% female. According to assessment data, 43% of the population in the affected area is either under 18 years old (32%) or over 60 years old (11%). This population of dependents is being supported by the remainder of the working age population (57%), aged between 18 and 59 years old.

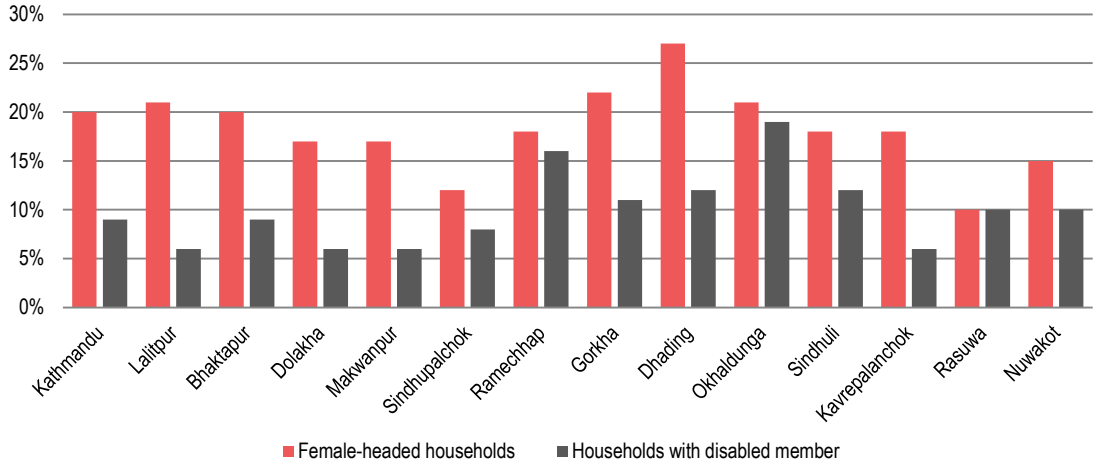
**Figure 1: Population pyramid by age group**




A considerable proportion of households across were reported as being female- or elderly (60+) headed households, with 19% and 27% respectively per category. Overall, 9% reported that their household included at least one person with a disability[4], while 3% of households reported that they were hosting separated, orphaned, or unaccompanied children, and only 2% of all households contained one adult or less.

[4] Disabilities were self-reported and as such could be subject to response bias.

**Figure 2: Percentage of female-headed households & households with >0 disabled member**



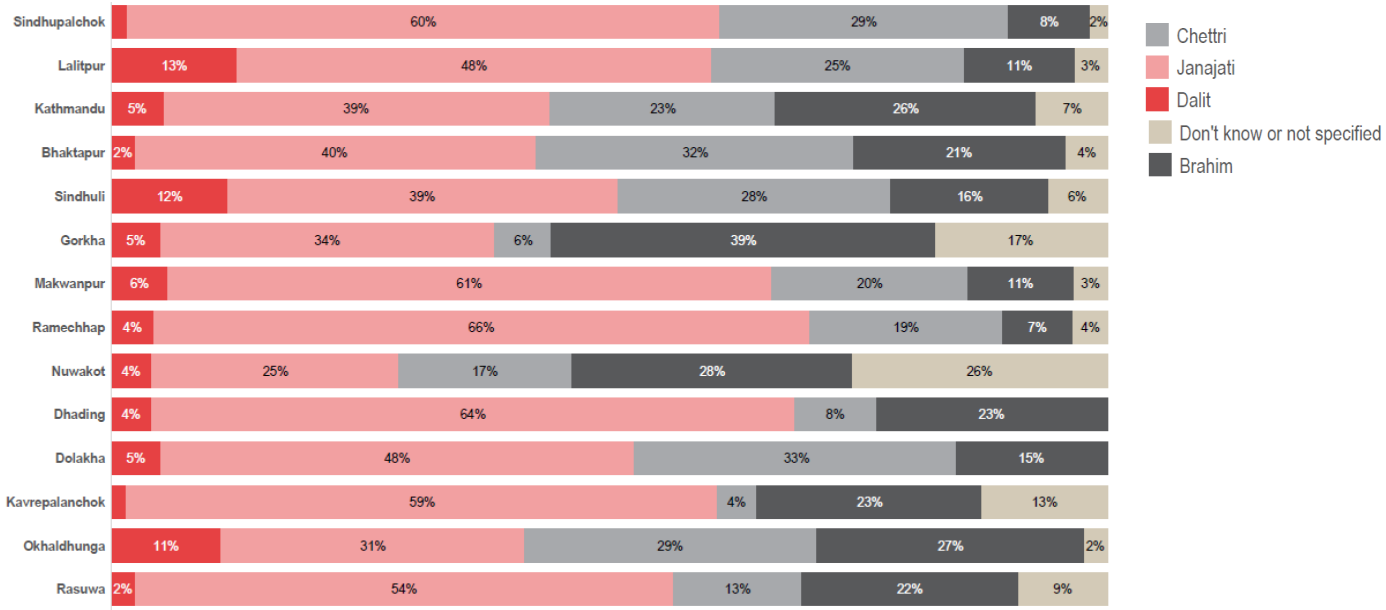

During the assessment, the majority of respondents (46%) reported to belong to Janajati communities, defined by the National Committee for Development of Nationalities as any community with its own language and culture that does not fall under the hierarchical Hindu caste structure.[5] Despite the high number of reported Janajati respondents, the group was described by the Special Rapporteur on the situation of human rights and fundamental freedoms of indigenous people as "historically marginalized from political decisions and deprived of the full benefits of citizenship".[6] The Janajati indigenous groups are followed by the Brahim caste (21%), Chettri caste (20%) and Dalit caste (6%). As caste still plays a determining role in contemporary Nepal, response bias might have occured among all reported castes. However, considering the particularly disadvantaged socio-economic status of Dalit communities in Nepal, the Dalit caste might have been particularly underreported during the data collection process.[7]

[5] These numbers are 10% higher than Janajati population recorded in the 2011 National Census. This could be due to the particular districts assessed, as well the ill-defined definition of Janajati populations in Nepal. Indigenous Janajati groups themselves gauge the number of Janajati residents to significantly higher than the reported number in the 2011 census. For further reference see Human Rights Council, "Report by the Special Rapporteur on the situation of human rights and fundamental freedoms of indigenous people, James Anaya" (A/HRC/12/34/Add.3), 20 July 2009.

[6] Ibid.,p.5

[7] United Nations Resident Coordinator's (UNRC) Office, Nepal, "Field Bulletin: Caste-based discrimination in Nepal: a local-level perspective from Dadeldhura District" (Issue 59), p.1, August 2013.

**Figure 3: Percentage of households by main castes and indigenous groups (Janajati) per district**




## LIVELIHOODS

Reported income sources were predominantly rurally-based, with 55% of respondents engaged in subsistence farming, and 31% in keeping livestock. The remaining predominant forms of income were reported to be informal work (22%), business (18%), and formal employment (18%).

As shown in table 2, there is a clear discrepancy between districts inside and outside the Kathmandu Valley, with most households that are engaged in formal employment or business located either in Kathmandu, Bhaktapur, or Lalitpur. The same districts also reported the lowest number of inhabitants who engaged in subsistence farming. Districts outside the Kathmandu Valley are essentially rural[8], and reported high levels of subsistence farming and livestock keeping. The highest proportion of households engaged in subsistence farming were found in Ramechhap (84%), Sindupalchok (83%), and Kavrepalanchok (82%).

Households engaged in low-income, rurally-based livelihoods like subsistence farming were particularly susceptible to socio-economic disruption as the earthquakes occurred several weeks prior to the start of the paddy planting season. [9] The same households were also predominantly residing in brittle mud-bonded brick and stone housing before the crisis, a wall material that was heavily damaged by the earthquakes due to its weak structural integrity (see Figure 16).

[8] Government of Nepal - National Planning Commission, "Nepal Earthquake 2015 - Post Disaster Needs Assessment (PDNA): Executive Summary", p. 5, 2015.
[9] Ibid. p.14

**Table 2: Reported sources of income per district***

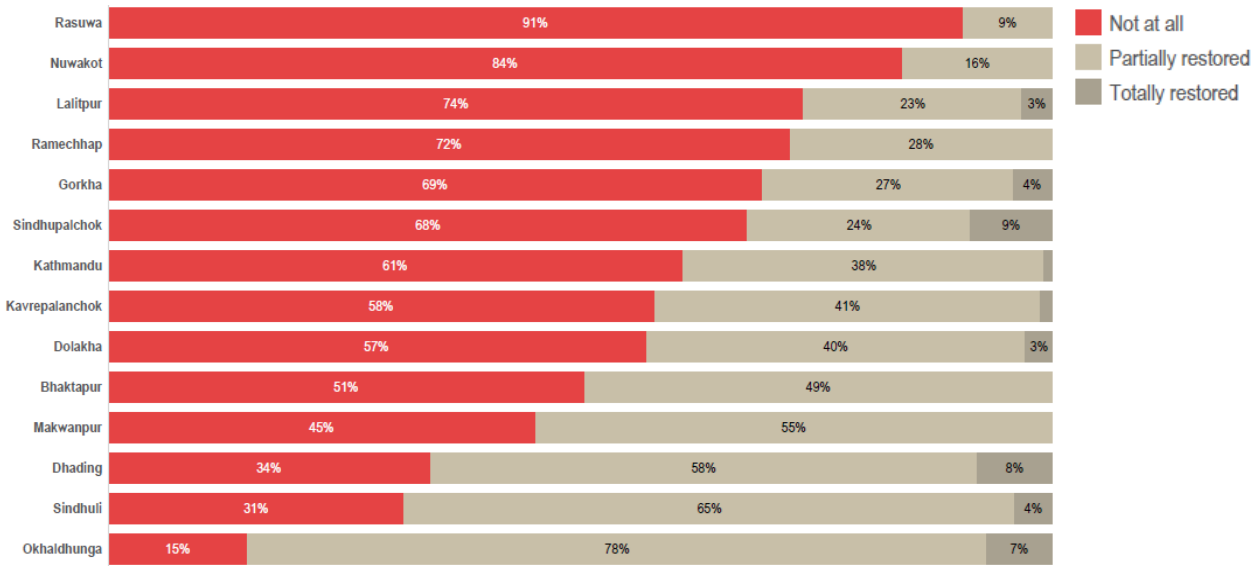
| | Subsistence Gardening | Remittances | Rent | Business | Informal Wages | Formal Wages | Livestock | Masonry | No income | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| Bhaktapur | 30% | 7% | 11% | 25% | 17% | 27% | 11% | 4% | 2% | 7% |
| Dhading | 57% | 10% | 0% | 16% | 22% | 13% | 47% | 4% | 5% | 4% |
| Dolakha | 79% | 7% | 2% | 10% | 21% | 11% | 54% | 23% | 4% | 2% |
| Gorkha | 62% | 7% | 2% | 14% | 17% | 13% | 28% | 6% | 2% | 3% |
| Kathmandu | 29% | 7% | 19% | 26% | 36% | 32% | 10% | 2% | 1% | 10% |
| Kavrepalanchok | 82% | 7% | 1% | 9% | 14% | 5% | 46% | 2% | 9% | 1% |
| Lalitpur | 57% | 6% | 7% | 21% | 26% | 18% | 23% | 2% | 6% | 3% |
| Makwanpur | 70% | 16% | 0% | 17% | 19% | 5% | 38% | 6% | 2% | 8% |
| Nuwakot | 55% | 3% | 2% | 14% | 8% | 14% | 34% | 1% | 2% | 1% |
| Okhaldhunga | 78% | 12% | 1% | 10% | 9% | 13% | 62% | 2% | 9% | 5% |
| Ramechhap | 84% | 4% | 1% | 15% | 9% | 7% | 56% | 21% | 0% | 4% |
| Rasuwa | 77% | 7% | 0% | 3% | 19% | 6% | 60% | 6% | 0% | 12% |
| Sindhuli | 78% | 7% | 0% | 7% | 15% | 7% | 43% | 3% | 8% | 3% |
| Sindupalchok | 83% | 4% | 0% | 12% | 4% | 3% | 69% | 17% | 1% | 4% |

** Respondents were able to select multiple options*

69% of respondents reported that their income had decreased due to the impact of the earthquakes, with 59% of these households reporting that their income had not been restored at all by the time of the assessment. When comparing reported decreases in income between female and male-headed households, 72% of female-headed households reported a decrease in income, compared to 68% of male-headed households.[10]

As noted in figure 4, large differences were found between districts; with 91% of inhabitants in Rasuwa reporting that their livelihood had not been restored at all, compared to 15% in Okhaldhunga.

**Figure 4: Reported extent to which lost income was restored, by district**




## DISPLACEMENT

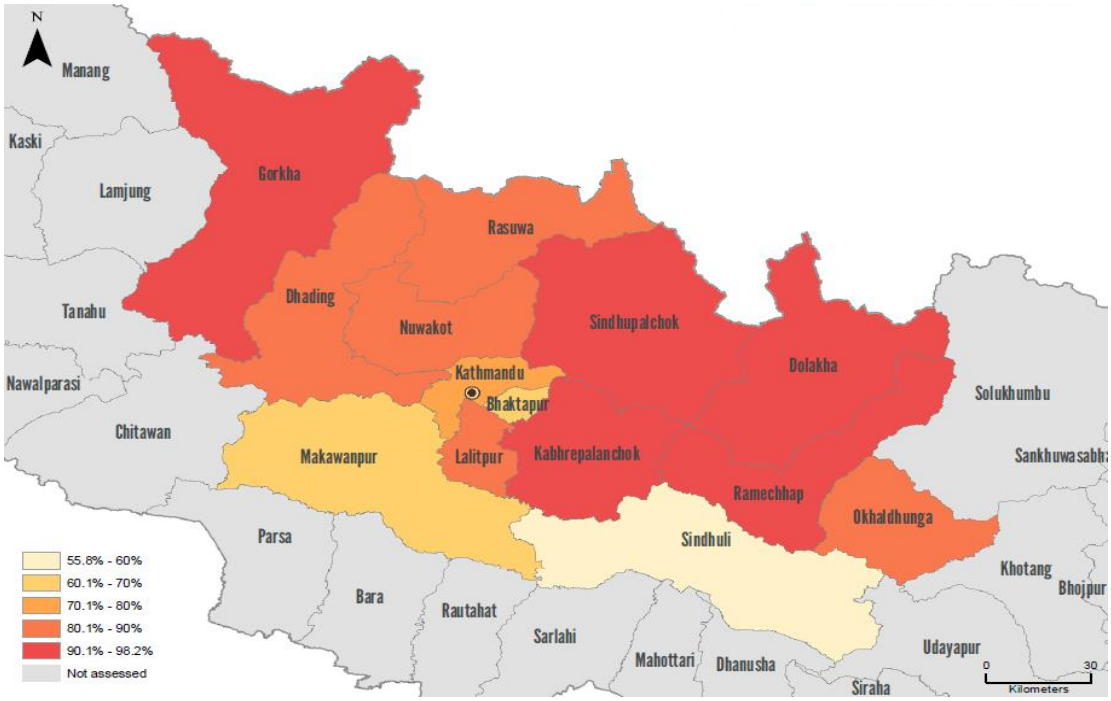
Households were categorised as displaced if they were forced to move outside of their home by the 25 April or 12 May earthquake, which includes households residing in temporary shelters on the same land as their original homes. Across

[10] Due to the small sample size of female-headed households, these findings can only be considered statistically significant with a 95% confidence and a margin of error of 7%. An insufficient sample size was available for each caste to compare the income loss or recovery or by caste.

all priority districts, 79% of all assessed households reported being displaced. The highest levels of displacement were reported in Ramechhap, Dolakha, and Kavrepalanchok at 98%, 95%, and 93% respectively.

Primary reasons for displacement were housing damage, cited by 86% of all displaced households, as well as fear of aftershocks (72%), and general fears regarding the structural safety of their home (41%). Of the sampled households, only 4% of respondents cited a lack of food as a reason for displacement. However, this is likely to have been influenced by the fact that only accessible areas were sampled, i.e. places where food and materials can be provided by 4x4 vehicles if needed.

**Figure 5: Percentage of displaced households in accessible areas of the priority districts**

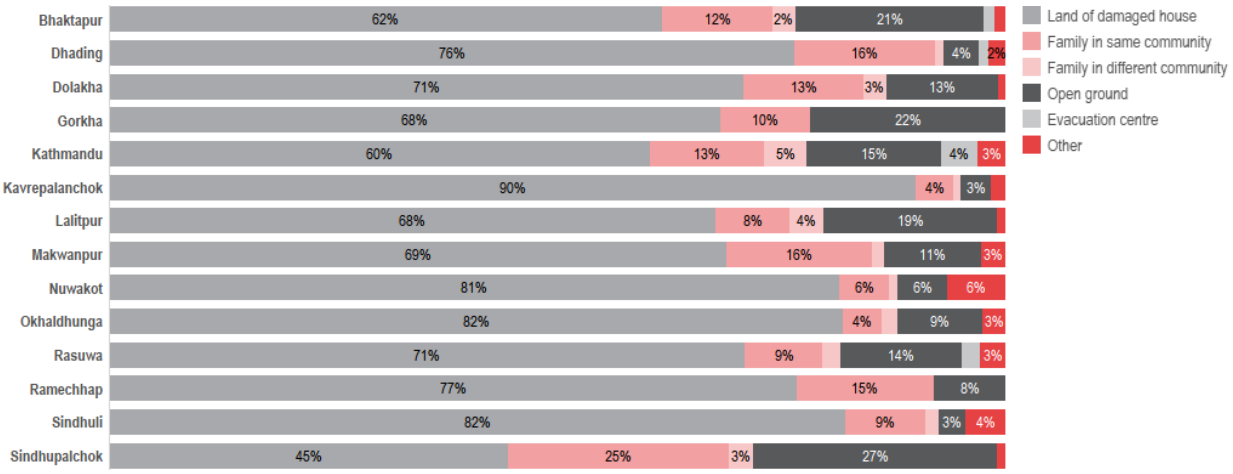



Of those households that had been displaced from their pre-crisis homes, a majority of 68% reported that they currently reside adjacent to their damaged homes; with the highest percentages reported in Okhaldhunga (82%), Sindhuli (82%), and Nuwakot (81%). The second most prevalent form of displacement, cited by 13% of all displaced households, was households residing on open ground in the same community. Sindupalchok contained the largest proportion of households residing on open ground (27%). Very few respondents reported living in evacuation centres, with the highest proportion of displaced persons living in evacuation centres reported in Kathmandu (5%) and Lalitpur (4%).

Overall, the median travel time of displaced households to their damaged homes was 2 minutes**.** This indicates that the vast majority of households have decided to remain in their communities and within close proximity of their homes.

No significant difference in the number of displaced households were found between female-, and male-headed households; although male-headed household were more likely to sleep in open-ground areas (13%) than female-headed households (9%).

**Figure 6: Displaced households by location of current post-crisis residence**




When asked about their intentions within the 7 days after the assessment, 83% of displaced households expressed their intention to stay on site, while 7% intended to return to their original home. The intentions of female and male-headed households over this period were almost identical. When asked about their intentions within the 30 days following the assessment, the proportion of households who planned to stay on site decreased to 55%, while the proportion of households who intended to return to their original house increased to 19%.

There are considerable differences across districts regarding the intentions of displaced households within 30 days of the assessment. Households that intend to return to their homes were predominantly located in the 5 least damaged districts, i.e. Kathmandu, Bhaktapur, Lalitpur, Makwanpur and Sindhuli, indicating that many of these households incurred little damage to their homes and were camping outside due to the fear of aftershocks. Of those households that intend to move away from their current shelter within 30 days of the assessment, the highest proportions among all assessed districts were found in the heavily damaged and predominantly rural districts of Dolakha (27%), Rasuwa (24%), and Kavrepalanchok (22%).

**Figure 7: Intended movement of households within 30 days after the assessment**

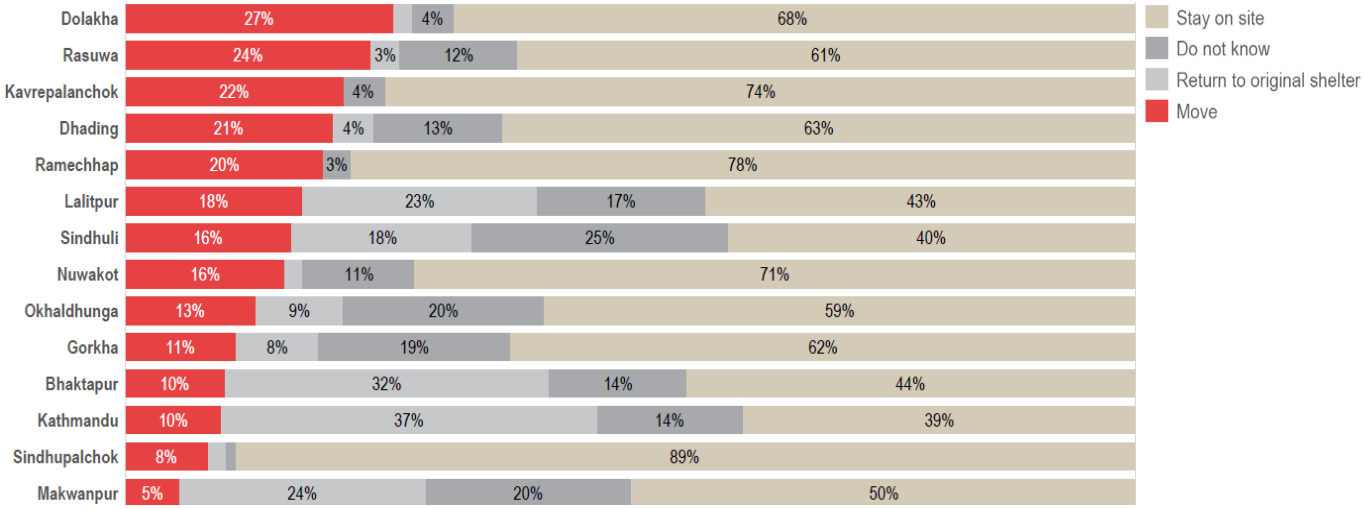
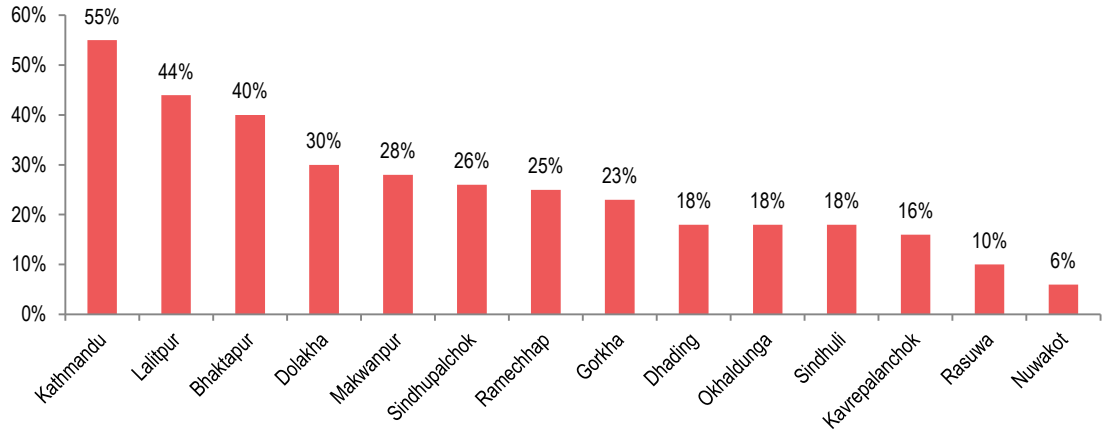


**Figure 8: Displaced households by location vs. intentions in 7 and 30 days after assessment**

| | Do not know | | Move | | Return to original shelter | | Stay on site | |
|---|---|---|---|---|---|---|---|---|
| | 7 Days | 30 Days | 7 Days | 30 Days | 7 Days | 30 Days | 7 Days | 30 Days |
| Evacuation Centre | 11% | 33% | 0% | 33% | 0% | 11% | 89% | 22% |
| Family in different community | 7% | 11% | 15% | 22% | 7% | 19% | 70% | 48% |
| Family in same community | 5% | 9% | 3% | 17% | 2% | 8% | 89% | 65% |
| Land of damaged home | 5% | 12% | 3% | 16% | 4% | 11% | 88% | 61% |
| Open ground in same community | 7% | 14% | 7% | 11% | 5% | 15% | 82% | 59% |
| Other | 0% | 10% | 7% | 17% | 0% | 7% | 93% | 67% |

At the time of the assessment, 35% of all assessed households reported that they were hosting displaced friends and / or family members in their shelter. This was most prevalent in the densely populated districts located in Kathmandu Valley, in particular Kathmandu, Lalitpur and Bhaktapur where 55%, 44%, and 40% of households reported they were hosting displaced persons.

**Figure 9: Households hosting displaced friends or family**




## PRE-CRISIS HOUSING SITUATION

### *Pre-crisis Land Tenure Status*

91% of all respondents stated that they owned the land on which they are residing, with 8% responding that they rented their property, and under 1% reporting to rent for free, with or without consent. Since enumerators did not ask any formal proof of legal ownership, answers given to this question are likely to reflect perceived rather than formal ownership. It should be noted that actual land ownership may differ and involve varying degrees of formality. Nonetheless, these findings show a marked difference in perceived tenure when compared to a recent IFRC country-wide study into regulatory barriers in Nepal, which states that "over half of all land holdings in Nepal are unregistered and without Ownership Certificates"[11]. The discrepancy between these two figures should be taken in to consideration by the response not only in terms of targeting, but especially in terms of assistance that could be provided to beneficiaries. The small percentage of households not reporting to own land are likely to be particularly vulnerable, as the landless in Nepal tend to have a lower coping capacity and scale of resilience.[12]

[11] IFRC Regulatory barriers to providing emergency and transitional shelter after disasters Country case study: Nepal, 2014.

[12] Government of Nepal - National Planning Commission, "Nepal Earthquake 2015 - Post Disaster Needs Assessment (PDNA): Executive Summary", p. 71, 2015.

The highest percentage of renters were found in the urbanized Kathmandu Valley, particularly in the Bhaktapur and Kathmandu districts, where 13% and 17% of respondents respectively reported to be renters. As renters predominantly resided in buildings constructed out of reinforced concrete, their housing was proportionally less affected by the earthquakes, although the findings for this small sample should be considered indicative only.

### *Pre-crisis Housing Components*

As part of the assessment, households were asked about the primary construction materials of the core elements of their house (roof, walls, floor, foundation, and doors / windows) prior to the 25 April earthquake, in order to understand the extent to which different types of housing construction were more or less vulnerable to earthquake damage. While results are helpful to categorise housing and understand vulnerability in a general sense, it should be noted that material of each housing component is only a proxy for its construction and quality.

The predominant roofing material utilised by households throughout the affected area before the 25 April earthquake was corrugated galvanised iron (CGI), at 50%. Considerable differences in shelter roofing were observed between districts. Over half of the pre-crisis roofing in the assessed districts consisted of CGI sheets; particularly so in Rasuwa (81%), Gorkha (72%), Makwanpur (69%), Kavrepalanchok (67%), Sindupalchok (66%) and Lalitpur (60%). In rural areas, where CGI was not the predominant roofing material, slate and tile was the most common roofing material, particularly in Ramechhap (60%), Sindhuli (58%), Okhaldhunga (50%).

The use of Reinforced Cement Concrete (RCC) for pre-crisis roofing was predominantly found in the urbanized and densely populated Kathmandu Valley; 51% in Kathmandu, 49% in Bhaktapur, and 27% in Lalitpur.

**Table 3: Pre-crisis roofing materials**

| | CGI | RCC | Tile / Slate | Tarpaulins | Thatch / Straw | Wooden Planks | Other |
|---|---|---|---|---|---|---|---|
| Bhaktapur | 37% | 49% | 14% | 0% | 0% | 0% | 0% |
| Dhading | 48% | 3% | 39% | 1% | 5% | 0% | 5% |
| Dolakha | 49% | 4% | 46% | 0% | 1% | 0% | 0% |
| Gorkha | 72% | 11% | 8% | 1% | 7% | 0% | 0% |
| Kathmandu | 43% | 51% | 6% | 0% | 0% | 0% | 0% |
| Kavrepalanchok | 67% | 3% | 28% | 0% | 2% | 0% | 0% |
| Lalitpur | 60% | 27% | 10% | 0% | 1% | 2% | 0% |
| Makwanpur | 69% | 3% | 22% | 0% | 5% | 0% | 1% |
| Nuwakot | 48% | 9% | 35% | 0% | 2% | 5% | 1% |
| Okhaldhunga | 23% | 0% | 50% | 0% | 28% | 0% | 0% |
| Ramechhap | 38% | 1% | 60% | 0% | 2% | 0% | 0% |
| Rasuwa | 81% | 2% | 15% | 0% | 0% | 0% | 1% |
| Sindhuli | 23% | 0% | 58% | 0% | 19% | 0% | 0% |
| Sindupalchok | 66% | 8% | 24% | 0% | 2% | 0% | 0% |

The predominant wall material used by households throughout the affected area before the 25 April earthquake was mud-bonded brick or stone, at 64%. Due to the widespread collapse of buildings which employed mud walls as their main load-bearing elements, this affordable, but vulnerable type of material has been linked to prior large-scale loss of life and property during previous earthquakes in Nepal.[13] This notion was further corroborated by this assessment. As outlined below in the Housing Damage section, findings indicate that 99% of all walls built from mud-bonded brick and stone were reported as damaged, with 86% reported as either heavily damaged or entirely destroyed.

[13] Government of Nepal - Department of Urban Development and Building Construction, Ministry of Physical Planning and Works, "Nepal National Building Code 204: 1994 Guidelines for Earthquake Resistant Construction - Earthen Building", p. 12, December 1993.

A clear divide in the usage of mud-bonded brick or stone was found between districts inside and outside the Kathmandu Valley. The rural districts outside the valley reported very high usage rates of mud-bonded brick or stone, while Bhaktapur and Kathmandu, both located in the urban Kathmandu Valley, relied more heavily on walls made of cement-bonded brick or stone.

Kathmandu also reported the highest rate (14%) of households using unbaked bricks as pre-crisis wall materials, while wooden planks were most commonly used in Sindhuli (19%) and Makwanpur (10%).

**Table 4: Pre-crisis wall materials**

| | Bamboo | Cement-bonded brick/stone | CGI | Mud-bonded brick / stone | Unbaked bricks | Wooden planks | other |
|---|---|---|---|---|---|---|---|
| Bhaktapur | 0% | 49% | 0% | 47% | 4% | 0% | 0% |
| Dhading | 1% | 6% | 0% | 89% | 0% | 2% | 2% |
| Dolakha | 1% | 9% | 0% | 90% | 0% | 0% | 0% |
| Gorkha | 0% | 19% | 2% | 71% | 2% | 3% | 2% |
| Kathmandu | 1% | 52% | 0% | 33% | 14% | 0% | 1% |
| Kavrepalanchok | 1% | 3% | 0% | 95% | 1% | 0% | 0% |
| Lalitpur | 0% | 25% | 2% | 74% | 0% | 0% | 0% |
| Makwanpur | 2% | 11% | 0% | 75% | 0% | 10% | 2% |
| Nuwakot | 0% | 12% | 0% | 87% | 0% | 0% | 1% |
| Okhaldhunga | 0% | 1% | 1% | 98% | 0% | 0% | 0% |
| Ramechhap | 1% | 5% | 0% | 94% | 0% | 0% | 0% |
| Rasuwa | 0% | 3% | 1% | 94% | 0% | 2% | 0% |
| Sindhuli | 9% | 11% | 0% | 61% | 0% | 19% | 0% |
| Sindupalchok | 0% | 9% | 2% | 88% | 1% | 0% | 0% |

The predominant flooring material used by households throughout the affected area before the 25 April earthquake was dirt or sand at 38%, while the vast majority (68%) of households used mud-bonded brick or stone as their predominant foundation material.

**Table 5: Pre-crisis floor materials**

| | Dirt or Sand | Cement or Cement-bonded brick or stone | Concrete | Milled Timber | Mud-bonded brick or stone | Other |
|---|---|---|---|---|---|---|
| Bhaktapur | 20% | 7% | 43% | 9% | 20% | 0% |
| Dhading | 48% | 2% | 5% | 2% | 43% | 0% |
| Dolakha | 65% | 10% | 1% | 0% | 25% | 0% |
| Gorkha | 35% | 4% | 18% | 8% | 30% | 4% |
| Kathmandu | 23% | 23% | 35% | 0% | 17% | 3% |
| Kavrepalanchok | 69% | 2% | 3% | 0% | 26% | 0% |
| Lalitpur | 35% | 6% | 21% | 5% | 33% | 0% |
| Makwanpur | 33% | 7% | 10% | 14% | 36% | 0% |
| Nuwakot | 51% | 2% | 10% | 0% | 37% | 0% |
| Okhaldhunga | 65% | 1% | 0% | 1% | 34% | 0% |
| Ramechhap | 53% | 3% | 1% | 1% | 43% | 0% |
| Rasuwa | 30% | 3% | 2% | 31% | 33% | 1% |
| Sindhuli | 60% | 3% | 6% | 3% | 29% | 0% |
| Sindupalchok | 55% | 5% | 6% | 5% | 29% | 0% |

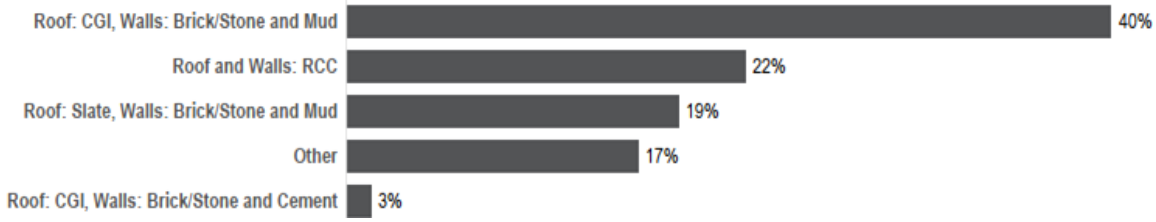
**Table 6: Pre-crisis foundation materials**

| | Cement-bonded brick or stone | Mud-bonded brick or stone | RCC Pillars | Wooden Pillars | None | Do not know | Other |
|---|---|---|---|---|---|---|---|
| Bhaktapur | 14% | 47% | 36% | 1% | 2% | 0% | 0% |
| Dhading | 3% | 90% | 2% | 2% | 1% | 1% | 0% |
| Dolakha | 8% | 90% | 1% | 0% | 1% | 1% | 0% |
| Gorkha | 7% | 73% | 10% | 9% | 2% | 0% | 0% |
| Kathmandu | 10% | 46% | 37% | 1% | 1% | 2% | 4% |
| Kavrepalanchok | 2% | 90% | 2% | 1% | 5% | 1% | 0% |
| Lalitpur | 10% | 68% | 17% | 2% | 0% | 2% | 2% |
| Makwanpur | 10% | 74% | 1% | 11% | 4% | 0% | 0% |
| Nuwakot | 2% | 88% | 9% | 0% | 0% | 0% | 0% |
| Okhaldhunga | 1% | 89% | 0% | 7% | 1% | 0% | 1% |
| Ramechhap | 2% | 97% | 1% | 0% | 0% | 0% | 0% |
| Rasuwa | 2% | 90% | 2% | 1% | 3% | 1% | 0% |
| Sindhuli | 6% | 70% | 0% | 9% | 14% | 1% | 0% |
| Sindupalchok | 2% | 89% | 7% | 2% | 1% | 0% | 0% |

## *Housing typologies*

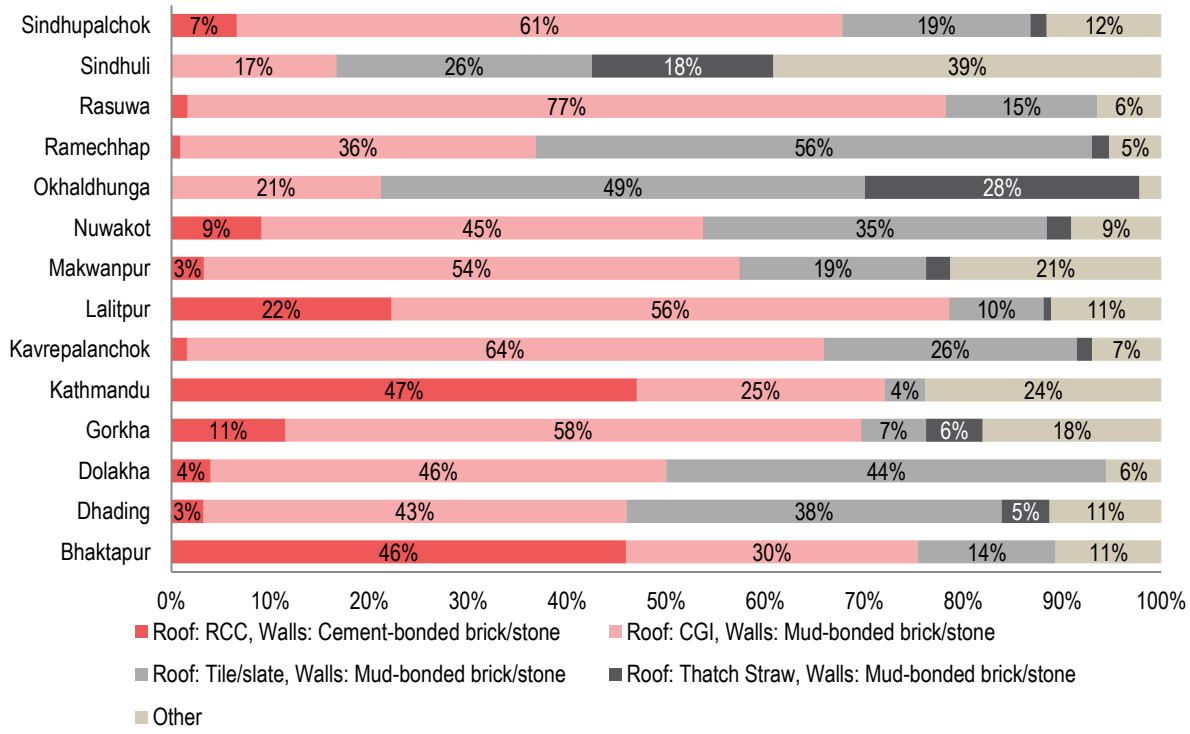
Across all assessed districts, 59% of households reported mud-bonded brick and stone walls in combination with either CGI or slate roofing as their pre-crisis housing typology, with CGI as the most predominant roofing material. Only 22% of all buildings had walls and roofs that were predominantly constructed from RCC or cement-bonded brick and stone.

**Figure 10: Overall pre-crisis housing typologies**




At the district-level, particularly households in rural districts outside the Kathmandu valley reported mud-bonded brick and stone walls in combination with either CGI or slate roofing as their pre-crisis housing typology, with 90 or more percent of respondents in Kavrepalanchok, Dolakha, Rasuwa, and Ramechhap doing so. Only in Bhaktapur, Kathmandu, and Sindhuli did a majority of households report that their pre-crisis housing typology did not include mud-bonded brick stone walls; in Bhaktapur and Kathmandu a majority of respondents reported cement-bonded brick/stone wall and RCC roof material usage, whereas households in Sindhuli reported particularly high usage levels of thatch straw roofing and wooden walls.

Figure 11: Pre-crisis housing typologies per district




## HOUSING DAMAGE

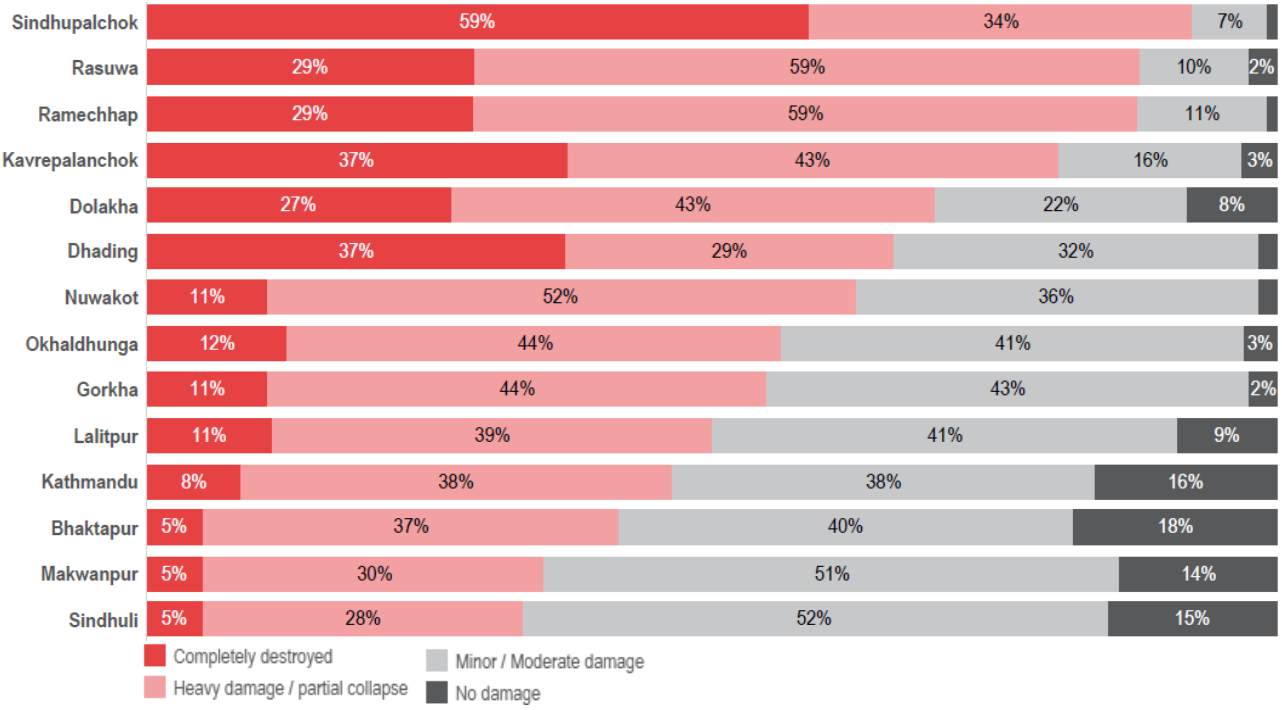
90% of households in the accessible areas of the assessed districts reported that their homes were damaged because of either the 25 April or 12 May earthquake, or both. Ten out of 14 districts reported damage levels over 90%, with the highest amount of households reporting damage to their homes identified in Sindupalchok (99%) and Ramechhap (99%).

It should, however, be noted that these figures include any level of damage, including for example small cracks, or broken windows and doors. As such, to ensure detailed analysis of damage levels, households were asked to identify damage according to 4 levels:

1. total collapse
2. severe damage / partial collapse
3. minor damage
4. no damage

When the two most severe tiers of damage are combined, it can be identified that 55% of all households reported that their homes were either completely destroyed, or severely damaged/partially collapsed. Reported damage figures by male and female-headed households showed little variation compared to national figures. Sindupalchok remained the most affected district with 93% of housing reported as totally or heavily damaged; with similar levels of destruction reported in Rasuwa (88%), Ramechhap (88%), and Kavrepalanchok (80%). The lowest levels of damage were recorded in the Kathmandu Valley districts of Lalitpur, Kathmandu, and Bhaktapur, as well in the two Southern-most assessed districts, Makwanpur and Sindhuli.

**Figure 12: Reported levels of housing damage due to 25 April and 12 May Earthquakes**




## *Damage per Housing Component*

In order to gain a more detailed understanding of damage levels across the affected area, the survey identified reported levels of damage sustained to core housing components: roofs, walls, floors, and foundations.

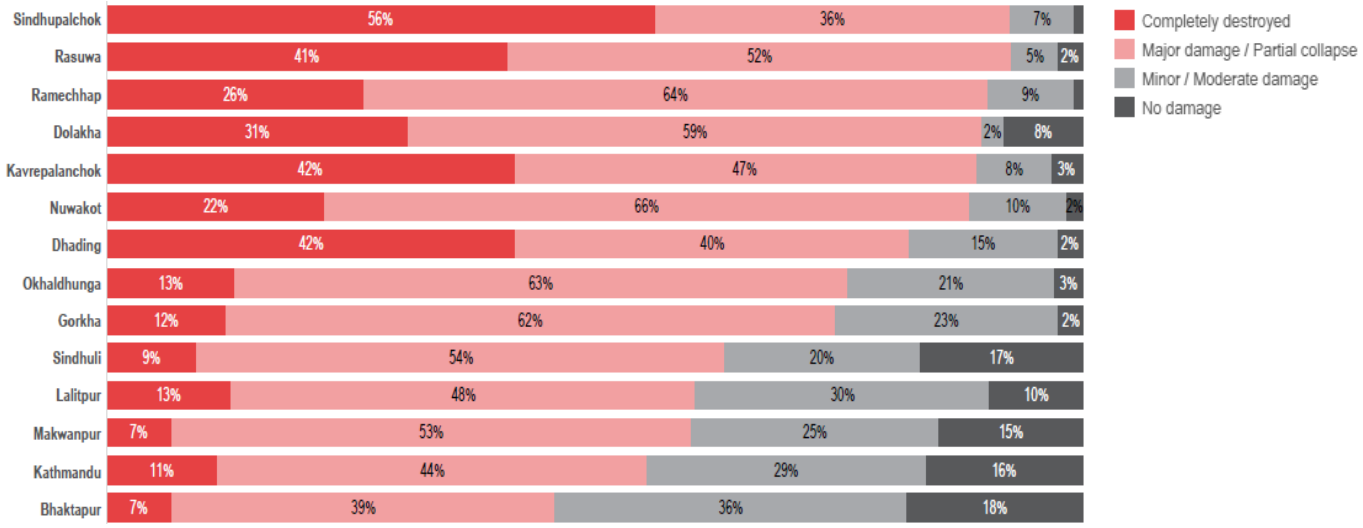
Damage to walls was widespread among all priority districts, with almost all households in the priority districts reporting some level of damage sustained to the walls of their homes, with 14% reporting minor damage, 55% heavy damage or partial collapse, and 30% total collapse.

Houses that used mud-bonded brick and stone, the predominant wall construction typology in the assessed districts, were particularly prone to damage. 99% of all walls built from mud-bonded brick and stone were reported as damaged, with 86% reported as either heavily damaged or entirely destroyed. The vulnerable structural integrity of houses built with mud-bonded brick and stone walls is reflected in the district-level findings. All districts where the material was less commonly used, i.e. Kathmandu, Bhaktapur, Lalitpur, Sindhuli and Makwanpur, reported lower levels of damage to walls.

Cement-bonded brick walls were identified as more resistant to the tremors sustained by the earthquakes. However, significant levels of housing damage were still recorded among households that used the material, likely due to poor construction methods and the usage of low-quality materials[14]: 29% of households whose wall material consisted of cement-bonded brick or stone reported no damage, 47% minor damage, 21% heavy damage and 3% total damage. It should be noted that 61% of respondents that used cement-bonded brick or stone as their predominant pre-crisis wall material were located in the Kathmandu Valley districts, i.e. Kathmandu, Bhaktapur, and Lalitpur. This could explain the relatively low levels of housing damage in these districts, compared to rural districts located outside the valley, where mud-bonded brick and stone was the prevalent pre-crisis wall material.

[14] Government of Nepal - National Planning Commission, "Nepal Earthquake 2015 - Post Disaster Needs Assessment (PDNA): Executive Summary", p. 3, 2015.

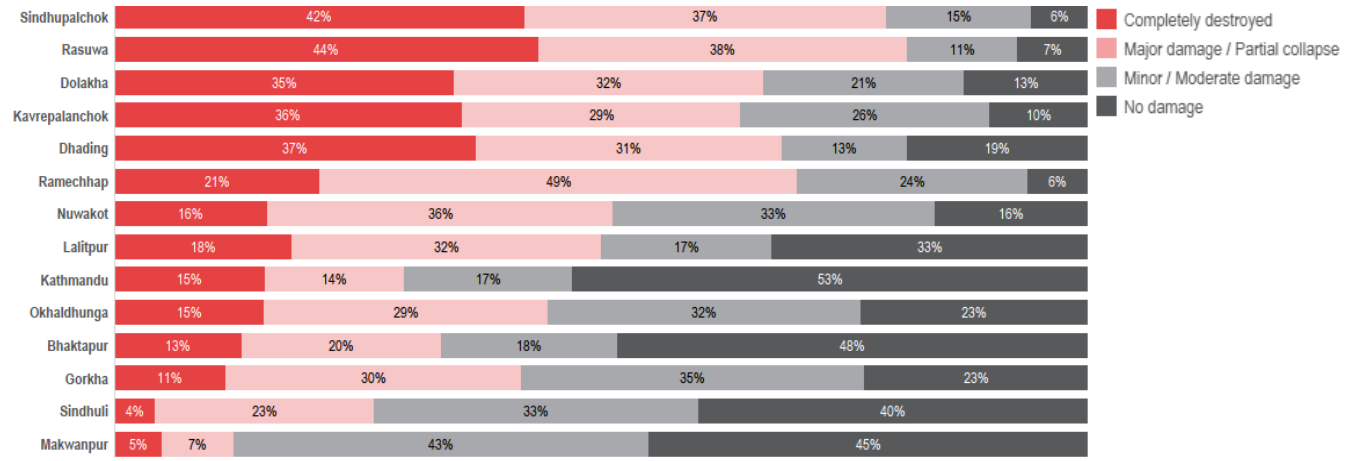
**Figure 13: Reported levels of damage to walls**




Overall 66% of households in the priority districts reported some level of damage sustained to the roofs of their homes, with 23% reporting minor damage, 24% heavy damage or partial collapse, and 19% total collapse. The largest proportions of households who reported no damage to their roofs were identified in Kathmandu (53%) and Bhaktapur (48%). These districts reported the highest usage rates of RCC as their pre-crisis roofing materials; at 51% and 49% respectively.

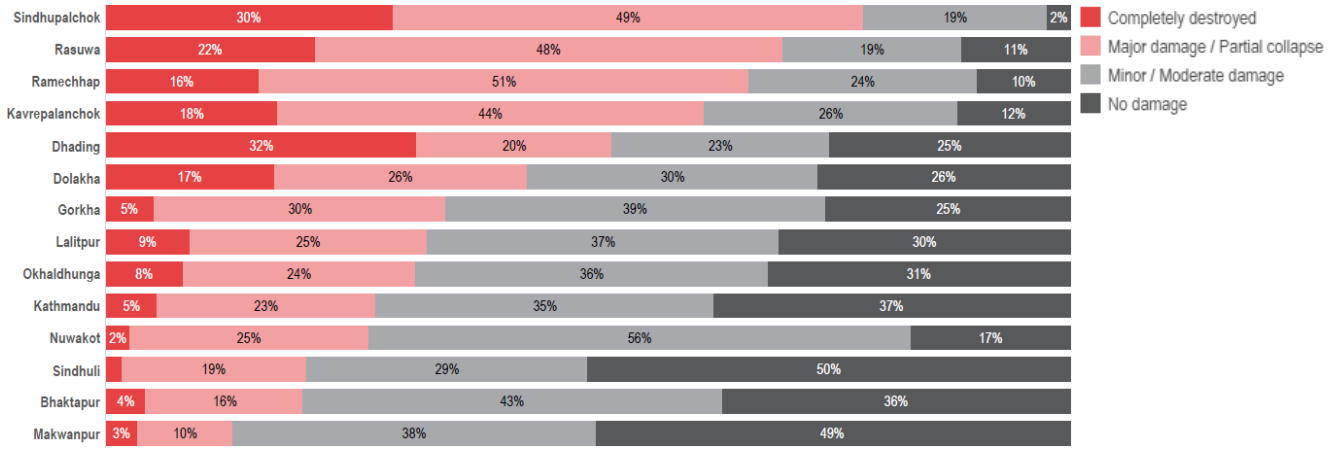
CGI was the most common type of roofing material used in the priority districts. Of those households citing CGI as their pre-crisis roofing material, 74% reported some form of roofing damage caused by the earthquakes; with 24% reporting minor damage, 27% reporting heavy damage, and 24% reporting total collapse. Similar levels of damage were incurred by households with slate or tile roofs: 98% of which reported roofing damage, with 59% reporting heavy or total damage.

**Figure 14: Reported levels of damage to roofing**




72% of all assessed households reported flooring damage, with 41% reporting minor damage, 26% heavy damage, and 6% total collapse. 46% of households with dirt floors, the most common pre-crisis flooring material, reported heavy or total flooring damage. Similarly, 48% of households with mud-bonded brick floors, the second most common flooring material, reported heavy or total flooring damage. Concrete was the most resilient reported flooring material; 64% of respondents with concrete flooring reported that their house did not sustain flooring damage.

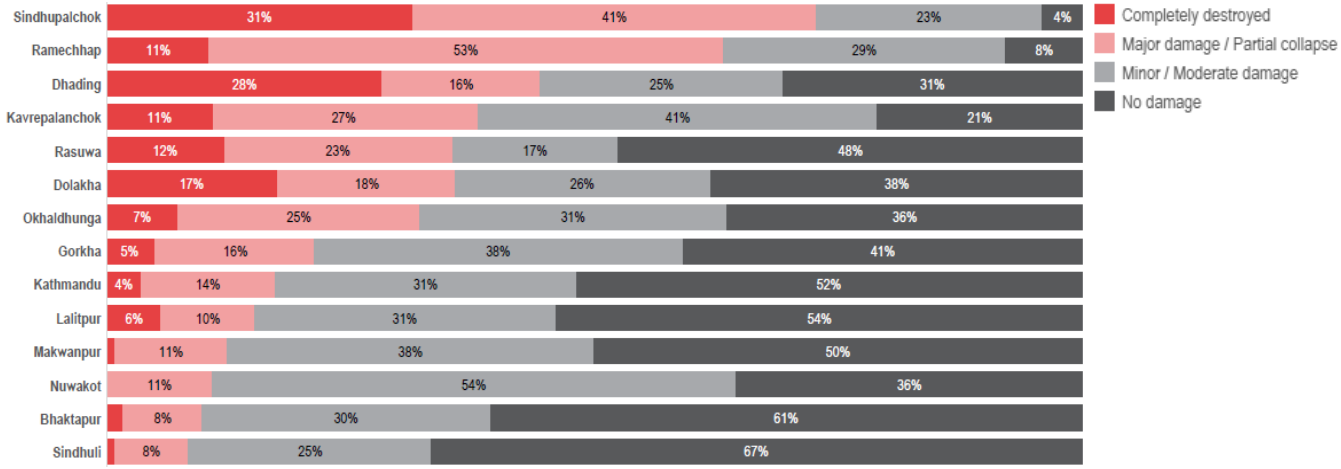
**Figure 15: Reported levels of damage to floors**




The foundations of houses proved to be the housing component least damaged by the earthquakes, with 42% of respondents reporting they did not sustain any damage to their foundations, 34% reporting minor damage, 19% heavy damage, and 4% total destruction.

Mud-bonded brick and stone foundations, the most prevalent pre-crisis foundation material across the priority districts, sustained relatively high levels of damage; 38% minor damage, 22% heavy damage, and 10% total damage respectively. In comparison, foundations made from RCC pillars sustained lower levels of damage; with 80% of households with RCC pillars reporting no damage, 17% minor damage, 4% heavy damage, and no cases of total damage reported.

**Figure 16: Reported levels of damage to foundations**

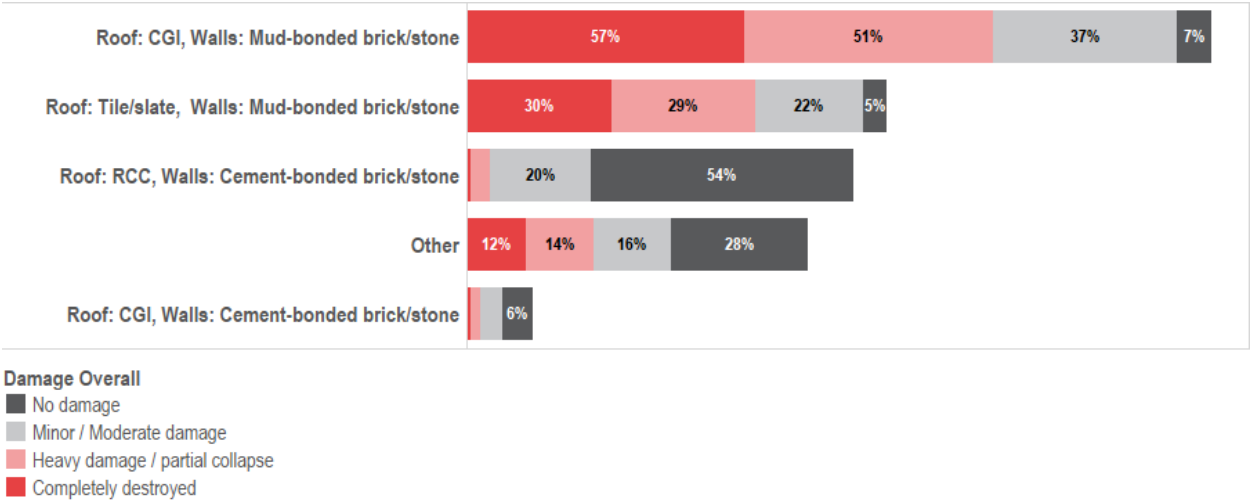



## *Damage per Housing Typology*

Housing typologies with walls comprised of brick/stone and mud masonry were most affected by the earthquakes: over 87% of reported completely destroyed housing had mud-bonded brick and stone walls in combination with either CGI, slate roofing or thatch. This is of particular significance since these were the most commonly reported housing typologies.

In contrast, housing units comprised of RCC roofing and cement-bonded brick or stone walls were found to be less likely to be severely affected. 60% of housing comprised of cement-bonded brick and stone and CGI roofing did not suffer from any damage.

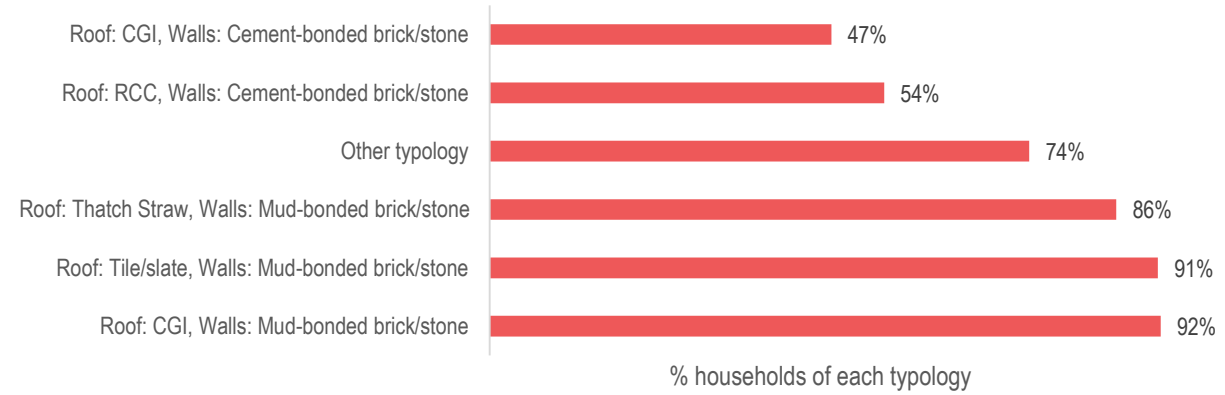
**Figure 17: Reported levels of damage by housing typology**




The vulnerability of households living mud-bonded brick or stone housing is underlined by displacement figures per housing typology. As shown in Figure 18, over 90% of households that resided in mud-bonded brick housing were displaced at the time of the assessment.

Around half of all households with cement-based housing typologies (reinforced concrete or cement-bonded masonry walls) reported that they were not residing in their original homes at the time of the assessment. However, likely due to the relatively low levels of housing damage incurred by these households, a majority of them expressed an intention to return to their original homes within 30 days.

**Figure 18: Reported displacement from pre-crisis shelter, by housing typology**




## *Damage Perceptions*

Surveyed households that incurred housing damage were asked to grade the perceived relevance of potential causes of damage. Six potential causes were given: fate, location of house, design of house, quality of construction materials,

poor construction practices, and neglect. It is important to note that these findings only concern the perceptions of respondents and are chiefly provided to guide community-based shelter programming.

Of all options that were provided, fate was most often cited as being a 'very relevant' cause of housing damage, as mentioned by 15% of the respondents, closely followed by the quality of construction materials (10%).

Housing design, the quality of construction materials and poor construction practices were cited as 'relevant' by approximately 30% of respondents. It is interesting to note that these crucial components were only cited as 'very relevant' to housing damage by a small number of respondents, while nearly 50% of all respondents considered the quality of construction materials, the design of the house, or poor construction practices as not relevant at all, or not so relevant to housing damage. Considering the overall poor construction practices and materials in the affected areas, this denotes a significant knowledge gap on sound construction techniques and materials that should be taken into consideration in future programming.

**Table 7: Perceived causes of damage among all respondents with damaged housing**

| | Do not know | Not relevant at all | Not so relevant | Relevant | Very relevant |
|---|---|---|---|---|---|
| Fate | 12% | 29% | 22% | 21% | 15% |
| Location of house | 14% | 41% | 25% | 17% | 3% |
| Design of house | 14% | 27% | 24% | 29% | 6% |
| Quality of construction materials | 11% | 26% | 22% | 32% | 10% |
| Poor construction practices | 14% | 25% | 22% | 33% | 6% |
| Neglect | 17% | 34% | 29% | 19% | 2% |

When these figures are narrowed down to respondents whose pre-crisis walls consisted of mud-bonded brick and stone walls, the results are equally striking. As noted above, 99% of all mud-bonded brick or stone walls were damaged during the earthquakes, with 86% heavily or totally destroyed. Of all respondents who sustained damage to the mud-bonded brick walls of their home, 43% cited the quality of construction materials as not relevant at all, or not so relevant; a similar proportion cited poor construction practices and housing design as not so relevant or not relevant.

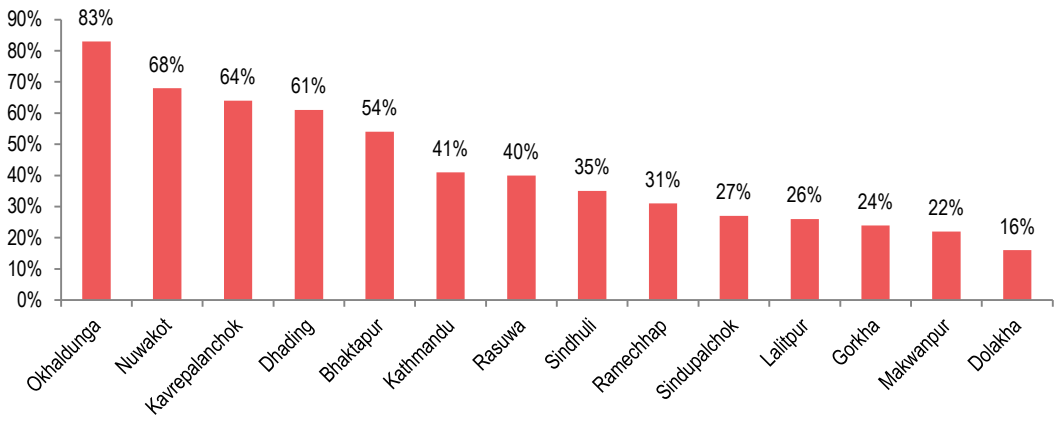
**Table 8: Perceived causes of damage among respondents with damaged mud-bonded brick walls**

| | Do not know | Not relevant at all | Not so relevant | Relevant | Very relevant |
|---|---|---|---|---|---|
| Fate | 12% | 25% | 24% | 23% | 15% |
| Location of house | 12% | 36% | 29% | 18% | 4% |
| Design of house | 13% | 24% | 25% | 30% | 8% |
| Quality of construction materials | 10% | 23% | 20% | 36% | 10% |
| Poor construction practices | 14% | 23% | 21% | 36% | 6% |
| Neglect | 16% | 32% | 28% | 23% | 2% |

### *Structural assessment and information on construction practices*

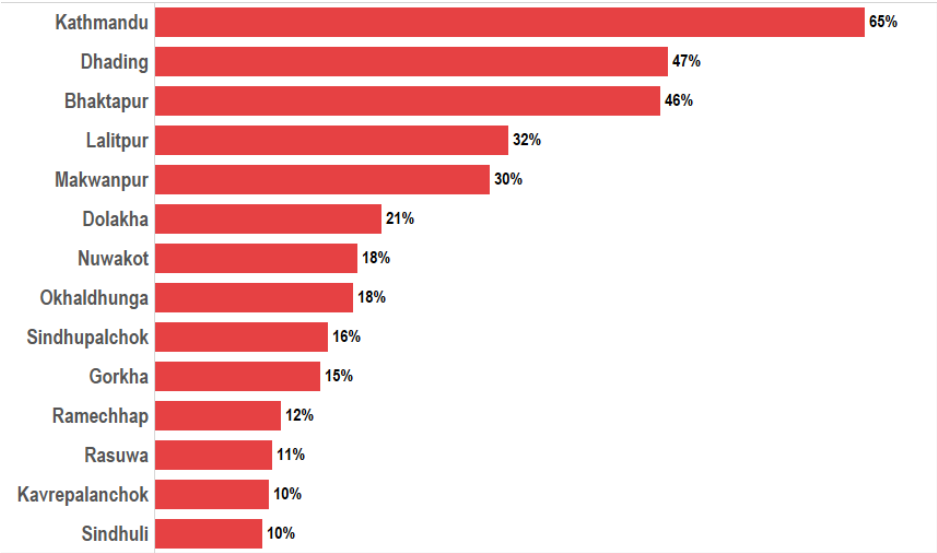
28% of households reported that their house had received a structural damage assessment after the 25 April 2015 earthquake, while 20% reported receiving an assessment after the 12 May earthquake. In total, 42% of all households reported that they had received a structural assessment by a qualified engineer at the time of assessment. Interestingly little difference was observed between the perceived safety of the shelter of households who had received a structural assessment and those who had not.

**Figure 19: Households that reported receiving a structural assessment**




64% of households reported that they never received information on how to build safely, including before the earthquakes. As highlighted in Figure 22, a considerable difference in information received is evident between districts, with 70% of respondents in Kathmandu stating they received information on how to construct safely, while in the bottom nine districts, less than 20% of respondents reported to have received similar information. Of the 36% that did receive information, 23% did so by television, 19% by radio, and 10% from neighbours. However, 90% of those that received information on safer construction practices reported that the information was not helpful.

**Figure 20: Households that reported receiving information on safe construction techniques**

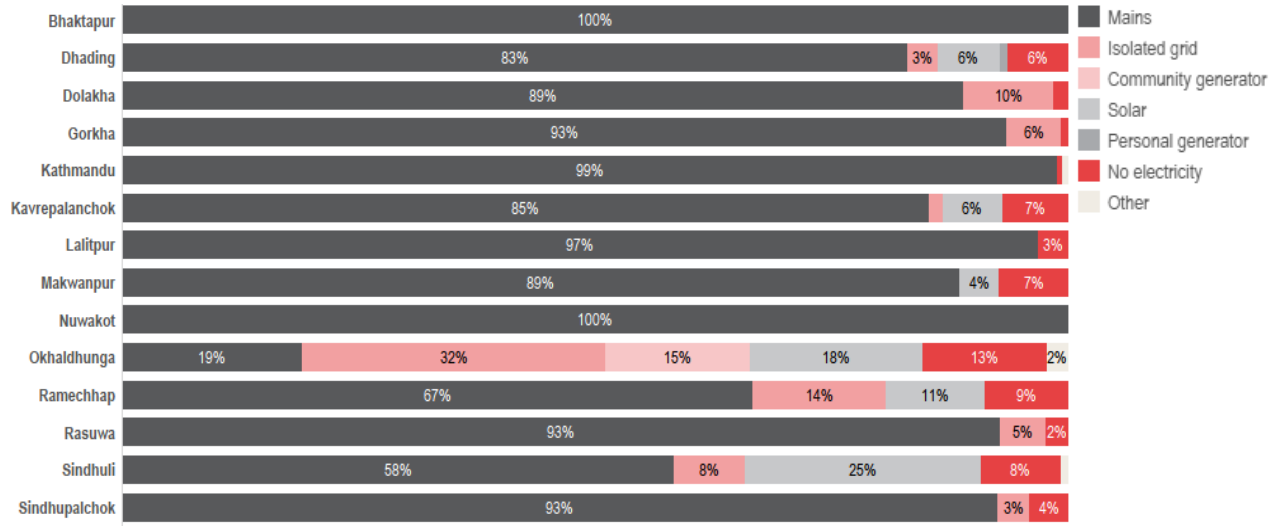



## *Electricity*

Prior to the 25 April and 12 May earthquakes, 97% of households across the assessed area reported that they were able to access electricity in their homes. Of this proportion, 92% of households reported that electricity supply came from the main grid, with 4% drawing their supply from solar panels, and 3% from isolated hydro-power grids. Considerable differences however in sources of electricity between districts were identified. In Okhaldhunga, 13% of households reported having no access to electricity, with only 19% of respondents drawing their electricity supply from the main grid; instead, 32% of households received electricity from isolated grids, 18% from solar panels, and 15% from community generators. Comparatively high proportions of respondents in Ramechhap and Sindhuli also reported

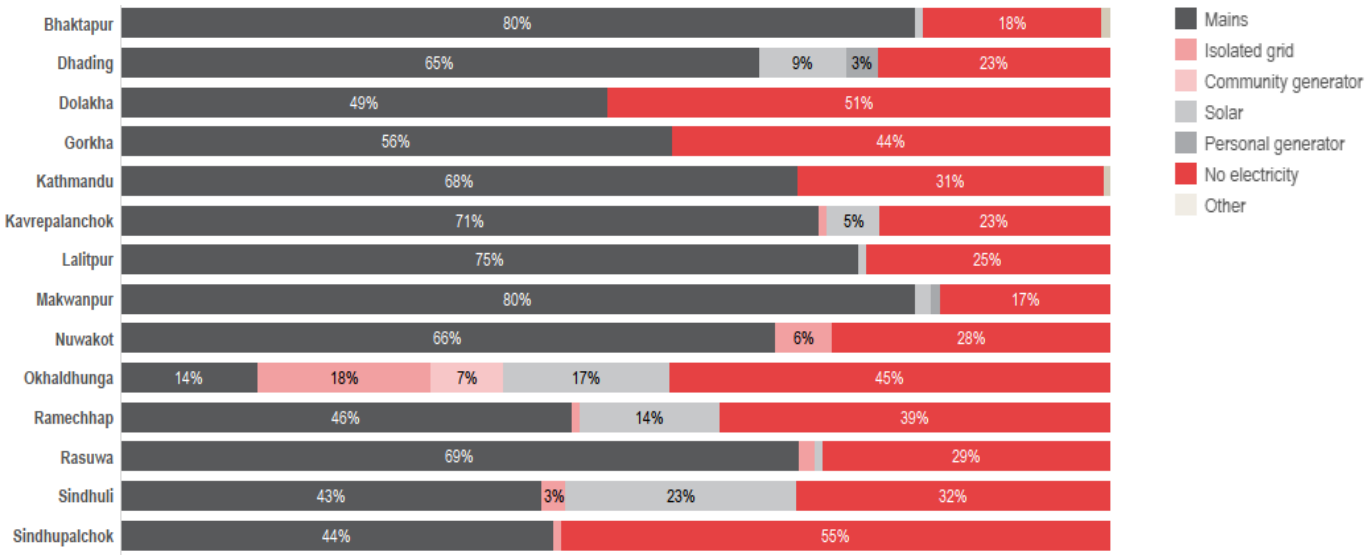
not rely on the main grid as their source of electricity, with 25% of respondents in Ramechhap and 33% in Sindhuli reporting to rely on either an isolated grid, community generator, or solar power.

**Figure 21: Pre-crisis levels of access to electricity**




After the earthquake, 33% of respondents in the assessed area reported not to have access to electricity, which constitutes an increase of 29% compared to pre-crisis levels of access. The highest amounts of respondents without access to electricity were identified in Sindupalchok, Dolakha, and Okhaldhunga, where 55%, 51%, and 45% of respondents respectively reported not to have access to electricity. Of those households that were still connected to a source of electricity, 92% were connected to the main grid, 5% to solar panels, and 2% to isolated hydro-power grids.

**Figure 22: Post-crisis levels of access to electricity**

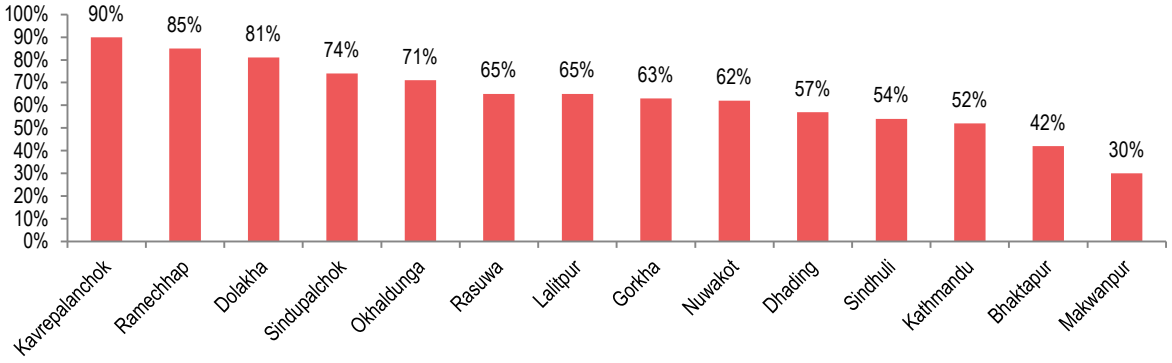


## SHELTER RECOVERY

### *Temporary Shelter Construction*

60% of households with damaged housing reported that they had started constructing a temporary shelter at the time of the assessment, with over 80% of households engaged in the construction of temporary shelter in Kavrepalanchok, Ramechhap, and Dolakha. Female-headed households were less likely to have initiated temporary shelter construction. Of the female-headed households that had incurred housing damage, 58% reported to have started in the construction of temporary shelter, compared to 66% of male-headed households.

**Figure 23: Households reporting being engaged in construction of temporary shelter**




To provide an overview of the materials used to construct temporary shelters, Tables 9, 10, 11, and 12 provide a comparison between pre-crisis and current (at the time of the assessment) housing materials as reported by respondents that reported damage to their homes, both displaced and not. It is clear that the significant damage sustained by predominantly mud-bonded brick and stone walls led many households to resort to alternative materials to build shelter walls; 17%, the largest proportion, of wall materials reported by households with damaged housing consisted of tarpaulins, 15% of plastic sheeting, 12% of cement-bonded brick or stone, while 12% of respondents had no walls. Sharp differences were identified between districts, often depending on natural resources available nearby. Increases in the use of bamboo to construct walls were recorded in Okhaldhunga and Ramechhap, while Sindupalchok, Ramechhap and Dolakha saw a rise in the use of timber.

While 12% of respondents with damaged housing across the assessed districts reported to live on a site without walls, only 1% reported not to have a roof, indicating the prioritization of roofing materials ahead of other shelter components. As part of shelter recovery process, a dramatic increase in the use of tarpaulin and plastic sheeting as roof material was identified, often as a temporary alternative to damaged tile or slate roofing in rural districts, and cement-based structures in the Kathmandu Valley. For future studies, it should be noted that the use of tarpaulin/plastic sheeting as a key shelter component is inherently temporary, and can therefore serve as an important longitudinal indicator to monitor progress throughout the mid- and long term recovery process.

The usage of CGI as roofing materials among households with damaged homes saw sharp decreases in Gorkha, Okhaldhunga, Rasuwa, and Kathmandu, while its usage as a temporary shelter material increased in Dhading, Nuwakot and Ramechhap. In Kathmandu, Bhaktapur, and Lalitpur, increases were seen in the usage of plastic sheeting and tarpaulin as wall- and roof materials despite the relatively low damage levels in these districts. As indicated above, this could be a sign of temporary displacement due to the fear of aftershocks.

## Table 9: Pre- and post-crisis shelter wall materials [households with damaged housing only]

| | Bamboo | | Cement-bonded brick/stone | | CGI | | Mud-bonded brick / stone | | Unbaked bricks | | Wooden planks | | Plastic Sheeting & Tarpaulin | | None | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST |
| Bhaktapur | 0% | 8% | 38% | 23% | 0% | 11% | 57% | 13% | 5% | 0% | 0% | 2% | 0% | 32% | 0% | 8% | 0% | 3% |
| Dhading | 1% | 5% | 7% | 5% | 0% | 16% | 90% | 22% | 0% | 0% | 2% | 10% | 1% | 26% | 0% | 14% | 0% | 1% |
| Dolakha | 0% | 18% | 6% | 3% | 0% | 9% | 94% | 4% | 0% | 0% | 0% | 24% | 0% | 18% | 0% | 22% | 0% | 1% |
| Gorkha | 0% | 8% | 18% | 3% | 2% | 6% | 73% | 5% | 3% | 1% | 3% | 5% | 2% | 60% | 0% | 11% | 0% | 2% |
| Kathmandu | 1% | 6% | 43% | 26% | 0% | 8% | 39% | 2% | 16% | 1% | 0% | 0% | 0% | 36% | 0% | 15% | 1% | 2% |
| Kavrepalanchok | 0% | 10% | 2% | 1% | 0% | 31% | 97% | 11% | 1% | 0% | 0% | 6% | 0% | 30% | 0% | 10% | 0% | 1% |
| Lalitpur | 0% | 0% | 21% | 10% | 0% | 10% | 79% | 15% | 0% | 2% | 0% | 0% | 0% | 56% | 0% | 6% | 0% | 1% |
| Makwanpur | 1% | 7% | 7% | 10% | 0% | 9% | 83% | 22% | 0% | 0% | 8% | 13% | 0% | 27% | 0% | 10% | 2% | 4% |
| Nuwakot | 0% | 9% | 11% | 8% | 0% | 22% | 88% | 25% | 0% | 0% | 0% | 9% | 0% | 21% | 0% | 5% | 1% | 1% |
| Okhaldhunga | 0% | 47% | 1% | 2% | 0% | 5% | 99% | 15% | 0% | 0% | 0% | 3% | 0% | 14% | 0% | 14% | 0% | 2% |
| Ramechhap | 0% | 38% | 5% | 1% | 0% | 11% | 95% | 4% | 0% | 0% | 0% | 17% | 0% | 23% | 0% | 6% | 0% | 0% |
| Rasuwa | 0% | 0% | 2% | 2% | 1% | 28% | 96% | 27% | 0% | 1% | 2% | 9% | 0% | 29% | 0% | 3% | 0% | 1% |
| Sindhuli | 7% | 19% | 9% | 5% | 0% | 2% | 69% | 33% | 0% | 0% | 16% | 8% | 0% | 10% | 0% | 22% | 0% | 2% |
| Sindupalchok | 0% | 5% | 8% | 2% | 2% | 31% | 89% | 1% | 1% | 1% | 0% | 21% | 0% | 28% | 0% | 11% | 0% | 2% |

## Table 10: Pre- and post-crisis shelter roof materials [households with damaged housing only]

| | CGI | | Plastic Sheeting & Tarpaulin | | RCC | | Thatch & Straw | | Tile & Slate | | Wooden planks | | Other | | None | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST |
| Bhaktapur | 45% | 34% | 0% | 40% | 38% | 18% | 0% | 3% | 17% | 3% | 0% | 0% | 0% | 0% | 0% | 0% |
| Dhading | 48% | 58% | 1% | 28% | 3% | 4% | 5% | 2% | 39% | 2% | 0% | 0% | 4% | 2% | 0% | 1% |
| Dolakha | 51% | 45% | 0% | 51% | 2% | 0% | 0% | 1% | 47% | 1% | 0% | 1% | 0% | 2% | 0% | 1% |
| Gorkha | 73% | 22% | 1% | 67% | 11% | 1% | 7% | 6% | 8% | 6% | 0% | 1% | 1% | 3% | 0% | 0% |
| Kathmandu | 50% | 21% | 0% | 50% | 43% | 23% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 4% | 0% | 1% |
| Kavrepalanchok | 66% | 62% | 0% | 27% | 3% | 2% | 2% | 2% | 26% | 2% | 0% | 0% | 2% | 2% | 0% | 1% |
| Lalitpur | 64% | 36% | 0% | 52% | 22% | 9% | 1% | 1% | 10% | 1% | 3% | 3% | 0% | 3% | 0% | 0% |
| Makwanpur | 70% | 45% | 0% | 32% | 1% | 3% | 4% | 8% | 24% | 8% | 0% | 1% | 1% | 1% | 0% | 4% |
| Nuwakot | 49% | 64% | 0% | 16% | 8% | 5% | 3% | 4% | 35% | 4% | 5% | 3% | 1% | 4% | 0% | 0% |
| Okhaldhunga | 22% | 19% | 0% | 54% | 0% | 1% | 28% | 17% | 50% | 17% | 0% | 0% | 0% | 0% | 0% | 0% |
| Ramechhap | 37% | 53% | 0% | 38% | 1% | 1% | 2% | 4% | 60% | 4% | 0% | 0% | 0% | 2% | 0% | 0% |
| Rasuwa | 83% | 56% | 0% | 38% | 1% | 2% | 0% | 2% | 16% | 2% | 0% | 1% | 1% | 2% | 0% | 0% |
| Sindhuli | 23% | 27% | 0% | 26% | 0% | 0% | 22% | 9% | 56% | 9% | 0% | 0% | 0% | 0% | 0% | 2% |
| Sindupalchok | 67% | 58% | 0% | 33% | 8% | 3% | 2% | 2% | 19% | 2% | 0% | 0% | 5% | 2% | 0% | 2% |

## Table 11: Pre- and post-crisis shelter floor materials [households with damaged housing only]

| | Bamboo | | Dirt and sand | | Cement/Cement-bonded brick/stone | | Concrete | | Milled Timber | | Mud-bonded brick/stone | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST |
| Bhaktapur | 0% | 0% | 25% | 67% | 6% | 6% | 34% | 18% | 11% | 1% | 24% | 8% | 0% | 0% |
| Dhading | 0% | 0% | 48% | 75% | 2% | 0% | 4% | 5% | 2% | 4% | 43% | 14% | 0% | 1% |
| Dolakha | 0% | 0% | 69% | 98% | 7% | 1% | 1% | 0% | 0% | 0% | 23% | 1% | 0% | 0% |
| Gorkha | 4% | 3% | 35% | 92% | 4% | 0% | 18% | 4% | 8% | 1% | 31% | 2% | 0% | 0% |
| Kathmandu | 3% | 4% | 27% | 71% | 23% | 10% | 27% | 15% | 0% | 1% | 20% | 0% | 0% | 4% |
| Kavrepalanchok | 0% | 0% | 70% | 93% | 1% | 1% | 2% | 0% | 0% | 1% | 27% | 5% | 0% | 0% |
| Lalitpur | 0% | 0% | 37% | 73% | 5% | 3% | 17% | 7% | 5% | 3% | 37% | 9% | 0% | 5% |
| Makwanpur | 0% | 0% | 33% | 66% | 5% | 7% | 10% | 7% | 14% | 7% | 38% | 14% | 0% | 0% |
| Nuwakot | 0% | 0% | 52% | 76% | 1% | 0% | 9% | 7% | 0% | 0% | 38% | 17% | 0% | 1% |
| Okhaldhunga | 0% | 0% | 65% | 88% | 1% | 1% | 0% | 2% | 1% | 2% | 34% | 7% | 0% | 0% |
| Ramechhap | 0% | 0% | 52% | 89% | 3% | 0% | 1% | 1% | 1% | 3% | 43% | 5% | 0% | 1% |
| Rasuwa | 1% | 1% | 31% | 79% | 2% | 1% | 1% | 1% | 32% | 5% | 33% | 14% | 0% | 0% |
| Sindhuli | 0% | 0% | 61% | 79% | 2% | 1% | 5% | 5% | 3% | 0% | 29% | 14% | 0% | 0% |
| Sindupalchok | 0% | 0% | 56% | 93% | 5% | 3% | 5% | 0% | 5% | 0% | 29% | 3% | 0% | 0% |

## Table 12: Pre- and post-crisis shelter foundation materials [households with damaged housing only]

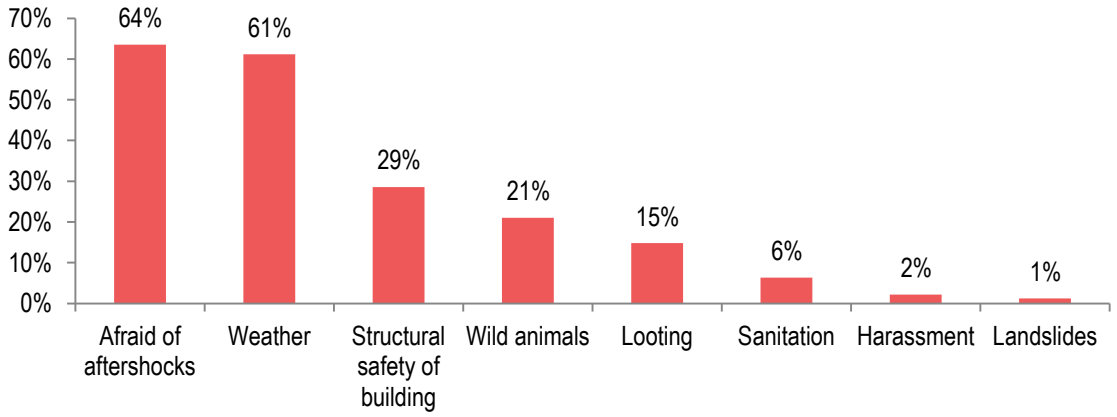
| | Cement-bonded brick/stone | | Mud-bonded brick stone | | None | | RCC Pillar | | Wooden Pillar | | Other | | Do not know | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST |
| Bhaktapur | 17% | 13% | 58% | 13% | 2% | 59% | 23% | 12% | 0% | 2% | 0% | 1% | 0% | 0% |
| Dhading | 3% | 2% | 92% | 34% | 0% | 54% | 2% | 2% | 2% | 2% | 0% | 0% | 1% | 6% |
| Dolakha | 6% | 2% | 93% | 11% | 0% | 62% | 0% | 0% | 0% | 25% | 0% | 0% | 1% | 0% |
| Gorkha | 7% | 3% | 74% | 11% | 2% | 55% | 9% | 1% | 8% | 29% | 0% | 1% | 0% | 1% |
| Kathmandu | 11% | 6% | 55% | 5% | 1% | 63% | 26% | 16% | 1% | 1% | 2% | 1% | 2% | 8% |
| Kavrepalanchok | 2% | 0% | 91% | 18% | 4% | 62% | 2% | 1% | 1% | 14% | 0% | 0% | 1% | 6% |
| Lalitpur | 10% | 3% | 73% | 25% | 0% | 55% | 14% | 8% | 2% | 2% | 0% | 0% | 2% | 7% |
| Makwanpur | 6% | 5% | 79% | 32% | 3% | 38% | 0% | 2% | 12% | 21% | 0% | 0% | 0% | 2% |
| Nuwakot | 3% | 0% | 90% | 23% | 0% | 68% | 8% | 7% | 0% | 3% | 0% | 0% | 0% | 0% |
| Okhaldhunga | 2% | 1% | 89% | 24% | 1% | 52% | 0% | 2% | 8% | 17% | 0% | 0% | 0% | 5% |
| Ramechhap | 2% | 0% | 97% | 17% | 0% | 54% | 1% | 1% | 0% | 26% | 0% | 1% | 0% | 2% |
| Rasuwa | 2% | 1% | 92% | 28% | 3% | 55% | 2% | 2% | 1% | 12% | 0% | 0% | 1% | 2% |
| Sindhuli | 4% | 4% | 70% | 33% | 15% | 48% | 0% | 0% | 11% | 14% | 0% | 0% | 1% | 1% |
| Sindupalchok | 2% | 1% | 88% | 25% | 1% | 34% | 7% | 0% | 3% | 34% | 0% | 0% | 0% | 6% |

### *Safety Perceptions - Current Shelter*

72% of all respondents reported that they do not feel safe living in their current residence, although considerable differences were found between districts. The highest number of participants who reported feeling safe were identified in the Kathmandu Valley, with 37% of households in Bhaktapur, and 33% in Kathmandu and Lalitpur reporting they felt safe living in their current homes. Respondents felt least safe in Okhaldhunga (13%), Dolakha, Gorkha and Dhading (16%), as well as Ramechhap (19%).

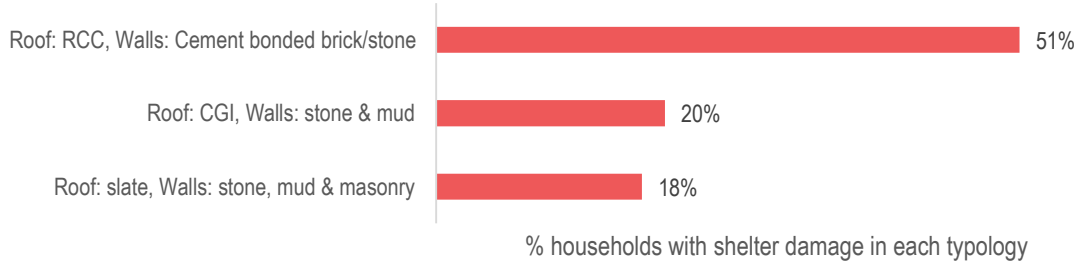
The main reasons provided by respondents for feeling unsafe in their current house or shelter were fear of aftershocks and housing/shelter structure, as well as protection against the weather - as outlined in Figure 19 below. 20% of respondents expressed a fear of wild animals; during interviews respondents regularly cited an increased exposure to snakes and insects, as well as larger predators.

**Figure 24: Main reasons reported by respondents for feeling unsafe**




Coherent with reported levels of damage, households living in shelters made of reinforced concrete and cement-bonded brick/stone were more likely to report feeling safe than those in other housing types. Over half of households living in this shelter type reported feeling safe (51%), compared to only 20% of households living in homes with CGI roofing and stone and mud walls; and 18% of households living in homes with slate roofing and stone, mud and masonry walls, as shown in Figure 25.

**Figure 25: Perceived safety of households living in the three most common shelter typologies[15]**

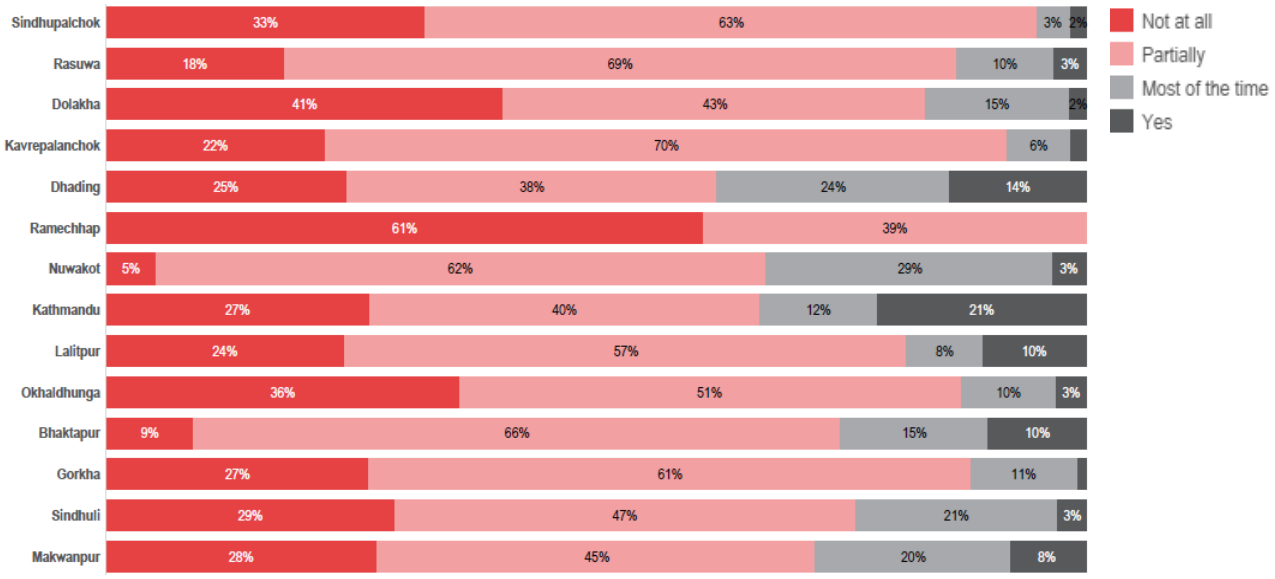



When asked about the ability of their shelter to provide adequate protection to withstand the local climate, only 15% of all households in the priority districts reported that they feel protected from current weather conditions, i.e. sun, rainfall, and wind. 13% of households reported they felt protected most of the time, 47% partially protected, and 25% not at all.

[15] Due to the many different shelter typologies observed, the sample sizes of other housing typologies were not large enough to make meaningful comparisons.

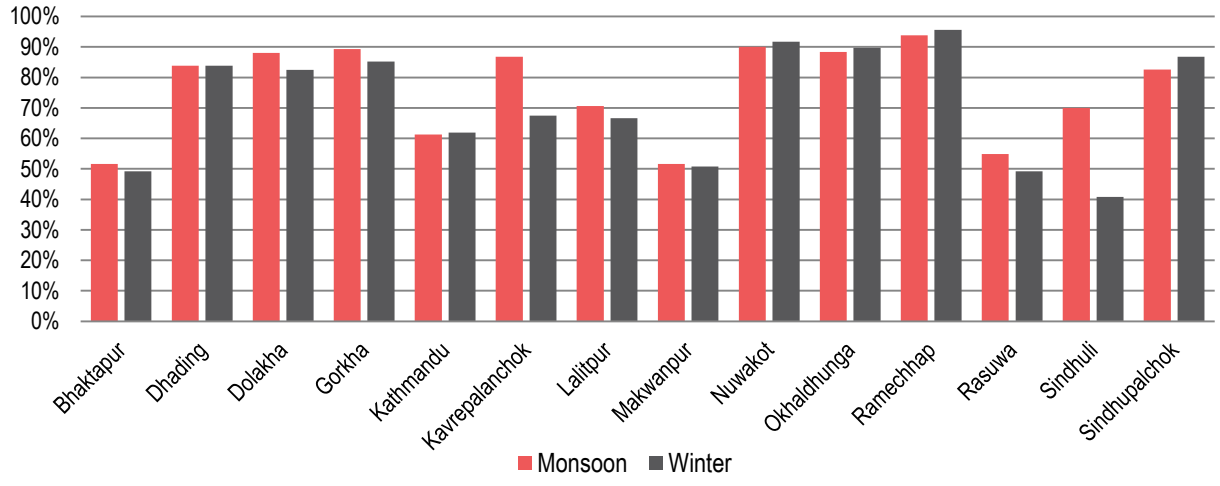
Large discrepancies were found between districts, with less than 5% of respondents reporting to feel fully protected from the elements in 9 out of 14 districts, in contrast with 21% of respondents in Kathmandu.

**Figure 26: Reported degree to which shelter offers protection from the weather, by district**




The monsoon season, expected to occur between June – September 2015, regularly causes torrential rains, floods and landslides, affecting lives and livelihoods on a yearly basis.[16] This year, the earthquake-affected vulnerable areas have become even more susceptible to these disasters due to the weakened, ruptured and destabilized slopes and surfaces.[17] The severity of the season is emphasized by the finding that only a minority of 22% of all households in the priority districts reported that they felt protected against the upcoming monsoon season at the time of the assessment. Similarly, only 23% of all households in the priority districts reported that they feel protected against the harsh weather conditions of the upcoming winter season.

**Figure 27: Households reporting they feel unprepared for the monsoon and winter seasons**




[16] Nepal Earthquake Assessment Unit, "Landslides and Flash Floods in the Monsoon", p.1, 23 June 2015
[17] Government of Nepal - National Planning Commission, note 1 *supra*, p. 5, 2015.

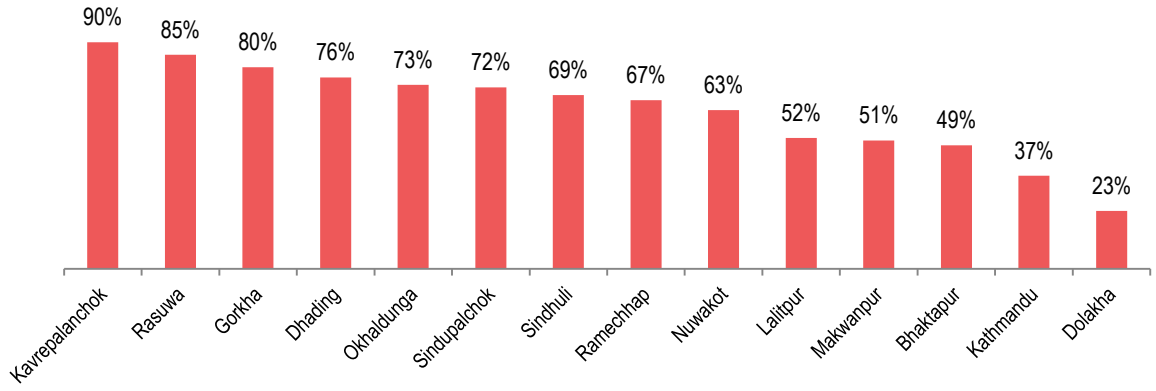
Despite being more likely to have had a structural assessment of their shelter, female-headed houses reportedly felt less safe than male-headed households, with 26% of female-headed households reporting to feel safe, compared to 28% of male-headed households.

### *Emergency Shelter Assistance*

Across all priority districts, 57% of all households with housing damage reported to have received some form of shelter assistance in response to the crisis. However, reported assistance varied considerably by region, with particularly low rates of reported assistance in Dolakha, Kathmandu and Bhaktapur.

Despite fears over access, all communities in 'hard-to-reach areas' assessed as part of the remote valley assessments reported having received some kind of emergency shelter assistance, with the exception of Langtang, where all households had reportedly been displaced from the valley at the time of assessment.

**Figure 28: Households with damage reporting to having received any form of emergency shelter assistance**

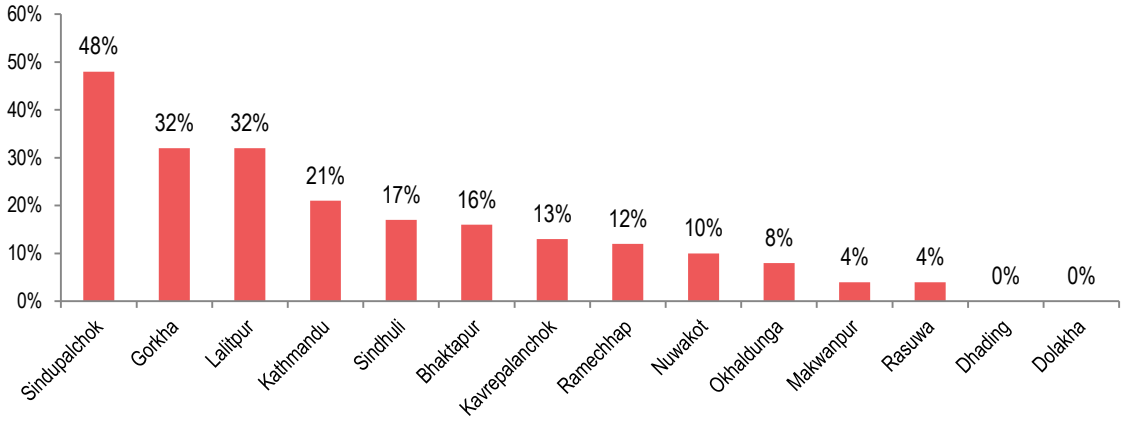



However, large discrepancies were found between reported levels of assistance and whether households perceived that the received shelter assistance was sufficient. As part of the recalibration of indicators after the second earthquake, respondents that had incurred housing damage after either the second or both earthquakes, and had subsequently received assistance, were asked whether the assistance received was sufficient. Only 17% of these households reported that they had received enough support. For example, in Kavrepalanchok and Rasuwa, where 90% and 85% of respondents who sustained damage in the second earthquake respectively reported to have received shelter assistance, only 13% in Kavrepalanchok and 4% in Rasuwa considered the assistance sufficient to construct a temporary shelter. In contrast, in Sindupalchok and Gorkha, where high levels of assistance were reported as well, 48% and 32% of households who sustained damage in the second earthquake respectively reported to have received enough assistance - a finding that corresponds with the relatively high level of humanitarian aid that was channeled towards these districts, as evidenced by the humanitarian hubs set up by United Nations Disaster Assessment and Coordination (UNDAC) teams in Gorkha and Sindupalchok to coordinate district level response.[18]

Female-headed households were more likely to have received assistance (63%) than male-headed households (59%). Further comparative research between this study and the 3W reporting structure of the shelter cluster should be made to determine whether this is the result of targeted assistance to female-headed households.

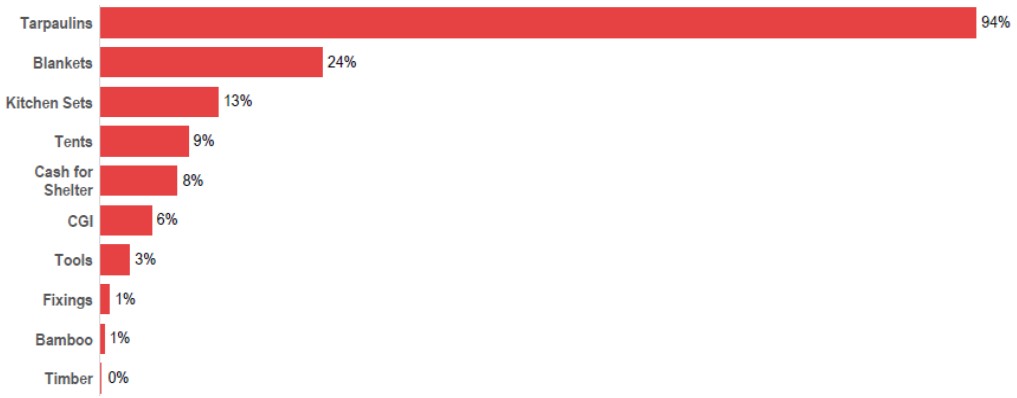
[18] On-Site Operations Coordination Center (OSOCC), "Situation Analysis Nepal Earthquake", p.1, 5 May 2015

**Figure 29: Households that incurred housing damage from the second or both earthquakes, who reported that shelter assistance received was sufficient**




In line with the short-term, life-saving shelter objectives set out by the Shelter Cluster[19], tarpaulins were the predominant form of emergency shelter assistance that was received, with 94% of households that received shelter assistance reporting that they had received tarpaulins. The second and third most received items were blankets (24%) and kitchen sets (13%). Findings from the remote valley assessments indicate that the two most commonly received types of assistance in these areas were also tarpaulins and tents.

**Figure 30: Type of shelter assistance received**




The reported main sources of tarpaulins across all districts were local authorities (41%), local NGOs (20%), international organizations (19%), as well as friends or family in Nepal or abroad (10%). It is important to note that these figures concern the perceptions of the recipient, with many local NGOs and authorities likely to be working in tandem with, or with goods provided by, international NGOs and vice versa.

At the time of the assessment, cash was only reported to have been received in 6 districts, predominantly in Rasuwa (85%), Nuwakot (67%), and Dolakha (63%). Of all households that received cash assistance, 89% reported to have spent, or an intent to spend, the money on emergency shelter needs.

### *Required emergency shelter materials*

When households with housing damage were asked to rank their emergency shelter needs, 42% of all households reported CGI as their primary emergency shelter need. CGI was also identified as the predominant reported secondary

[19] Nepal Shelter Cluster, note 2 *supra,* p.1

emergency shelter need. As shown in Figure 30, the demand for CGI was the highest in the Okhaldhunga, Ramechhap, Gorkha, Sindupalchok, and Kavrepalanchok, and lowest in the Kathmandu Valley districts of Lalitpur, Kathmandu, and Bhaktapur. Only in Dhading was CGI not defined as the primary form of shelter need by respondents.

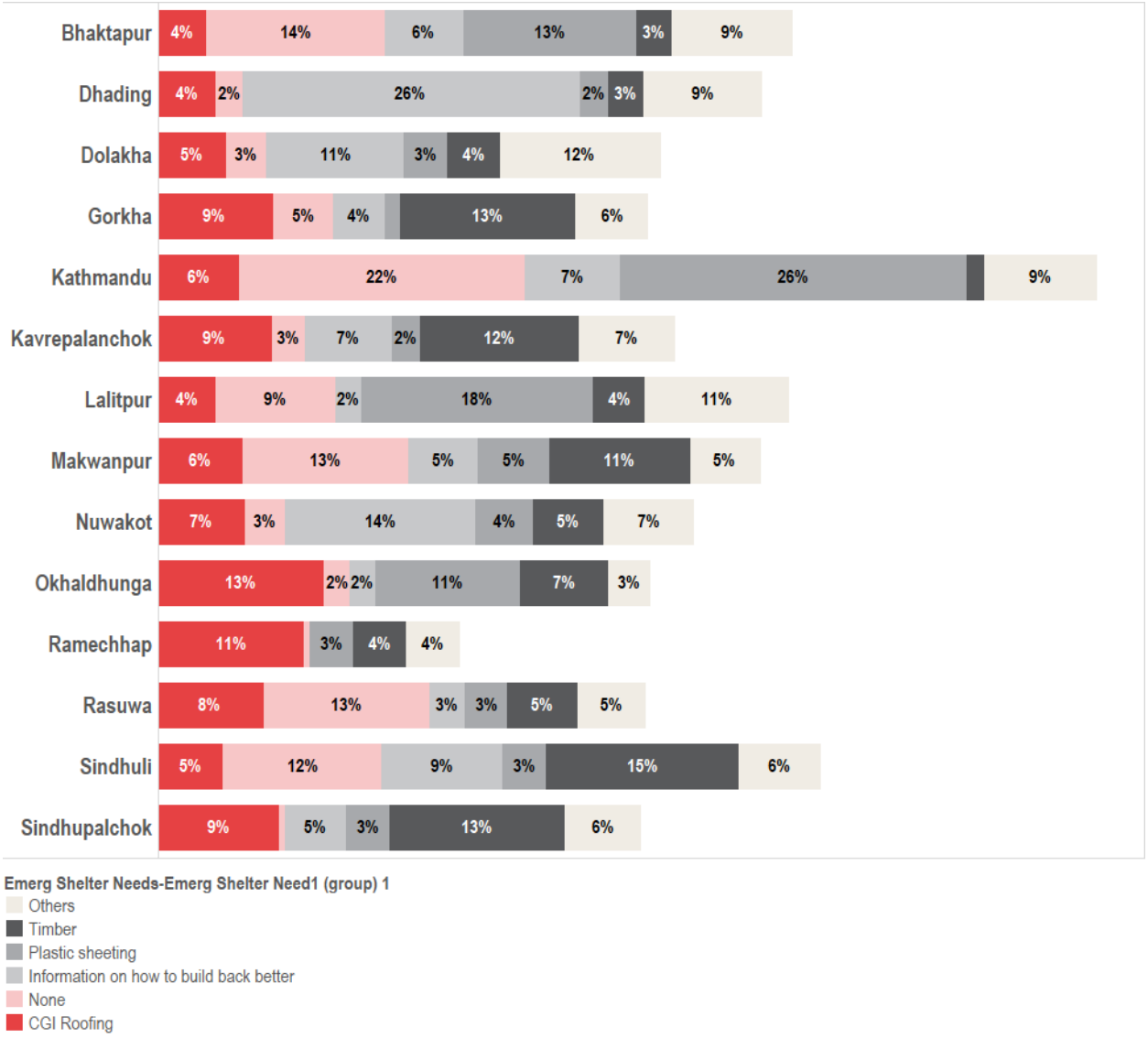
**Figure 31: First, second and third priority emergency shelter need reported by households**

| | 1st Priority | 2nd Priority | 3rd Priority |
|---|---|---|---|
| Bamboo | 5% | 10% | 4% |
| Bricks | 5% | 3% | 7% |
| Cement | 4% | 8% | 8% |
| CGI roofing | 42% | 20% | 6% |
| Information on how to build back better | 9% | 3% | 4% |
| Labour | 3% | 4% | 8% |
| Lacing rope | 0% | 2% | 6% |
| Nails | 0% | 3% | 9% |
| None | 9% | 12% | 18% |
| Others | 0% | 0% | 0% |
| Recovery of belongings | 4% | 1% | 2% |
| Sand | 1% | 4% | 3% |
| Steel | 1% | 2% | 2% |
| Technical assistance | 3% | 4% | 4% |
| Timber | 4% | 13% | 6% |
| Tools | 1% | 2% | 5% |
| Plastic sheeting | 8% | 9% | 7% |

A considerable amount of respondents with housing damage said they did not need any form of emergency shelter assistance: 9% of all households with housing damage reported having no priority shelter needs. The districts with the highest proportions of respondents who reported no need for shelter assistance were also districts with relatively lower levels of damage, i.e. Bhaktapur, Kathmandu, Makwanpur, Lalitpur and Sindhuli.

No significant differences were observed between the priority reported emergency shelter needs of female and male-headed households. However, 12% of female-headed households reported no emergency shelter needs, compared to 16% of male-headed households

Figure 32: Primary reported emergency shelter needs per district [top 5 priorities visualized]

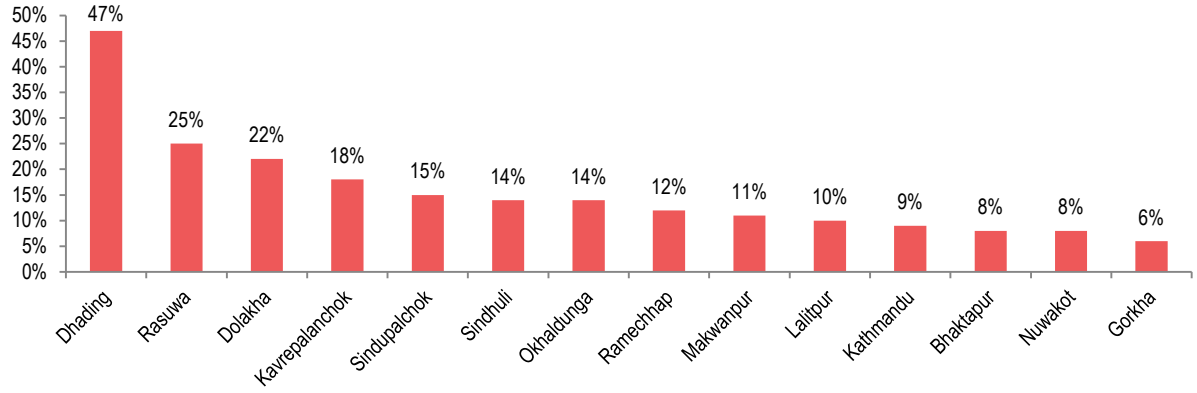



## *Housing Repair and Reconstruction*

A minority of households with damaged housing had started to repair or rebuild their damaged homes by the time of the assessment: 14% of all households with damaged housing reported that they have started to rebuild or repair their original houses, with the lowest proportion found in Gorkha (6%), and highest in Dhading (47%). The relatively low number of households engaged in reconstruction could be attributed to limited overall access to key construction materials, low levels of debris usage, and the need for more comprehensive shelter assistance.

A smaller proportion of female-headed households had initiated repairs on their damaged homes (10%) than male-headed households (14%).

**Figure 33: Households with damaged housing that had begun to repair/ rebuild their houses at the time of assessment, by district**




When asked what type of shelter assistance was needed to repair or rebuild their homes, households predominantly cited financial assistance (65%), durable construction materials like CGI roofing (52%) and cement (45%), as well as labour (43%).

Nine of the 14 assessed districts have human development index (HDI) scores lower than the national average. The finding that 65% of respondents indicated a need for financial assistance, by far the most commonly cited shelter assistance need, corroborates the socio-economic vulnerability of affected households in the assessed area.[20] In the aftermath of the earthquakes, the Government of Nepal estimated that the financial impact of the earthquakes will average around NPR 130,000 (USD 1,277) per person across the 14 most affected districts, a figure that will disproportionally affected those that could not afford higher construction standards.[21] As such, cash assistance schemes to revitalize and support targeted vulnerable groups could be taken into consideration for future programming.

The particularly high demand for CGI—the most commonly used pre-crisis roofing material--suggests a desire to initiate permanent reconstruction, as well as to urgently replace tarpaulins, which were the predominant roofing material among households that incurred housing damage at the time of assessment. This is particularly important in relation to the upcoming monsoon season, which will bring torrential rains that commonly last for over one month.

When households cited materials that were needed to reconstruct or rebuild their home, they were asked for their ability to access (defined as availability on the local market) each of the items mentioned, resulting in the overview of access to needed materials outlined in Figure 33. Much-needed durable construction materials, CGI and cement were reported as either not available or only in limited quantities by 72% and 68% of respondents that needed these materials. Similarly, labour was considered by 22% of households as not available, and an additional 55% of households as only available in limited quantities.

[20] Government of Nepal - National Planning Commission, note 1 *supra*, p.10

[21] Government of Nepal - National Planning Commission, "Nepal Earthquake 2015 - Post Disaster Needs Assessment (PDNA): Vol A Key Findings", p. 16, 2015.

**Figure 34: Reported needed materials to reconstruct or rebuild damaged housing**

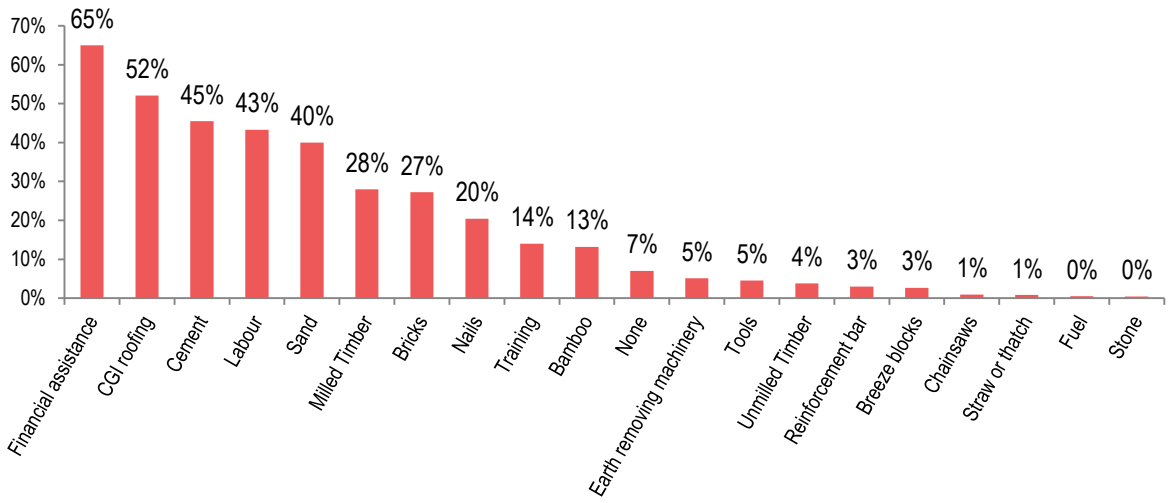
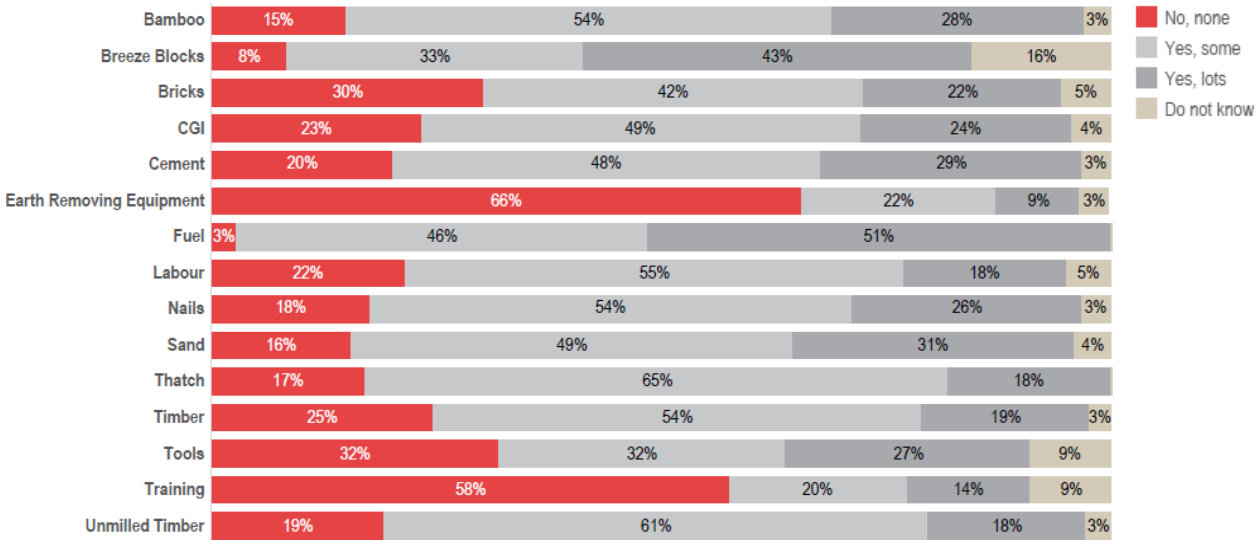
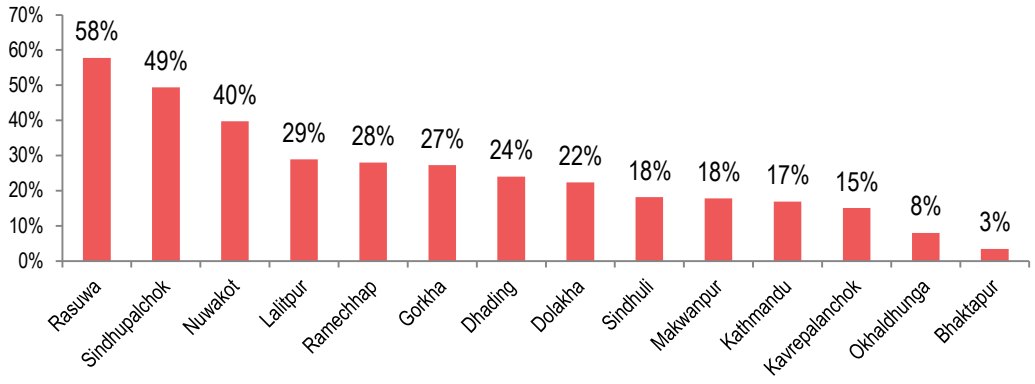



**Figure 35: Reported access to materials needed to reconstruct or rebuild damaged housing**




Considerable differences exist at the district-level between the availability of essential construction materials. The lack of availability of CGI, the most needed construction material, ranges between 55% in Rasuwa, and 3% in Bhaktapur. As outlined above, due to the vulnerable financial position of many affected households it is likely that, despite the potential availability of goods on local markets, the number of households that have no financial access to expensive construction materials like CGI or cement is much greater than indicated in Figure 34.

**Figure 36: Households in need of CGI who reported not to have access to the material**



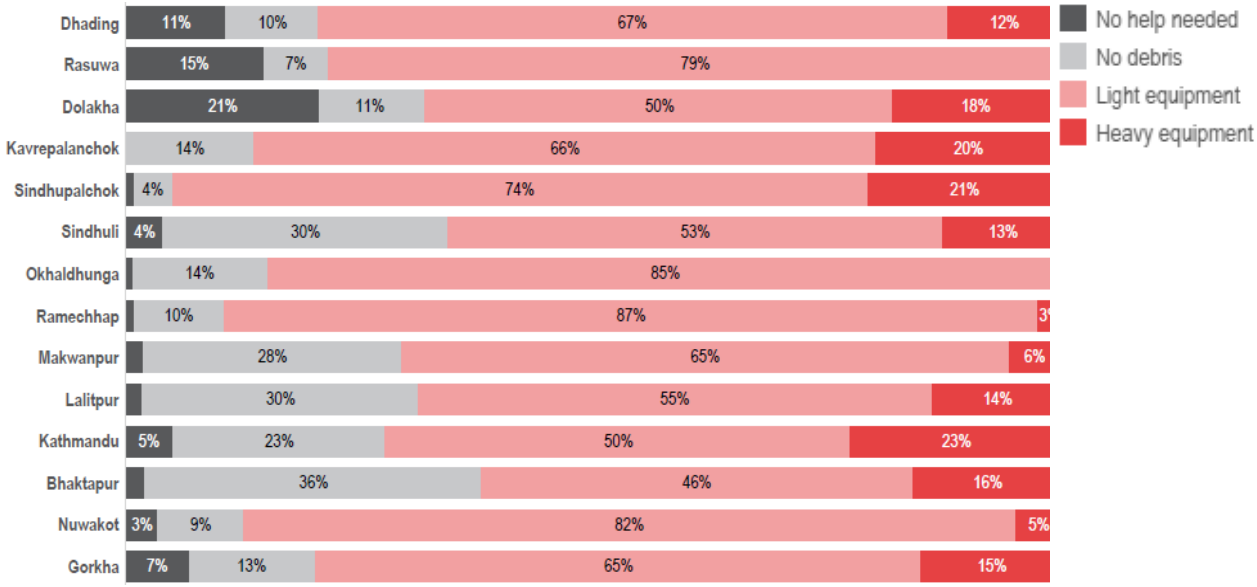

37% of all households with damaged housing reported that they are able to use debris for housing recovery, with variation by district shown in

Figure 37. However, 76% of all households with damaged housing reported that they needed some form of debris removal assistance, predominantly labour and tools. In addition 19% of respondents reported that no debris was present, while 4% said debris was present but that no help was needed.

**Figure 37: Households with housing damage able to use recovered materials for shelter repair / reconstruction**


Despite potential rebuild/repair activities, some households are likely to remain at risk due to being located in geographically hazardous areas that were previously affected by natural disasters. When asked about the impact of prior disasters on their housing, 28% of all respondents reported to have sustained prior housing damage due to natural events; 22% reported damage incurred due to earthquakes that occurred before 25 April 2015, 11% due to storms, 3% due to floods, and 2% because of landslides.

**Figure 38: Types of assistance needed to clear debris and recover materials**

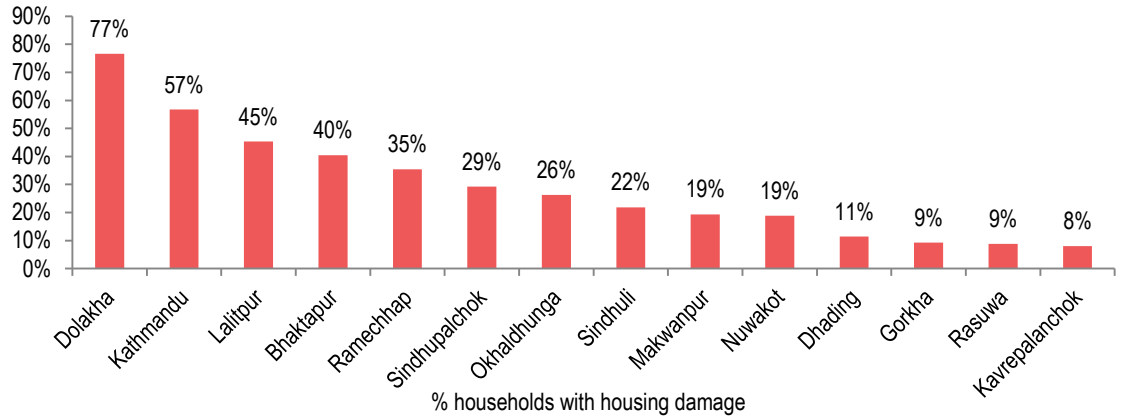



## *Shelter Self-Recovery*

One indication of the potential for shelter self-recovery can be gauged by examining the proportion of households who initiated the construction of temporary shelters without having received any emergency shelter assistance. However, it is vital to take into account that these findings are also dependent on the amount of assistance delivered, and the wide variation, as shown in

Figure 39, is likely to be more affected by differing levels of assistance received across the different districts, than a differing capacity for self-recovery. When compared to *Figure 29: Households that incurred housing damage from the second or both earthquakes, who reported that shelter assistance received was sufficient,* it is also apparent that the receipt of shelter assistance does not necessarily imply that households felt that sufficient assistance was provided.

**Figure 39: Households that initiated temporary shelter construction without assistance**




The construction of a temporary shelter is an immediate coping strategy in response to damage which has made a household's original home unsafe or uninhabitable, but should not be confused with longer-term repair or reconstruction activities. A better measure of self-recovery, as shown above in

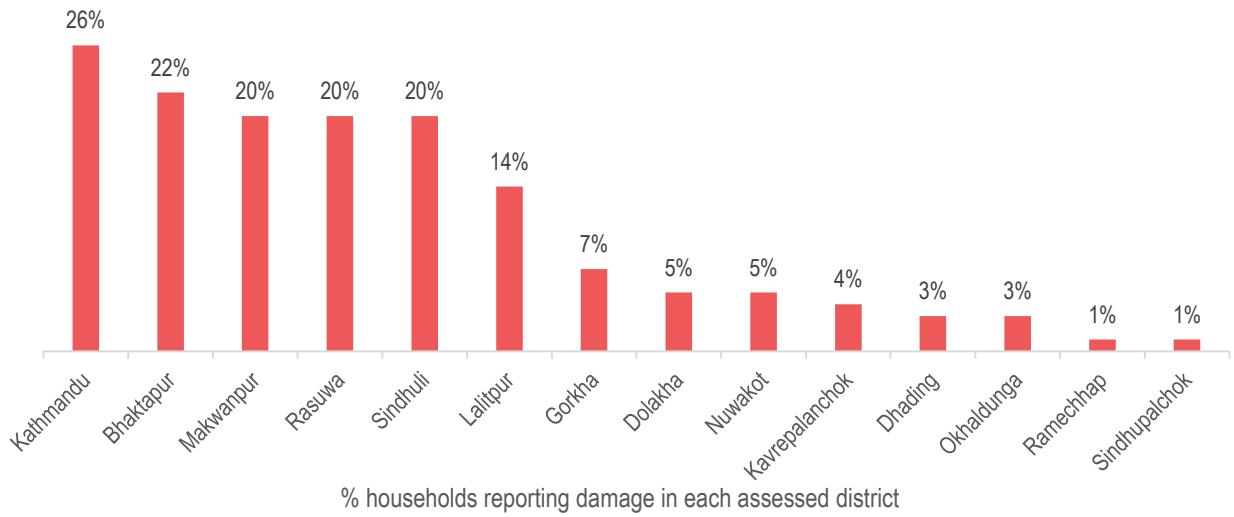
*Figure 33: Households with damaged housing that had begun to repair/ rebuild their houses at the time of* assessment*, by* district, is the proportion of households who had already begun repair or reconstruction of their damaged homes was considerably smaller, with only 14% of all households reporting that they had begun repair or reconstruction.

Interestingly Dhading, the district with the highest proportion of households engaged in shelter reconstruction, was also the district in which the highest proportion of households reported being able to salvage or re-use materials. Despite the majority of households in this district reporting to have received information on how to build back better, the need for information about safer construction was more commonly reported as a top priority need in Dhading than in any other district (see

Figure 32, above), suggesting that other barriers to reconstruction (inability to remove debris, lack of assistance, or lack of access to materials) may have already been removed. Further exploration of the factors that have enabled such a significant proportion of households to rebuild in Dhading compared to elsewhere could serve as a useful case study to understand the conditions necessary to support self-recovery in future responses.

Another helpful measure of the capacity for shelter self-recovery is the proportion of households with housing damage that reported no shelter-related needs. As shown in the figure below, this was most commonly reported by households with shelter damage in Kathmandu (26%), compared to only 1% of households with shelter damage in Sindupalchok.

**Figure 40: Households with shelter damage reporting no priority shelter needs**



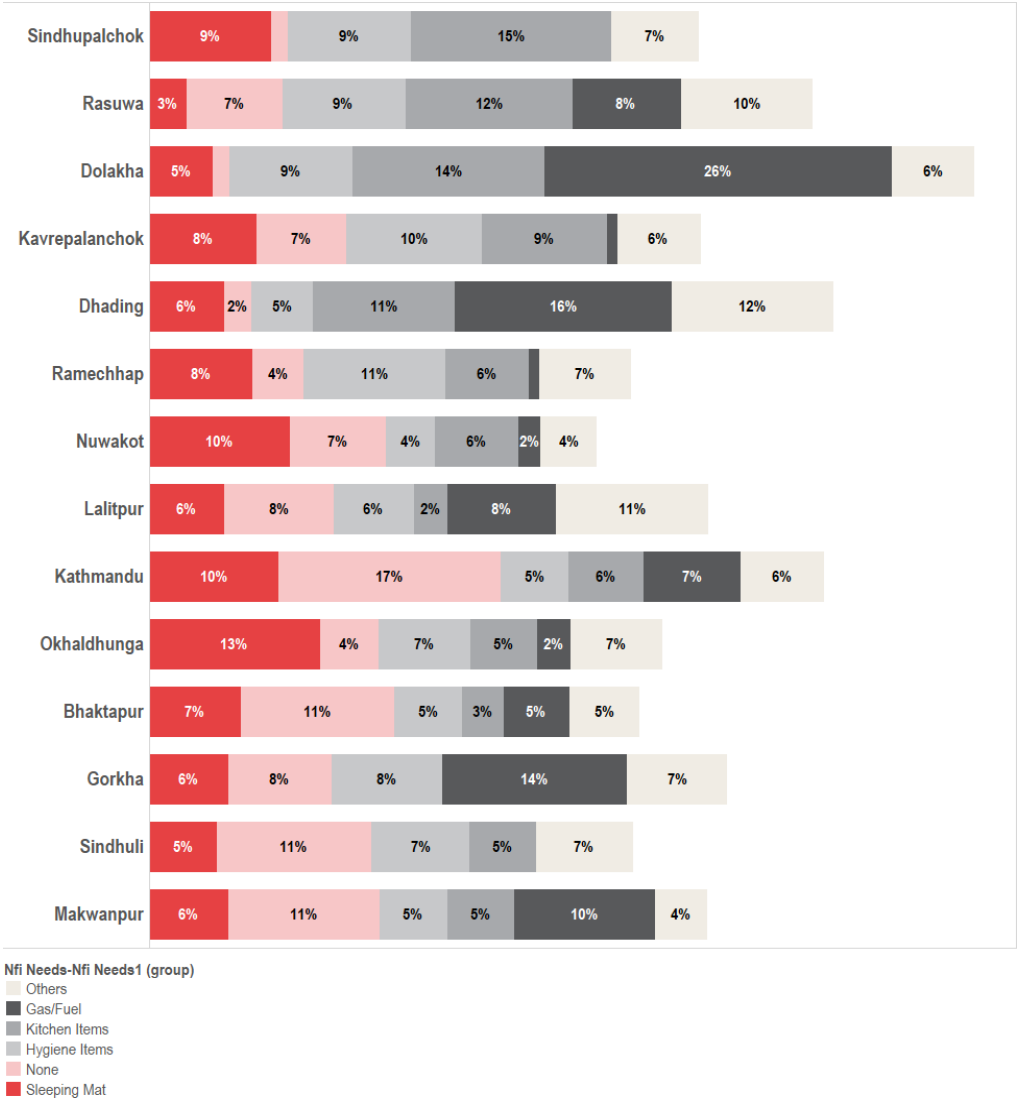

## *Priority NFI Needs*

As outlined in Table 14 below, sleeping mats were identified as the priority NFI need by the majority of respondents, and were also cited as the main 2nd priority NFI need. However, as with shelter needs, a considerable proportion of respondents (23%) said they had no immediate NFI needs at all. Of those households that reported a need for NFIs, the most commonly cited NFIs - beyond sleeping mats - were hygiene items, kitchen items, and clothing.

**Table 13: Top three priority NFI needs, as reported by households**

| | 1st Priority | 2nd Priority | 3rd Priority |
|---|---|---|---|
| Clothing | 3% | 8% | 11% |
| Footwear | 0% | 1% | 2% |
| Gas cooker | 3% | 1% | 1% |
| Gas fuel | 7% | 6% | 5% |
| Hygiene items | 12% | 10% | 12% |
| Jerry-cans | 2% | 6% | 6% |
| Kitchen items | 9% | 15% | 7% |
| None | 20% | 31% | 42% |
| Sleeping mat | 37% | 14% | 6% |
| Torches | 7% | 8% | 7% |
| Other | 0% | 0% | 0% |

**Figure 41: First priority NFI needs by district [only top five visualized]**



## HOUSEHOLD NEEDS

Respondents were asked to provide the top three priority needs at the household-level. **The vast majority, 61% of households, categorized shelter/housing needs as their top priority need.** Food was the most commonly cited second priority need (17%), with sizeable amounts of respondents citing employment/jobs, drinking water and building tools as their second priority need. The majority of respondents (24%) reported that they had no third priority need.

**Table 14: Reported priority households needs**

| | 1st Priority | 2nd Priority | 3rd Priority |
|---|---|---|---|
| Shelter / Housing | 61% | 8% | 4% |
| None | 9% | 6% | 24% |
| Drinking water | 8% | 12% | 4% |
| Employment / Jobs | 4% | 13% | 9% |
| Building tools | 3% | 11% | 8% |
| Food | 3% | 17% | 7% |
| Wastewater disposal systems | 2% | 1% | 2% |
| Hygiene items | 2% | 3% | 6% |
| Security / Policing | 2% | 4% | 3% |
| Health | 1% | 5% | 8% |
| Education | 1% | 5% | 6% |
| Solid waste management | 1% | 2% | 2% |
| Electricity supply | 1% | 6% | 5% |
| Clothing | 0% | 2% | 4% |
| Roads | 0% | 3% | 2% |

Shelter/housing was predominantly cited as primary priority need by the majority of households across all assessed districts. With shelter largely removed from the equation, the secondary priority need indicates a broad range of needs that vary across districts. As visible in Table 18, in Sindupalchok and Ramechhap, food was a clear secondary priority need, while building tools were a top priority in Nuwakot, and drinking water in Kavrepalanchok and Okhaldhunga.

**Table 15: Reported primary priority household need by district**

| | Building Tools | Clothing | Drinking Water | Education | Electricity Supply | Employment | Food | Health | Hygiene Items | Shelter/ Housing | None | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bhaktapur | 3% | 0% | 21% | 1% | 0% | 7% | 3% | 2% | 1% | 46% | 7% | 8% |
| Dhading | 2% | 3% | 13% | 2% | 2% | 2% | 2% | 6% | 13% | 50% | 2% | 6% |
| Dolakha | 3% | 2% | 5% | 3% | 6% | 5% | 3% | 2% | 6% | 59% | 4% | 3% |
| Gorkha | 0% | 0% | 3% | 2% | 5% | 6% | 2% | 1% | 0% | 75% | 3% | 2% |
| Kathmandu | 5% | 0% | 7% | 1% | 0% | 4% | 5% | 1% | 2% | 48% | 20% | 9% |
| Kavre | 5% | 0% | 9% | 0% | 0% | 5% | 0% | 0% | 0% | 79% | 1% | 1% |
| Lalitpur | 3% | 0% | 15% | 1% | 2% | 5% | 5% | 1% | 1% | 57% | 3% | 7% |
| Makwanpur | 2% | 0% | 7% | 3% | 0% | 8% | 1% | 2% | 2% | 57% | 10% | 7% |
| Nuwakot | 0% | 0% | 4% | 0% | 0% | 2% | 2% | 0% | 0% | 85% | 2% | 6% |
| Okhaldhunga | 1% | 0% | 9% | 0% | 5% | 10% | 1% | 0% | 0% | 70% | 0% | 3% |
| Ramechhap | 1% | 0% | 1% | 1% | 1% | 0% | 2% | 1% | 0% | 93% | 0% | 1% |
| Rasuwa | 0% | 0% | 7% | 2% | 0% | 8% | 13% | 1% | 1% | 60% | 4% | 4% |
| Sindhuli | 5% | 0% | 3% | 0% | 0% | 6% | 1% | 5% | 0% | 68% | 11% | 2% |
| Sindupalchok | 0% | 0% | 2% | 1% | 1% | 0% | 2% | 1% | 0% | 88% | 0% | 6% |

## Table 16: Reported secondary priority household need by district

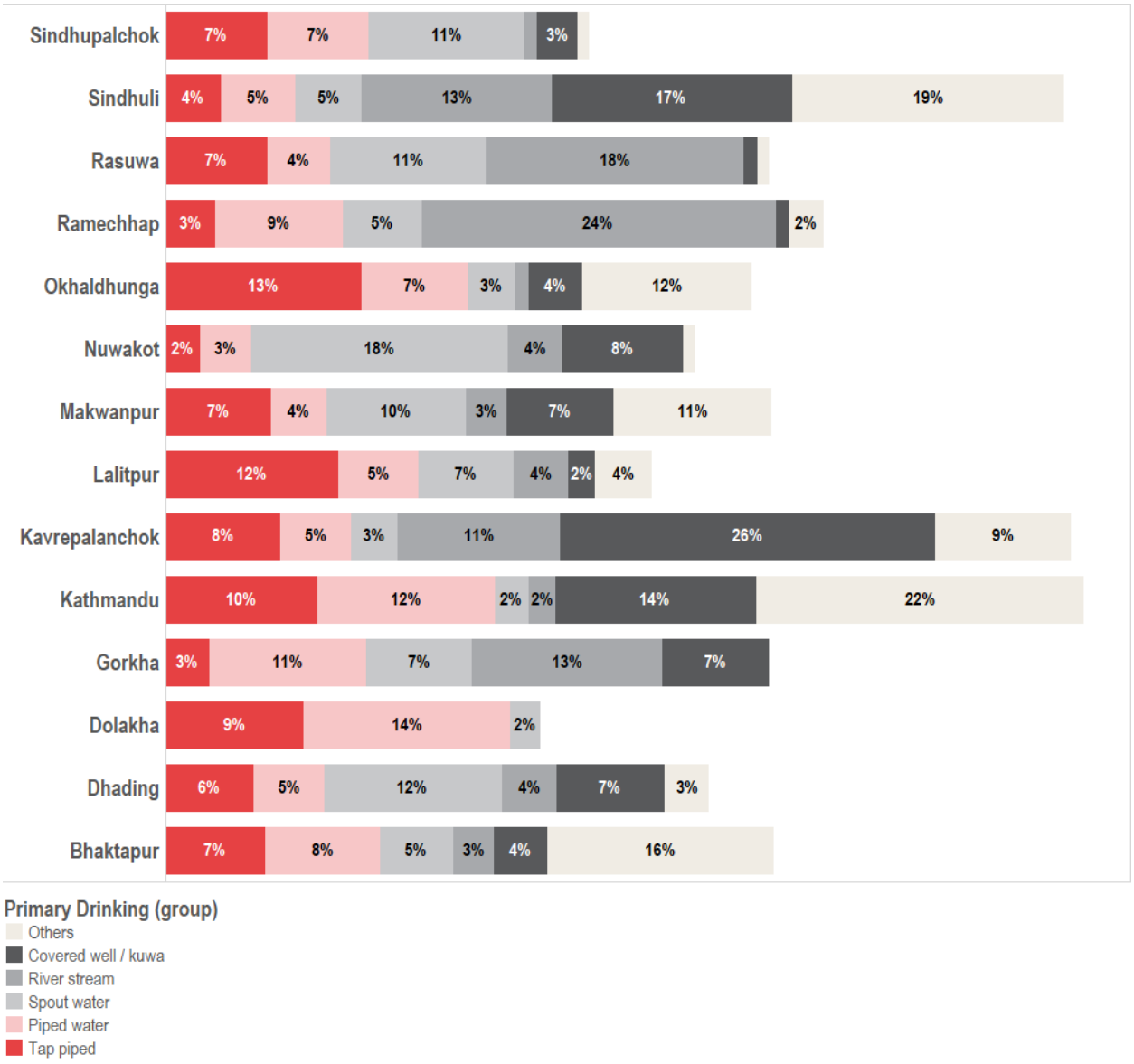
| | Building Tools | Clothing | Drinking Water | Education | Electricity Supply | Employ ment | Food | Health | Hygiene Items | Shelter/ Housing | None | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bhaktapur | 8% | 2% | 12% | 4% | 1% | 12% | 17% | 6% | 3% | 9% | 7% | 20% |
| Dhading | 9% | 10% | 11% | 7% | 4% | 6% | 19% | 8% | 2% | 7% | 2% | 15% |
| Dolakha | 5% | 9% | 5% | 8% | 9% | 7% | 14% | 15% | 12% | 9% | 0% | 6% |
| Gorkha | 9% | 1% | 7% | 10% | 11% | 12% | 23% | 2% | 1% | 8% | 8% | 8% |
| Kathmandu | 15% | 0% | 10% | 5% | 4% | 19% | 14% | 1% | 1% | 8% | 8% | 12% |
| Kavre | 15% | 2% | 25% | 1% | 6% | 11% | 3% | 9% | 2% | 12% | 5% | 10% |
| Lalitpur | 8% | 0% | 7% | 2% | 3% | 8% | 22% | 6% | 5% | 14% | 7% | 18% |
| Makwanpur | 5% | 0% | 10% | 7% | 7% | 19% | 8% | 8% | 2% | 3% | 8% | 22% |
| Nuwakot | 28% | 1% | 15% | 4% | 3% | 12% | 18% | 2% | 2% | 3% | 3% | 10% |
| Okhaldhunga | 4% | 1% | 23% | 6% | 16% | 9% | 8% | 2% | 4% | 5% | 3% | 18% |
| Ramechhap | 4% | 3% | 8% | 4% | 9% | 10% | 37% | 9% | 0% | 4% | 1% | 13% |
| Rasuwa | 10% | 11% | 8% | 8% | 4% | 11% | 18% | 3% | 3% | 12% | 3% | 9% |
| Sindhuli | 12% | 2% | 9% | 2% | 15% | 16% | 5% | 9% | 3% | 8% | 4% | 15% |
| Sindupalchok | 3% | 5% | 12% | 7% | 3% | 5% | 45% | 3% | 2% | 2% | 0% | 12% |

# WASH

## *Sources of drinking water*

29% of all households cited municipal piped tap water as their main pre-crisis water source, while an equal 29% cited private piped water. These figures dropped slightly after the earthquakes, with 25% of all households reporting the use of municipal piped tap water as their main source of water, and 26% citing private piped water. The largest increases were seen in usage of bottled water, which rose from 4% pre-crisis to 8% post-crisis, and households drinking straight from rivers or streams, which increased from 4 to 6%.

**Figure 42: Pre-crisis reported sources of drinking water per district**



When compared by district, the most significant decreases in the use of water from municipal taps were seen in Sindupalchok, Bhaktapur, Dolakha and Lalitpur. The most significant decreases in the use of piped water were seen in Dolakha and Ramechap. Meanwhile, the highest reported increase in use of bottled water as a primary drinking water source was in Kathmandu, where use of this source changed increased from 10% to 20% (see Figure 43 below). Water access appears to have been particularly affected in Dolakha, where reduced access to tapped or piped water has led to an increase in water from spouts or natural sources, such as river/ spring streams.

**Figure 43: Reported change to drinking water source since the earthquakes, per district***

| | Bottled Water | Covered Well/ Kuna | Piped Water | River/ Spring Stream | Spout Water | Municipal Tap | Tubewell/ Handpump | Water Trucking | Other |
|---|---|---|---|---|---|---|---|---|---|
| Bhaktapur | 8% | 0% | 0% | 1% | -2% | -9% | 3% | -1% | 0% |
| Dhading | 0% | -1% | -5% | 2% | 4% | -2% | 0% | 0% | 1% |
| Dolakha | 0% | 1% | -9% | 5% | 10% | -8% | 0% | 0% | 1% |
| Gorkha | 0% | -2% | -2% | -2% | 2% | 2% | 0% | 0% | 0% |
| Kathmandu | 10% | -1% | -5% | 1% | 0% | -5% | 1% | 0% | 0% |
| Kavrepalanchok | 0% | -6% | 1% | 5% | 3% | -2% | -1% | 0% | 0% |
| Lalitpur | 5% | -1% | -2% | 1% | 0% | -8% | 0% | 3% | 2% |
| Makwanpur | 0% | 0% | 2% | 0% | -1% | 0% | -2% | 0% | 0% |
| Nuwakot | 0% | -1% | -1% | 1% | 0% | 0% | 1% | 0% | 0% |
| Okhaldhunga | 0% | 6% | 2% | 1% | 1% | -5% | -1% | 0% | -4% |
| Ramechhap | 0% | 4% | -11% | -1% | 5% | 0% | 0% | 0% | 3% |
| Rasuwa | 0% | 1% | 0% | 1% | 0% | -1% | -1% | 0% | 0% |
| Sindhuli | 0% | 1% | 2% | -1% | 1% | 0% | -3% | 0% | 0% |
| Sindupalchok | 0% | 3% | -4% | 3% | 8% | -13% | 0% | 0% | 2% |

**A positive number denotes a reported increase in use of this source, while a negative number represents a decrease in use.*

## *Damage to water sources*

Reported damage to water sources was relatively low compared to the levels of housing damage in the priority districts, with 84% of households reporting that their primary source of water had not sustained damage due to the earthquakes. However, levels of a perceived decrease in the quality and quantity of water were considerably higher: 31% of all households reported a decrease in the quality of water, while 24% reported a drop in the quantity of drinking water at their disposal.

**Figure 44: Households who reported damage to their water source**

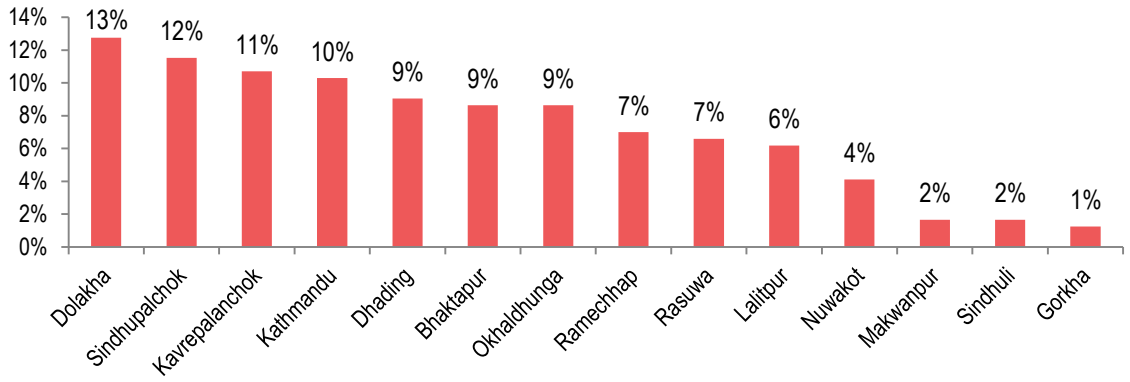
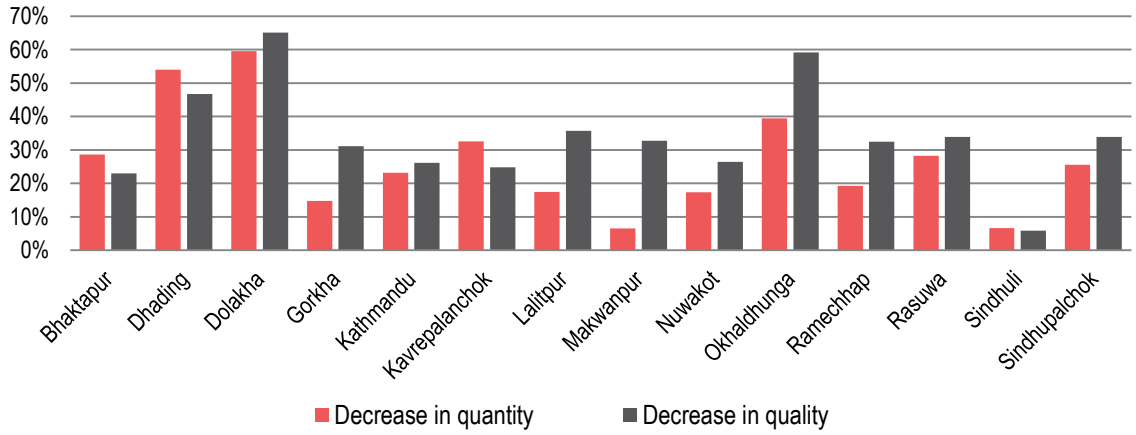



**Figure 45: Households who reported a decrease in the quantity or quality of their drinking water**




## *Toilets*

The type of toilet used across the affected districts was found to be significantly affected by the earthquakes, as outlined in Figures 52 and 53 below. The percentage of flush toilets - public or private septic tank - dropped from 81% to 70% across all assessed districts. In tandem, the number households without access to a toilet more than tripled from 3% to 11%, with particularly high percentages reported in Dolakha (36%), Sindupalchok (29%) and Kavrepalanchok (25%).

Dolakha and Sindupalchok also reported comparatively high levels of temporary makeshift emergency toilets. Combined with the number of households without access to toilets, it can therefore be estimated that 68% and 64% of households in Dolakha and Sindupalchok respectively did not have access to either a permanent flush or drop toilet, a figure significantly higher than the average of 20% across the priority districts.

10% of respondents reported that they were sharing toilets before the crisis; predominantly in Kathmandu (16%), Dolakha (16%), and Okhaldhunga (13%). After the crisis, this number increased to 22%, with most households sharing with other households in Kathmandu (34%), Bhaktapur (25%), and Lalitpur (23%); these top three districts are all located in the densely urban Kathmandu Valley, where potential for open defecation or emergency toilets is lower than rural districts. Female-headed households were found to be sharing toilets more often than male-headed households, with 26% of female-headed households who reported doing so, compared to 21% of male-headed households.

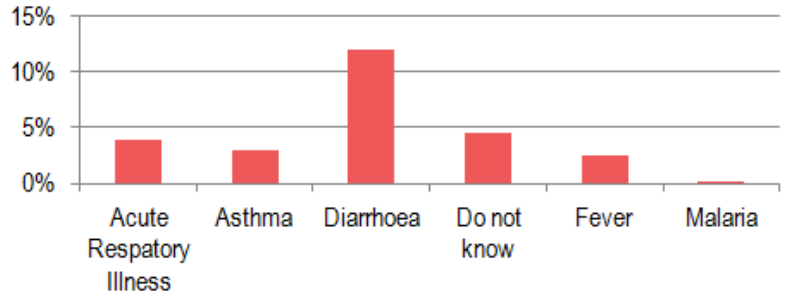
## Figure 46: Pre and post-crisis usage of toilet, by type

| | Drop Toilet | | Flush Toilet Public | | Flush Toilet - Septic Tank | | No Toilet | | Emergency Toilet | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST | PRE | POST |
| Bhaktapur | 4% | 2% | 34% | 31% | 61% | 57% | 0% | 5% | 0% | 5% | 0% | 0% |
| Dhading | 15% | 14% | 4% | 4% | 76% | 62% | 6% | 9% | 0% | 11% | 0% | 0% |
| Dolakha | 60% | 9% | 0% | 0% | 40% | 24% | 0% | 36% | 0% | 30% | 0% | 1% |
| Gorkha | 45% | 36% | 2% | 1% | 52% | 49% | 1% | 2% | 0% | 12% | 0% | 0% |
| Kathmandu | 2% | 1% | 42% | 37% | 55% | 52% | 0% | 4% | 0% | 5% | 0% | 0% |
| Kavrepalanchok | 9% | 7% | 0% | 0% | 80% | 60% | 11% | 25% | 0% | 8% | 0% | 0% |
| Lalitpur | 17% | 13% | 13% | 13% | 68% | 62% | 1% | 6% | 0% | 7% | 0% | 0% |
| Makwanpur | 26% | 25% | 4% | 2% | 63% | 66% | 7% | 7% | 0% | 0% | 0% | 0% |
| Nuwakot | 24% | 23% | 2% | 1% | 72% | 58% | 2% | 13% | 0% | 6% | 0% | 0% |
| Okhaldhunga | 32% | 26% | 0% | 0% | 57% | 51% | 11% | 12% | 0% | 10% | 0% | 0% |
| Ramechhap | 32% | 25% | 4% | 2% | 61% | 44% | 3% | 19% | 0% | 10% | 0% | 0% |
| Rasuwa | 47% | 35% | 1% | 0% | 50% | 37% | 2% | 18% | 0% | 10% | 0% | 0% |
| Sindhuli | 12% | 11% | 0% | 0% | 72% | 66% | 17% | 20% | 0% | 3% | 0% | 0% |
| Sindupalchok | 20% | 8% | 3% | 0% | 75% | 24% | 2% | 29% | 0% | 39% | 0% | 0% |

## HEALTH

28% of respondents said they had developed a medical condition since the earthquakes. Diarrhea was the most common identified affliction, as reported by 12% of all respondents, and occurred more than twice as often among all displaced households (14%) than those who were not (6%).

**Figure 47: Most commonly reported medical condition developed after the earhquakes**




## MASS COMMUNICATIONS

The majority of respondents reported that their main source of information was word of mouth (71%), followed by radio (61%) and television (51%). As shown table 15, only in the urbanized Kathmandu Valley do a significant portion of households receive information through newspapers, the internet, or social media. In districts outside of the Kathmandu Valley, word of mouth, radio and phone calls are the primary channels through which households receive public information on a regular basis.

**Figure 48: Reported sources through which households regularly receive public information by type**

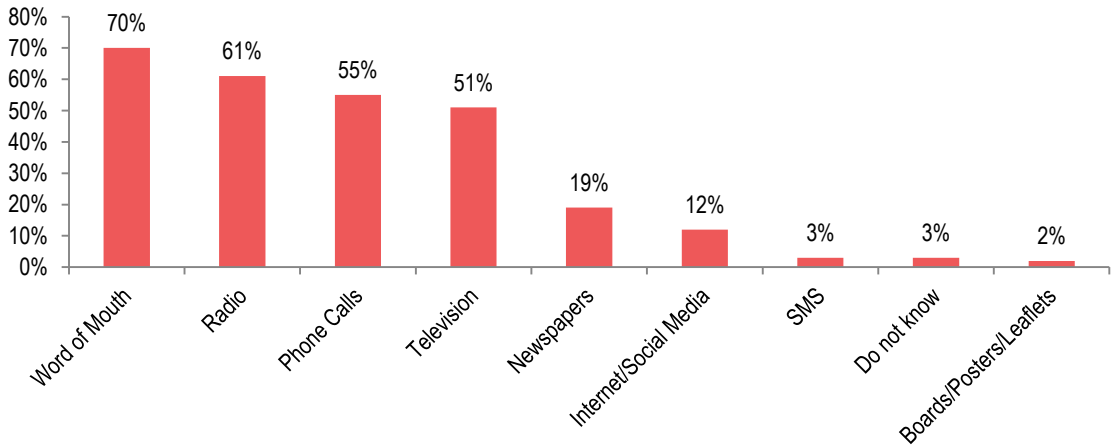


Table 17: Reported sources through which households regularly receive public information by type, per district

| | Internet/ social media | Newspapers | Phone calls | Radio | Television | Word of mouth | Boards/posters /leaflets | SMS | Do not know |
|---|---|---|---|---|---|---|---|---|---|
| Bhaktapur | 19% | 28% | 57% | 62% | 80% | 60% | 2% | 0% | 1% |
| Dhading | 1% | 3% | 66% | 73% | 40% | 90% | 1% | 1% | 0% |
| Dolakha | 2% | 2% | 60% | 72% | 23% | 84% | 6% | 0% | 4% |
| Gorkha | 3% | 0% | 68% | 70% | 48% | 81% | 0% | 7% | 5% |
| Kathmandu | 26% | 43% | 52% | 54% | 67% | 51% | 3% | 4% | 1% |
| Kavrepalanchok | 0% | 1% | 51% | 44% | 28% | 71% | 0% | 0% | 9% |
| Lalitpur | 15% | 22% | 62% | 62% | 65% | 66% | 2% | 8% | 2% |
| Makwanpur | 1% | 2% | 74% | 70% | 59% | 80% | 0% | 0% | 1% |
| Nuwakot | 6% | 3% | 72% | 89% | 41% | 88% | 0% | 2% | 0% |
| Okhaldhunga | 1% | 1% | 52% | 53% | 29% | 90% | 0% | 0% | 9% |
| Ramechhap | 3% | 6% | 28% | 73% | 39% | 93% | 1% | 3% | 0% |
| Rasuwa | 0% | 4% | 85% | 57% | 44% | 78% | 3% | 1% | 2% |
| Sindhuli | 1% | 2% | 32% | 50% | 29% | 73% | 0% | 0% | 8% |
| Sindupalchok | 0% | 4% | 28% | 58% | 10% | 95% | 1% | 7% | 2% |

Respondents that received assistance were asked whether they knew of anyone in their community that was consulted before the delivery of aid. 44% of respondents reported that either someone they know or that they themselves had been consulted before the delivery of aid to their community; 48% said no one was consulted, and 8% said there unsure. It should be noted that respondents did not discriminate between agencies/government personnel conducting assessments and those actors that provided aid to the communities.

## PUBLIC SERVICES

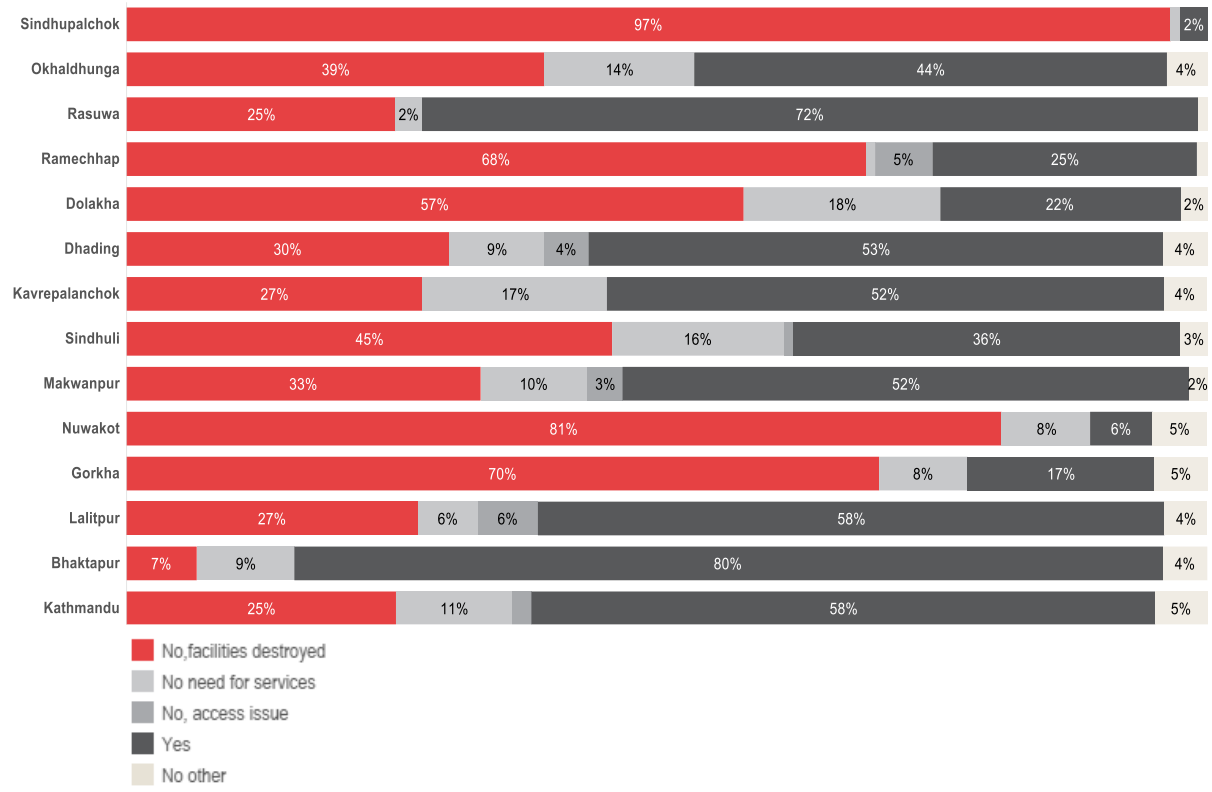
Damage caused by the earthquakes was found to have had a significant impact on the ability of households to access education, health and municipal services. On average, 44% of respondents said they needed to access education facilities but were not able to because of the crisis, with the majority (39%) reporting that they did not have access because their education facilities were destroyed.

As shown in Figure 46 in some districts the effects of the crisis on the educational infrastructure were significant. In Sindupalchok, for example, 97% of all respondents reported not to have access to education services due to the facilities being destroyed. Overall, the lowest levels of access to education facilities were reported in Sindupalchok (2%), Nuwakot (6%), and Gorkha (17%).

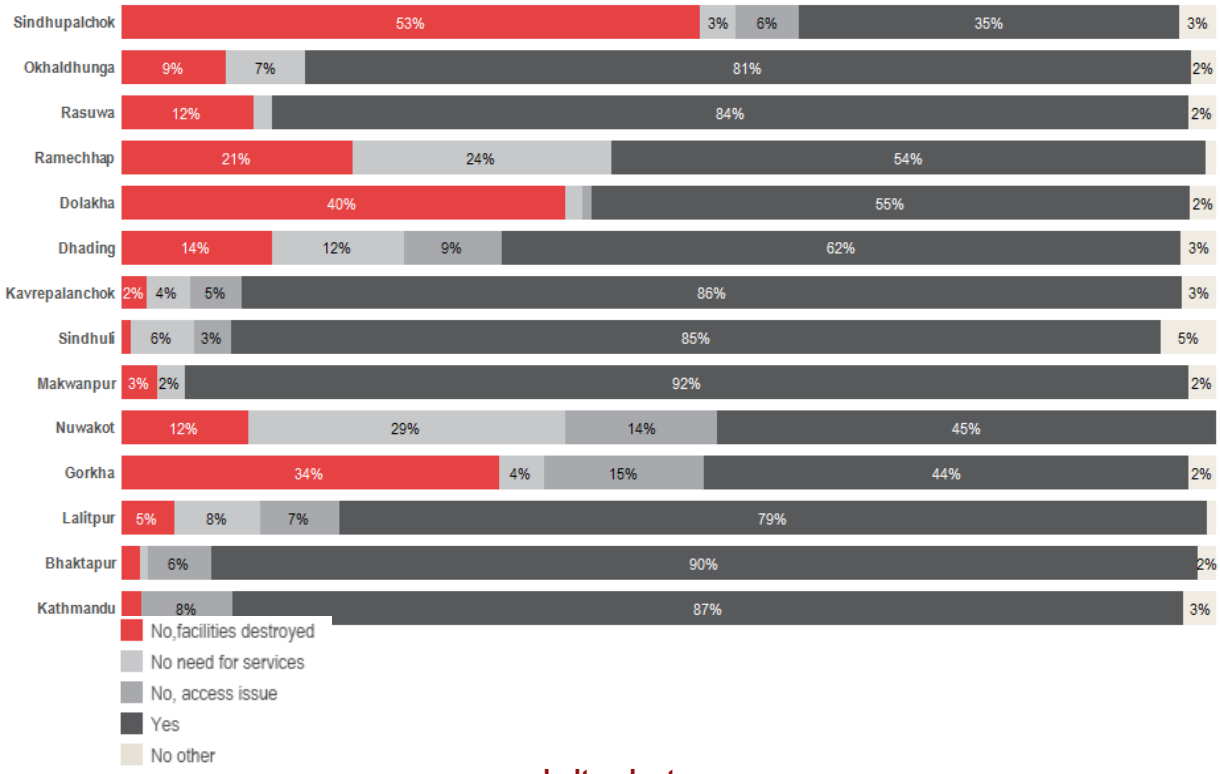
Health services were slightly less affected than schools, with 18% of respondents stating they needed to access hospitals but were not able to because of the crisis. Of these, the majority (10%) reported that their lack of access was due to the health facilities being destroyed. Similar to the education facilities, Sindupalchok, Nuwakot and Gorkha were most heavily affected, as shown in Figure 47.

Municipal services were also found to be affected by the earthquake, with 23% of respondents stating that they needed access to municipal services but were not able to; 8% due to physical access issues, and 6% due to municipal facilities being destroyed. No major access differences were identified between female-and male-headed households.

## Figure 49: Reported access to education services after the crisis




## Figure 50: Reported access to health services after the crisis



# CONCLUSION

This assessment, implemented in the aftermath of the 25 and 12 May 2015 earthquakes that struck Nepal, sought to verify the coverage of emergency shelter & NFI assistance and conduct gap analysis, to enable the shelter cluster to define a comprehensive shelter & settlements recovery strategy, to inform the revised flash appeal, and to establish a baseline and method for a longitudinal study of recovery.

The findings reveal widespread destruction of housing and livelihoods, with particularly high levels of housing damage in rural districts outside the Kathmandu Valley. The results also indicate that strategic directions set out by the Shelter Cluster during the emergency relief phase were matched by the reality on the ground: a majority (59%) of displaced households reported to have received immediate, life-saving shelter assistance, consisting predominantly of tarpaulins.

The assessed population itself was identified to have a resilient capacity to provide localized emergency shelter solutions, as demonstrated by the high rate of households engaged in temporary shelter construction, with or without having received assistance, and significant proportion of respondents with housing damage who reported no emergency shelter needs. Despite the high proportions of households that had begun construction of a temporary shelter, only 14% of households with shelter damage had begun to repair or reconstruct their original shelter at the time of assessment, suggesting that the majority of households face barriers to engaging in permanent shelter reconstruction. Such challenges are likely to include several variables, including a lack of access to permanent shelter materials, assistance, or the need to remove debris.

To enable a shift from the emergency phase towards medium to long-term programming, it is clear that comprehensive, district-level shelter responses involving all stakeholders will play a fundamental role in the post-earthquake recovery process in Nepal. As the response progresses, these assessment findings can provide a reference for stakeholders to ensure assistance is harmonized with the reported needs of households. The assessed population indicated a clear desire to move away from emergency relief assistance in order to initiate permanent shelter construction: CGI (52%), cement (46%) and labour (40%) materials were the top priority shelter emergency needs that were identified by households across all districts; strikingly, 0% of respondents cited tarpaulins as an emergency shelter need. Households report that access to these priority resources is limited, establishing a clear programmatic space for targeted intervention. Of all households that cited CGI as their primary need, 24% do not have any access to CGI, while 49% only reported some access; similar levels of access were reported for both cement and labour. Considerable support will be also needed for debris removal, with 76% of households with damaged housing reporting a need for either light or heavy equipment to clear debris. Last of all, training remains an urgent need as nearly 50% of all respondents considered the quality of construction materials, the design of the house, or poor construction practices as not relevant at all, or not so relevant to housing damage. This knowledge gap on sound construction techniques and materials should be taken into consideration in future programming.

During the planning and prioritization of assistance, the disproportionate effect of the earthquakes on low-income, rural households, due to vulnerable pre-crisis housing typologies and livelihoods, should be taken into account. Findings indicate that low-income households were less likely to have used durable construction material before the crisis, and had received little to no training on safe construction methods. The pre-crisis housing typologies of low-income households predominantly consisted of mud-bonded brick and stone, which sustained particularly high levels of housing damage during the earthquakes: 99% of all mud-bonded brick or stone walls were reported as damaged by the earthquakes, with 86% reported to be heavily or totally destroyed. The impact of the earthquakes on low-income households is highlighted by the finding that of the 80% of households who reported to be displaced, the large majority relied on subsistence gardening and livestock as their main forms of livelihood. Considering their precarious socio-economic status and the levels of damage incurred, these rural households will require comprehensive, contextualized shelter-based interventions. When compared to male-headed households, female-headed households were found to be more vulnerable across a number of indicators, with female-headed households more likely to report feeling unsafe in their homes, to feel inadequately prepared for the coming monsoon season, and less likely to have begun repair or reconstruction. While the higher proportion of female-headed households to have received structural assessments

suggests that some targeting of assistance is already ongoing, findings suggest that the needs and capacities of this group should be taken into account during the prioritization and targeting of assistance.

Regarding inter-cluster initiatives, tailored interventions by the shelter and education clusters towards the sustainable rehabilitation of education facilities should be considered: 39% of respondents reported a need to access education facilities, but were not able to because the facilities were destroyed. Needs are particularly high in Sindupalchok, Nuwakot and Gorkha where 97%, 81% and 70% of all respondents reported not to have access to education services due to the facilities being destroyed. Similarly, the increase in open defecation and use of emergency latrines, particularly in the rural areas is a potential area of intervention for coordinated response by the shelter and WASH clusters. In districts like Sindupalchok and Dolakha, over 65% of respondents either reported to use emergency latrines or were engaged in open defecation. Interventions could be staged to combine the short-term provision of WASH kits and hygiene promotion activities with the necessary materials, tools and training to construct safer and more resilient WASH facilities.

As an overarching concern, it is crucial to note any readjustment of the response towards the mid-term recovery stage will be further complicated by the upcoming monsoon season. Torrential rains are likely to aggravate existing housing damage, trigger additional landslides and floods, and further impact the affected population. **As such, it is alarming that 72% of respondents reported that their current shelter or house is not sufficiently prepared for the monsoon season.** This finding underlines the urgent need for contextually appropriate modalities of shelter assistance that allow for durable repair/rebuild materials, in particular CGI, to be delivered to those in need ahead of the monsoon.

Furthermore, during the monsoon season, repair/rebuild activities among the affected population are likely to be placed on hold due to heavy rains and inaccessible roads. For the duration of the monsoon, particular attention could be placed on capacity building and the provision of safer construction methods/build-back-better training modules, which could then establish the necessary knowledge base for comprehensive shelter recovery strategies in the post-monsoon period. This could be achieved through the preferred channels of communication among the affected communities, namely word-of-mouth (70%), radio (61%), phone calls (55%). Findings clearly indicate that radio remains the predominant form of mass communication; particularly in rural districts with relatively low reported levels of television ownership.

In order to monitor changing needs as the response to the earthquakes continues, REACH, through the framework of its partnership with the Global Shelter Cluster, intends to re-deploy to Nepal after a period of several months to monitor how needs have changed since the beginning of the response, and to inform the medium to long term development of the cluster's shelter and settlements recovery strategy.

# ANNEXES

## Annex 1: Assessed VDCs (sub-districts) in the accessible areas of the Priority Districts