



WHAT NEXT FOR NEPAL?

Evidence of What Matters for Building Resilience
After the Gorkha Earthquake

November 2015

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I. EXECUTIVE SUMMARY

Nepal is a nation in transition. In the last decade, Nepal ended its lengthy civil war and halved the percentage of people living in extreme poverty from 53% to 24%.¹ Despite recent improvements, Nepal remains one of the poorest countries in the world, ranking 197th in GDP per capita. When a 7.8 magnitude earthquake struck Nepal in April 2015, just 50 miles outside of the capital Kathmandu, the effects were devastating: over 9,000 people were killed, more than 800,000 homes were destroyed or badly damaged, and approximately 2.8 million people were displaced.²

In nearly any disaster, not all households are impacted equally. Mercy Corps' quick response enabled us to collect data from nearly 1,200 households in areas that were equally affected by the physical damage of the earthquake, but where there was a great deal of variation in how well people are coping or recovering. Ten weeks after the earthquake, households showed varied levels of food consumption patterns, shelter quality, livelihood recovery, and investment in assets. The goal of this research is to understand what contributes to this difference: ***What capacities, if reinforced, hold the greatest potential to enhance coping, promote recovery, and strengthen the resilience of communities to future natural disasters in Nepal and similar contexts?***

Mercy Corps defines resilience as the capacity to learn, cope, adapt and transform in the face of shocks and stresses. Resilience capacities can be understood as resources or strategies, employed before or after a crisis, that help households mitigate its effects in the short and long term. The study analyzed four capacities, or factors that could contribute to resilience: (1) disaster preparedness and response, (2) social identity and networks, (3) access to and use of financial services, and (4) access to and use of economic options.

KEY FINDINGS AND RECOMMENDATIONS

Within the study area in Sindhupalchok District, the earthquake had a dramatic effect. Nearly 30% of respondents reported had no official shelter at all 10 weeks after the earthquake. Poverty likelihood rose drastically, from an average of 8.7% to 28%. While nearly all households were negatively affected, our analysis identified key factors that appear to have mitigated the worst effects on households' abilities to meet their basic needs. These findings provide insights into what type of efforts can help improve disaster resilience.

Existing approaches to community-based disaster risk reduction may be insufficient to support disaster resilience, unless they extend capacity to households and advocate for effective local governance. The vast majority of sampled households (83%) lived in communities that did not have a disaster plan or committee. Yet even when community-level disaster risk reduction (DRR) systems were in place, they did not appear to contribute to better coping or recovery outcomes. This may be because the severity of the earthquake outstripped the abilities of the often nascent DRR systems to adequately respond. However, the apparent ineffectiveness of community-level DRR mechanisms also appears linked to the overall limited governance capacities in Nepal.³ Households who perceived that local government disaster preparedness mechanisms existed may have been overly reliant on a weak system that was little able to meet their needs. In contrast, greater household-level disaster risk preparedness was associated with higher ability to maintain or quickly regain food and livelihood security following the earthquake. This suggests that community disaster preparedness measures must connect to the household to be effective.

1 World Bank. *Data Indicators*, accessed September 2015

2 USAID. *Nepal Earthquake Factsheet*, April 2015

3 World Bank. *Worldwide Governance Indicators – Nepal*, 2014

RECOMMENDATION: Assess the limitations of current DRR approaches in contexts of weak governance, placing greater emphasis on household-level DRR and advocacy capacity for improved accountability and response.

Who you are matters – social characteristics and relationships can determine welfare and well-being after a crisis. Being a member of any caste other than the two elite groups was associated with use of more distressful coping strategies and a reduction in household dietary diversity – a key measure of food security. The lower castes also experienced a delay in the receipt of aid relative to others, controlling for remoteness. At the same time, relationships within castes supported recovery. Households reporting greater levels of *bonding* social capital relationships within their own caste – i.e. an ability to rely on them for help – were more likely to be able to meet their food consumption needs after the earthquake. Greater *linking* social capital, or perceptions of being able to rely on and influence local government officials, was associated with poorer coping and recovery outcomes. This finding points again to the risk of overreliance on government networks in contexts of weak governance capacity.

RECOMMENDATION: Ensure humanitarian response efforts do not reinforce structural inequalities. This can be achieved by supporting trusted and diverse community groups to maintain mutual support functions in a crisis.

Financial inclusion can support resilience, but resilience outcomes vary drastically based on the product or service, and their level of access in times of crisis. Before the earthquake, over 57% of respondents held formal savings, and 25% held informal savings.⁴ Households with *formal savings* before the earthquake were better able to meet their short-term food needs post-shock. Families that had *informal savings* were more likely to have regained or maintained improved shelter conditions and had a reduced likelihood of moving below the poverty line. Importantly, more marginalized castes made higher use of informal savings relative to other groups. Credit also appeared to matter, though the effects were mixed. Access to *formal loans* after the crisis was important to recovery. However, having any form of pre-crisis debt appeared to make families rely on more distressful coping strategies. Further, the use of *informal loans* after the crisis seemed to further undermine coping ability, both by increasing reliance on distressful food consumption patterns and lowering household dietary diversity. Those with informal loans before the crisis appeared highly more likely to draw on informal loans after the earthquake.

RECOMMENDATION: Support financial service providers to offer more appropriate products, and to maintain services in times of crisis, while enhancing household financial management capacity for disaster resilience.

Maintaining or regaining livelihoods and restoring market functions as part of early response is critical for improved coping and recovery. Households' ability to maintain or regain their livelihood and income sources was the strongest predictor of resilience. It was associated with less distressful coping mechanisms, greater dietary diversity and investment in productive assets, better shelter quality, and a lower likelihood of poverty just 10 weeks after the shock. Yet short-term recovery of livelihoods was not always dependent on market access. In fact, the data indicates that households with greater access to markets may have been worse off after the earthquake, perhaps because of overreliance on markets that were not restored and poorly functioning. After the earthquake, access to and availability of goods in local markets fell sharply, with nearly half of respondents stating that their nearest market was completely unreachable. Ten weeks after the earthquake, access to agricultural items, seeds, and construction materials was not yet restored. Qualitative reports confirmed that early aid distribution deliberately targeted more remote households, often bypassing communities in and

⁴ The study defined formal products as savings, loans and insurance associated with cooperatives, microfinance institutions, or banks. Informal products included those associated with local savings and lending groups, family and friends, moneylenders and savings held at home in the form of cash and assets.

around the market centers. Distributing aid more equitably across peri-urban and remote areas could enhance early livelihood recovery. Research and experience suggests that well designed and targeted emergency cash transfers can meet immediate needs, restore livelihoods, and support market recovery for a triple win.⁵

RECOMMENDATION: Restore markets and support livelihoods as part of early response. Use effective and rapid cash transfer approaches that can both meet immediate social protection needs and restore market functions and livelihoods.

The study offers a snapshot of household welfare and recovery, and what contributed to it, 10 weeks after the Gorkha earthquake. The results shed new light on people's resilience capacities, immediate responses, and their resulting prospects for recovery and long-term development. These findings have important implications for how investments can be targeted to support the resilience of communities at risk of natural disasters, who often face multiple, recurrent crises.

Since the time of the survey, earthquake-affected communities experienced floods and landslides during the monsoon season, and the whole country has suffered from an extensive fuel crisis that resulted from reactions to Nepal's new constitution. Mercy Corps plans to conduct follow up research in the study area, to further understand how specific resilience capacities support households' recovery and resilience over time, following the onset of multiple shocks. It is anticipated that these research results will enable humanitarian and development actors to be more deliberate in mitigating and responding to such crises in ways that best support household and community resilience for the future.

5 Casual Design. *Beyond Meeting Immediate Needs: The Impact of Electronic Cash Transfer Approaches on Disaster Recovery and Financial Inclusion*, 2015

II. INTRODUCTION

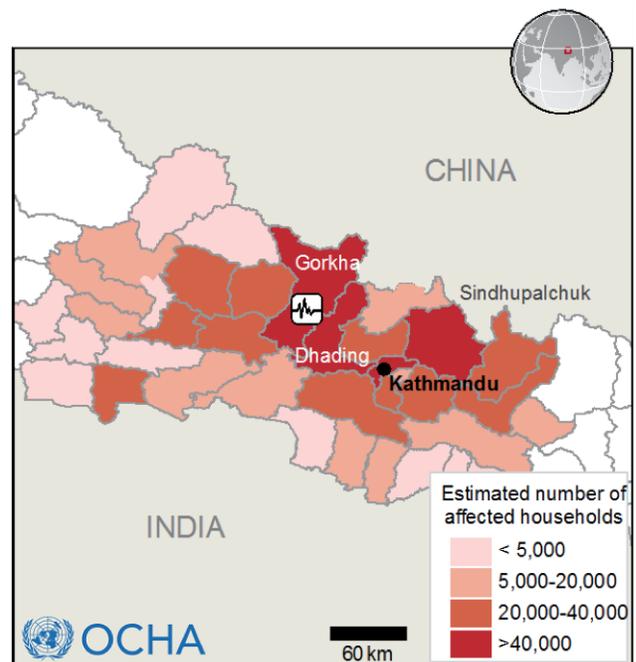
Nepal is a nation in transition. In the last decade, Nepal ended its 12-year civil war and dedicated itself to transformative progress in important development indicators. Nepal is one of the poorest countries in the world, ranking 197th in GDP per capita—barely ahead of Afghanistan and South Sudan.⁶ Yet between 2003 and 2010, Nepal managed to halve the percentage of people living in extreme poverty from 53% to 24%.⁷ In September 2015, Nepal approved its first constitution written by elected representatives.

Despite progress in poverty reduction, Nepal remains highly vulnerable to disasters. The country loses hundreds of lives and hundreds of millions of dollars each year to fires, floods, and landslides, exacerbated in recent years by the effects of climate change and land degradation. The Himalayan range that gives Nepal Mount Everest comes with constant tectonic stress and low-level tremors, destabilizing the land that 75% of the population relies on for agricultural livelihoods. Nepal's impoverished population is ill-equipped to invest in significant disaster prevention, and the government is still in the early stages of implementing a nationwide disaster management plan. Investment in disaster risk reduction is complicated by the political context. Since arising from a decade of conflict in 2006, high party fragmentation and a long political battle to pass the new constitution have resulted in frequent strikes, interruption of basic services, and more rarely intimidation and violence.

Nepal's massive 7.8 magnitude earthquake in April 2015 brought the nation's vulnerabilities quickly to global attention. Over 9,000 people were killed, 800,000 homes were badly damaged or destroyed, and approximately 2.8 million people were displaced across more than half of the country's districts.⁸ A series of powerful aftershocks continued to pummel the region for the following two months, including another 7.3 magnitude quake only 17 days later. The US\$10 billion cost of recovery, devastation to the tourism sector (formerly 10% of GDP), forced delay in major hydropower investments, and widespread infrastructure damage will significantly set back Nepal's progress on all major development indicators.⁹ Sindhupalchok District was among the worst hit, with over 40,000 households affected and a death toll of over 1,000 people (see Figure 1 for details).

Mercy Corps has been working in Nepal since 2005, primarily in regions in the Mid-West, Far West and Eastern Development Regions, on strengthening livelihoods, food security, and resilience through a combination of market development, financial inclusion and disaster risk reduction programming. Following the earthquake, Mercy Corps quickly mobilized an emergency response in earthquake-affected Central Development Region, which was previously not part of Mercy Corps' program areas.

Figure 1. Map of Earthquake Affected areas



Map Sources: UNCS, Nepal Survey Department, UN-Nepal, USGS, Nepal OBS. The boundaries and names shown and the designations used on this map do not imply an official endorsement or acceptance by the United Nations. Map created on 27 April, 2015.

6 Central Intelligence Agency. World Factbook: Nepal, 2015

7 World Bank. Data Indicators, accessed September 2015

8 USAID. Nepal Earthquake Factsheet, April 2015

9 Statement by Dr. Ram Sharan Mahat, Finance Minister of Nepal, at the Asian Development Bank, April 25, 2015. Retrieved from <http://www.spotlightnepal.com/News/Article/Finance-Minister-Dr-Ram-Sharan-Mahat-Baku-ADB>.

Mercy Corps reached more than 130,000 people with emergency shelter kits, hygiene supplies, solar lanterns, chargers, blankets, water purification tablets, and kitchen kits, across four severely affected districts. In addition, Mercy Corps' approach focused on rebuilding Nepal's markets and communities by providing unconditional cash transfers to those in need. Wherever possible, cash transfers were delivered in parallel with kits, as early delivery of cash transfers was a core strategy for meeting immediate needs while restarting economic transactions and livelihoods. Cash transfers were delivered directly through merchants or local formal savings and credit cooperatives to promote economic recovery.

In nearly any disaster, not all households are impacted equally. Even where physical damage is the same, some individuals, families, and even communities are better able to cope or recover more quickly than others. This study is part of Mercy Corps' efforts to understand what factors lead to these differing outcomes, and to test the theories on what matters for disaster resilience. Mercy Corps' quick response to the earthquake enabled us to collect data from almost 1,200 households in areas that were equally affected by the physical damage of the earthquake, but where there was significant variation in how well people were coping or recovering.

The aim of this research is to generate insight into what types of interventions – both pre-crisis, and in the immediate aftermath – are most likely to support the resilience of communities at risk of natural disasters, who face multiple, recurrent crises.¹⁰ The results will guide Mercy Corps' and our partners' recovery strategies in Nepal, where they will also be used to influence earthquake recovery interventions of government, donors, international, and national agencies. Finally, it is expected that the findings will be relevant for informing policies and program decisions aimed at strengthening resilience in other parts of Nepal, and in other contexts experiencing similar crises.

10 The April 2015 earthquake and aftershocks triggered a number of landslides, which were subsequently made worse by monsoon rains in July. On September 20, 2015, Nepal promulgated its newly passed constitution, prompting border blockades with India. At the time of writing this report, Nepal had faced a 12 week-long fuel crisis that nearly brought the country to a standstill. The passing of the new constitution has also resulted in increased political instability, and violent clashes in pockets of the country.

III. RATIONALE

RESEARCH QUESTIONS

Mercy Corps defines resilience as the capacity to learn, cope, adapt, and transform in the face of shocks and stresses. Capacities can be absorptive, to help people, households, or systems better prepare for or recover from shocks and stresses; adaptive, mitigating the very presence, nature, and impacts of shocks and stresses over time; or transformative, fundamentally changing the dynamics within systems in order to enhance coping and adaptation. Resilience capacities can take the form of resources – human, natural, social, financial, and physical – or strategies, as these resources are applied to enhance resilience. Resources and strategies for resilience can be employed as a preventative measure pre-crisis, or drawn upon in its aftermath. Importantly, capacities applied after a crisis can determine not only whether a household better copes and recovers, but whether it can maintain or build resilience for future shocks and stresses.

The primary question this study seeks to answer is: ***What capacities, if reinforced, hold the greatest potential to enhance coping, promote recovery, and strengthen the resilience of communities to future natural disasters in Nepal and similar contexts?***

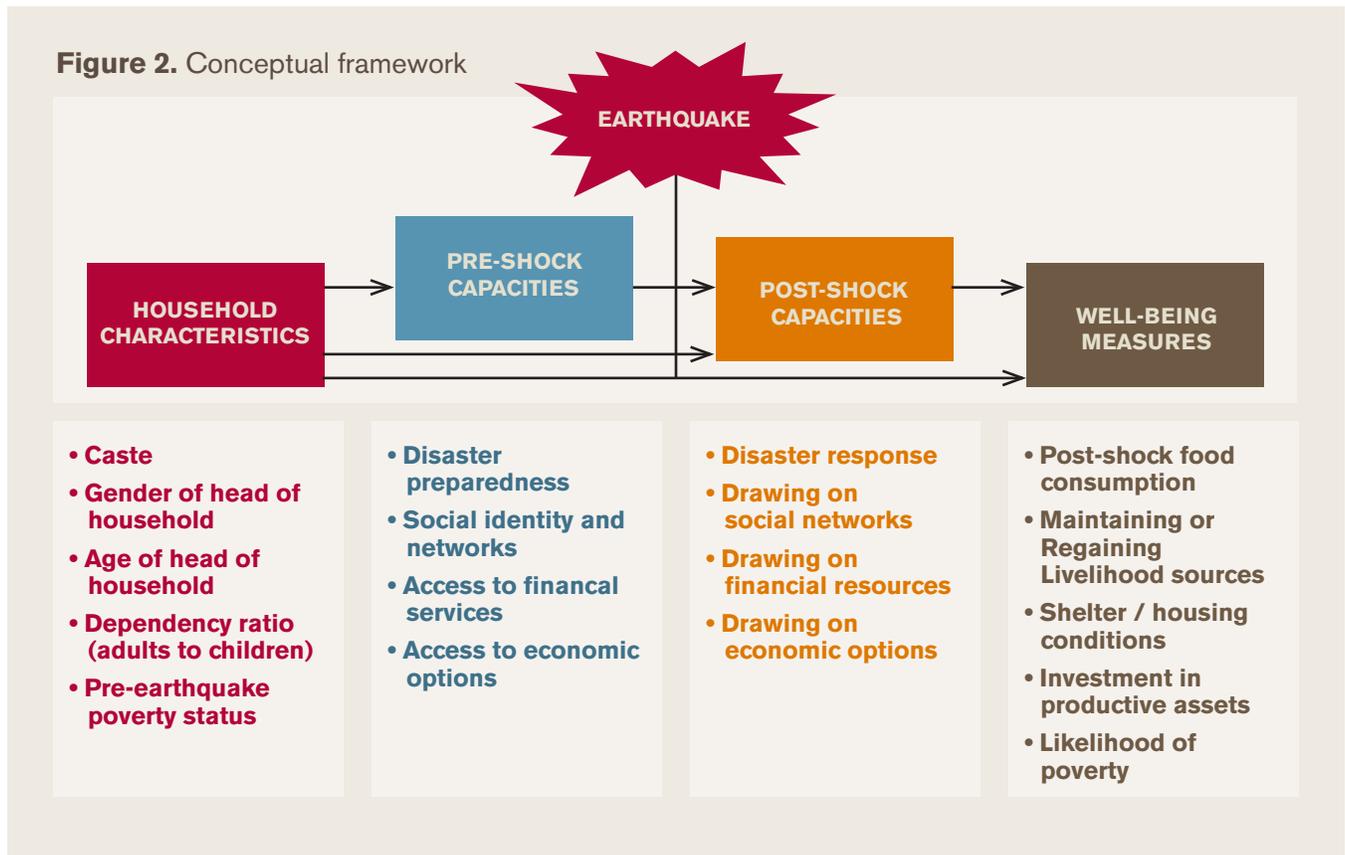
Based on qualitative data collection in Nepal and secondary literature review of research that examines what matters to resilience, the study specifically looked at the role of the following capacities that may contribute to disaster resilience:

- Disaster preparedness and response
- Social identity and networks
- Access to and use of financial services
- Access to and use of economic options

For each of these factors, the study examined:

- **What matters?** To what extent did these presumed resilience capacities support households' abilities to cope with and/or recover from the earthquake?
- **What enables this?** What capacities did households have prior to the earthquake that enabled them to employ more effective, and less harmful, responses following the shock?
- **For whom?** What populations and sub-groups were most and least likely to possess the types of capacities and apply strategies found to be most important for increased resilience?

The conceptual framework in Figure 2 illustrates the presumed relationships between the resilience capacities and well-being outcomes examined.



The selected well-being measures ranged from those associated with shorter-term coping (such as food consumption) to medium term recovery (such as shelter quality) and longer-term well-being (like poverty likelihood). This approach enabled the research to distinguish between factors that contribute to each type of outcome, and better understand how households may make trade-offs between short- and longer-term strategies following a disaster.



HYPOTHESES AND RATIONALE

Disaster Preparedness and Response

In areas with high disaster risk, such as Nepal, development cannot be achieved without disaster resilience. Disasters can set back development gains drastically, and the effect is multiplied for countries where disasters are frequent. In wealthier countries, where response systems and prevention measures tend to be stronger, disasters cause far fewer deaths. Between 1980 and 2002, India experienced fourteen major earthquakes that killed 32,117 people, while the United States experienced eighteen major earthquakes that killed only 143 people. Higher income is a big indicator of disaster preparedness, but evidence shows that other factors such as effective governance institutions also have a significant impact in reducing deaths.¹¹

Disaster risk reduction (DRR) often takes a two-fold approach: (1) taking steps to reduce the incidence of disaster or its effects on a population, and (2) establishing systems that can quickly and efficiently respond to disasters when they occur. For example, a local government can invest in infrastructure that mitigates the impact of floods, while also investing in early warning systems that ensure communities evacuate quickly when floods occur. Addressing the impacts of a disaster can include providing humanitarian assistance, rebuilding structures, restoring economic activity, and offering psycho-social support to citizens to help them cope with the trauma of the disaster and return to productivity. The more quickly this aid can be provided, the better the impact on recovery.¹²

The 2015 earthquake in Nepal was not unanticipated. Historically, the region has been hit by major earthquakes about every 80 years, with the most recent in 1934 that killed 4,000 people. In response to warnings that another disaster was likely imminent, the Government of Nepal began widespread disaster risk preparations. Nepal's first National Strategy for Disaster Risk was approved in late 2009, creating a master plan for coordinating national and local authorities to prevent, reduce, and mitigate the effects of a disaster. In early 2015, the government of Nepal released a progress report on disaster risk reduction efforts, drawing attention to the inadequacy of their efforts.¹³ Many priorities, such as mainstreaming DRR into broader development efforts, had national institutional support but had not yet reached the level of the 3,500 Village Development Committees (VDCs) that form the core decentralized administrative unit in the country.¹⁴ Other priorities had made some progress but lacked institutional commitment, such as allocating a portion of local budgets to DRR efforts. Where efforts were reaching the VDC level, meaningful DRR implementation was prevented by lack of outreach to households (and hence low citizen participation), cumbersome bureaucratic procedures for the release of funds, politicization of projects, or simply low technical capacity for allocation and implementation of DRR funds.¹⁵

Our research tested the hypothesis that households who were able to access disaster risk reduction and response mechanisms, prior to and again after the earthquake, would be more likely to productively cope with and recover from its effects, compared to households without these capacities. Specifically, this study examined the apparent contributions of the following common disaster preparedness and response mechanisms in helping households cope with and recover from the earthquake:

11 Kahn, M.E. *The Death Toll from Natural Disasters: The Role of Income, Geography, and Institutions*, May 2005

12 Resosudarmo, B.P., Sugiyanto, C., & Kuncoro, A. *Livelihood Recovery After Natural Disasters and the Role of Aid: The Case of the 2006 Yogyakarta Earthquake*, May 2011

13 Ministry of Home Affairs., *National Progress Report on the Implementation of the Hyogo Framework for Action (2013-2015)*, January 2015

14 A Village Development Committee (VDC) acts as the core administrative unit of decentralized government in Nepal, operating at a sub-district level. A district may range from less than 20 to more than 10 VDCs. VDCs population in the study area ranged from 600 to 1200 households.

15 Ministry of Home Affairs., *National Progress Report on the Implementation of the Hyogo Framework for Action (2013-2015)*, January 2015

- **Community-level disaster preparedness:** existence of DRR plans and committees; allocation of resources and training at the VDC levels
- **Household-level disaster preparedness:** family members are aware of disaster risks and have knowledge of appropriate response actions
- **Timely receipt of disaster assistance:** receiving one or more forms of aid within one week of the earthquake
- **Amount of assistance:** the number of sources of aid received

Social Identity and Networks

Caste and Gender

In Nepal, social and political rights and privilege are highly linked to caste and gender. Caste is the primary determinant of income and social standing, and also tracks to other development indicators such as education, gender equality, and maternal health, perpetuating inequalities across generations.¹⁶ These disparities are also apparent during disasters. Research looking at the recovery of Indian fishing villages following a tsunami found that caste, family status, and wealth made a significant difference in determining who received aid.¹⁷

Religion, caste, and ethnicity are closely related and often conflated in the Nepali caste system. Our study examined the four major castes that comprise the majority of the population in Sindhupalchok District: Brahmins, Chhetris, Janajatis, and Dalits. Brahmins and Chhetris bear the highest social standing, with Brahmins traditionally being considered priests and Chhetris warriors. Brahmins and Chhetris generally enjoy the same levels of social privilege and have close inter-caste relationships, although they do not intermarry. The Janajati designation of caste is composed of numerous ethnicities and sub-castes with their own diverse social hierarchies. Within the study area, the Janajati group is composed primarily of Newars, Gurungs, and Tamangs. Newars are a merchant class and considered the most privileged among them, with Tamangs the most marginalized among the three.

The Dalit caste is the most marginalized in Nepali society and viewed as untouchable. They are associated with occupations such as ironwork or tailoring. Among other barriers, Dalits cannot drink from the same water tap as other castes, cannot sell milk and cannot touch milk that is sold in the market.¹⁸ Though caste-based discrimination in Nepal has been illegal since 1955 and became criminal in 2011, these practices are widespread, particularly in rural areas.¹⁹ Following the earthquake, lower castes shared stories of negligence, blatant discrimination, and even violence in denying equitable distribution of relief.²⁰

Gender inequality also perpetuates marginalization. Nepal is ranked 112 of 142 countries in the World Economic Forum's Global Gender Gap report.²¹ In traditional Nepali society, men are the dominant decision-makers in the household, controlling income, asset purchase, and livelihood sources. Men and boys also have privileges with respect to food consumption over women and girls, and boys are often prioritized for schooling, while young girls support household work from a young age. Women suffer from cultural practices of early marriage, poor spacing of pregnancies, and high rates of domestic violence.²² Women's status and autonomy is determined

16 Bennett, L., Dahal, D.R., & Govindasamy, P. *Caste, Ethnic and Regional Identity in Nepal: Further Analysis of the 2006 Nepal Demographic and Health Survey*, 2008.

17 Aldrich, D.P. *Separate and Unequal: Post-Tsunami Aid Distribution in Southern India*, 2010

18 United Nations High Commissioner for Human Rights. *Opening the Door to Equality: Access to Justice for Dalits in Nepal*, December 2011

19 World Bank. *Unequal Citizens: Gender, Caste, and Ethnic Exclusion in Nepal*, 2006

20 Amnesty International. *Nepal: End Discrimination in Earthquake Relief Effort*, 1 June 2015. Retrieved from <https://www.amnesty.org/en/latest/news/2015/06/nepal-end-discrimination-in-earthquake-relief-effort/>

21 World Economic Forum. *Global Gender Gap Report 2014*, 2015. Retrieved from <http://reports.weforum.org/global-gender-gap-report-2014/rankings/>

22 United States Agency for International Development. *2011 Nepal Demographic and Health Survey*, 2011.

by the number of children, ethnicity, income, and education. With high rates of male migration for work, women remaining behind may have greater responsibility for decision-making, but may also suffer from social exclusion or not have the full authority to make necessary decisions. Mother-in-laws in Nepal take a strong decision-making role in a son's absence.

Social Capital

Increasingly, evidence is showing that elements other than income or even disaster preparedness make a significant difference in a household's ability to manage the effects of disasters.²³ Social capital, defined as the level of cohesion and mutual assistance among a group or groups of people, can be a critical source of assistance. Social capital takes three forms. Bonding social capital is based on family kinship, locality or ethnicity. Neighbors, friends, or family members may support each other during a crisis by sharing food and scarce supplies. Bridging social capital goes beyond immediate family and friends to build ties across economic, ethnic, or other divides. Bridging social capital can connect households to outside assets, which can be critical if the impact of a disaster varied across geographies. Linking social capital is the strength of the connection between households and formal or informal institutions, representing a vertical relationship. In theory, households with high levels of linking social capital are better connected to their government and other sources of power or influence, and can access their support to manage losses better.²⁴

Each form of social capital has a different role in disaster recovery, with potential risks. First responders after a disaster are most often neighbors or other community members, emphasizing the importance of bonding social ties.²⁵ Yet if a disaster of a large magnitude affects multiple households negatively, the support from neighbors can quickly expire and be of little use for recovery.²⁶ Bridging capital to peers outside the community, and linking capital through broader social networks (government, or even non-governmental agencies) may have more impact in these cases. Linking capital relationships are complicated, and not always beneficial. For example, a study in Bangladesh following Cyclone Sidr showed that overreliance on linking capital may cause dependency, with potentially negative effects.²⁷

Our study tested the hypothesis that households with greater social capital were more likely to productively cope with and recover from the effects of the earthquake, compared to households without these capacities. The research also analyzed how the contributions of social capital differed across caste and gender. This study sought to better understand how households' social relationships, as detailed below, affect their disaster resilience:

- **Collective Action:** participation in communal self-help efforts prior to the earthquake, and reconstruction efforts around community sites post-earthquake
- **Bonding social capital:** perceived ability to rely on members of their own caste to help them when in need
- **Bridging social capital:** perceived ability to rely on members of other castes to help them when in need
- **Linking social capital:** perceived support from and influence on local officials and institutions

23 Aldrich, D.P. & Meyer, M.A. *Social Capital and Community Resilience*, 2014.

24 Adger, W.N. 2009; Aldrich, D.P., 2011; Frankenberger, T., Mueller, Spangler, & Alexander, 2013

25 Aldrich, D.P. & Meyer, M.A. *Social Capital and Community Resilience*, 2014.

26 Maxwell, D., et. al. *Facing Famine: Somali Experiences in the Famine of 2011*, October 2015. Retrieved from <http://fic.tufts.edu/publication-item/facing-famine/>

27 Islam, R. & Walkerden, G. *How do links between households and NGOs promote disaster resilience and recovery?*, 2015

Financial Services

The link between households' access to financial services, such as credit and saving mechanisms, and household income is well-established.²⁸ These mechanisms can be particularly important following an emergency, as households grapple to manage the effects of shocks without resorting to harmful coping strategies. Having access to cash, through savings, credit, or cash transfers can provide houses with resources for basic needs and to restore damaged livelihoods.

But whether the financial services are beneficial for disaster affected households depends on their source and use. Mercy Corps' research following Typhoon Yolanda in the Philippines found that use of savings was related to greater household recovery from the disaster.²⁹ However, the study showed little difference between the effects of formal and informal credit and savings, suggesting that informal financial tools may be as effective as formal ones in supporting disaster resilience. While credit can be an important coping lifeline, borrowing that comes with predatory interest rates can also make households more vulnerable to future shocks, or undermine recovery.³⁰

Unconditional emergency cash transfers have also been shown to effectively assist households that are not able to access their savings or appropriate credit following a disaster. Appropriate cash transfer amounts serve as immediate liquidity that not only assist households to meet immediate needs, but can also restore productive assets.³¹

Nepal is rapidly accelerating the reach of its financial services. A series of reforms since 2000 have improved access to capital for businesses and individuals, and increased options for branchless banking and registration of local co-operatives. Despite growth, financial services remain concentrated in urban and male populations. Only 22% of rural adults have a bank account, for example, compared to 51% of urban adults.³² And the informal sector continues to grow. In 2006, about 38% of Nepalese households had loans from only the informal financial sector and 15% from the formal sector.³³ Yet the increase in mobile financial services – predominantly money transfer and payment platforms – may change this dynamic and enable better access to formal services. Mobile subscriptions skyrocketed from only 9 million in 2010 to over 23 million in 2014, servicing a total population of 28 million people. Nearly 50% of remittance income moves through money transfer points, though much of it is still channeled through returning relatives or friends.³⁴

Our research tested the hypothesis that households who were able to access and use financial services were more likely to productively cope with and recover from the earthquake, compared to households without these capacities. Specifically, we examined the apparent contributions of the following types of financial services to households' coping and recovery³⁵:

- **Formal savings:** having formal sources of savings (e.g. in a bank or credit union) prior to the earthquake, and drawing on these sources after the earthquake
- **Informal savings:** having informal sources of savings (e.g. at home, in a local savings club, with family and friends) prior to the earthquake, and drawing on these sources after the earthquake
- **Formal credit:** having borrowed from a formal financial institution (i.e. bank, or government-registered microfinance institution or cooperative) prior to and/or after the earthquake
- **Informal credit:** having borrowed from an informal financial institution (e.g. a local shop) prior to and/or after the earthquake

28 Dupas, G. & Robinson, J. *Savings Constraints and Microenterprise Development: Evidence from a Field Experiment in Kenya*, 2010. Also supported by Burgess, R. & Pande, R. Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment, 2003

29 Hudner, D. & Kurtz, J. *Do Financial Services Build Disaster Resilience? Examining Determinants of Recovery from Typhoon Yolanda in the Philippines*. Retrieved from Mercy Corps at <https://www.mercycorps.org/research-resources/do-financial-services-build-disaster-resilience>.

30 Pitamber, S. *Factors Impeding the Poverty Reduction Capacity of Micro-credit: Some Field Observations from Malawi and Ethiopia*, 2003. Retrieved from <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/00157682-FR-ERP-74.PDF>.

31 Causal Design. *Beyond Meeting Immediate Needs: The Impact of Electronic Cash Transfer Approaches on Disaster Recovery and Financial Inclusion*, 2015

32 UN Capital Development Fund. *Understanding the Demand for Financial Services in Nepal*, November 2014

33 The World Bank. Access to Financial Services in Nepal, 2007

34 The World Bank. Large Scale Migration and Remittance in Nepal Issues and Challenges, June 2012

35 The survey questionnaire also looked at insurance. However, reported insurance coverage in study areas was extremely low or not existent. So this was not included in the analysis.

Economic Options

Livelihood strategies, and the ability to manage income streams to mitigate disaster risk, are critical to resilience. Likewise, the key to a successful long-term recovery from a disaster is the restoration or adaptation of livelihoods. Livelihood “comprises the capabilities, comprised of assets (including both material and social resources) and activities used by a household for means of living. A household’s livelihood is secure when it can cope with and recover from stresses and shocks, and maintain or enhance its capabilities and productive asset base.”³⁶

Households that rely on different forms of livelihoods may be better able to maintain a source of income following a disaster, improving their resilience. Previous studies have examined this assumption, with several finding that having several livelihood sources is often not sufficient to spread risk to major disasters.³⁷ In these contexts, livelihood streams that are truly independent of each other – which draw income from different economic sectors, such as farming and salaried work, and are not exposed to the same types of risk – may enable households to maintain at least part of their livelihoods after a disaster, and thereby rebuild or recover more quickly.³⁸

Livelihoods are also closely linked to the markets in which they operate. In Nepal, where markets are ‘thin,’ households in peri-urban areas or with transportation access are likely to depend more on markets for livelihoods than more remote households. In such contexts, market performance may be fragile, and likely to be severely disrupted following natural disasters. Aid distribution may also undermine market performance, as free provision of goods and services undermines the ability of businesses to operate, and markets may be slow to recover in a post-disaster setting.³⁹ Restoring market functions and reconnecting disaster victims with markets is critical to renewing growth and restoring livelihoods.⁴⁰

Remittances are another critical income source in Nepal. In 2014, remittances reached an estimated US\$5.8 billion and made up 29% of GDP. Five months following the earthquake, remittances were estimated to increase 35% compared to the previous year, although this has wide geographic and wealth variation.⁴¹ Wealthier households and those in the Kathmandu Valley historically receive more. Remittances are believed to have played a large role in the reduction in Nepal’s poverty rate over the last twenty years, by boosting consumption and providing financial relief that is independent of internal economic variability.⁴² The proportion of income from remittances has increased as labor migration from Nepal rose from 3.2% of the population in 2001 to 7.3% in 2011 (not including the high use of informal migration channels across the open border with India, or traveling without a work permit).⁴³ Remittances, however, also have negative effects. Migration on average costs over 92,000NPR, seven times an average salary and 11 times monthly savings.⁴⁴ Funds often come from local money lenders that carry 30% interest rates, putting families deep into debt.⁴⁵ Driven primarily by poor rural productivity, remittance income is being used to smooth consumption, rather than invest in productive, long-term activity. Furthermore, migration is having a large social toll. Women are often left behind with greater household responsibility, but rarely greater authority, restricting their ability to effectively manage child-rearing, livelihoods, household expenditures and make productive investments.

36 Chambers, R. & Conway, G. *Sustainable Rural Livelihoods: Practical Concepts for the 21st Century*, 1992

37 Boudreau, Tanya. *Livelihoods at the limit: reducing the risk of disasters and adapting to climate change – evidence from the consolidated household economy Analysis database*, Save the Children and the Food Economy Group, 2013.

38 Kurtz, J. *What Really Matters for Resilience? Exploratory Evidence on the Determinants of Resilience to Food Security Shocks in Southern Somalia*, Mercy Corps, 2013.

39 Food and Agriculture Organization. *State of Food and Agriculture: Economic controversies over food aid, 2006*. Retrieved from <ftp://ftp.fao.org/docrep/fao/009/a0800e/a0800e03.pdf>.

40 DFID. *Making Market Systems Work Better for the Poor (M4P) Introduction*, February 2005.

41 UN Nepal Earthquake Assessment Unit. *Note on Migration and Remittances*, August 2015.

42 Pant, B. *Remittance Inflows to Nepal: Economic Impact and Policy Options*, 2006.

43 International Labour Organization. *Labor Migration for Employment: A Status Report for Nepal 2013/2014*, October 2014.

44 The World Bank. *Large Scale Migration and Remittance in Nepal Issues and Challenges*, June 2012

45 Omelaniuk, I. *Global Perspectives on Migration and Development: Nepal*, 2012, pg. 40

This research tested the assumption that households with a greater range of income streams, and better access to markets and remittances, will be more likely to productively cope with and recover from the effects of the earthquake, compared to households without these capacities. Specifically, we explored how the following economic options supported household disaster resilience:

- **Income diversity and independence:** holding multiple sources of income, including at least one income source that has a different risk profile relative to agriculturally-based sources
- **Access to functioning markets:** relative ease of physically accessing a market center, and ability to purchase needed food and non-food items there, before and after the earthquake
- **Remittances:** having received remittances as a form of income from individuals working in Nepali cities or outside of the country before and after the earthquake⁴⁶

46 The number of households reporting having received remittances following the earthquake was too low to include in the analysis.

IV. METHODOLOGY

APPROACH TO RESILIENCE MEASUREMENT

The research design for this study is grounded in Mercy Corps' approach to measuring resilience.⁴⁷ This approach incorporates key elements of the integrated framework for resilience measurement developed by the Resilience Measurement Technical Working Group.⁴⁸ Specifically, the study collected data on the three sets of measures called out in that framework to be essential for analyzing resilience:

- Pre-shock conditions: captures initial states of household well-being, their characteristics and capacities⁴⁹
- Disturbance component: captures the severity of the shock(s) and stressors, and people's exposure and sensitivity to them
- Post-shock conditions: represents subsequent levels of household well-being and capacities

In addition to these measures, the research incorporated analysis of households' responses to the earthquake – i.e. what they did following the earthquake to manage the effects. As Bene et al, point out “not all responses to shocks and stressors necessarily result in positive well-being outcomes.” Rather, such outcomes are “the combined result of the effect of the shock, the capacities that people drew on, and the response(s) that individuals, households or communities used in an attempt to deal with the shock.”⁵⁰ Following this thinking, the study analyzed:

- If/how households' drew on certain capacities in response to the earthquake;
- What enabled households to employ more effective responses, which were less harmful to their long term well-being; and,
- How households' responses appear to have contributed to their abilities to cope and recover.

DATA COLLECTION

The research employed a sequential, mixed method approach. Preliminary hypotheses on what may have contributed to resilience following the earthquake were posed based on qualitative assessments from Mercy Corps operational areas in other parts of Nepal.⁵¹ We then conducted a qualitative assessment in May 2015 in earthquake-affected areas among selected Village Development Committees (VDCs) in the target Sindhupalchok District. The results of this fieldwork further assisted with refining hypotheses, selecting indicators, informing questionnaire design, and sample selection.

Quantitative data was then collected through a standardized survey administered in June 2015 to a representative set of households within five affected VDCs: Barhabise, Ramche, Gushkin, Karthali and Raneeshwara. Five months after the earthquake, Mercy Corps conducted a qualitative and quantitative monitoring survey around its humanitarian distributions, which assisted in interpreting and corroborating results.

47 Frankenberger, T., J. Kurtz, B. Sagara, *Approach to Measuring Resilience. Mercy Corps Resilience Discussion Paper*, #02, 2015.

48 For additional information on the Working Group, see their website: <http://www.fsincop.net/topics/resilience-measurement/technical-working-group/en/>.

49 Pre-shock data was collected using recall questions.

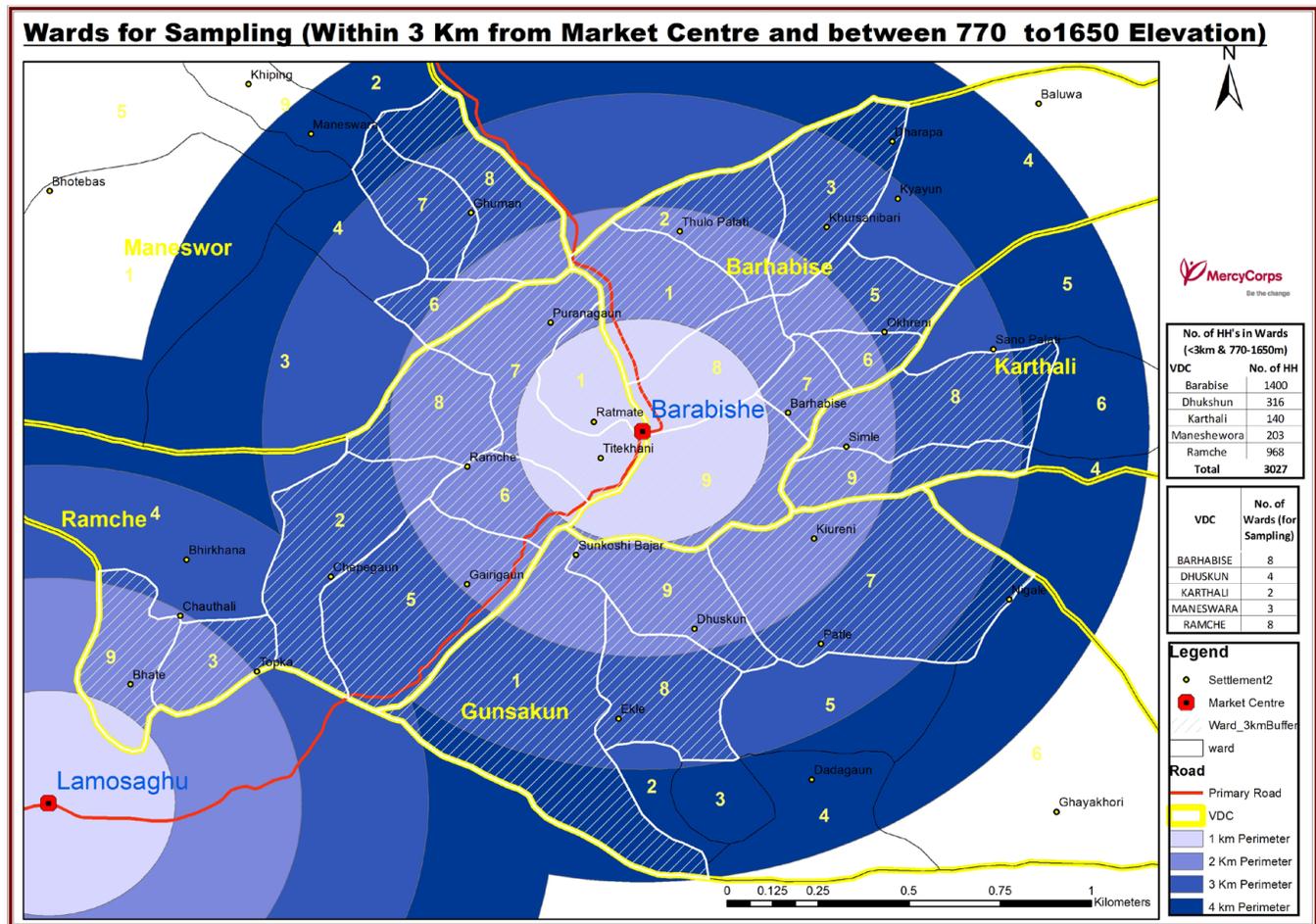
50 Béné, C., T. Frankenberger, S. Nelson. 2015. *Design, Monitoring and Evaluation of Resilience Interventions: Conceptual and Empirical Considerations. Brighton: Institute of Development Studies*

51 *Strategic Resilience Assessment of West and Far West Nepal, conducted for the USAID FFP-funded Promoting Agriculture, Health and Alternative Livelihoods Program*. Report forthcoming in December 2015.

Sample selection

Within these five VDCs, 26 Wards⁵² were purposively selected for inclusion in the study, based on the following criteria: similar levels on the Earthquake Severity Index,⁵³ up to three kilometers away from a market center, and between 770 and 1,650 feet in elevation. See Figure 4 below for a map of the study area with the sampling criteria. These areas were selected to capture populations that had a range of access to roads, goods, and financial services.

Figure 4: Map with Sample Selection Criteria



Sampling was stratified into five caste groups to ensure sufficient representation of castes with lower population representation in the area. One stratum was a combined group of the Brahmin and the Chhetri caste, considered the most elite and privileged in Nepali society. The caste group referred to as the Janajatis was broken down into the three strata reflecting the three dominant Janajati ethnicities residing in earthquake-affected areas, or the Newar, Tamangs, and the Gurungs. The final stratum was composed of the Dalit caste, considered as the untouchables in Hindu culture, and reflecting the most marginalized community in Nepal.

A total sample size of 1,225 households was reached using systematic random sampling. A final sample of 1,177 was used for the analysis. Table 1 provides a description of major socio-demographic attributes of the sampled households.

⁵² A ward is an administrative sub-division of a VDC. Rural VDCs are each composed of nine wards.

⁵³ UNOCHA. *Nepal Earthquake Severity Index (Version 4 - 30 April 2015)*, April 2015. Retrieved from <https://data.hdx.rwllabs.org/dataset/nepal-earthquake-severity-index>.

Table 1. Sample characteristics

	Frequency	Percent
Caste		
Strata 1 – Brahmin and Chhetri	378	32.12%
Strata 2 – Janajati, Gurung	187	15.89%
Strata 3 – Janajati, Newar	234	19.88%
Strata 4 – Janajati, Tamang	230	19.54%
Strata 5 – Dalit	141	11.98%
Gender of Head of Household		
Male	945	80.29%
Female	232	19.71%
Age		
18-34	392	33.31%
35-64	632	53.70%
65+	153	13%
TOTAL	1,177 households	

Variables

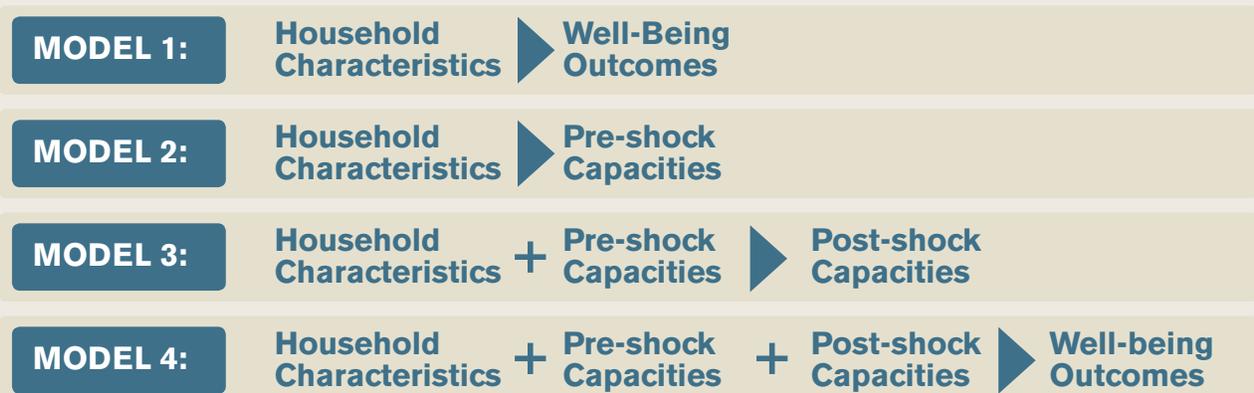
The survey instrument included modules covering the sets of measures listed in the conceptual framework (see Figure 2). The main variables are defined in Annex 2, including details on how the indices and scales were constructed.

DATA ANALYSIS

We used cross-sectional correlation analysis, following a theory-driven approach, to determine the key factors linked to more productive coping strategies and greater short-term recovery at the household level following the earthquake in Nepal. The analysis framework followed a multi-step model that began by analyzing the pre-existing variation in household characteristics, including their socio-demographic attributes and capacities prior to the earthquake. This household status was expected to affect household responses following the earthquake (post-shock capacity), as well as their ultimate well-being. The main goal of the analysis was to better understand which characteristics and capacities were associated with better post-earthquake well-being outcomes.

Following this theoretical chain, several models were run to test the presumed relationships, as outlined in Figure 5.

Figure 5: Regression models



Model 1 – Impact of the Earthquake on Household Well-being:

Regressing well-being outcomes on socio-demographic characteristics and severity of shock measure to determine to what extent the earthquake affected well-being outcomes. This model takes the functional form below:

$$\mathbf{F1} : \gamma_i = \beta_0 + \beta_1 \cdot Shock_i + \mu_i + \theta_j + \varepsilon_i$$

- γ_i represents the well-being outcomes of household i
- $Shock_i$ is a measure of the severity of the earthquake's effects on household i
- μ_i consists of demographic controls for household i , including the head of household's age and gender, a matrix of the gender control over household decisions, the ratio of dependents to adults, and the household's caste. Predicted poverty prior to the earthquake was also included.
- θ_j consists of fixed effects for ward j
- ε_i represents the error term

Model 2 – Socio-Demographic Determinants of Resilience Capacities:

Regressing pre-shock capacities on socio-demographic characteristics to determine what types of households and sub-groups appear to possess or be deprived of important resilience capacities.

$$\mathbf{F2:} Capacities_i = \beta_0 + \mu_i + \theta_j + \varepsilon_i$$

- $Capacities_i$ represents the pre-shock resilience capacities of household i

Model 3 – Effect of Resilience Capacities on Responses:

Regressing post shock responses on pre-shock capacities and socio-demographic characteristics to determine which pre-shock capacities are significantly correlated with specific post-shock responses.

$$\mathbf{F3:} Responses_i = \beta_0 + \beta_1 \cdot Capacities_i + \beta_2 \cdot Shock_i + \mu_i + \theta_j + \varepsilon_i$$

- $Responses_i$ represents the post-earthquake responses household i

Model 4 – Determinants of Resilience:

This model represented the complete theoretical chain, regressing the final well-being outcomes on post-shock responses, pre-shock capacities, socio-demographic characteristics, and controls. Sub-models were used for each of the four factors explored: disaster preparedness and response, social capital, financial services, and economic options. In each category, survey responses were collapsed to essential independent variables via index creation, factor analysis, and binary variable creation.

$$\mathbf{F4:} \gamma_i = \beta_0 + \beta_1 \cdot Responses_i + \beta_2 \cdot Capacities_i + \beta_3 \cdot Shock_i + \mu_i + \theta_j + \varepsilon_i$$

For all the models, OLS regression was used for continuous dependent variables, and probit regression was used for binary dependent variables. All models used robust standard errors to account for heteroscedasticity. All models included Ward fixed effects to control for unmeasured differences across the geographies that may be correlated with the explanatory variables and the outcomes of interest. Variables which are significant in these models are considered to be significant at the ten, five or one% levels. As multiple outcomes were used, explanatory variables were considered to have a clearer relationship with outcomes when the correlation was significant across multiple outcomes.

CHALLENGES AND LIMITATIONS

Cross-sectional analysis

This study draws upon cross-sectional data collected at a single point in time. The results of the analysis show correlation between household characteristics, capacities, responses, and well-being, rather than causation. Omitted variable bias is a particular concern, as unobservable characteristics such as personal ability or motivation may be correlated with both the explanatory and outcome variables. Additionally, the correlations identified through the analysis represent pre-existing factors among the population. The effects of a program which built households' capacities, or led to certain responses, may have different impacts on households' well-being.

Survey timing

The timing of the baseline survey, two months after the earthquake, also limits the measurement of well-being outcomes to a particular point in time. Both significant and insignificant relationships between explanatory variables and outcomes are only indicative of short-term recovery. Responses or capacities which had no relationship to recovery at two months may come to hold a significant relationship over a longer time period. Likewise, those explanatory variables which are related to recovery in the short-term may not be correlated with longer-term recovery and resilience. Further rounds of data collection and analysis are planned to develop an understanding of both short- and long-term predictors of resilience.

Generalizability

The sample was drawn from a selection of Wards within three kilometers of the market center, and between 770 and 1,650 feet in elevation. The results are therefore indicative of populations which had moderate access to roads, market goods, and financial services. Population characteristics, and the specific factors which are correlated to well-being outcomes, may be different for households located in more remote areas. Further, two Wards selected for sampling were inaccessible during the survey period due to landslides. This further limits the generalizability of the sample to the more accessible or urban Wards in Sindhupalchok District.

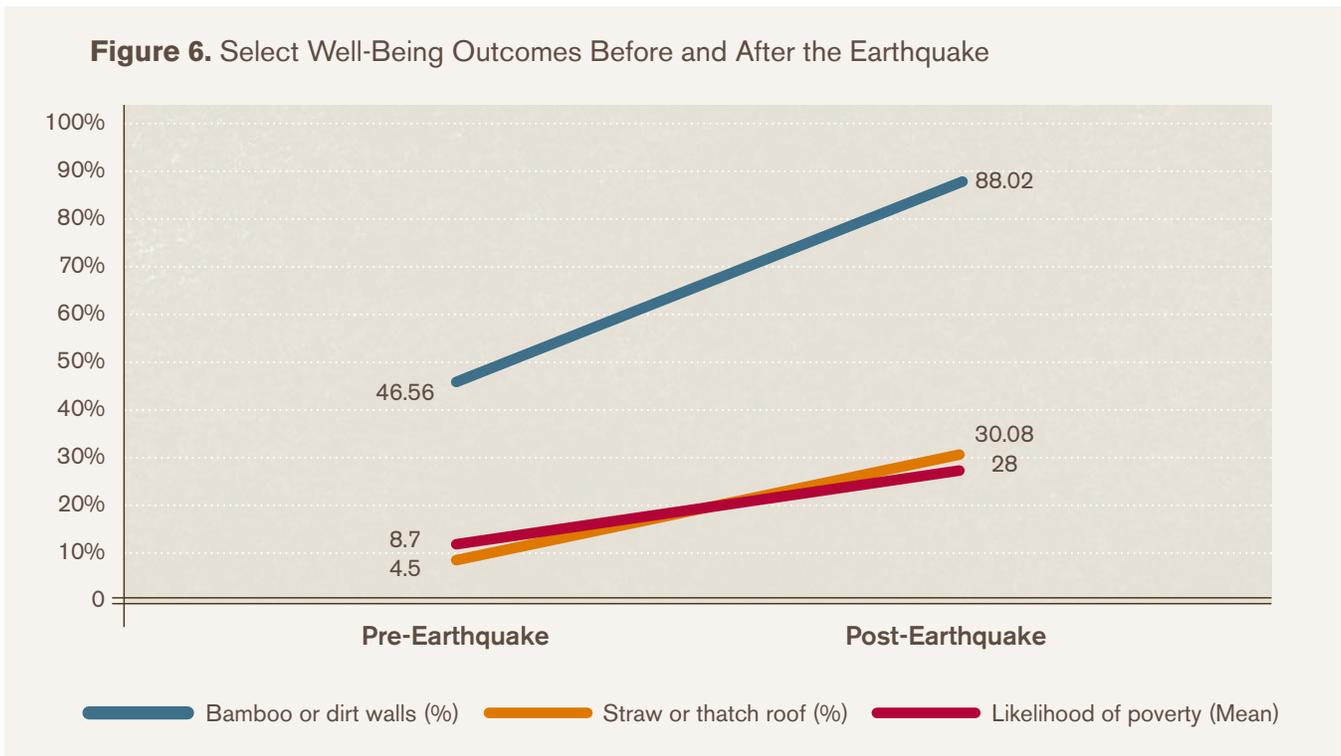
Additionally, large shifts in the population as a response to the earthquake led to a high rate of replacement in respondent selection. A substantial proportion of the chosen respondents had migrated out of the Sindhupalchok area. As a result, this analysis applies only to households which either chose to remain within their Wards, or were unable to leave. Further research may be required to examine the differences between those who remained near their home, and those who migrated elsewhere.

V. FINDINGS

EFFECTS OF THE EARTHQUAKE

The earthquake had catastrophic effects on communities already struggling to overcome poverty, though the exact impact varied across households. Over 50% of households reported having houses built of cement or stones before the earthquake, and over 90% reported tile, wood, or metal roofing. After the earthquake, these values fell drastically—only 11% of households reported having cement or stone walls (see Figure 6 below). Almost 30% of respondents reported having no shelter at all after the earthquake. This percentage did not differ greatly across caste or gender, showing that the earthquake's effects reached all groups fairly equally.

The Progress out of Poverty Index (PPI) gives a similar picture of the earthquake's effects. The index consists of a series of questions on household demographics and asset ownership, and draws on research conducted by the Grameen Foundation to predict the likelihood of a household being below the national poverty line. Before the earthquake, the average likelihood of poverty was 8.7%, with over 70% having less than a 5% likelihood of being below the poverty line. After the earthquake, the mean rose drastically to 28%, showing a much higher likelihood of poverty.

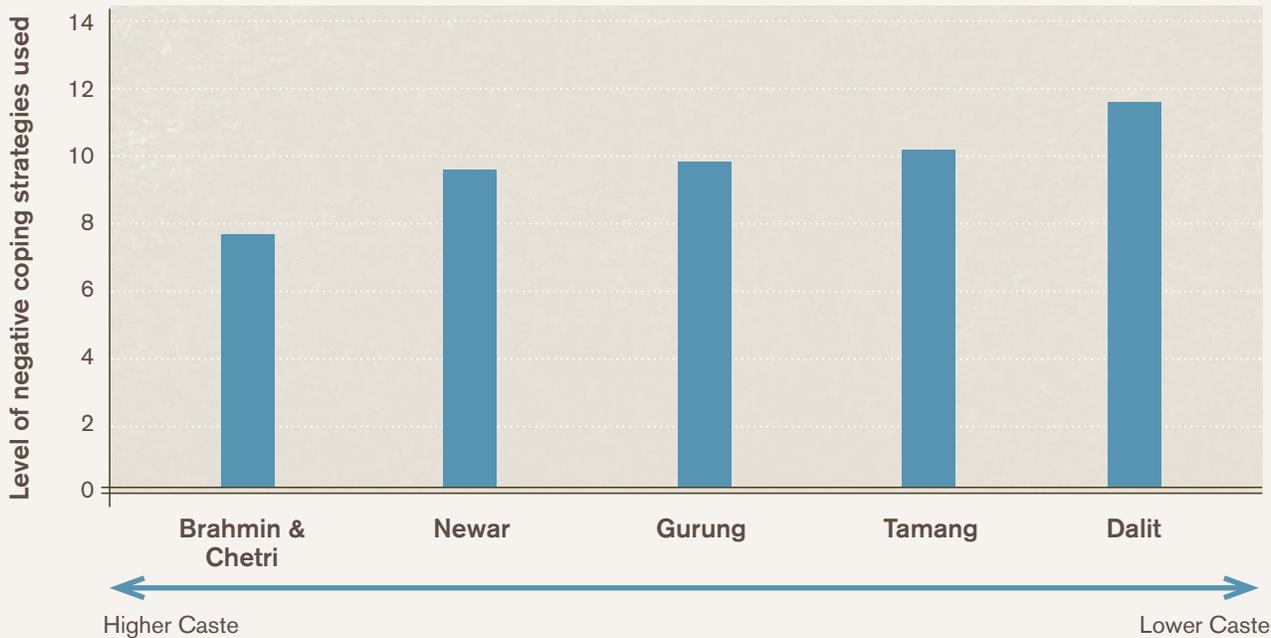


How are People Coping?

Though the earthquake impacts were spread evenly across caste and gender, the ability of households to respond was not. This is evident in the results for the Coping Strategies Index (CSI). The CSI assesses households' use of distressful coping mechanisms to meet their food needs, such as skipping meals and taking children out of school. A higher score indicates that households are forced to use more negative coping mechanisms. Based on this index, the higher caste groups were much more able to respond to the earthquake without resorting to coping techniques that may harm their future prospects. The Brahmin caste reported an average CSI score

of 7.69, compared to 11.43 for the often-marginalized Dalit caste. This means Dalits were much more likely to resort to selling livestock or productive assets to survive, even though this may jeopardize their ability to earn income in the future. These results held even when controlling for pre-earthquake poverty status, meaning that the differences in CSI scores are not because of income differences between Brahmins and Dalits.

Figure 7. Coping Strategies Index Score, by Caste



To What Extent are People Recovering?

Two months following the earthquake, communities and households were beginning to show signs of recovery, but the process was slow and varied across groups. Only 18% of respondents reported having invested in productive assets to replace what had been lost. Livelihoods were also hit; only 40% of respondents said they were able to either maintain or regain any of their livelihood sources following the earthquake.

DETERMINANTS OF DISASTER RESILIENCE

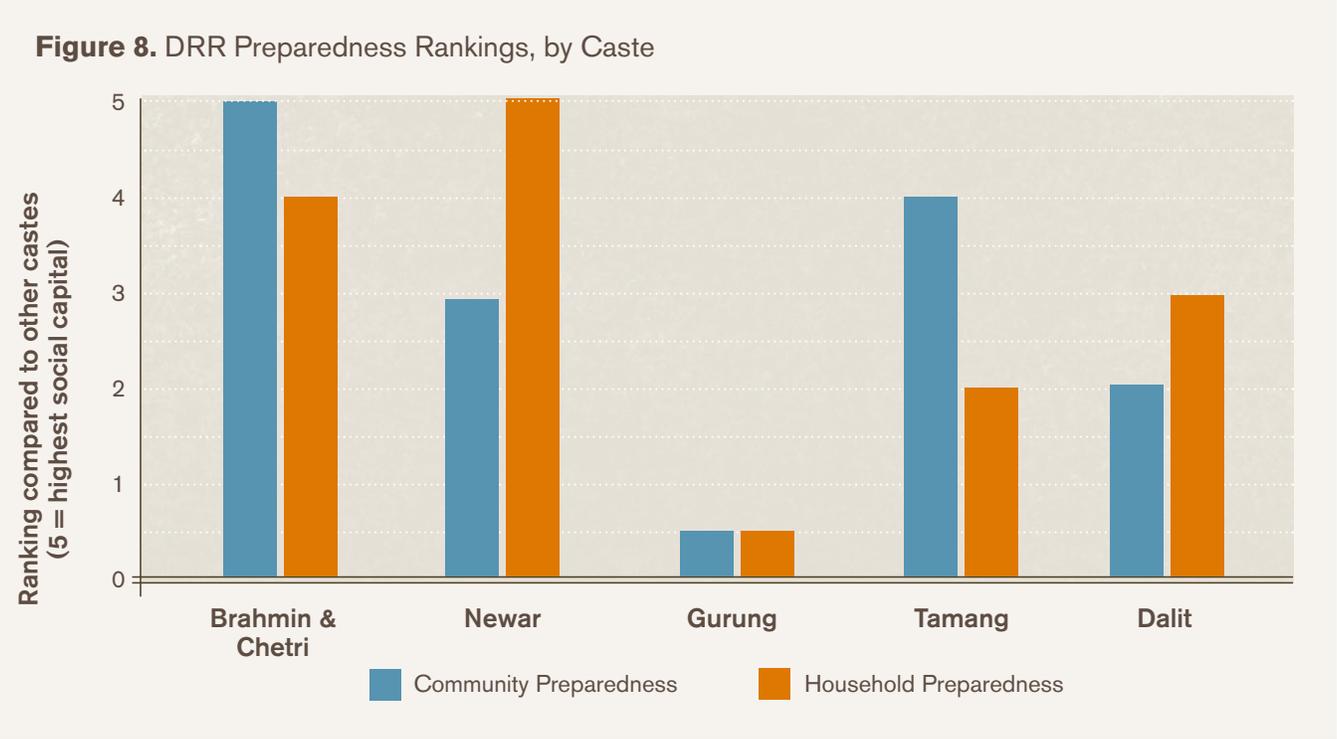
Disaster Preparedness and Response

Profile of Study Area

The research examined the apparent contributions to households resilience made by disaster preparedness as a pre-shock capacity at a community and household level. At a community level, this included the combined effects of a having a community disaster plan or committee, as well as an index measuring the existence of community-based DRR mechanisms, including whether communities had taken steps to mitigate disasters, could access resources, and had relevant training. In the study area, the vast majority of households (83%) did not have a DRR plan or committee in place in their communities. On the index of community preparedness, respondents indicated low levels of disaster preparedness across the communities. Gurungs, Newars and Dalits all had statistically significant lower scores relative to Brahmins and Chhetris.

Household-level disaster preparedness was measured through an index that examined self-reported disaster awareness, familiarity with evacuation routes, and knowledge of appropriate measures to take following disaster onset. Overall scores were low, indicating limited overall disaster preparedness, though scores varied greatly among castes. Again, all the other caste groups besides Newar reported lower average scores than the higher caste Brahmins and Chhetris, possibly indicating lower investments in DRR in areas where lower castes are the majority.

Figure 8. DRR Preparedness Rankings, by Caste



As response variables, or post-shock capacities, the study looked at number of aid sources and timeliness of aid, as measured by the number of days it took for households to first receive disaster assistance, with less than seven days being considered 'timely.' In the study area, only 18% of respondents reporting receiving aid within the first week after the earthquake. Based on qualitative information, the vast majority of aid within this time frame was reported to come from government and local NGOs in the form of life-saving assistance, primarily food and tarpaulins. By ten weeks, at the time the survey for this study was administered, almost 90% of respondents received between two and four sources of assistance, ranging from the national government to international NGOs. Only 3.5% said they had received no aid at all by the time of the survey. Importantly, Tamangs and Dalits were statistically less likely to receive aid within seven days, relative to Brahmins and Chhetris. Female-headed households, on the other hand, were 60% more likely to receive timely aid than households with male heads.

Another element of household disaster preparedness examined was perceptions of control over one's destiny, or whether the respondents felt their circumstances were more determined by luck or external forces. Households averaged scores of 2.35 on a 1 to 5 scale, where 5 indicated a high level of local of control, or low helplessness.

Multivariate Analysis Results

Table 2. Effects of Disaster Risk Preparedness and Response Measures on Well-being Outcomes

	Lower use of negative coping strategies (CSI)	Higher household dietary diversity (HDDI)	Investment in productive assets	Able to maintain or regain livelihoods	Higher shelter quality	Lower likelihood of poverty (PPI)
Disaster Risk Reduction						
Existence of community disaster management committee and plans	--					
Level of community DRR preparedness				---		
Level of household DRR preparedness		+++		+++	--	
Relief Assistance						
Number of aid sources received		--		---	+	++
Timeliness of aid (received within 7 days of the earthquake)	+++		++	+++	+++	
Locus of Control						
Sense of self-determination (versus helplessness)	+		+		+++	
Perceived ability to cope with the effects of the earthquake					+++	

(+) represents a positive relationship between indicators, with more (+) representing a relationship that is statistically stronger
 (-) represents a negative relationship between indicators, with more (-) representing a relationship that is statistically stronger

FINDING 1: Timely aid helped households cope effectively and recover more quickly in the aftermath of the earthquake.

Among all post-shock variables, timeliness of aid was associated with the most positive short-term coping and recovery outcomes. Households who reported receiving timely relief, or within seven days of the earthquake, were nearly twice as likely to have (1) invested in productive assets and (2) maintained or regained their livelihood sources, comparing with households that received aid later or not at all. They also tended to have better shelter conditions and used fewer distressful coping mechanisms to meet their family food needs. Importantly, the vast majority of aid within seven days was food and critical life-saving items, suggesting that very basic but immediate support can ensure families don't have to lose critical assets and savings just to meet immediate food consumption needs. These findings point to the critical need for aid actors and government to quickly mobilize and distribute relief within the first seven days of a crisis.

The number of aid sources received by households had mixed results. Families that reported receiving more aid sources over the first ten weeks were more likely to have better quality shelter and a reduced likelihood of poverty, compared to families who had received less relief assistance. However, they were also 30% less likely to be able to maintain or regain livelihoods, and had a slightly lower dietary diversity scores. These results are difficult to interpret based on our cross-sectional analysis. They may indicate that aid was ultimately successful in targeting households with the highest food and livelihood insecurity. An improvement in shelter suggests that multiple organizations may have been distributing shelter materials, but not other critical items required to enhance food consumption and dietary diversity. Finally, the need to meet numerous—even competing—bureaucratic requirements for multiple aid sources could have resulted in decreased time and ability to make more productive investments.

FINDING 2: Community-level disaster preparedness mechanisms were not associated with better coping and recovery, except where they channeled timely aid.

Higher levels of reported community DRR preparedness, a pre-shock capacity, did not have statistically significant effects on most of the short-term coping or long-term well-being measures. The exception was maintaining and regaining a livelihood source, where it had a negative relationship. Similarly, having a community disaster plan or committee in place was not associated with positive outcomes, but was associated with more distressful food consumption patterns post-shock. Better DRR community preparedness was, however, linked to households receiving aid within seven days, increasing the likelihood of this by 183%. Linking social capital appeared to be one of the mechanisms at work here. Higher scores on the community DRR measures were associated with a greater likelihood of households being able to draw on government networks for assistance post-earthquake. Such officials may have influence over where and when relief assistance is distributed. Qualitative data also confirmed that early distribution in the study area was predominantly from government entities in the form of food and tarpaulins.

The results suggest that where community preparedness was higher, community DRR systems channeled aid within seven days, but were otherwise ineffective in helping households manage the effects of the shock holistically. In Nepal, community disaster preparedness is implemented through Village Development Committees, or the equivalent of decentralized local government structures. In cases where households understood that local government disaster preparedness was in place, either because of trainings or messaging pre or post-crisis, they may have over-relied on a system that was already weak, poorly functioning and over-stretched, at the expense of other self-help mechanisms.

This interpretation is supported by the qualitative findings. A number of focus groups revealed that various political party leaders had made promises of assistance. Most of these announcements were unofficial and misleading. The Government of Nepal had officially announced within one month after the earthquake that households would each receive an unconditional 15,000NPR transfer to begin recovery and reconstruction. Five months later, only four out of ten focus groups in Sindhupalchok district that Mercy Corps conducted as part of its intervention monitoring stated that they received the full amount; another focus group reported receiving a single installment of 7,000NPR, and the remaining five received no government cash at all. Also as part of the monitoring, key informants revealed that local party leaders were making promises to local citizens ranging from the distribution of rice cookers to permanent residence in a first world country.

An ineffectual government response at a local level is also underscored by challenges at the national level. At the time of writing this study, the Government of Nepal had yet to approve its Nepal Recovery Act, which is to include new building codes for post-earthquake reconstruction. Residents have been warned that they will not receive a government allocated 200,000NPR cash transfer per affected household for reconstruction unless they follow these new building standards, which have not yet been approved.

FINDING 3: Household-level disaster preparedness and self-determination appear to support coping and recovery.

In contrast to community-level preparedness, households that reported their families were aware and knew what to do following disasters tended to be coping and recovering from the earthquake better than families without such DRR awareness. Specifically, they were 50% more likely to have maintained or regained their livelihoods, and had higher household dietary diversity. At the same time, the higher scores on the family DRR preparedness index were associated with lower shelter quality. Taken together, these findings suggest that family DRR preparedness supported households to invest in positive short-term coping and recovery strategies, including diet and livelihoods, potentially at the expense of longer-term well-being measures like shelter. Underinvestment in shelter here may also have been driven by fears that unpredictable and heavy monsoon rains could cause landslides and force relocation once again. In addition, it was understood that government would offer financial and technical assistance for rebuilding after it had completed technical assessments and approved new building codes. These were again due to come out after the monsoon.

Respondents' perceptions of their abilities to exert control over their future (as opposed to being resigned to fate), were associated with a number of positive outcomes, including reduced reliance on distressful food consumption patterns, a 30% greater likelihood of investing in productive assets, and improved shelter quality. Focus group data from the pre-survey assessment also observed differences between optimistic groups and those with fatalistic attitudes. Those with greater optimism were noted to share stories of community re-building in contrast to stories of fatalism and awaiting more aid. These results should be looked upon with a degree of caution, as they may also be suggesting reverse causality, where those who are doing better see themselves as having more control over their lives. Nonetheless, given the documented contributions of people's aspirations towards recovery and well-being during periods of stress,⁵⁴ the results underscore a positive reinforcing loop among improved coping measures, a positive psychosocial state, and enhanced signs of recovery.

TAKE AWAY: Existing approaches to community-based disaster risk reduction may be insufficient to support disaster resilience, unless they extend capacity to households and advocate for effective local governance. DRR community preparedness, a local government function in Nepal, appeared to facilitate channeling timely aid through life saving items to affected households. Beyond this, it did little else to improve community members' abilities to manage the effects of the earthquake. This suggests that in contexts of limited governance capacity, forming DRR committees and plans, allocating resources, and providing trainings are not enough to support disaster resilience. Rather, they may wrongly encourage citizens to rely on structures and systems that exist in form, but not in function. Importantly, household-level preparedness appears to be a critical resilience capacity, suggesting community preparedness mechanisms can be more effective if they connect to and directly support household-level preparedness and response. Research shows that this link is currently missing in Nepal.⁵⁵ Furthermore, DRR investments must do more to assess where the local governance structures are and are not up to the task of leading disaster preparedness efforts, and build advocacy capacity among citizens' groups to strengthen government accountability and responsiveness in DRR.

Social Identity and Networks

Profile of Study Area

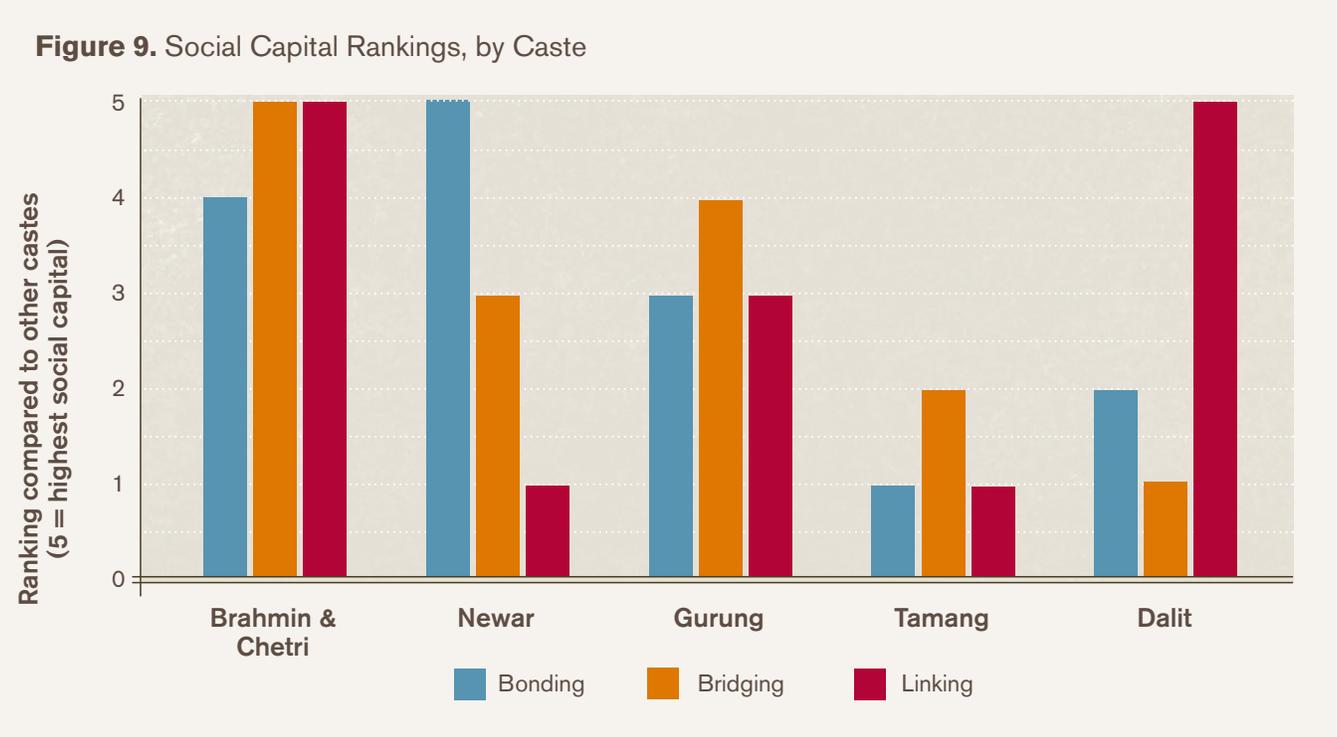
Given the strong rules and norms associated with caste and gender in Nepal, the study examined how these identity markers affect access to pre-shock capacities, post-shock responses, and ultimate well-being in a disaster setting. The apparent contributions of social networks on resilience was measured through bonding,

54 Frankenberger, T., et al. Ethiopia: The path to self-resiliency. Final Report prepared for CHF-Partners in Rural Development, July 2007

55 Ministry of Home Affairs. National Progress Report on the Implementation of the Hyogo Framework for Action (2013-2015), January 2015

bridging, and linking social capital, as well as collective community action, both as a pre-shock capacity and after the earthquake as a response. Bonding and bridging respondents claimed confidence that they could rely on their own caste for help prior to the earthquake, and 81% continued to feel the same after the shock. Another measure of bonding social capital, collective action, examined to what extent households participated in the traditional Nepali self-help system called *perma*.⁵⁶ In this case, Newars had the lowest mean, and made up 45% of households that did not participate at all in the traditional Nepali system prior to the earthquake.

Bridging social results were very similar: 84.5% of respondents perceived other castes helped them when in need prior to the earthquake, and 81% said they maintained this belief post-shock. In this case, a clear caste trend is visible. Brahmins and Chhetris combined reported the highest levels of bridging social capital with a mean of 4.05 out of 5, and continuing down until Dalits, with the lowest level of bridging social capital at 3.77 out of 5. See Figure 9 below for rankings of the caste groups on bonding, bridging, and linking.



For all forms of social capital, questions asking about post-earthquake examples returned lower values than the estimates from before the earthquake. In particular, Brahmin and Chhetri respondents appeared to overestimate their levels of pre-earthquake social capital, which may not have materialized into support for them following the disaster. Another trend was that the mean response for female-headed households was lower than male-headed households across all forms of social capital, both before and after the earthquake. This is likely because of the high marginalization and workload of Nepali women, which would restrict their time to participate in community organizations or other social groups.

⁵⁶ The *perma* system is a self-help, labor exchange system in Nepal. It applies particularly to agriculture, where one works on someone's land, and receives the same favor in return.

Multivariate Analysis Results

Table 3. Effects of Social Capital on Well-being Outcomes

	Lower use of negative coping strategies (CSI)	Higher household dietary diversity (HDDI)	Investment in productive assets	Able to maintain or regain livelihoods	Higher shelter quality	Lower likelihood of poverty (PPI)
Bonding						
Bonding social capital (prior)		++	-			
Drawing on bonding social capital (after)		+				
Collective action (prior)			++		+	
Collective action (after)						
Bridging						
Bridging social capital (prior)		---		---		
Drawing on bridging social capital (after)						
Linking						
Linking social capital (prior)		---			++	
Drawing on linking social capital (after)	---	---				

(+) represents a positive relationship between indicators, with more (+) representing a relationship that is statistically stronger (-) represents a negative relationship between indicators, with more (-) representing a relationship that is statistically stronger

FINDING 1: Caste and gender identity limited access to resources and resilience strategies, and were strong predictors of poorer coping and recovery after the earthquake.

Being a member of any caste other than the two elite groups was associated with a greater use of distressful food consumption patterns and worse household dietary diversity after the earthquake. The data also showed that caste, independent of poverty status, determined people's ability to access resources and apply strategies that could support more productive coping before and after the disaster. Tamang and Dalit households were more likely to experience a delay in the receipt of aid by 65% and 84% respectively, relative to Brahmins and Chhetris combined, controlling for remoteness. In addition, respondents from all the lower castes tended to have poor household-level DRR awareness and preparedness, and Dalits were less likely to access formal credit post-disaster.⁵⁷

However, lower caste groups were more likely to report informal savings prior to the shock, itself a measure associated with improved shelter and reduced likelihood to enter into poverty. This suggests that marginalized groups are more likely to draw on certain, largely informal, strategies that assist them in managing disasters. However, the wider systems within which they are embedded are discriminatory and do not permit them to optimize resources and strategies towards resilience, compared to the two highest caste groups.

⁵⁷ DRR family preparedness and drawing on formal credit were both associated with positive outcomes post-earthquake.

Households where women had responsibility over decision-making were nearly 57% less likely to maintain or regain livelihoods, or invest in assets post-earthquake. On the surface, this appears to contradict theories on gender empowerment and resilience⁵⁸ But upon further analysis, these results shed light on how the extreme marginalization of women in Nepali society impacts household well-being during crises. Many of the households that reported near or exclusive female decision-making were female-headed households, where the adult males had either migrated or died. For these families, women may have been forced to take on traditionally male roles, but likely had reduced bargaining power and ability to access needed resources or opportunities. Lacking true empowerment, these women would have faced greater challenges in investing in assets and maintaining or regaining livelihoods post-earthquake.

FINDING 2: Active bonding networks and relationships helped people cope and begin recovery following the earthquake.

Higher levels of bonding social capital pre- and post-earthquake were associated with better household dietary diversity, suggesting that being able to rely on members of one's own caste for help assisted in bolstering food consumption immediately after the disaster. However, bonding social capital pre-earthquake was associated with decreased investment in assets after, suggesting a potential trade-off between investments in short-term food consumption and longer-term recovery measures, with households potentially trading assets for food within bonding networks.

Involvement in community collective action – an important form of bonding social capital – appeared to contribute to better recovery. Families reporting participation in the traditional self-help *perma* system prior to the earthquake were more likely to invest in productive assets and better quality shelter after the earthquake. Given that *perma* relies on mutual assistance through labor exchange, this suggests households who had invested in such social capital stocks could draw on them after the disaster.

Bridging social capital, as measured by the ability to rely on members of other castes for help, was not found to be significantly related to any of the coping or recovery measures, despite being reported at high levels. Help from other castes in Nepal traditionally comes through contributions during marriage or funeral ceremonies. Support in funerals may have maintained its relevance post-earthquake. However, this form of bridging capital may not have translated into other forms of assistance, such as sharing food or shelter, which would likely have had a more direct effect on coping and recovery.

FINDING 3: Linking social capital was associated with poorer resilience, suggesting that over-reliance on government assistance may hinder coping and recovery in contexts of weak governance.

Households with higher levels of linking social capital, as measured by respondents' confidence that they could influence government and that it was working to help them recover in the post-earthquake context, actually showed poorer short-term coping and medium-term recovery, 10 weeks after the earthquake. Households showed poorer quantity (as measured by the CSI) and quality (as measured by HDDI) of food consumption, as well as lower likelihoods of maintaining or regaining livelihood sources after the earthquake.

The findings here are instructive. Previous studies that measure linking social capital have shown positive associations between government ties and household resilience.⁵⁹ Not seeing this result here suggests that

58 Mercy Corps. Rethinking Resilience: Prioritizing Gender Integration to Enhance Household and Community Resilience to Food Insecurity in the Sahel. Retrieved from <https://www.mercycorps.org/research-resources/rethinking-resilience>

59 Aldrich, D.P. *Building resilience: Social Capital in Post-Disaster Recovery*, 2012

perceptions of being linked to government officials may not in fact yield returns if government capacity is low, or where governance systems are not adequately functioning. Nepal ranks in just the 19th percentile in government effectiveness on an index of global indicators.⁶⁰ The claim of weak governance has been further underscored by the qualitative examples above of where local political leaders misguided citizens, as well as Mercy Corps' observations in the coordination of recovery efforts. As has been seen in other disasters in the region, people that perceived local government mechanisms to be supportive may have relied on them for assistance instead of other support structures, leaving their families worse off.⁶¹

TAKE AWAY: Who you are matters – social characteristics and relationships can determine welfare and well-being after a crisis. The negative relationship between being from a lower caste and short-term coping and long-term well-being outcomes suggests humanitarian actors must do more to address entrenched social hierarchies. This must include reinforcing positive informal coping strategies among marginalized groups, such as strengthening bonding social capital and access to informal savings. At the same time, it requires connecting marginalized groups to formal support structures, including formal financial services and opportunities for receiving government aid. Importantly, more must be done to address potential threats of over-dependency on government in contexts of weak institutions. This means humanitarian assistance must be aware of and sensitive to the local governance context, not only analyzing when and how to work with government and formal civil society, but also where it is required and ethical to work beyond them. Responders can do this by strengthening legitimate, alternative community platforms that can enhance equity and impact in disaster preparedness and response.

Financial Services

Profile of Study Area

The research examined the role of financial services access on household's abilities to manage the effects of the earthquake. Households were considered to have access to savings if they held cash or assets in formal accounts or through informal means in the 12 months prior to the earthquake. They were also asked whether they drew on these sources, or tried to access them and could not after the shock. Households were considered to have credit access if they took loans, formal and/or informal, in the 12 months prior to the earthquake, and again if they accessed formal or informal loans after the shocks. Table 4 below describes which sources were considered formal and informal for savings and credit.

All sampled households were within a three kilometer radius of Barhabise town, the major commercial center with banks, cooperatives, microfinance institutions, and remittance agents. However, travel time to the town center varied considerably, with 61% of respondents taking less than an hour to reach the center, another 29% between 1-2 hours, and 7% more than 2 hours. Informal financial services were commonly within the households' settlement, or cluster of households within a VDC; this was the case for 47% of savings groups and 38% of moneylenders.

In terms of use of financial services, 70% of respondents reported having either formal or informal savings prior to the earthquake, and 54% reported having used some form of credit. Surprisingly, rates of formal savings were higher than informal savings in the study area. Over 57% of respondents had held formal savings and 33% had taken formal loans in the 12 months preceding the earthquake. Newars had the highest rate of formal savings and borrowing, at 75% and 37% of respondents respectively, likely because of their merchant and trader status. Only 25% of respondents reported holding informal savings beforehand, whether in the form of cash or as assets, and informal credit was used by 30% of respondents.

60 World Bank Worldwide Governance Indicators. *Country Data Report for Nepal, 1996-2014*. Retrieved from <http://info.worldbank.org/governance/wgi/index.aspx#home>

61 Islam, R. & Walkerden, G. *How do links between households and NGOs promote disaster resilience and recovery?*, 2015

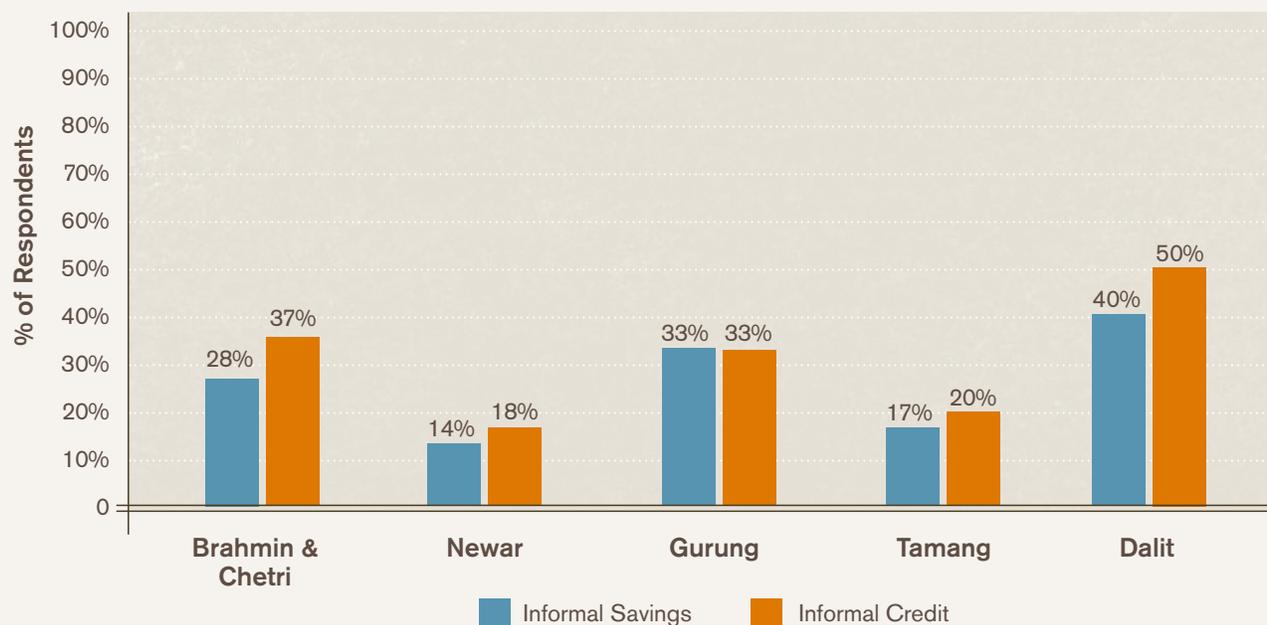
Table 4. Formal and Informal Savings and Credit Sources Pre-earthquake
(% of households using each financial service*)

Savings		Credit	
FORMAL			
Cooperatives	44.44%	Banks	27.61%
Banks	30.76%	MFI's	7.14%
Financial institution	1.78%		
INFORMAL			
Local savings group	20.14%	Community, family, or friends	13.68%
Investing in assets	3.57%	Jamindaar (wealthy landlord)	10.62%
At home	2.55%	Local credit shop	8.92%
Lending to others	0.85%	Community welfare program	5.27%
With friends	0.17%	Other borrowing	0.68%
		Employer	0.59%
NO SAVINGS	29.74%	NO LOANS	45.45%

* Note that because households can have multiple forms of savings and credit, the sum of the percentages exceeds 100 percent

Overall, 40% of Dalit respondents had informal savings, the highest ratio of all the castes (the next highest is the Gurungs, where 33% had informal savings). Fifty percent of Dalits also held informal credit, by far the highest rate of any group. Newars were statistically less likely to borrow informally and had the lowest rate of informal borrowing in the group at 18%. Thirty seven percent of female-headed households borrowed informally compared to 29% among their male-headed counterparts.

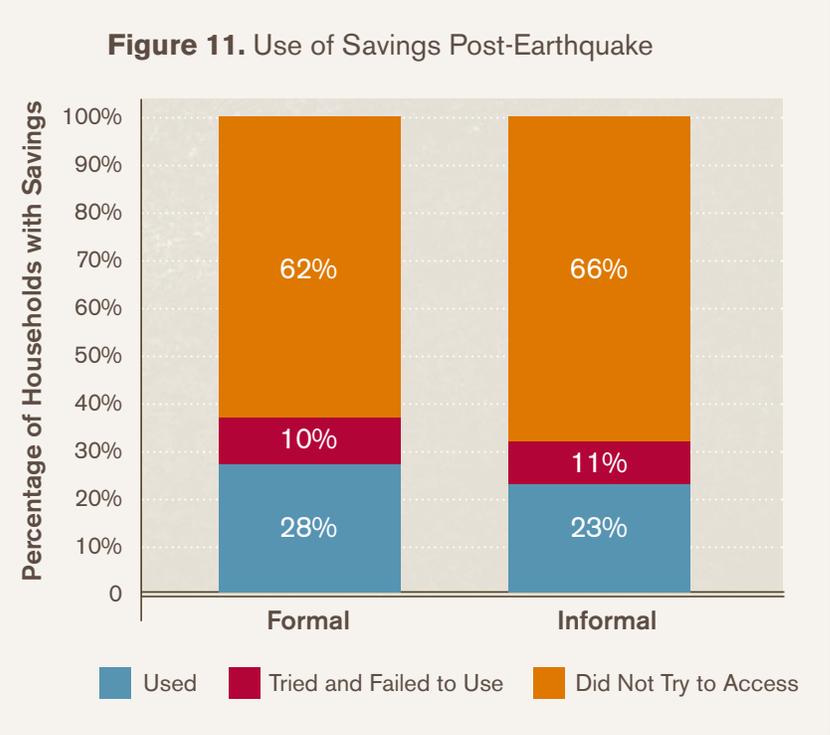
Figure 10. Informal Savings and Credit Rates Before the Earthquake, by Caste



Rates of financial service use dropped significantly after the shock, though only a small portion of the decrease was explicitly attributable to having physical access to services cut off. Less than 30% of households with formal savings said they tried to use their savings after the earthquake, while another 10% said they tried to use the savings after the earthquake but were unable to do so. This means 60% of those who had formal savings did not attempt to use them. Withdrawal rates were even lower for informal savings. Of the small number of households who had informal savings (only 25% of all respondents), only 14.5% said they tried to use this money after the earthquake, and less than 7% said they tried to access these savings and were unable to do so. This suggests that 80% of those who had informal savings did not attempt to access them to help them in the post-earthquake context.

Only 13% of households used formal credit post-earthquake, far below the pre-earthquake formal borrowing rate of 33%. Out of the households who held formal credit prior to the earthquake, 15% tried to access credit and were unable to do so; another 10% who never had formal credit tried but were unable to access it post-earthquake. Rates of informal credit used post-earthquake were slightly higher at 24%.

Multiple reasons exist for why households did not access their savings, and had low credit use post-earthquake: local savings and credit groups may have been rendered inoperative, for example, and broken apart; or households may have not attempted to withdraw their savings because they knew the financial services were non-operational after the earthquake. While the survey did not ask about receipt of emergency cash transfers, this cash would have likely been used first, allowing households to preserve savings for the future. Alternatively, households could have leveraged savings or drawn on the relationships within savings groups (bonding capital) to receive community assistance. More investigation is required to understand the reasons behind low savings withdrawal and credit use post-earthquake.



Multivariate Analysis Results

Table 5. Effects of Financial Services on Well-being Outcomes

	Lower use of negative coping strategies (CSI)	Higher household dietary diversity (HDDI)	Investment in productive assets	Able to maintain or regain livelihoods	Higher shelter quality	Lower likelihood of poverty (PPI)
Savings						
Formal savings (prior)		+++	-			--
Informal savings (prior)					+++	+++
Credit						
Formal credit (prior)	-		-			
Drawing on formal credit (after)	++			+++		
Informal credit (prior)	-		--			
Drawing on formal credit (after)	---	---				

(+) represents a positive relationship between indicators, with more (+) representing a relationship that is statistically stronger (–) represents a negative relationship between indicators, with more (–) representing a relationship that is statistically stronger

FINDING 1: Savings appeared to be an important form of support in a post-crisis context, with informal savings being particularly critical for marginalized groups.

Households who had informal savings prior to the earthquake tended to fare better in its aftermath than those who did not—having informal savings was associated with improved shelter quality and a lower likelihood of poverty. This finding is particularly interesting considering that only 23% of those with informal savings actually used them after the earthquake. The benefits of savings may have had more to do with social support received from being part of a savings groups, where the vast majority of informal savings were held, rather than drawing directly on the source of cash. Because people from lower caste ethnicities were statistically more likely to hold informal savings pre-earthquake, this suggests that informal savings groups may be a critical source of support for more marginalized groups after a disaster.

Holding formal savings pre-earthquake showed mixed results. Households with formal savings were likely to have greater dietary diversity, but tended to be at greater risk of being in poverty, and were 40% less likely to have invested in productive assets post-shock. This suggests that those with formal savings were better able to access diverse foods, or used their savings to receive food assistance from the wider community.

The ability of those with both formal and informal savings accounts to better leverage community assistance—despite low withdrawal rates—is supported by the fact that both groups were 50% more likely to engage in collective action post-shock, as measured by helping to rebuild community structures. However, the apparent improvement in dietary diversity among those who had formal savings contrasts with informal savings holders, who showed better long-term well-being outcomes (such as improved shelter or investment in assets), but not short-term coping (such as food consumption). These findings illustrate where trade-offs may exist between

investments in positive short-term coping, and long-term well-being outcomes. More investigation is needed to understand which choices yielded better outcomes over the long term.

FINDING 2: Pre-crisis debt may have made families worse off in the aftermath, but access to appropriate loan products post-crisis was important for recovery.

Use of credit prior to the earthquake was negatively associated with multiple coping and well-being outcomes. Households who used formal and informal credit sources in the 12 months prior to the earthquake were more likely to rely on distressful coping strategies after. Similarly, households that used informal credit pre-shock had a 44% lower likelihood of investing in productive assets post-earthquake. After the earthquake, drawing on informal credit was associated with greater food insecurity. However, only drawing on formal credit after the earthquake appeared to play a positive role, being associated with a decreased reliance on distressful food consumption patterns and an 80% increase in the likelihood of maintaining or regaining a livelihood source.

These results illustrate that families with a debt burden prior to the earthquake had to resort to more distressful coping mechanisms post-shock – most likely because these households were already relying on credit to meet basic needs, and because creditors needed to be repaid in a crisis. This may have required new, expensive credit sources that further increased debt and limited coping options. The data supports this analysis: households with informal credit prior to the earthquake were over five times more likely to draw on informal credit after the earthquake; while those with formal credit were 60% more likely to do so. Of the households who used informal credit post-earthquake, the majority had multiple informal sources including family and friends, wealthy proprietors, and credit shops, where interest rates could reach 36% per annum. All three informal sources were drawn upon by the same proportion of households.

Despite the negative relationship between use of formal credit pre-earthquake and household food security, accessing formal loans pre-shock nearly tripled the likelihood of drawing on formal loans post-earthquake (a 289% increase), a response that had strong, positive outcomes. This suggests that a history of positive formal lending assists with accessing more appropriate loans in a crisis, likely because of an established credit history with the financial institution. Importantly, members of the Dalit community, considered the Untouchables, were 60% less likely to draw on formal credit sources after the earthquake relative to the top two castes, indicating caste-related barriers to accessing formal financial services that are important for resilience.

TAKE AWAY: Financial inclusion can support resilience, but resilience outcomes vary drastically based on the product or service, and their level of access in times of crisis. The positive results around formal credit, and both informal and formal savings, underscore how financial inclusion can make vital contributions to household resilience. However, not all financial services are appropriate, and informal credit in particular may harm households' abilities to cope and recover from disasters if not managed or structured properly. Informal credit can have extreme negative and cyclical effects, as shown by the fact that households with pre-shock informal debt were five times more likely to seek additional informal credit post-shock. The results suggest that emergency cash transfers can serve as an important protection mechanism among the most vulnerable in times of crisis. Additionally, cash transfers may prevent depletion of savings, which had a positive effect on well-being outcomes. Finally, the low rates of savings withdrawal, combined with low use of formal loans after the earthquake suggest it is critical to enhance the capacity of financial institutions to maintain their operations in times of crisis, so that more appropriate financial services can contribute to disaster resilience.

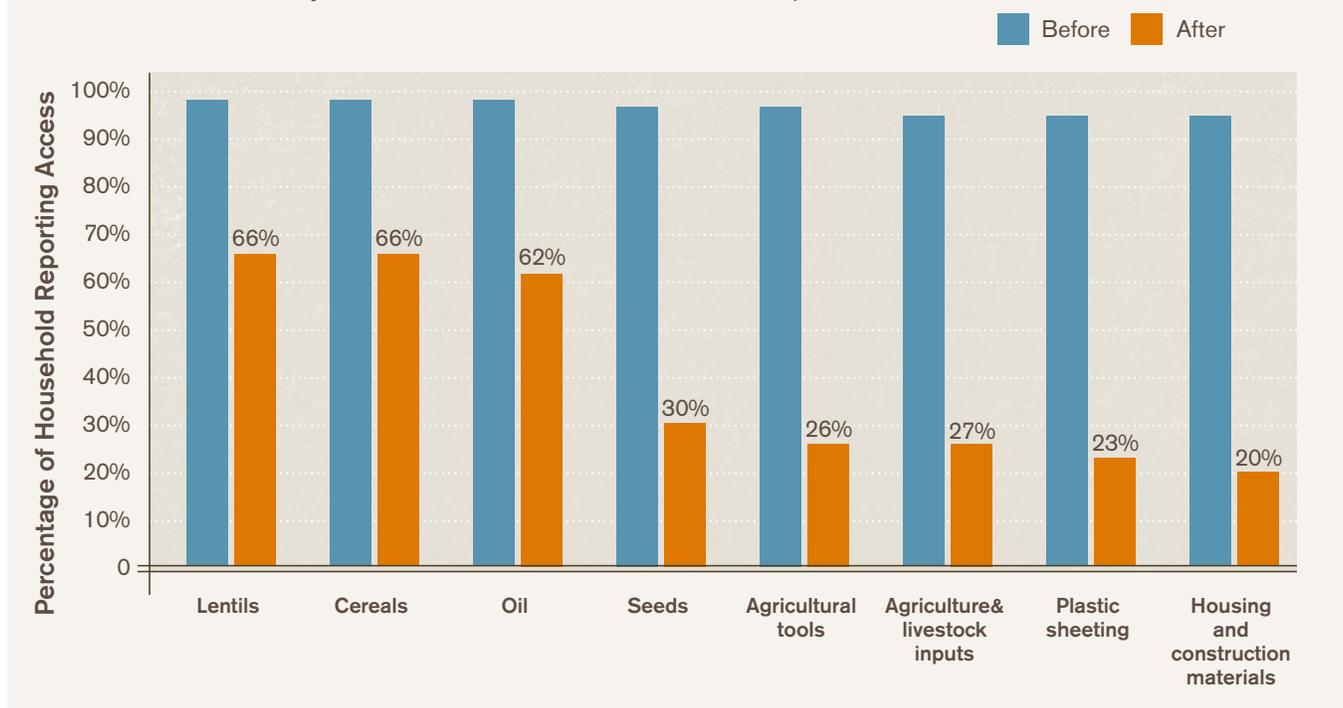
Access to Economic Options

Profile of Study Area

The research examined how markets and income sources contributed to resilience through three primary categories: physical access to markets, goods available in the market, and income sources (including remittances).

As with formal financial services, the vast majority (92%) of respondents identified Barhabise as their main market center. Over 37% of respondents reported being able to access modes of transport to or from the market town before the earthquake. Data also showed that basic goods, including staple food and non-food items, were widely available in the market in sufficient quantities prior to the earthquake, with 94% saying all eight goods were regularly available.

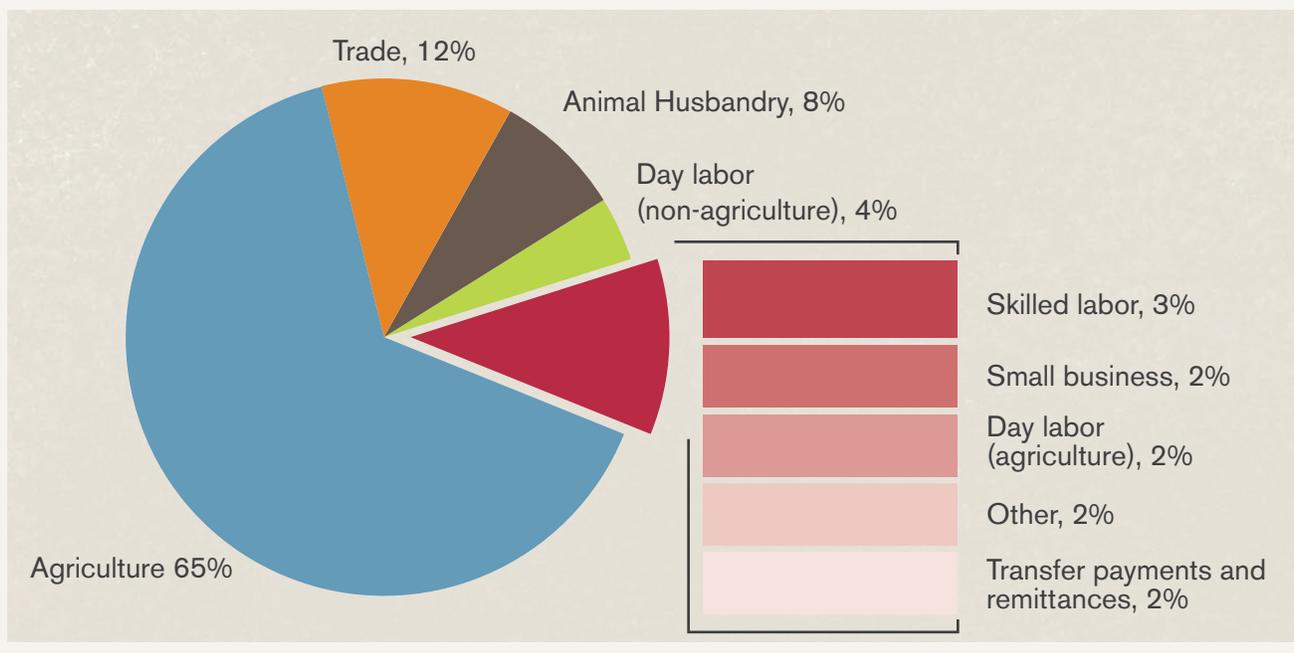
Figure 12. Availability of Goods Before and After the Earthquake



The situation changed drastically after the earthquake. Sixty eight percent of respondents stated that access to Barhabise town was negatively affected after the disaster, with 47% stating the area was completely unreachable for them. Rates of transportation access to the market dropped to 14%. Starkly, the goods available also dropped, with only 14% of respondents reporting access to all basic food and non-food items 10 weeks after the earthquake. Notably, availability of food items was the least affected by the earthquake, with 65% of households reporting sufficient food in the market. In contrast, only 30% reported sufficient availability of seeds, 26% sufficient availability of agricultural tools, and only 20% sufficient availability of tarpaulins or construction items (see Figure 12 for a complete before/after comparison).

Regarding income sources, over 70% of respondents relied on agriculture before the earthquake. Yet many had additional sources of income; almost 40% of respondents reported another source of income aside from agriculture – a key measure of livelihood independence. Male-headed households were more likely to have multiple income streams, even if in the same sector – 40% compared to 32% of female-headed households. Only 40% of households reported maintaining or regaining their livelihoods at the time of the study, meaning over half of the households had lost and not yet recovered at least one income source.

Figure 13. Primary Livelihood Sources, % of Total Respondents



Only 12% of all households reported receiving remittances prior to the earthquake, although the proportion was slightly higher among female-headed households. This low rate of remittances is likely a combination of both lower-than-average remittance rates in Sindhupalchok and underreporting.⁶²

Multivariate Analysis Results

Table 6. Effects of Economic Options on Well-being Outcomes

	Lower use of negative coping strategies (CSI)	Higher household dietary diversity (HDDI)	Investment in productive assets	Higher shelter quality	Lower likelihood of poverty (PPI)
Market					
Access to market goods (after)		+++		---	---
Availability of transport to the market (after)	-		--		
Livelihoods					
Livelihood independence			++		
Ability to maintain or regain livelihoods	++	+++	+++	+++	+++
Remittances					
Received remittances prior					

(+) represents a positive relationship between indicators, with more (+) representing a relationship that is statistically stronger (-) represents a negative relationship between indicators, with more (-) representing a relationship that is statistically stronger

62 The World Bank. Large Scale Migration and Remittance in Nepal: Issues and Challenges, June 2011

FINDING 1: The ability to maintain or regain livelihoods after a shock was a critical determinant of resilience, supporting both improved coping and initial recovery after the earthquake.

The ability for households to maintain or regain their livelihood sources post-earthquake was the strongest predictor of better coping, recovery, and well-being.⁶³ Households reporting this capacity were far more likely to maintain an adequate quantity and quality of food, were twice as likely to invest in productive assets, had better quality shelter, and were at lower risk of poverty. Several factors stand out as contributing to households' ability to hold on to their livelihood sources, including being able to draw on formal credit after the earthquake, receiving timely aid, and having higher levels of household-level disaster awareness and preparedness.

The data immediately points to the need for emergency aid to more quickly and effectively support communities to restore livelihoods early, within ten weeks of a crisis. Literature on the role of emergency cash transfers in disaster response suggests that this may be the most effective mechanism to achieve this goal. Specifically, research has shown that targeted, lump sum emergency cash transfers have been more effective in restoring productive assets and livelihoods than smaller consumption-based transfers.⁶⁴ Market studies following the Haiti earthquake also showed that stimulating economic recovery through well-designed cash assistance to households or businesses has positive effects.⁶⁵ When considered with this research, the data here point to the need to explore how cash can be delivered faster, as part of early emergency response, and structured to help restore livelihoods in the immediate aftermath of a shock rather than as part of second-stage recovery measures.

Livelihood independence, or holding at least one income stream with a risk profile that differed from that of agriculture, was positively linked to an 80% greater likelihood to invest in assets after the earthquake. However, having independent sources of income did not appear to contribute to households' ability to maintain or regain livelihoods, although livelihood diversity – i.e. having a greater number of different income sources, did. Livelihood independence on its own did not have a statistically significant relationship with any of the other well-being measures. This suggests that more income sources may have provided more options for restoring livelihoods after the earthquake; however, due to the scale of the disaster, even non-agricultural livelihood sources would have been significantly affected, thus limiting the role of livelihood independence.

FINDING 2: Proximity to a marketplace on its own was insufficient to support resilience if not coupled with efforts to restore market functions.

Access to markets had mixed results. Households that reported better availability of food and non-food items in their local market after the earthquake were more likely to have higher dietary diversity, but they also tended to have poorer shelter quality and a greater likelihood of being impoverished. The results reflect which items were most available in the marketplace: food was widely available, while seeds, agricultural tools, livestock, tarpaulins, and construction materials were reported much less frequently. The higher availability of food items helped households maintain their dietary diversity post-earthquake, but may have resulted in trade-offs between investing in shelter and assets (as captured by the higher PPI).

Access to market transportation both before and after the earthquake yielded counterintuitive results. Those households who reported they had access to market transport post-shock were more likely to show distressful food consumption practices, such as skipping meals, and were 45% less likely to have invested in assets.

63 Households' ability to maintain or regain a livelihood was treated here as an explanatory variable in the 'economic options' model, whereas in the other models it was treated as an outcome.

64 Causal Design. *Beyond Meeting Immediate Needs: The Impact of Electronic Cash Transfer Approaches on Disaster Recovery and Financial Inclusion*, 2015

65 Brady, Carol. *An Emergency Market Mapping and Analysis Study: Changing Responses to the Haiti Earthquake*, 2012

Availability of transport to market was surprisingly also associated with a 70% higher likelihood of drawing on informal credit (a distressful coping mechanism based on this study), a 52% lower likelihood of maintaining or regaining livelihoods, and a 56% higher likelihood of receiving aid later than 7 days.

The results suggest that market access must be examined closely in measures that go beyond physical access and look more deeply at function. The poor availability of goods in the market post-crisis suggests market functions were not restored 10 weeks after the earthquake, with agricultural commodities and construction materials particularly suffering. Households who normally access markets with relative ease would naturally be more dependent on them for livelihoods, and therefore be left worse off if those markets are not functioning. In contrast, more isolated households may have developed more subsistence or community-based coping mechanisms due to their remoteness. In addition, the negative relationship between market transportation and timeliness of aid suggests that development assistance may have been bypassing areas with greater physical market access, aiming for remote targeting. This finding was supported by qualitative data, which showed that much aid distribution was initially targeted to more remote areas. Assistance could have been distributed more evenly across the region to restore market functions, and quicken livelihood recovery across the board.

FINDING 3: Remittances did not appear to play a role in either coping or recovery in the immediate post-earthquake context.

Despite the extent of out-migration from rural areas in Nepal, the research found that remittances had no effect on coping and recovery 10 weeks after the earthquake. Only 12% of respondents stated that their household had received remittances in the past 12 months prior to the earthquake, and only 5.89% received remittances after. The low response rates for remittances are likely a combination of underreporting and a lower-than-average remittance receipt rate for Sindhupalchok based on official statistics. Households who accessed income from abroad may have been concerned about eligibility of assistance from other sources, particularly government. In cases where households may have had family members abroad, qualitative data confirmed that most cash transfer points were still cut off 10 weeks following the earthquake in the study area. Migrants also frequently send remittances through friends or relatives, but there were very few migrant returnees in the aftermath of the shock.

Nonetheless, the results challenge common assumptions that remittances will play an important role in assisting households with absorbing a shock. Research on remittances in Nepal shows that remittances are most often used to smooth consumption or support investments in human capital (such as health or education), rather than for productive investments.⁶⁶ This would support the fact that accessing remittances in the 12 months prior to the earthquake would have had few immediate benefits for families post-crisis. Furthermore, Nepali migrants and their families also face unusually high debt burdens, and a large percentage of remittance income goes to paying back the costs of migration to employment agencies or employers. More research is required to understand the role of remittance in the recovery once infrastructure and services in more remote market centers were restored.

TAKE AWAY: Maintaining or regaining livelihoods and restoring market functions as part of early response is critical for improved coping and recovery. The ability to maintain or regain livelihoods within the first 10 weeks after the earthquake appeared to make strong, positive contributions to all short-term coping, medium-term recovery, and long-term well-being outcomes. However, poorly functioning markets undermined coping and recovery in the study area, apparently leaving communities with greater access to (and dependence on)

66 Pant, B. *Harnessing Remittances for Productive Use in Nepal*, 2011

markets less able to cope, as reflected by negative food consumption patterns. The findings suggest that post-shock well-being can be significantly improved if emergency assistance targets maintaining and regaining livelihoods and market recovery as part of early response, and immediately following life-saving interventions. Reinforcing or restoring economic options early and quickly could also have multiplier effects, as rapid market recovery provides improved opportunities to maintain or regain livelihoods. Research and experience suggests that economic recovery can be most effectively achieved through emergency cash transfers, but would require cash to be targeted at levels that can support productive investments by households and businesses, and to be distributed with awareness of the economic context. Follow-up research in the study area will support a greater understanding of to what extent approaches to cash transfers, distributed around the time of this study, contributed to economic recovery and resilience.

VI. CONCLUSIONS AND RECOMMENDATIONS

The study offers a snapshot of household well-being and recovery, and what resilience capacities and responses contributed to it, 10 weeks after the Gorkha earthquake. Given the recurrent nature of natural disasters, the results have important implications on how recovery investments can be implemented to mitigate future crises and build resilience in Nepal and other similar contexts. We recommend government, donor, international, and national agencies working in Nepal and other disaster-prone contexts take the following actions.

- 1. Assess the limitations of current DRR approaches in contexts of weak governance, placing greater emphasis on household-level DRR and advocacy capacity for improved accountability and response.** Research findings show that the effectiveness of current disaster risk reduction approaches –such as establishing and supporting local DRR committees, developing plans, allocating resources, and providing trainings – may be significantly compromised in contexts of weak governance. In a time of crisis, DRR mechanisms that are perceived to exist, but in fact do not function effectively, may have negative effects on coping and recovery as they encourage citizens to depend on a system that does not work. The negative relationship between linking social capital and coping and recovery further reinforces this point. Yet results indicate that the effectiveness of DRR in such contexts can be dramatically improved if interventions focus on household level preparedness and response. This should include not only enhancing household disaster awareness of prevention and response measures, but also capacity to organize and advocate for meaningful citizen participation and government accountability in DRR. To tailor interventions, DRR programs must at a minimum assess where governance limits and undermines current approaches. Ultimately DRR actors should be prepared to advocate for broader political and institutional reforms that can have the greatest wide-scale impact on effective DRR mechanisms.
- 2. Ensure humanitarian response efforts do not reinforce structural inequalities. This can be achieved by supporting trusted and diverse community groups to maintain mutual support functions in a crisis.** Social characteristics around caste and gender affect households' resilience. For example, the study showed that members of underprivileged castes experienced a delay in aid, relative to more privileged groups. Dalits also showed a decreased ability to access positive resilience capacities post-shock, such as formal credit. To avoid perpetuating inequalities, humanitarian actors must be cautious in delivering assistance through government or other local networks where social hierarchies are often entrenched and can privilege delivery of assistance to some communities over others. Given the positive roles played by local bonding networks and traditional collective action, humanitarian actors should identify where these can serve as effective entry-points for distributing aid and assisting recovery, particularly for marginalized groups. For example, humanitarian actors can strengthen trusted community networks and self-help groups to build critical resilience capacities, including household disaster preparedness and access to financial services. Using existing informal systems can decrease over-reliance on inequitable or overstretched formal institutions in times of crisis.
- 3. Support financial service providers to offer more appropriate products, and to maintain services in times of crisis, while enhancing household financial management capacity for disaster resilience.** Our results reinforce that financial services can work for resilience, but that success depends on both the form of financial access and how households use them. The mixed effects of formal savings and credit, and apparent negative effects of informal credit, all suggest that financial services must be better tailored to meet needs in a post-disaster setting. Furthermore, the reduced rates of drawing on formal credit post-shock relative to pre-shock rates, and low rates of all savings withdrawal post-shock, suggest that financial service providers must be supported to maintain function

in times of crisis. Humanitarian actors should work with financial service providers to (1) develop operations and mitigation plans for disasters to serve clients in the immediate aftermath of a shock, and (2) develop products pre-disaster that can assist with post-disaster needs. Nepal may benefit from disaster savings and credit mechanisms being developed in partnership with Mercy Corps, microfinance institutions, and national insurance companies in Indonesia. These mechanisms offer disaster-specific savings products bundled with insurance for high-impact, low frequency events such as earthquakes. The partnership is also supporting microfinance institutions to improve their access to liquidity immediately after disasters, to allow them to maintain services when their clients need them most.⁶⁷

4. Restore markets and support livelihoods as part of early response. Market and livelihood recovery is often seen as a medium-term recovery intervention in a disaster risk reduction cycle, often only materializing months after a shock. The findings suggest that post-shock well-being can be significantly improved if emergency assistance targets maintaining and regaining livelihoods and market recovery as part of early response and immediately following life-saving interventions. Households who were able to maintain or regain their livelihoods ten weeks after the earthquake did better on all coping, recovery, and long-term well-being measures. However, poorly functioning markets seemed to have a negative effect on food consumption patterns for those with the greatest market access, suggesting those most dependent on markets were left with limited coping options. Reinforcing or restoring economic options early and quickly could also have multiplier effects, as rapid market recovery provides improved opportunities to maintain or regain livelihoods.

5. Use effective and rapid cash transfer approaches that can both meet immediate social protection needs and restore market functions and livelihoods. Study findings emphasize the important role of financial services, maintaining and regaining livelihoods, and market functions in post-shock coping and recovery. Cash transfers have significant potential to support these elements, reducing post-shock vulnerability and building long-term resilience. For example, households with the largest informal pre-shock debt burden had higher rates of informal credit withdrawal after the earthquake, which resulted in negative effects on coping and recovery. This suggests rapid cash transfers early in the crisis could have prevented deepening vulnerability among this population. Similarly, cash transfers could also allow households to preserve and leverage limited savings, which contributed positively to coping or recovery despite low savings withdrawal rates. Finally, a body of research suggests that stimulating economic activity—such as restoring livelihoods and markets—can be most effectively achieved through emergency cash transfers. Cash should be targeted to support productive investments by households and businesses, and be distributed with awareness of the economic context.

As a follow up to this study, Mercy Corps plans to conduct further research to understand how specific resilience capacities support households' recovery over time – and to identify what interventions work to strengthen those capacities. In the study area, the April earthquake was one of a range of challenges that face the people of Nepal. Since the time of survey, these communities experienced floods and landslides through the monsoon season, and the whole country has suffered from an extensive fuel crisis that resulted from reactions to Nepal's new constitution. Tracking change over time will be particularly critical to observe how exposure to other shocks post-earthquake has affected the ability of households to cope and recover, and which resilience capacities are most effective where crises are multiplying and recurrent. The results will enable humanitarian and development actors to be more deliberate in responding to future crises in ways that best support household and community resilience.

67 Anderson, T. and Syahrin, M., Vulnerable Households Need Resilient Institutions in Disasters, September 2015. Retrieved from <http://www.cgap.org/blog/vulnerable-households-need-resilient-institutions-disasters>

VII. ANNEXES

ANNEX 1: SUMMARY OF SIGNIFICANT FINDINGS

	Lower use of negative coping strategies	Higher household dietary diversity	Investment in productive assets	Able to maintain or regain livelihoods	Higher shelter quality	Lower likelihood of poverty
Positive Correlation	<ul style="list-style-type: none"> • Higher self-determination • Receiving aid within one week • Drawing on formal credit • Able to maintain/regain livelihoods 	<ul style="list-style-type: none"> • Higher family DRR preparedness • Higher bonding social capital (before and after) • Formal savings prior • Able to maintain/regain livelihoods • Access to market goods (after) 	<ul style="list-style-type: none"> • Higher self-determination • Receiving aid within one week • Higher collective action (prior) • Able to maintain/regain livelihoods 	<ul style="list-style-type: none"> • Higher family DRR preparedness • Receiving aid within one week • Drawing on formal credit (after) 	<ul style="list-style-type: none"> • Higher self-determination • Higher perception of ability to cope • Receiving aid within one week • Receiving aid from multiple sources • Higher linking social capital • Higher collective action (prior) • Informal savings prior • Able to maintain/regain livelihoods 	<ul style="list-style-type: none"> • Receiving aid from multiple sources • Informal savings prior • Able to maintain/regain livelihoods
Negative Correlation	<ul style="list-style-type: none"> • Presence of a DRR committee or plan • Drawing on linking social capital (after) • Formal credit prior • Informal credit (before and after) • Availability of market transport (after) 	<ul style="list-style-type: none"> • Receiving aid from multiple sources • Drawing on linking social capital (after) • Using informal credit (after) 	<ul style="list-style-type: none"> • Higher bonding social capital • Formal savings prior • Informal credit prior • Availability of market transport (after) 	<ul style="list-style-type: none"> • Higher community DRR preparedness • Receiving aid from multiple sources • Drawing on linking social capital (after) 	<ul style="list-style-type: none"> • Higher family DRR preparedness • Access to market goods (after) 	<ul style="list-style-type: none"> • Formal savings prior • Access to market goods (after)

ANNEX 2: DETAILED DESCRIPTIONS OF THE VARIABLES

Household Characteristics

- Respondent age
- Respondent education level
- gender of the head of household
- household ethnicity and caste
- household dependency ratio (adults to children)

Shock Exposure

- Level of damage to home caused by the earthquake⁶⁸

Well-being Outcomes

- Coping Strategies Index (CSI)

The CSI is created by combining responses to a set of questions on strategies taken to maintain food security, which are weighted by severity. The questions and their weights are below:

In the past 30 days, how frequently did your household use one or more of the following strategies to have access to food?

Activity	Weight
Rely on less expensive or less preferred foods	1
Limit portion sizes or reduce quantity	1
Reduce number of meals eaten per day	2
Reduce adult consumption so children can eat more	2
Reduce female consumption so males can eat more	2
Borrow food or rely on help from friends or relatives	2
Purchase food on credit (from trader using a loan)	2
Gather unusual types or amounts of wild food/hunt	4
Send household members to eat at friends or relatives' house	2
Rely on begging for food	4
Participate in abnormal migration for work	3
Consume seed stock to be saved for next season	3
Since the earthquake, has your household had to sell household items to have enough money to access food?	2*
Since the earthquake, has your household had to sell productive assets to have enough money to access food?	3*
Since the earthquake, has your household had to take children out of school to work to have enough money to access food?	4*

* These items were a binary yes/no response, not a frequency.

68 A more accurate measure of shock exposure was available: the Earthquake Severity Index (<https://data.hdx.rwlab.org/dataset/nepal-earthquake-severity-index>). However, this data is only available at the Ward level or higher. Since Ward fixed effects were used in the analysis, inclusion of the Earthquake Severity Index would not add any additional predictive power to the models.

Frequency	Score
Never	0
Seldom (Less than 1 time per week)	1
Sometimes (1-2 times per week)	2
Often (3 or more times per week)	3
Daily	4

- **Household Dietary Diversity Index (HDDI)**

A composite number of unique foods consumed by household members over a given period.

See: Bwindale, Bilinsky. Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access: Indicator Guide, Version 2.FANTA, September 2006.

- **Maintaining or regaining livelihood sources**

- **Condition of shelter or housing**

The shelter quality value was the sum of the score for two below questions on the materials used for the roof and walls of the respondent's current shelter.

Frequency	Responses	Score
Thinking about where you sleep now, what is the roof currently made of?	Straw/thatch, earth/mud, or tarpaulin	0
	Tiles/slate, or other	2
	Wood/planks, or galvanized iron	6
	Concrete/cement	7

Frequency	Responses	Score
What is the main construction material of the outside walls of where you are sleeping now?	Bamboo/leaves, unbaked bricks, wood (including bamboo), mud-bonded bricks/stones, tarpaulin, or no outside walls	0
	Cement-bonded bricks/stones, or other material	6

- **Investment in productive assets**

- **Progress out of Poverty Index (PPI)**

Likelihood of living below the national poverty line was calculated based on the Grameen Foundation's Progress out of Poverty Index for Nepal, updated in 2013.

See: <http://www.progressoutofpoverty.org/country/nepal>

Resilience Capacities

- **Number of Aid Sources Received**

The quantity of disaster relief was represented by the total count of the types of aid received by a household, from among the following:

Type of Aid
Food
Shelter
Non-food items (tarps, corrugated sheets, mattresses, etc.)
Medical Assistance
Cash
Other

- **Timeliness of Disaster Relief**

A binary variable was created to indicate receiving aid within 1-7 days after the earthquake.

- **DRR Community Preparedness Index**

The community disaster preparedness index is a computer-generated factor incorporating responses to the following questions:

On a scale of 1-5, how much do you agree with the following statements	Scale
Our community has taken steps/actions to reduce our risk of being negatively affected by a disaster.	1-5 Scale: Strongly Disagree to Strongly Agree
Our community has been able to secure resources for preparedness and disaster management from local government, NGOs, or other sources.	1-5 Scale: Strongly Disagree to Strongly Agree
People in our community have been trained on search and rescue, first aid, or other skills needed to help save lives during a disaster.	1-5 Scale: Strongly Disagree to Strongly Agree
My community has a mechanism or group in place to help people during disasters.	1-5 Scale: Strongly Disagree to Strongly Agree

- **Household DRR Preparedness Index**

The household disaster preparedness index is a computer-generated factor incorporating responses to the following questions:

On a scale of 1-5, how much do you agree with the following statements	Scale
My family is aware of the evacuation routes to leave the community used in case of an emergency.	1-5 Scale: Strongly Disagree to Strongly Agree
My family is aware of the main disaster risks faced by our community.	1-5 Scale: Strongly Disagree to Strongly Agree
My family understands what action to take when responding to disasters.	1-5 Scale: Strongly Disagree to Strongly Agree

- **Locus of Control**

The locus of control index is the average value of the responses to the following questions. During analysis, scales were reversed as needed so that a 1 indicated the lowest feeling of control, while a 5 indicated the highest.

On a scale of 1-5, how much do you agree with the following statements	Scale as used in question
In my life, good luck is more important than hard work for success	1-5 Scale: Strongly Disagree to Strongly Agree
Every time I try to go ahead, something or somebody stops me	1-5 Scale: Strongly Disagree to Strongly Agree
My plans hardly ever work out, so planning makes me unhappy	1-5 Scale: Strongly Disagree to Strongly Agree
I do not have enough control over the direction my life is taking	1-5 Scale: Strongly Disagree to Strongly Agree
Chance and luck are very important for what happens in my life	1-5 Scale: Strongly Disagree to Strongly Agree

- **Bonding Social Capital**

The questions below were used as indicators of bonding social capital.

Question	Scale
Prior to the earthquake, I could count on members of my own caste to help me.	1-5 Scale: Strongly Disagree to Strongly Agree

Bonding social capital prior to earthquake

Question	Scale
Since the earthquake, members of my caste group are helping each other recover.	1-5 Scale: Strongly Disagree to Strongly Agree

Drawing on bonding social capital post-earthquake

Question	Scale
Prior to the earthquake, I could count on members of other castes to help me out.	1-5 Scale: Strongly Disagree to Strongly Agree

Drawing on bridging social capital post-earthquake

Question	Scale
Since the earthquake, members from different caste groups are helping each other recover.	1-5 Scale: Strongly Disagree to Strongly Agree

- **Linking Social Capital**

The linking social capital indices are computer-generated factors incorporating responses to the following questions:

Linking social capital prior to the earthquake:

On a scale of 1-5, how much do you agree with the following statements	Scale
Prior to the earthquake, our Ward Citizen Forum worked to solve problems and met needs.	1-5 Scale: Strongly Disagree to Strongly Agree
Our community groups are able to influence the Ward Citizen Forum to help us recover.	1-5 Scale: Strongly Disagree to Strongly Agree
Since the earthquake, our VDC Secretary is working to help my community recover.	1-5 Scale: Strongly Disagree to Strongly Agree
Our community groups are able to influence the VDC Secretary to help us.	1-5 Scale: Strongly Disagree to Strongly Agree

Drawing on linking social capital post-earthquake

On a scale of 1-5, how much do you agree with the following statements	Scale
Since the earthquake, our Ward Citizen Forum is actively working to help my community recover.	1-5 Scale: Strongly Disagree to Strongly Agree
Our community groups are able to influence the Ward Citizen Forum to help us recover.	1-5 Scale: Strongly Disagree to Strongly Agree
Since the earthquake, our VDC Secretary is working to help my community recover.	1-5 Scale: Strongly Disagree to Strongly Agree
Our community groups are able to influence the VDC Secretary to help us.	1-5 Scale: Strongly Disagree to Strongly Agree

- **Collective action prior to the earthquake**

On a scale of 1-5, how much do you agree with the following statements?	Scale as used in question
Prior, households in our community frequently participated in <i>perma</i> (communal work groups).	1-5 Scale: Strongly Disagree to Strongly Agree

- **Collective action post-earthquake**

On a scale of 1-5, how much do you agree with the following statements?	Scale as used in question
Prior, households in our community frequently participated in <i>perma</i> (communal work groups).	1-5 Scale: Strongly Disagree to Strongly Agree

- **Use of Formal and Informal Financial Instruments**

Savings tools are classified according to the following criteria:

Savings Instrument	
Formal	Informal
Bank	Invest in livestock, crops, or material assets
Cooperative	Local savings group
Financial institution	Moneylending to others
	Safe place in the home
	With relatives or trusted friends

- **Sources of loans are classified according to the following criteria:**

Loan Source	
Formal	Informal
Formal institution	Employer
Micro-finance institution (MFI)	Jamindaar (local moneylender)
	Community welfare scheme
	Neighborhood community, family, and friends
	On credit from shop

- **Livelihood Diversity**

Livelihood diversity was defined as the total number of income sources reported by the household, from the following choices:

Income Sources
Agriculture/Farming
Animal husbandry/livestock
Trade (buy and sell goods for profit)
Small business (retail shops and tea stalls, etc.)
Day labor in agriculture
Other daily labor (construction, etc.)
Skilled labor (plumbing, electrician, tailor, etc.)
Remittances
Transfer payments (pensions, gifts, aid, etc.)
Other

- **Livelihood Independence**

A binary variable was used to represent having both an agricultural income (farming or animal husbandry) and a non-agricultural income. This variable was equal to 1 for those with both agricultural and non-agricultural incomes, and 0 for those with only one or none of the two.

ABOUT MERCY CORPS

Mercy Corps is a leading global humanitarian agency saving and improving lives in the world's toughest places.

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