

**Nepal's 2015 Earthquake:**  
**Communication and the Marginalization of Dalits**



*(Dalit houses in rural Nepal)*

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By

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## **ABSTRACT**

The goal of this project was to assess communication technologies and information networks before and after Nepal's 2015 earthquakes and look at how rural social barriers affected the spread of relief information. We used reports from international organizations, surveys conducted in earthquake displacement camps, local and international newspaper articles, and interviews from experts for our research. We found that caste-based discrimination towards Dalits in rural Nepal after the 2015 earthquakes was exacerbated by poor emergency telecommunications. Existing discriminatory practices persisting within many groups such as survivors, relief workers and rescue operators and the government's unpreparedness for disaster hindered relief information. We suggested better educating Dalits and relief workers and reducing false reports in the media.

## EXECUTIVE SUMMARY

On April 25<sup>th</sup> 2015, a 7.8 magnitude earthquake shook Nepal. Two weeks later a 7.3 magnitude earthquake hit. Together, they left 9,000 dead and thousands injured. The damage has ruined many families, destroying their houses, razing their fields and ending any sense of normalcy their lives had. When communication and information was essential to survival, the earthquakes hindered many forms of communication to remote villages: cell towers, radio stations, and internet connections. The inability to contact survivors and pass on life saving information plagued the relief efforts in the month after the earthquakes. Information flow was more challenging in Nepal because of its unique features: complex topography; unstable political structure and government inaction; an outdated communication sector; and most importantly, a discriminatory social hierarchy.

While communication for all Nepalese with survivors after the earthquake was difficult, those in the socially marginalized communities--women, children, elderly, and the lower castes--faced more barriers. Caste discrimination in Nepal was a big problem especially in rural areas of Nepal, where the Dalits were at the bottom of the caste hierarchy and faced the brunt of the discrimination. Also known as the "untouchables," the Dalits faced many unique challenges in receiving information about aid and having access to communication technologies after the quake due to their low social standing.

The goal of this project was to assess the communication technologies and information networks before and after the earthquakes in Nepal and look at how rural Nepal's social barriers affected the spread of relief information. To do so, we:

1. Determined the geographical and infrastructure factors that affected the communication landscape before the earthquakes in Nepal.
2. Assessed practices in communication and information delivery used during the relief efforts for the earthquake and the challenges they faced.
3. Examined what communication difficulties marginalized groups such as Dalits in rural areas faced in the month immediately after the earthquake.
4. Assessed communications preparations that have been made for the next time an earthquake strikes Nepal.

This study draws heavily upon reports and interviews with experts in communication and Dalit studies.

## **Findings & Analysis**

### **Objective 1: Communication Before the Earthquakes**

Finding 1 – Hills and mountains in Nepal often blocked cellular and radio signals.

Finding 2 – Nepal’s hilly topography posed a significant barrier to accessing many remote areas by road before the earthquakes.

Finding 3 – The limited supply of electricity made charging communications devices such as phones, radios, and televisions difficult.

### **Objective 2: Communication After the Earthquakes**

Finding 1 – The destruction of weak infrastructure in rural areas obstructed the flow of information.

Finding 2 – Unstable electricity supply impeded the flow of information all over Nepal after the earthquakes.

Finding 3 – The 2015 earthquakes damaged the communication sector severely.

Finding 4 – Commonly used means of communication failed to successfully survive the earthquakes.

Finding 5 – The Nepali government was unprepared to effectively mobilize resources.

Finding 6 – The Media failed to provide reliable information after the earthquakes.

Finding 7 - Language differences hindered the communication between relief workers and survivors.

### **Objective 3: Difficulties Faced by Dalits**

Finding 1 - Many Dalits were short-changed in relief operations.

Finding 2 – Many Dalits did not have proper access to information because the location of their settlements in villages.

Finding 3 - Higher caste people did not share information and relief with Dalit communities.

Finding 4 - Some local aid workers did not pass on information to the Dalit community.

Finding 5 - Dalits generally did not get opportunity for participation in local disaster risk management bodies.

### **Objective 4: Preparations for the Next Earthquake**

Finding 1 – Some preparations are being made throughout the country that are more generalized and do not focus on specific marginalized communities.

Finding 2 – From the research that we have conducted, it seems that most of the country's resources have been put towards rebuilding communities rather than making sure that Nepal is prepared for the next earthquake.

## **Conclusions & Recommendations**

- 1. To address the uneven distribution of aid in rural communities, we recommend international organizations and their workers be educated about the caste system and the discrimination towards the Dalit castes in rural areas.**

Many of the international aid workers who came to help with relief were unaware of the extent of discrimination towards Dalits in rural villages; therefore, there should be some way established to educate foreign aid workers so that relief supplies are distributed fairly.

- 2. To increase the flow of information into rural Dalit communities, we recommend that Dalits be educated on how they can go about requesting or receiving information from local leaders and get opportunities to participate in local disaster management bodies.**

Educating Dalit communities in rural villages about how to get information and aid would reduce the chance of neglect by higher castes.

- 3. To avoid rumors being reported in the media following a disaster, we recommend reporters undergo training to learn how to distinguish facts from rumors while gathering information.**

With more reliable information, news organizations would become more trusted and more listeners would follow important instructions.

- 4. We recommend that a WPI project be established focused on educating rural Dalit communities on information technologies and ways to become more involved in village decision making bodies.**

This project would continue our work by gaining individual reports on the situation for Dalits following the earthquakes and educating Dalits on how to recover after a similar disaster.

## **AUTHORSHIP**

**Chapter 1: Introduction** (Ben Hassett)

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- Seth Tuler for providing variety of sources to build the background of our project and answering our research questions
- Steven Folmar for sharing his expertise regarding Dalit communities and their everyday livelihood after the earthquake
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# 1. INTRODUCTION

On April 25<sup>th</sup> 2015, a 7.8 magnitude earthquake shook Nepal. Two weeks later, a 7.3 magnitude earthquake hit. Together, they killed 9,000 and destroyed over 800,000 homes. The damage ruined families, destroying their houses, razing their fields, and ending any sense of normalcy their lives had.<sup>1</sup> The damage is estimated to be \$7.06 billion (US) in a country where 25% of the population makes less than \$1.25 a day. By the loss of jobs or the death of the working family member, these earthquakes pushed nearly 1 million more people below the poverty line.<sup>2</sup>

While earthquakes are devastating anywhere, they are especially damaging in Nepal. Due to forced isolation from the outside world until the mid-20<sup>th</sup> century, Nepal's political system and economy still lags behind the rest of the world; it ranks 157th out of 187 countries on the United Nations' development report, making disaster recovery especially hard.<sup>3</sup> Additionally, the mountainous terrain makes building an adequate road system extremely expensive and leaves them susceptible to landslides. In response to regular earthquakes, the Nepali people, especially those in rural villages, usually recover slowly through rebuilding their damaged homes and fields with the help of friends and neighbors. They have been forced to become more self-reliant, knowing that the people in power think more of themselves than they do of the country's citizens.

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<sup>1</sup> National Planning Commission. "Post-Disaster Needs Assessments: The Critical First Step." *PsycEXTRA Dataset*. ReliefWeb. Government of Nepal, 20 June 2015.

<sup>2</sup> Ibid.

<sup>3</sup> Malik, Khalid. "Human Development Report 2013." *United Nations Development Programme*. United Nations. 2013.

In an earthquake, communication and information are essential to survival, especially in remote villages. The 2015 earthquakes hindered many forms of communication: cell towers, radio stations, and internet connections. In the month following the earthquakes, the time-frame of this study, the inability to contact survivors and pass on life saving information plagued relief efforts. The Nepali government did not have an adequate emergency communications plan to deal with this level of destruction. It relied heavily on the Emergency Telecommunications Cluster (ETC) to provide an emergency wireless network to help coordinate relief workers and organizations. Even with the ETC, Nepali citizens were dissatisfied with the government's involvement and their disorganized aid distribution.

While communication for all Nepalese after the earthquake was difficult, those in the socially marginalized communities--women, children, elderly, and the lower castes--faced additional barriers. Caste discrimination in Nepal, the focus of our study, is a big problem in both urban and rural areas, especially towards the "untouchable" Dalit castes. While discrimination based on caste has been made illegal, the laws are often overlooked in the more rural settings since the caste system has become so ingrained in everyday life.

The goal of this project was to assess the communication technologies and information networks before and after Nepal's 2015 earthquakes in Nepal and examine how rural Nepal's social barriers affected the dissemination of relief information. To do so, we:

1. Determined the geographical and infrastructure factors that affected the communication landscape before the earthquakes in Nepal.
2. Assessed practices in communication and information delivery used during the relief efforts for the earthquake and the challenges they faced.

3. Examined what communication difficulties marginalized groups such as Dalits in rural areas faced in the month immediately following the earthquake.
4. Assessed communications preparations that have been made for the next time an earthquake strikes Nepal.

Due to its location on top of a major fault line, a major earthquake could happen again. We hope that through our paper people will come to recognize the increased vulnerability of the lower castes and the role communication can play in limiting the lives lost in the case of future disasters.

## 2. BACKGROUND

This chapter describes Nepal and the specific socio-economic factors that affect its people, particularly the marginalized community of the Dalit castes. In a disaster such as Nepal's 2015 earthquakes, research shows that while disaster affects everyone, those living in the fringes such as Dalits in rural areas usually experience the brunt of the damage. After the earthquakes, Dalits faced many challenges in receiving information about aid and getting access to communication technologies due to their low social standing. We support our arguments with 4 sections:

1. Social Marginalization in the Face of a Disaster
2. Nepal's History of Earthquakes and Government Inaction
3. Nepal's Rural Citizens are the Most Affected in 2015 Quake
4. Nepal's Unstable Government Unprepared for Earthquakes

After reading this chapter, readers should understand the socio-economic factors that affect Nepal's people, particularly the marginalized community of the Dalit caste and how their place in society affects their ability to communicate effectively and get information during the month after the earthquake.

### 2.1 Social Marginalization in the Face of Disaster

Disasters affect people living in the same area differently based on social hierarchy and customs. In disasters, socio-economic structures often lead to marginalized groups being taken further advantage of. Scholars have identified several ways this problem occurs:

**Governments avoiding responsibility for disaster.** Disasters, according to historian Ted Steinberg, usually result in justifying and preserving a particular set of social relations. Usually, no one is held accountable for damages caused by disasters, even in situations where proper governmental preparation and disaster planning could have lessened the damages. Disasters such

as earthquakes are generally, Steinberg writes, “seen as freak events cut off from people's everyday interactions with the environment.”<sup>4</sup> Because the disaster is poorly understood, civilians do not understand that governmental actions could have helped. Governments discouraged questions about their lack of disaster prevention measures. “By recruiting an angry God or chaotic nature to their cause,” Steinberg also claims, “those in power have been able to rationalize the economic choices that help to explain why the poor tend to wind up in harm's way.”<sup>5</sup>

**Marginalized groups usually don't have allies to represent their interests.** Because of the social and economic barriers, marginalized groups don't have “muscle” or connections with powerful people. Government focus disaster preparations and relief efforts on groups with power. Marginalized groups, however, are left to “nature” without the same type of support as the rest of society.

**Caste and the Earthquake.** . A disaster has two parts to it: the real disaster and people's response to that disaster. The real disaster is usually unavoidable but socio-economic hierarchy affects the people's response. Resiliency, or the ability to bounce back from the disaster, is not shared equally by people in the same region.

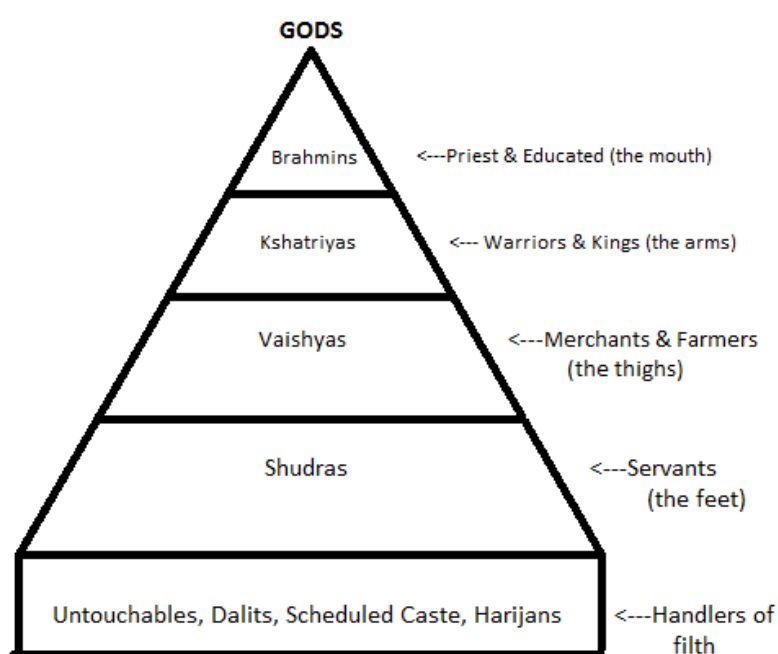
Even before the disaster, the lowest caste group called Dalits had a hard life. Also known as “Untouchables,” their hardships only increase in disaster for two reasons: 1) the Dalits were not as prepared and 2) higher castes treated Dalits as lesser people. Their treatment in the disaster recovery and relief compared to higher castes needs to be examined carefully.

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<sup>4</sup> Steinberg, Ted. *Acts of God*. Cary, GB: Oxford University Press, USA, 2006.

<sup>5</sup> Ibid.

Nepal's caste system, which is similar but different from India's orders groups in a social hierarchy. The caste system, separates those considered the most pure, Brahman and Chhetri/Kshatriyas, from the less pure, Vaisyas, Sudra and untouchable, the Dalit.<sup>6</sup> While caste-based discrimination has been outlawed since the 1960s, inequality and degradation remains strong.<sup>7</sup> Because social hierarchy is enforced by the higher castes, Dalits are “among the poorest groups in Nepal.”<sup>8</sup>



*Figure 1. Social hierarchy in caste system of Nepal (Alamy)*

Dalits are “assigned tasks too ritually polluting to merit inclusion” in the caste system.<sup>9</sup> Caste is something one is born with and lasts for life; getting out of the cycle is not possible.

<sup>6</sup> Bennet, Lynn, Dilli Ram Dahal, and Pav Govindasamy. “Caste, Ethnic and Regional Identity in Nepal: Further Analysis of the 2006 Nepal Demographic and Health Survey.” *Macro International Inc.* United Nations. Sep. 2008.

<sup>7</sup> Kumar BK, Sushil et. al. “Waiting for ‘Justice in Response.’” *IDSN*. N.p. 25 May 2015.

<sup>8</sup> Folmar, Steven (2007) "Identity Politics Among Dalits in Nepal," *Himalaya, the Journal of the Association for Nepal and Himalayan Studies*: Vol. 27: No. 1, Article 6.

<sup>9</sup> Human Rights Watch. "Background." Caste Discrimination: UN World Conference, Sept. 2001.

Dalits, aren't allowed to cross the line dividing their part of village from that occupied by higher caste. They cannot share the same well, temple or even drink from same cup as the higher caste.<sup>10</sup> Many rural Dalits are either landless or have little land.<sup>11</sup> Rural Nepal is still very dependent on agriculture so land is something more than just a place to live on. Dalit houses are usually made from earth and stones even in places where higher castes are using modern materials. From his visit before the earthquake, anthropologist Steven Folmar wrote that the Dalits he met "lacked jobs, food, adequate housing and health, and kept children home because they lacked the paltry amount of cash needed for supplies."<sup>12</sup> The Dalit life only gets worse in disaster situation as society segregate them from disaster preparations.



*Figure 2. Water tap for Dalits only in Western Nepal (ISDN, 2015)*

Take India, for example. Ray Bennett researched how social difference influenced surviving disaster in India. During a super cyclone in 2003, he found that because upper castes had better housing and location, they coped with disasters more effectively. Lower caste were the

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<sup>10</sup> Ibid.

<sup>11</sup> Folmar, Steven (2007) "Identity Politics Among Dalits in Nepal." Web. 28 Apr. 2016.

<sup>12</sup> Ibid.



most affected with lack of robust houses and social network. The lower caste however later gained an advantage as they became primary beneficiary of government's housing scheme.<sup>13</sup> Although having a concrete house doesn't equate to reduced vulnerability, it does offer a better chance for lower caste people. This was a case study that showed higher caste could cope with disasters better while lower caste could possibly receive more focus during relief due to the extensive damage to them.

## 2.2 Nepal's History of Government Inaction in Earthquakes

Nepal has a history of earthquakes. Nepal was created nearly 40 million years ago when the Indian continent collided with Southern Tibet and pushed sediments upwards to form the Himalayas. The tectonic plate movement makes the region very unstable. A slight shift cause devastating earthquakes. Hills and mountains cover about 83% of Nepal's land. Higher elevation and the steepness can increase both the likelihood of landslides and also their devastating power.

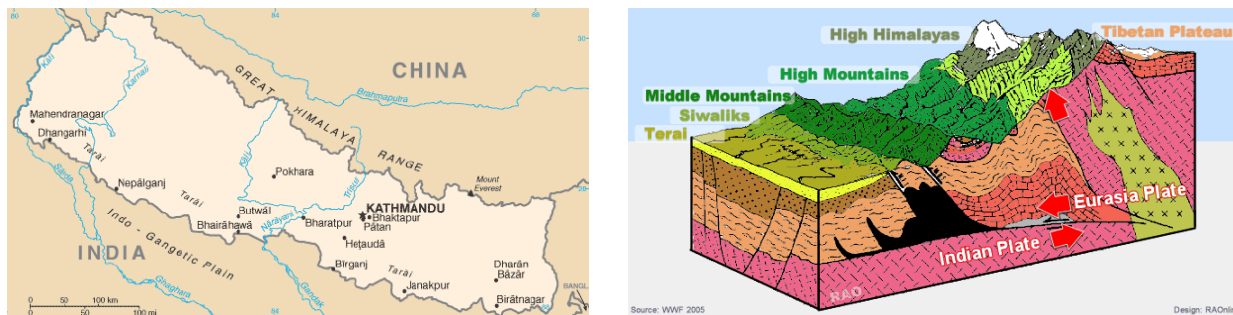


Figure 3. Map of Nepal (Left) (Nepal-CIA, 2005) and Diversity of Topography in Nepal (Right) (WWF 2005)

<sup>13</sup> Ray-Bennett, Nibedita S. "The Influence of Caste, Class and Gender in Surviving Multiple Disasters: A Case Study from Orissa, India." *Environmental Hazards* 8.1 (2009): Gdnonline.

**Nepal's government has usually failed to respond adequately to earthquakes.** Two earthquakes in the last century show that government inactions hurt the relief effort. The Government avoided responsibility during the earthquake by treating it as natural calamity beyond its control. In early 1990s, the government came up with better preparations for future earthquakes but with limited effectiveness.

**Poor Earthquake response in 1934.** Nepal's 1934 earthquake, its deadliest, killed over 10,000 people.<sup>14</sup> Nepal's foreign restriction policy barred outsiders from seeing the damage and otherwise limited information about the earthquake. Nepali major Brahma Shamsheer was one of the only ones to make historical notes of the earthquake. He writes about the valor of the national army who quickly transitioned to rescue operations for civilians. This was especially impressive when they were unaware of how their own family and houses fared. Shamsheer also records the political reactions. The king created an earthquake relief fund with loans for the earthquake victims.<sup>15</sup> That is one of the main needs for most people to recover from the disaster. The Nepali prime minister worked towards relief efforts. Then, he explained the government response plan to the common people and started reconstruction which slowly helped rebuild Nepal.<sup>16</sup> Nepal implemented decent response measures in the aftermath of the earthquake.

**Government excuses in earthquakes.** Until quite recently, the rulers of Nepal have defined disasters such as earthquakes to be acts of a deity. This was to shrink away from the disaster's responsibility and to strengthen their rule. For example, King Birendra enacted an act

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<sup>14</sup> "Comments for the Significant Earthquake." *National Center for Environmental Information*. NOAA, n.d.

<sup>15</sup> Subedi, Sheetal, and Tilottam Paudel. "A Report on Earthquake in Nepal - DCLI - Centre International Lebrecht-Irfed." *A Report on Earthquake in Nepal*. N.p., n.d. Web. 05 Mar. 2016.

<sup>16</sup> Shamsheer, Brahma. *Nepalko Maha Bhukampa 1990 (1934 A.D)*. Kathmandu: n.p., 1935. Print.

dedicated to calamity relief.<sup>17</sup> Its Nepali name is ‘Divine Calamity Relief Act’ (1982) as opposed to its English name of ‘Natural Calamity Relief Act’ (1982). Nepali, being the primary language would prevail if there was of disambiguation over the meaning of the word.<sup>18</sup> This is a pretty good explanation of the reason for Nepal’s government having been so lax in responding to earthquakes even after passing this act.

**In 1988 Earthquake, government obstructed relief efforts.** Another major earthquake struck Nepal in August 1988. On their own, ordinary citizens organized to offer relief to the earthquake victims. The government announced their one door policy that declared those offering relief need to get government’s permission and that organizations wishing to help have to register with the government.<sup>19</sup> Afterwards, civilians criticized the government for corruption with allegations such as favoring close associates, corrupt handling of relief funds and excluding people who did not support the panchayat system. Earthquake victims criticized the government as there was both inclusion and exclusion errors in the relief fund list. Maintaining the one door policy created complications such as delays, misuse and wastes of the relief efforts. The government responded by arresting unauthorized relief operators and censoring newspapers.<sup>20</sup>

**In 1993, Earthquake Preparation committee formed better preparation.** The 1988 earthquake served as a wakeup call for the Nepali government towards the dangers of the earthquake. Nepal recognized the need to develop strategy for seismic risk reduction. As a result, they established the National Society for Earthquake Technology (NSET) in 1993. The new

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<sup>17</sup> *Natural Calamity (Relief) Act. 2039 B.S. (1982) (n.d.): n. pag. Www.lawcommission.gov.np.* Nepal Government. Web. 31 Mar. 2016.

<sup>18</sup> Shedai, Ram Sharan. "The Sociology of Disaster." *The Sociology of Disaster.* National Society for Earthquake Technology- Nepal, 4 May 2011. Web. 10 Mar. 2016.

<sup>19</sup> Committee, Asia Watch. *Human Rights Violations in Nepal.* New York, NY: Asia Watch Committee, Human Rights Watch, 1989. comma69. P

<sup>20</sup> Ibid.

organization would help with both effective planning and preparedness for the earthquakes. They have since carried out many assessments for earthquake risks in Nepal and also worked with foreign powers to better prepare Nepal for the next disaster.<sup>21</sup>



Figure 4. NSET building founded in 1993 (NSET Nepal 2009)

### 2.3 Nepal's 2015 Earthquake: Rural Citizens Bear the Brunt

82 percent of Nepalese live in rural areas.<sup>22</sup> Already facing economic, social and health challenges, rural people—including Dalits—found themselves exposed to further stress. Prior to

<sup>21</sup> Shaw, Rajib, and Takako Izumi. *Civil Society Organization and Disaster Risk Reduction: The Asian Dilemma*. Springer: Springer Science & Business Media, 2014. 84-86.

<sup>22</sup> "Rural Population (% of Total Population)." *Rural Population (% of Total Population)*. World Bank, n.d. Web. 06 Mar. 2016.

the earthquake, Rural Nepalese faced two main types of challenges: economic and health problems, and the lack of youth manpower.

**1. Rural economic and health problems.** The rural population faces many problems that add to the complexities of the relief efforts. One is poverty. Majority of the rural Nepalese earn less than \$1.25 per day.<sup>23</sup> To make matters worse, the earthquakes have destroyed farmlands, badly damaging subsistence farming, the primary income source for most of the people in these areas.<sup>24</sup> In addition to their poor economic status, rural residents have limited access to clean water and food and good sanitation, increasing the risk of spread of infectious diseases like cholera and dysentery, which already plague many parts of Nepal.<sup>25</sup>

**2. Lack of youth manpower.** Many men from rural areas have gone abroad for work; remittance alone comprises nearly 29% of Nepal's economy.<sup>26</sup> Rupa Joshi, a communications officer with UNICEF Nepal, said, "In many of the villages in Nepal, many of the men are out of the country. So what you find in these villages are the elderly, women and children. They are now the ones who are having to deal with this massive thing - when their houses have come down, their homes wiped out - without men, who are usually the ones running around, setting things straight."<sup>27</sup> Social practices also make it difficult for women to access relief items, further complicating the situation.<sup>28</sup>

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<sup>23</sup> "New Challenges for Nepal Post-Earthquake." *World Accord*. 06 Nov. 2015.

<sup>24</sup> "Nepal – Earthquake, 2015". Rep. no. 1. *World Food Programme*. 27 Apr. 2015.

<sup>25</sup> Rai, Shiba K et al. "The Health System in Nepal—An Introduction." *Environmental Health and Preventive Medicine* 6.1 (2001): 1–8. *PMC*.

<sup>26</sup> Zhong, Raymond. "Nepalese Migrants Return Home to Face Havoc; Many Nepalese Who Left to make a Living Abroad are Back to Help Deal with Earthquake's Devastation." *Wall Street Journal (Online)*. May 01 2015.

<sup>27</sup> "Nepal Earthquake: Rural Regions Prepare for the Worst - BBC News." *BBC News*. BBC, 27 Apr. 2015.

<sup>28</sup> "Nepal Earthquake Situation Reports" Rep. no. 9. *UNHabitat*. 04 May 2015. Web. 05 Mar. 2016.



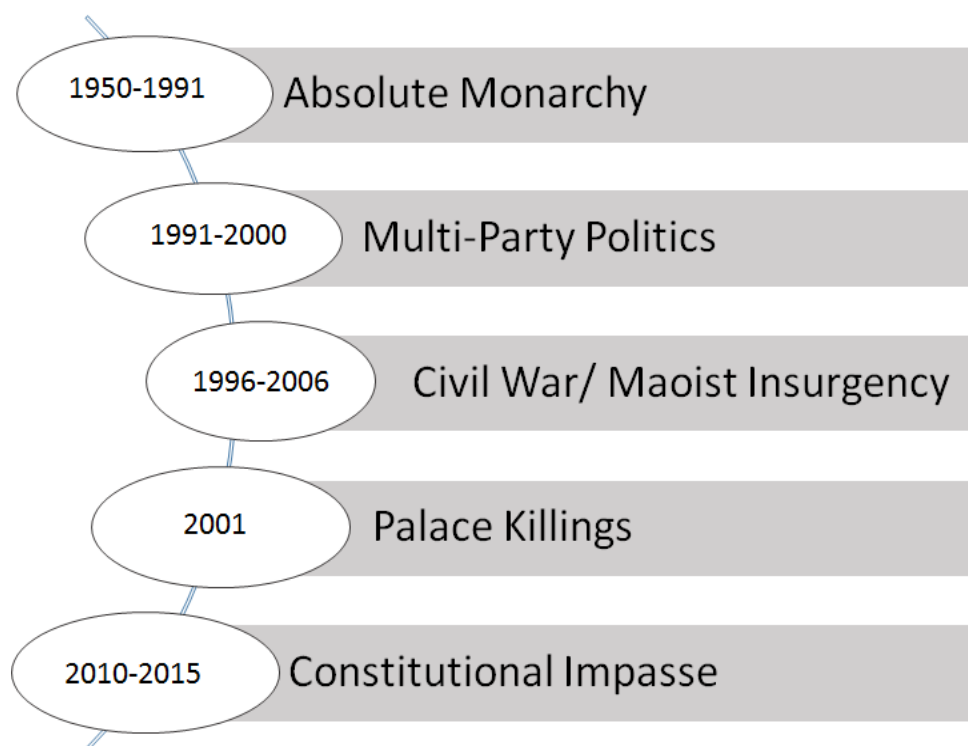
*Figure 5. Impassable roads in a village in Dhading District (Shukuko Koyama 2015)*

## **2.4 Nepali Government Unprepared for the Earthquake**

Political instability in Nepal over the past few decades has caused inefficiency in government policies and actions. Nepal's unstable government has generally focused on arguing about past problems instead of focusing on the country's future concerns such as disaster preparedness.

**Nepal's deeply rooted political problems.** The country's biggest political problem is not having a stable and working government to rely on. In 1960, King Mahendra launched a military coup, and installed himself as the unchallenged ruler. The king's eldest son and successor Birendra continued to wield considerable power. Capitalizing on the countryside's endemic poverty, in 1996 Nepalese Maoists launched a civil war that lasted for a decade — at their peak they claimed to control roughly 80 percent of the country. And then in 2001, the crown prince went on a rampage and massacred nine members of his family, including the king and queen.

That tragedy prompted yearnings for fundamental change. In April 2006, one-third of Nepal's 30 million people took to the streets for 19 days to depose the slain monarch's brother Gyanendra, who became king and staged a coup in 2005. Soon after, Nepal became a republic.<sup>29</sup> The Nepal government has changed over the last few decades, yet the country is still one of the poorest in Asia and is in desperate need of more change.



*Figure 6. A timeline showing brief history of Nepal's Political Instability*

**Nepal's ethnic and cultural diversity is a big reason for the fragile democracy.** Nepal has an astonishing ethnic and cultural diversity. There are the Khas, who form the ruling elite. There are the Janajatis, who include the Sherpas of Everest and the various groups who make up the Gurkhas, sent by Nepal's rulers to fight in foreign wars over the centuries. And then the

<sup>29</sup> Paramendra Bhagat, "An Earthquake exposes Nepal's Political Rot." *Foreign Policy*. April 30, 2015.

Madhesis, people from the southern plains who have a strong ethnic and cultural affinity with the Indians in Bihar and Uttar Pradesh. The Khas, the Janajatis and the Madhesis make up roughly 20, 30, and 30 percent of the population respectively. Another 10-15 percent of Nepalese are Dalits, "untouchables" who occupy the lowest rung in the Hindu caste system.<sup>30</sup>

**Nepali politicians are divided in forming the constitution and ignoring other needs of the country.** In 2008, two years after the war ended, Nepal acquired a constituent assembly that boasted 601 members – bigger than the national legislatures in the United States or India. A second followed four years later. The assembly's leaders claim to have reached agreement on all issues except the big one: the nature of Nepali federalism.<sup>31</sup> Given the country's diverse population, the leaders have found it extremely challenging to come to a unison. This has become a major obstacle to political development. Therefore, competing and highly divisive factions of Nepali politics have been unable to agree on a constitution, and issues like disaster preparedness have taken a backseat.

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<sup>30</sup> Paramendra Bhagat, "An Earthquake exposes Nepal's Political Rot." *Foreign Policy*. April 30, 2015.

<sup>31</sup> Ibid.



### 3. RESEARCH QUESTIONS AND METHODOLOGY

The goal of this project was to assess the communication technologies and information networks before and after the earthquakes in Nepal and examine how rural Nepal's social barriers affected the dissemination of relief information. To do so, we:

1. Determined the geographical and infrastructure factors that affected the communication landscape before the earthquakes in Nepal.
2. Assessed practices in communication and information delivery used during the relief efforts for the earthquake and the challenges they faced.
3. Examined what communication difficulties marginalized groups such as Dalits in rural areas faced in the month immediately following the earthquake.
4. Assessed communications preparations that have been made for the next time an earthquake strikes Nepal.

#### **Objective #1. Determined the geographic and infrastructure factors that affected the communication landscape before the earthquakes in Nepal.**

**Rationale.** Specifically, we focused on what Dalits used as their preferred means of communication as well as the prevalence of mobile phones in rural villages. Knowing this information, we would be able to better understand and compare it to post-earthquake damages.

**Information-Gathering Methods.** Our primary sources of information were:

- Country profile reports from worldwide Non-Governmental Organizations (NGO's) as well as reports and statistics released by Nepal's government.

- Informal interview with a communications expert on campus to explain the limitations imposed by Nepal's mountains. This interview was kept informal, but professional with questions focused on how different forms of communication – cellphones, radio, television – are affected in the mountainous region.

From a better understanding of the communication landscape before and after the earthquake it would be easier to compare the damages and what sectors were the most at risk during a disaster.

**Analysis Methods.** We compared information from separate reports to minimize the bias in the papers. We then followed up with research to back up the information given to us in the interview on how signals were sent through the mountainous regions of Nepal. Research on Nepal's geography was done through country profiles detailing the creation of the mountain ranges in the country.

## **Objective #2. Assessed practices in communication and information delivery used during the relief efforts for the earthquake and the challenges they faced.**

**Rationale.** We set out to understand the kind of systems or tactics that worked well during the earthquakes. The systems could be improved upon and communication in future earthquake relief would have a better chance of functioning. The reports about this earthquakes communication practices gave a good understanding of the system in place already and highlight its faults during the earthquakes. While the earthquakes struck everywhere indiscriminately, communication was restored ineffectively. Most relief operations were based in Kathmandu so they needed a strong communication network to all of their teams but more rural work was hard

since the cell towers were down and radio stations are nonfunctioning. We ended with 6 major groups and we looked at their role and impact during the earthquake.

**Analysis Methods.** Through our research, we found out reliability of information to be the most important factor in evaluating these means of communication. Other criteria used to assess the means of communications were:

- Training
- Price range
- Speed
- Coverage
- Electricity

Our criteria were devised using the following reasoning:

**1) Training:** Some of the devices used would require training before being able to use it properly, making it difficult for illiterate groups such as the Dalits to use it. The assessment would simply show whether the device needs training or not.

**2) Price:** For poor families in Nepal, availability of communication devices is less important than its price. We decided to analyze this criteria based on a scale from 1-5, 5 being the most expensive.

**3) Speed:** The speed at which information flows is a very important factor, especially in times of disasters such as earthquake. A scale from 1-5 was used to classify this criteria as well.

**4) Coverage:** Since our project was focused mostly on rural areas, we decided to make coverage a criteria. This section would show the viewers which area the device is mostly prevalent in.

**5) Electricity:** The ability to power devices was important for some devices to communicate. So, our last criteria was to state if the devices used needed electricity or not.

We found information on the groups through local newspaper articles and organization reports on related topics.

**Methods.** We tried to vary our sources to get a realistic understanding of what happened and how it was affected by the earthquake. We had 3 Nepali people in our research group so we were also cross checking that the information was practical to their idea of everyday life. Additionally, we talked to some communication experts such as WPI Professor Wyglinski, who helped us understand the difficulties of the terrain in communication and also some viable options to overcome it.

### **Objective #3. Examined communication and relief difficulties Dalits in rural areas faced in the month following the earthquake.**

**Rationale.** We set out to find out what disparities were present in the flow of information to the survivors who were Dalits. To do this we focused on what communication technologies were used in the tent camps and by the survivors, how reliable the information from these sources was, and what social barriers prevented Dalits from accessing this information.

**Methods.** We gained most of our information from:

- Reports detailing the first few weeks of relief after the earthquakes
- Surveys taken from those living in the tent camps

- Informal interviews with professors who were present in Nepal following the earthquakes helping with the relief efforts
- Local and international newspaper articles

The reports, surveys and newspaper articles allowed us to understand the situations in the camps and the needs of the survivors, whereas the interviews allowed us to see how even after the earthquake, discrimination in the rural villages was taking its toll on relief efforts.

**Analysis Methods.** To reduce the bias in our information we compared the surveys to each other to find the common themes and complaints from the people. The interviews were conducted with a focus on interactions with Dalit survivors and their relation to the aid workers. Much of the interviewee's information came from observations and personal experiences so they were compared to the facts given in reports. As for reports, they were looked at for information regarding Dalit experiences and discrimination. Much of the information on discrimination was based on individual accounts making it more reliable than the surveys collected.

#### **Objective #4. Assessed communications preparations that have been made for the next earthquake.**

**Rationale.** Before reinventing the wheel, we thought it best to look at what has already been proposed and done to do that already. This way we would end up with different solutions instead of having something that others have already worked on.

Looking at Nepal, there was a lot more focus on doing repairs than preparations for the future. It is to be expected as Nepal is still developing and lot of survivors are only thinking of rebuilding, not preparing for the next time. We also looked the constraints in our research. Some of the

recommendations from organizations would be impractical for Nepal. It was obvious they had not thought of Nepal's ability to follow through on those ideas. Another thing was that recommendations were good but knowing if it will be followed through was debatable. We tried our best to look at follow up on recommendations for improving communication preparations but were not able to get much.

**Methods.** We went through reports by organizations and the recommendations they made. Most of these organizations were known international NGOs so that it would be more reliable information. It does not mean those organizations are always correct but they have a certain level of credibility. We also looked at a Nepali online newspaper to see the public's response to many of the proposed plans. We attempted to reach out to local VDCs in hope that they could give us the rural people's perspective. Due to their lack of response we relied on surveys conducted in many of the different districts.

## **Limitations in Information**

For all four objectives, much of the information used and presented in this IQP is from reports released by international and local NGO's that have programs and offices in Nepal. While many of them have a reputation for providing reliable information, some form of bias is often present in the writing. Along with reports we also used surveys and interviews with professors and other experts. With the surveys, many of them seemed to under-represent the Dalit caste but were good at determining the major problems plaguing earthquake survivors in different districts. As for the interviews, many of the points and observations given by the

interviewee were their own experiences in either a specific town or district in Nepal and may not be representative of the country's actions and beliefs as a whole.

A second problem was that current reports on the Dalit caste and the caste system in general were hard to find. Part of this is due to the Government outlawing caste based discrimination and making it a punishable offense in the past. Additionally, many of the reports written about caste identity and problems with discrimination were written by those from the upper castes. Therefore there may be a lack of understanding about the daily struggles a Dalit would face and the discrimination they go through in their lives.

As a group, we were unaware of the extent of the caste-based discrimination in rural villages. The three students who are Nepali were raised in urban areas and while they knew about the castes, they did not understand the role it played in more rural areas. The divide between caste discrimination in rural and urban life in Nepal is very steep. The one student who was not from Nepal was unfamiliar with the idea of a caste system and was surprised at the prevalence of discrimination in the rural areas.

## 4. FINDINGS AND ANALYSIS

Through government and organization reports as well as personal interviews with experts we identified several findings for each of our objectives. This chapter presents these findings organized under each of the respective objectives.

### **Objective #1. Determine the special geographic and infrastructure factors that affected the communication landscape before the earthquakes in Nepal.**

#### **Finding 1: Nepal's geography posed a significant barrier to access remote areas via roads.**

The topography of Nepal makes building roads from cities to remote hills and mountainous districts very challenging.

The Himalayan range lies in the north of the country, including eight of the world's 10 highest mountains, and these present huge physical obstacles. In the southern lowland plains of the country, rivers descending from the mountains change course frequently, presenting another challenge. Meanwhile Nepal's Hill Region includes altitudes ranging from 800-4,000m, itself providing difficulties for road builders.<sup>32</sup> As a result of the technical issues resulting from the country's geography as well as a shortage of construction machinery, building roads between cities, towns and villages in Nepal is an expensive and painfully slow process.

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<sup>32</sup> Ram Krishna Wagle. "Nepal Plans Road Infrastructure Expansion." *World Highways*. 1 Feb. 2014.



A study in 2007 revealed that the country had 10,142km in all of surfaced roads and a further 7,140km of unsurfaced roads. Nepal has 75 District Headquarters and up to 15 have no direct connection by road, while 33% of the population live at least two hours walk from a road, presenting a major challenge to economic growth as well as for other factors such as education or health.<sup>33</sup>

### **Finding 2: Limited electricity supply made charging communication devices difficult.**

Before the EQ, Nepal suffered a severe lack of electricity, with daily power outages up to 12 hours a day.<sup>34</sup>

With more than 2 percent of all global water resources at its disposal, Nepal has long been poised to be a self-sustaining electricity powerhouse. A prodigious monsoon season and vast water stores from the Himalayan glaciers represent as much as 83,000 megawatts of hydropower potential — enough to turn Nepal into a powerful regional electricity supplier.<sup>35</sup> However, beset by political bickering, the nation has only managed to harness less than one percent of that potential thus far.

Prior to the earthquake, the rapid deployment of small-scale, increasingly independent hydropower projects in dozens of remote communities had helped to gradually improve and expand the unsteady electricity system in Nepal. Fully electrified urban areas in and around the Kathmandu Valley — while subject to routine, daily power outages, due to supply shortages in

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<sup>33</sup> Ram Krishna Wagle. "Nepal Plans Road Infrastructure Expansion." *World Highways*. 1 Feb. 2014.

<sup>34</sup> "A Year in Review: 2013/2014." Annual Report 2014 (2014): n. pag. [www.nea.org.np](http://www.nea.org.np). Nepal Electricity Authority.

<sup>35</sup> Tom Zeler Jr. "Earthquake Strains Nepal's Already Shaky, But Potentially Powerful, Electricity Sector." *Forbes*. 8 May. 2015.

the dry season — had seen their daily outage hours gradually reduced, according to NEA’s 2014 annual report.<sup>36</sup>

### **Finding 3: Hills and mountains in Nepal often blocked cell signals.**

Before the EQ, transmitting cell phone signals in Nepal was extremely difficult because approximately 83 percent of Nepal’s land is covered by hills or mountains.

Most cell phone reception has been more or less line of sight. Cell phone transmissions are not obscured by most modern structures but mountains are a different matter. The wrinkles and folds of the mountains and their density deflect the signal. If you live on the side of a mountain, and the cell tower is on the other side of that mountain, a repeater is not likely to be able to pick up a strong enough signal through that obstacle to improve your coverage.<sup>37</sup>

Geographical reception barriers are often insurmountable. It is possible to have repeaters to direct and expand a local signal, but that becomes very challenging for a poor country like Nepal.

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<sup>36</sup> Tom Zeler Jr. “Earthquake strains Nepal’s already shaky, but potentially powerful, electricity sector”. *Forbes*. 8 May. 2015. Web

<sup>37</sup> Ken Perkins. “The Top 5 Surprising Things You Didn’t Know Could Block Your Cell Signal.” *Weboost*. 10 Nov. 2015. Web. 27 Apr. 2016

**Objective #2. Assess practices in communication and information delivery used during the relief efforts for the earthquake and the challenges they faced.**

**Finding 1: The destruction of weak infrastructure obstructed the flow of information to rural areas.**

After the EQ, Nepal's feeble infrastructure severely hampered access to information in rural areas from. Unpaved roads and fragile community buildings made getting information to rural areas extremely challenging.

Following the earthquake, road and highway network in Nepal was badly damaged with 13% of it either damaged or destroyed.<sup>38</sup> "The road was very bad," Hari Krishna Bhattarai, a World Wildlife Fund Nepal worker stressed, "So it was hard to reach the village [Gorkha]. We had to park and walk for two hours to reach the village."<sup>39</sup> The complex topography and the disruption of roads due to landslides, distributing relief materials to rural areas was posed challenging.<sup>40</sup> For villages that couldn't receive cell signals, word of mouth was the only means of communication. That means when villages get isolated, they are separated not just physically but even in terms of communication. Community infrastructure such as rural road and

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<sup>38</sup> Benfield, Aon. "2015 Nepal Earthquake." AccessScience (n.d.): n. pag. Thoughtleadership. Aon Plc, 1 Sept. 2015. Web.

<sup>39</sup> Joel, Lucas. "Narratives from Nepal: Relief and Rebuilding after the Gorkha Earthquake." *Earth Magazine*. 6 Dec. 2015. Web. 23 Mar. 2016.

<sup>40</sup> Sakzewski, Emily. "Nepal Earthquake: Damage to Last Years for Hard-hit Rural Communities, as Aid Provided in Kathmandu." *ABC News*. 27 Apr. 2015. Web. 05 Mar. 2016.

community buildings were heavily affected in the 2015 earthquake.<sup>41</sup> This led to loss of place for social interactions and exchanging information. As a result, the flow of information was disrupted in the aftermath of the earthquake when information such as relief aid time and location, safe practices and other similar details can determine the fate of a person.

## **Finding 2: Unstable electricity impeded the flow of information.**

The lack of electricity after the 2015 earthquake resulted in loss of access to communication for many Nepalese. In particular, it took away access to lots of services essential during the aftermath of an earthquake, such as communication with rescue operators and hospitals.

The earthquake dealt a substantive blow to Nepal's already vulnerable electricity grid. More than a dozen hydropower plants — the chief source of electricity generation in the country — suffered damages, reducing the country's domestic power production capabilities by as much as much as 30 percent, according to the state-run Nepal Electricity Authority, which is responsible for about two-thirds of the nation's domestic electricity generation.<sup>42</sup> It took about a month to restore electricity in the urban cities and longer for rural villages.<sup>43</sup> This severely complicated recovery efforts in — and hindered past tense communication with — some of the thousands of remote towns and villages that dot the mountains stretching out in all directions from Kathmandu. What's worse, extensive damage to the nation's distribution network — which delivers power from the transmission grid to individual homes and businesses — has kept

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<sup>41</sup> Ibid.

<sup>42</sup> Sakzewski, Emily. "Nepal Earthquake: Damage to Last Years for Hard-hit Rural Communities, as Aid Provided in Kathmandu." *ABC News*. 27 Apr. 2015. Web. 05 Mar. 2016.

<sup>43</sup> "Years Review 2014-2015." Nepal Electricity Authority Years Review 2014-2015 (2015): n. pag. <http://www.nea.org.np/>. Nepal Electricity Authority. Web.

hundreds of thousands of Nepali people in the dark and, for a country heavily reliant on mobile telephones, struggling with basic communication.

**Finding 3: The 2015 earthquake damaged the communication sector severely.**

Nepal faced an estimated \$36.1 million damage to the communication sector because of the 2015 earthquake.

Telecommunications sector suffered the most with an estimated \$17.4 million cost in damage and \$45.5 million estimated losses. These figures were mostly due to mobile base transceiver station (BTS) damages and power disruptions during and after the earthquake. In addition, network backhaul infrastructure including aerially installed fiber optic cables and microwave links were also damaged in a number of areas. The Association of Community Radio Broadcasters reported that the earthquake damaged community radio equipment and buildings at 60 locations across 19 affected districts. 50 FM radio stations were impacted by the earthquakes, 20 of which were off-air for approximately 3 days after April 25, 2015. The state owned Radio Nepal which continued its broadcast for 24 hours for a few days after the disaster, halted all advertising and focused on public service announcements. The total requirement for reconstruction is estimated to be \$49.4 million over a 24-month period.<sup>44</sup>

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<sup>44</sup> "Years Review 2014-2015." Nepal Electricity Authority Years Review 2014-2015 (2015): n. pag. <http://www.nea.org.np/>. Nepal Electricity Authority. Web.

#### **Finding 4: Means of communication present in Nepal failed to successfully survive the earthquake.**

There were 6 most commonly used means of communication following the earthquake: the Mobile Phone; Ham Radio; Internet; Radio; Television; Newspaper

Word of Mouth was another means of communication used by people; however, since it is not a technical device, we have kept it separate from our analysis. We are providing a brief background on the outlet and their role in 2015 earthquake:

**Mobile Phone.** Before the earthquake, mobile phones were used by 92 percent of people in urban areas compared to 84 percent in rural as their main source of information. Immediately after the earthquake, use of mobile phones increased significantly. Mobile phones acted as an important medium to access information through phone calls, SMS, alerts, listening to radio, accessing social media and internet, etc. While a large number of people used mobile phones, major problems were faced, forcing aid workers at times to ask people to walk or drive, if possible, to send messages. This was a result of 3 main reasons. First, cell phone users faced connectivity issues. Right after the earthquake, phone links were choked by the large number of people trying to connect to their loved ones. Over 80 percent categorized the coverage during the time as bad or very bad. Second, access to electricity to charge mobile phones was a challenge for many people with over 30 percent charging their phones in public areas such as community centers, camps or with support from Government and NGOs.<sup>45</sup> Third, cell phone companies faced an enormous challenge during recovery period to convince homeowners to allow transmission towers on their roofs. Fearing the additional weight of the Base Transmitter

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<sup>45</sup> Information & Communication Need Assessment. Rep. N.p.: *Inter-Agency Common Feedback Project*. March 2016.

Stations will increase risk during future earthquakes, many wanted rooftop towers to be removed. And telecom companies found it difficult to find new sites for their towers.<sup>46</sup>

**Ham Radio.** Immediately following the earthquakes, Ham Radio was very successful in connecting rescuers and relief workers to survivors. However, they were only useful as long as someone in the affected area was also using a radio. Their coverage was limited to a very small portion of the Kathmandu valley since there are not many operators in Nepal and most of them lived in the city.<sup>47</sup> There is also the problem that it is an expensive skill to learn; operators having to spend around \$93 US dollars to buy the receiver and then pay more to take a course and get licensed. For future disasters the government is working on training the police force in using Ham Radios in an effort to have a reliable means of communication if the cell and radio towers are damaged beyond use.<sup>48</sup>

**The Internet,** although patchy, served as a lifeline in mostly urban areas where other means of communication didn't work. However, in several rural areas, where the access to internet isn't available yet, communication to the outside world became very challenging. In places that had access, the use of the internet to communicate was crucial for the coordination of relief efforts. After two days or so, Facebook and Twitter started exploding. Requests for help started inundating social media feeds. "300 people are stranded on the hill opposite last resort,"... "4000 people in Kavre need tents and blankets,"..."Trapped people badly need food and tents in Sitapaila,"... "Muchchok, Gorkha is devastated, all homes collapsed."<sup>49</sup> Moreover, The International Red Cross and tech companies like Facebook and Google introduced tools to

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<sup>46</sup> Sahina Shrestha. "The Subscriber Cannot be Reached". *Nepali Times*. August 27. 2015. Web. April 18. 2016.

<sup>47</sup> Mani, Sarthak. "Ham Radio to the Rescue." *Nepali Times*. 15-21 Jan. 2016. Web. 5 Apr. 2016.

<sup>48</sup> Ibid.

<sup>49</sup> Danielle Preiss. "How Social Media is helping Nepal Rebuild after Two Big Earthquakes." *Quartz India*. May 19. 2015. Web. April 18. 2016.

help users check online on people affected, but their effectiveness were limited by large-scale power outages affecting people's ability to recharge their devices and last-mile Internet connectivity problems.<sup>50</sup>

**Radio.** Before the earthquake, around 45 percent in both rural and urban areas had used radios as a means to obtain information. However, devices commonly used to listen to radio in rural and urban areas differed significantly. While 77 percent of people in rural areas use radio as their preferred device, 70 percent in urban areas use their mobile phones to listen to the radio.<sup>51</sup> Access to radios was less prevalent immediately after the quake. The low turnover could be due to a combination of damaged radio transmitters, damaged radio sets, not owning a radio set, electricity outages and other logistical barriers that existed due to the quake. Among the people who listened to radio after the quake, 64% took action (stayed in a safe place, drank clean water, built temporary shelter, helped others and shared information with others) based on information received from the radio.<sup>52</sup>

**Television.** Nepal has about a dozen of TV channels that operate regularly. About 42 percent of people in rural areas and almost 80 percent in urban areas have access to television. The use of television is also more prevalent in urban areas, where more than 70 percent of the people use watch television frequently, while only about 36 percent in the rural areas follow television channels regularly.<sup>53</sup> However, immediately after the 2015 earthquake, the access to television was less prevalent and only 31 percent as their main source of information.<sup>54</sup> The use

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<sup>50</sup> John Riberio, "Nepal Communications hit by Power Outage, Last-Mile Issues." *ComputerWorld*. April 27. 2015. Web. April 18. 2016.

<sup>51</sup> Nepal Media Landscape 2014. Rep. *Internews*, 2014. Web.

<sup>52</sup> *Information & Communications Need Assessment*. Inter-Agency Common Feedback Project, March 2016.

<sup>53</sup> Nepal Media Landscape 2014. Rep. *Internews*, 2014. Web.

<sup>54</sup> *Information & Communication Need Assessment*. Rep. N.p.: *Inter-Agency Common Feedback Project*. March 2016.



of television decreased for 3 main reasons. First, the lack of electricity made the access to television impossible. Second, the fear of living inside the house because of continuous aftershocks decreased the use of television. Lastly, television channels disseminated unreliable information that made public less interested in watching them.

**Newspaper.** Nepal has only about a dozen publication that have a wide circulation.<sup>55</sup> That circulation is mostly limited to urban areas. During the 2015 earthquake, damage to the building did not halt stop the newspaper publications but distribution was lost so the paper was not getting out to many people.<sup>56</sup> People affected by disaster need information to understand the situation and respond accordingly. Having lost access to physical newspaper, people who had access to internet got their news from online newspapers instead.<sup>57</sup> This further affects Dalits as only 49% percent of Dalits were literate but the percent with access to internet would be even smaller.<sup>58</sup>

**Word of Mouth.** Around 20 percent of people considered friends and family, and community meetings/events as their main source of information before the earthquake. While this means of communication was very slow after the earthquake following the earthquake, it was the most trusted form of communication in rural communities. Speaking to a person face to face made the information the survivors received seem more trustworthy.<sup>59</sup> While the information was well received and trusted, the time it took for someone to travel to the villages

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<sup>55</sup> Fitzgerald, Gerald, Apil Gurung, and Bharat Poudel. "How the Media Struggled in Nepal's Earthquake Rescue." *The Conversation*. N.p., 5 May 2015. Web. 18 Apr. 2016.

<sup>56</sup> Ibid.

<sup>57</sup> Ibid.

<sup>58</sup> Civil Society, Dalit, Asia Dalits Right Forum, and National Dalit Watch. *Waiting for "Justice in Response"* (2015): n. pag. *Idsn.org*. Dalit Human Rights, India, 25 May 2015. Web.

<sup>59</sup> UNICEF. "Reaching the Unreached Nepal Earthquake: Six Months Review" UNICEF Nepal. UNICEF. 25 Oct. 2015. Web. 15 Mar. 2016.

made this an unfavorable form of communication for the relief workers. The earthquakes had destroyed many of the roads leading to villages making travel very slow and sometimes impossible turning trips that should have taken a couple hours into trips lasting for a few days.

<b>Means of Communication Ranked by Reliability of Information</b>					
<b>Sources</b>	<b>Training</b>	<b>Price</b>	<b>Speed</b>	<b>Coverage</b>	<b>Electricity</b>
Mobile Phone	No	3	5	Both	Yes
Ham Radio	Yes	4	4	Urban	No
Internet	Yes	3	5	Mostly Urban	Yes
Radio	No	2	4	Both	No
Television	No	4	4	Both	Yes
Newspaper	Yes	1	1	Mostly Urban	No

Word of Mouth	No	0	1	Both	No
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*Figure 7: Analysis of means of communication used after the earthquake ranked by reliability of information (Scale: 5 is best).*

During the rescue period of the 2015 earthquake, the Nepal government's disaster response authority failed to have clear communication and coordination strategies and guidelines in place.

Resource mobilization was probably the sector most affected by lack of proper and systematic communication. Multiple Nepali and foreign newspaper reports expressed frustration at the lack of governmental action.<sup>60</sup> As foreign donations started pouring in after the quake,

<sup>60</sup> Lyengar, Rishi. "Why Nepal Wasn't Ready for the Earthquake." *Times*. April 28. 2015. Web. April 04. 2016.

local NGOs rushed to the villages with relief. Many organizations and groups started their own fundraising campaigns nationally and internationally. An unaccounted amount of money was wired through money transfers. The Prime Minister's office soon jumped in, set up a PM Relief Fund and declared that it would pool all the money collected at all the accounts set up by fundraisers. After news that the NGOs relief work was not transparent and not monitored, the government made another announcement that NGOs could distribute relief only through government channels. The distribution of those funds however was delayed by the Nepal government even a year after the earthquake.

Nepali Prime Minister KP Oli explained that the lack of reconstruction effort was because the destroyed homes were in very remote areas. He also suggested that NGOs raised issue of corruption to influence donors to give money to NGOs instead of the government. Finally, his main reasoning for the government inaction was the political upheaval where the politicians were caught up in details of the new constitution which has been a topic of discussion since end of monarchy in 2008.<sup>61</sup> Corruption and financial mismanagement aside, the lag time difference between the disaster and relief speaks volumes about the speed of the government and explains the frustration of disaster victims.

### **Finding 6: Media failed to provide reliable information.**

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<sup>61</sup> Rowlatt, Justin. "Nepal Earthquake: Patience Wearing Thin One Year on." *BBC News*. BBC News, 25 Apr. 2016. Web. 27 Apr. 2016.

During the 2015 earthquake, the media failed to provide authentic information to their audience and gain their trust. This was a result of publicizing rumors and reporting without fact checking and.

In times of crisis, accurate information is as essential as it is difficult to find. Dr. Orlando Mercado, an international expert on communicating disaster risks, while in Kathmandu in 2013, once said, “Media shape our perception of risk and that the risks that kills us are not necessary the risks that scare us the most.” Indeed, dispelling rumors and making the mass media communicate the right message was another challenging task after the earthquake. There was false news about “scientists forecasting 9 or 11 Richter scale quake” and “rotten human corpses under the debris,” of food and water shortages in the Kathmandu valley, and of cholera that terrified already scared people of spreading infectious disease and more serious disaster. Similar sensational news helped worsen the situation and forced over 1 million terrified people out of Kathmandu in very few days. Another outstanding phenomenon after the earthquake was the twitter campaign called “GoHomeIndianMedia” with thousands of supporters that began after the public found coverage by the Indian media too “intense” and “insensitive.”<sup>62</sup>

**Finding 7: Language differences were a barrier between survivors and relief workers.**

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<sup>62</sup> K.R. Sigdel and Dol Raj Kafle. “Nepal needs Better Communication Infrastructure to Respond to Disaster.” *World Association for Christian Communication*. May 11. 2015. Web.

For about a month following the earthquakes--when relief information was crucial-- some rural villages could not understand rescue workers due to language differences.<sup>63</sup>

Much of Nepal's population speaks Nepali, but not everyone. There are 123 languages spoken throughout the country.<sup>64</sup> For example, in a remote village the predominant language may be Tibetan due to the history of the area. Because of these limitations, relief work in some areas was slower than elsewhere since reconstruction workers had to decipher the instructions given by the villagers. This situation can be seen all over Nepal and is mostly experienced in villages where the younger, working age people have gone abroad for work, leaving the elderly who cannot speak Nepali to look over the village. However, relief workers are usually able to find someone in the village to translate, making this a relatively small problem compared to the others.

### **Objective #3. Examine what communication and relief difficulties Dalits in rural areas faced in the month after the earthquake.**

#### **Finding 1: Many Dalits were short-changed in relief operations.**

In many cases, the problems of Dalit victims after the earthquake got less priority and attention. Some were even left out in the rescue efforts. 80 percent of Dalits surveyed within a month after the quake reported feeling that there had been willful negligence in providing relief

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<sup>63</sup>UNICEF. "Reaching the Unreached Nepal Earthquake: Six Months Review" UNICEF Nepal. UNICEF. 25 Oct. 2015. Web. 15 Mar. 2016.

<sup>64</sup>Government of Nepal. National Population and Housing Census 2011. N.p.: Central Bureau of Statistics, n.d. Central Bureau of Statistics, Nov. 2012. Web. 6 Apr. 2016.

and support to their communities. Sixty-five percent also said they had been unable to access rescue services and shelter on time.<sup>65</sup>

Dalit residents in Dhading were beaten up when they asked for equal relief distribution. Likewise, Dalits in Ramechhap suffered unequal behavior during the distribution of earthquake relief cards. The Village Development Committee secretary provided one card for three Dalit households while non-Dalits got two cards for each household. Similarly, in Dolakha district, there were reports that non-Dalits distributed all the relief materials to the higher castes and very little remained for Dalits, who were eventually forced to divide a packet of oil and a piece of tarpaulin between two households.<sup>66</sup>

There were also some cases where Dalits were left out in rescue efforts. A Dalit woman reported that the police had ignored her when she was begging for help to retrieve her daughter who was buried under the rubble. Two weeks after the quake, in the rural areas, only 40% of the Dalits had received food support. Moreover, it was reported to be unequally distributed: Dalit families received one pack of rice while non-Dalits got two packs. Dalits also faced challenges in getting access to health services and water in many villages.<sup>67</sup>

**Finding 2: Many Dalits did not have proper access to information because of the location of their settlements in villages.**

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<sup>65</sup> Kumar BK, Sushil. "Waiting for 'Justice in Response.'" *IDSN*. N.p. 25 May 2015.

<sup>66</sup> Pariyar, Raj. "Double Trouble." *OpEd*. The Kathmandu Post, 30 Dec. 2015.

<sup>67</sup> "Urgent Appeal to Combat Caste Discrimination in Nepal Earthquake Relief Efforts." *International Dalit Solidarity Network*. Humanitarian Aid, Nepal, 3 June 2015. Web.

Dalit houses in rural areas are often far away from roads and mainstream settlements, hindering distribution of relief aid supplies. The distance also made information outreach to their communities very challenging.



*Figure 8. A Dalit family in a rural village of Nepal. Dalit settlements are far from roads and prone to landslides especially after earthquakes. (Bikash Khadge/CAFOD)*

Dalit settlements are situated far from the roads, where the relief materials were usually dropped.<sup>68</sup> “I had to walk three to four hours [from the main road] to reach the settlement,” recounted an emergency support officer working for the Feminist Dalit Organization (FEDO) after his visit to a large Dalit settlement one month after the earthquake.<sup>69</sup> Dalit houses are also far from settlements of higher caste people and from community buildings in the villages, where important notices about relief aid were temporarily posted in many villages. For example, in

<sup>68</sup> Government of Nepal. National Population and Housing Census 2011. N.p.: Central Bureau of Statistics, n.d. Central Bureau of Statistics, Nov. 2012. Web. 6 Apr. 2016.

<sup>69</sup> Qureshi, Jasmin. "Life after the Earthquake for Dalit Communities in Nepal." *Minority Rights*. Minority Rights Group International, 29 Dec. 2015. Web.

Dhading, one of the earthquake-affected districts, these notices were posted by tea shops close to mainstream settlements, making the information access for Dalits very challenging unless they walked for hours to reach these shops.<sup>70</sup> The Dalits did not have access to the information as a result.

Moreover, the Dalit settlements are prone to flooding and landslides triggered by earthquakes, which render the roads to these areas impassable especially during the crucial emergency relief efforts immediately after an earthquake. This posed more challenge to information outreach and distribution of relief aid to these communities because the aid workers could not easily reach the area.<sup>71</sup> One of the aid volunteers who walked to a Dalit settlement in Gorkha district eleven days after the quake said that the walk was very unsafe due to the landslides and fissures in roads. “Apart from army personnel and a few journalists from Nepal and India, no one had reached there,” she added.

With an aim to provide easy and early access to news and information about different services and facilities provided by the government bodies and other national and international organizations, some organizations like the FEDO and UN Women Nepal distributed radio sets to the marginalized Dalit communities. In a particular distribution site in Sindhupalchowk district, 297 sets were provided to women who lived a four-hour walk away from the relief distribution site. They seemed to be very happy after getting the radio sets. One woman in her late 50s remarked that the radio would be her friend while some others said that it would help them forget

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<sup>70</sup> Ferretti, Silva, Marine De Clarens, Brooke Gibbons, and Urmila Simkhada. *Review of the Humanitarian Response in Nepal*. N.p.: Humanitarian Coalition, 2016. Print. A Focus on Inclusion and Accountability.

<sup>71</sup> Folmar, Steven (2016, April 11). Skype interview



the pain inside them and help them get through their loneliness. Some even added that they could now listen to the FM and express their love for singing and dancing.<sup>72</sup>



*Figure 9. Dalit women in Sindhupalchowk district received radio sets distributed by FEDO and UN Women Nepal (FEDO Nepal, 2015)*

### **Finding 3: Higher caste people did not share information and relief with Dalit communities.**

During the post-quake relief efforts, discrimination and social norms based on caste were prominent in the rural areas of Nepal—particularly in regard to information outreach to marginalized communities. Because they did not have proper information about the relief efforts, many Dalit families saw their share of relief materials taken away by people of the higher

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<sup>72</sup> "Radio Sets Has Distributed to Vulnerable Women Earthquake Survivors." *FEDO Nepal*. N.p., 13 Sept. 2015. Web. 18 Apr. 2016.

castes.<sup>73</sup> The discriminatory practices also made it difficult for Dalits to have access to relief information.

“Only big people know when the relief is coming,” said a Dalit woman living in one of the earthquake-affected villages within a month after the quake, stressing that the marginalized community did not have access to information compared to the other groups.<sup>74</sup> The higher caste people living in those villages were unwilling to share information about relief aid and recovery with them because they lived in close communities of their own and shared the information only with their relatives and neighbors. They also did not prefer sharing information with Dalits because of the big social divide present between the communities.<sup>75</sup>

Harka Damai, a Dalit resident of Gorkha district—one of the most affected rural areas, complained, “Help is pouring in for higher people, but not for the like of us.” The higher caste people in his area had access to “big and colorful tents” whereas the marginalized Dalits did not, even a month after the earthquake. The situation was identical in other areas as well. In Dandakhark, a remote village in Ramechhap District, more than a month after the quake, only 36 out of 57 Dalit families had received tents while all dominant caste families had got them. Moreover, the tents received by the latter were more sophisticated than the ones received by the Dalits.<sup>76</sup> In other areas of Gorkha and Lalitpur districts, the Dalits complained of not receiving all the distributed materials due to an information gap others whereas the other families had been getting them frequently.<sup>77</sup> To make matters worse, in some cases, the Dalit’s share of packages

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<sup>73</sup> Kumar BK, Sushil et. al. “Waiting for ‘Justice in Response.’” *IDSN*. N.p. 25 May 2015. Web.

<sup>74</sup> “Report: Dalits Short-changed in Aid Delivery in Nepal - International Dalit Solidarity Network.” *International Dalit Solidarity Network*. Humanitarian Aid, Nepal, 29 May 2015. Web.

<sup>75</sup> Folmar, Steven (2016, April 11). Skype interview.

<sup>76</sup> Kumar BK, Sushil. “Waiting for ‘Justice in Response.’” *IDSN*. N.p. 25 May 2015. Web.

<sup>77</sup> Pariyar, Raj. “Double Trouble.” *The Kathmandu Post*. 30 Dec. 2015. Web

of tarps and blankets distributed by relief workers had been taken by someone else leaving them with nothing.<sup>78</sup>



*Figure 10. Distribution of tents and shelter in a village in Gorkha district around two weeks after the earthquake (Kathmandu Post, 2015)*

Harka's wife, Sita, further added that they had "neither money nor connections to people in power like the high castes," which made the information access more challenging. Reports compiled by Amnesty International and International Dalit Solidarity Network (IDSN) stated that in some communities, the higher caste people had political connections that allowed them to get information and manipulate relief efforts in their favor.

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<sup>78</sup> Kumar BK, Sushil. "Waiting for 'Justice in Response.'" *IDSN*. N.p. 25 May 2015. Web

#### **Finding 4: Some local aid workers did not pass on information to the Dalit community.**

There were reports that the relief workers willfully neglected the Dalit community when it came to passing information or relief aid materials.<sup>79</sup> This was a big dent on the hopes of Dalits getting information because relief workers were generally an important source of information.<sup>80</sup>

Relief workers in some areas only contacted local political leaders, activists and accessible persons of the village. They did not pass on the information to the Dalit community.<sup>81</sup> Reports stated that some relief workers were members of political parties and wanted the Dalits to vote for their party in exchange for relief.<sup>82</sup> In some cases with the international relief organizations, the local relief workers they hired had a sense of what the organizations wanted to deliver for aid, but had little knowledge of details. For example, they did not get detailed information from the organizations about the rationale and criteria for focusing aid on specific groups, which afforded them too much liberty to make arbitrary choices including whom to distribute aid supplies, increasing chances of prejudice and discrimination towards the marginalized population. The main reason for this lack of proper information was that the aid organizations delivered objectives verbally. When the rationale for focusing aid on specific groups was clear, they had no problem even in accepting that some people received free assistance.<sup>83</sup>

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<sup>79</sup> *Earthquake Recovery Must Safeguard Human Rights*. Rep. Amnesty International, 2015.

<sup>80</sup> Folmar, Steven (2016, April 11). Skype interview.

<sup>81</sup> Pariyar, Raj. "Double Trouble." OpEd. *The Kathmandu Post*, 30 Dec. 2015.

<sup>82</sup> Adhikari, Deepak. "Nepal Dalits Discriminated against for Quake Relief." Anadolu Agency, 8 Dec. 2015. Web.

<sup>83</sup> Ferretti, Silva, Marine De Clarens, Brooke Gibbons, and Urmila Simkhada. *Review of the Humanitarian Response in Nepal*. N.p.: Humanitarian Coalition, 2016. Print. A Focus on Inclusion and Accountability.

### **Finding 5: Dalits generally did not get opportunity for participation in local disaster risk management bodies.**

In many rural communities, Dalits did not get opportunities for meaningful participation in disaster management bodies and other committees that were involved in the relief, aid and information-related decision-making processes after the quake. As a result, the voices of the Dalit communities were not well heard in the relief efforts.

According to a representative of the Feminist Dalit Organization, “Inclusion is in the policy and the talk but not in the reality.”<sup>84</sup> In many villages, the relief materials were distributed locally through the Ward Citizen Forums (WCF), whose main goal is to hear the voices of the rural communities. However, the participation of Dalit communities was negligible in these forums. For example, even though a Dalit was a member of a WCF in Bhaktapur, he was never called to the meetings or informed about relief distribution. In addition, the District Disaster Relief Committees (DDRC)—district-level bodies to monitor and evaluate the local level disaster relief operation—of the 14 earthquake-hit districts did not include a single Dalit person. Dalit organizations like the Dalit NGO Federation, International Dalit Solidarity Network and Feminist Dalit Organization were also poorly represented in these bodies. Moreover, these bodies were predominantly upper-caste.<sup>85</sup>

In Nepal, a blanket approach targeting the entire population as a whole was carried out in the immediate aftermath of the quake due to the need for speed in relief aid. One of the major problems for the marginalized community was that this approach was not followed by another

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<sup>84</sup> *A Case Study on the Experience of Marginalised Groups in Humanitarian Action*. Did the Humanitarian Response to the Nepal Earthquake Ensure No One Was Left Behind? N.p.: Save the Children, March 2016.

<sup>85</sup> *A Case Study on the Experience of Marginalised Groups in Humanitarian Action*. Did the Humanitarian Response to the Nepal Earthquake Ensure No One Was Left Behind? N.p.: Save the Children, March 2016.

program more tailored to the needs of this community.<sup>86</sup> Dalit's lack of representation in the local disaster management bodies might have proved costly in this regard because the voices of the Dalit community was not well heard. This meant that the specific needs of the Dalits were not well known, possibly slimming the chance of proper implementation of this specific approach even if it had been planned to take place.

#### **Objective #4. Assess communications preparations that have been made for the next time an earthquake strikes Nepal.**

##### **Finding 1: Some preparations are being made throughout the country that are more generalized and do not focus on specific marginalized communities.**

The Nepal Academy of Science and Technology was installing earthquake early warning sensors throughout the Kathmandu valley.

Nepali media outlets are reporting that the Nepal Academy of Science and Technology (NAST) have begun installing seismic sensors in the Kathmandu valley.<sup>87</sup> These sensors will act as an early warning system for earthquakes sending out an alert 10 to 20 seconds before the earthquake strikes. NAST plans on installing enough sensors to be able to monitor up to a third of the country with the help of the Institute of Care-Life, a Chinese organization. The alerts are to be sent out using phones, radios, and sirens so as to reach the maximum amount of people.<sup>88</sup>

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<sup>86</sup> Ibid.

<sup>87</sup> Post Report. "Nast Installs 10 Quake Warning Sensors." *Kathmandu Post*. 27 Aug. 2015. Web. 26 Apr. 2016.

<sup>88</sup> Southasia.com.au. "Nepal Installs Earthquake Early Warning System, Alerts 10-20 Seconds in Advance." *Southassia.com.au*. 19 Jun. 2015. Web. 26 Apr. 2016.

Due to their background as reliable means of communication during disasters, Nepali police will be trained on how to use ham radios over the coming years.

Following the earthquakes, ham radio was a reliable way to keep in contact with survivors, but it was limited to the Kathmandu valley due to the lack of operators in Nepal. The Nepali government is planning to have their police force trained on how to use ham radios so that they can have a reliable form of communication in a disaster. Additionally, other organizations are giving small grant to help reduce the cost of the equipment to allow for it to be more accessible to the general public.<sup>89</sup>

From a report on Nepal's disaster preparedness we found that the Nepal Telecommunications Authority had plans to assess and rebuild the existing cellular and radio towers throughout Nepal to make them more earthquake resistant.

The Nepal Telecommunications Authority (NTA) is the governmental authority on communications. Many of the cellular and radio towers in Nepal are poorly constructed and placed in top of buildings that are at risk of collapse in an earthquake which would render the tower unusable. The NTA has proposed a plan to visit and assess the vulnerability of all of the towers throughout Nepal and rebuild or reinforce them based on their observations. This is all in an effort to make the towers more earthquake resistant in hopes of keeping the cell and radio connections to more remote areas available in the event of a disaster.<sup>90</sup>

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<sup>89</sup> Mani, Sarthak. "Ham Radio to the Rescue." *Nepali Times*. 15-21 Jan. 2016. Web. 5 Apr. 2016.

<sup>90</sup> ASNEng, ANMF, and CAN-USA. "Earthquake Preparedness and Disaster Relief in Nepal A Position Paper." *ASNEng; ANMF; CAN-USA*. May 2015. Web. 26 Apr. 2016.

**Finding 2: From the research that we have conducted, to our eyes it seems most of the countries have been put towards rebuilding communities rather than making sure that are prepared for the next time an earthquake strikes.**

The lack of information regarding earthquake preparation in Nepal coupled with the reports of rebuilding have led our group to believe not much work has been done to prepare for a future disaster.

While there are some reports on preparation activities like the ones in the first finding, the majority of the resources after the earthquakes seems to have gone towards rebuilding houses and fields so people will at least be able to sleep and eat. It is hard to prove a lack of information in a subject, however many of the pieces we have found are just suggestions as to what should be done and are not essentially going to be implemented in the future.<sup>91</sup>

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<sup>91</sup> ASNEng, ANMF, and CAN-USA. "Earthquake Preparedness and Disaster Relief in Nepal A Position Paper." *ASNEng; ANMF; CAN-USA*. May 2015. Web. 26 Apr. 2016.



## 5. CONCLUSION

When the earthquakes struck Nepal in 2015, countless lives were lost or uprooted due to the damage, and Dalits were among those hit the hardest. In the aftermath following the earthquakes, survivors needed access to many services to begin the road to recovery, one of the most important of those was access to communication technology and information. Without this many people and families were unable to contact relatives to report that they were safe; they were also unable to get reliable information on relief services and aid packages that should be available to them. The discrimination present in society, especially in rural villages, was one of the major contributors to the restricted access Dalits had to communication.

Through our research we found many factors that had an effect on the access to communications technology:

### **Objective 1: Communication Before the Earthquakes.**

Finding 1 – Hills and mountains in Nepal often blocked cellular and radio signals.

Finding 2 – Nepal’s hilly topography posed a significant barrier to access many remote areas by road before the earthquakes.

Finding 3 – The limited supply of electricity made charging communications devices such as phones, radios, and televisions difficult.

### **Objective 2: Communication After the Earthquakes.**

Finding 1 – The destruction of weak infrastructure in rural areas obstructed the flow of information.

Finding 2 – Unstable electricity supply impeded the flow of information all over Nepal after the earthquakes.

Finding 3 – The 2015 earthquakes damaged the communication sector severely.

Finding 4 – Commonly used means of communication failed to successfully survive the earthquakes.

Finding 5 – The Nepali government was unprepared to effectively mobilize resources.

Finding 6 – The Media failed to provide reliable information after the earthquakes.

Finding 7 – Language differences hindered the communication between relief workers and survivors.

### **Objective 3: Difficulties Faced by Dalits.**

Finding 1 – Many Dalits were short-changed in relief operations.

Finding 2 – Dalits did not have proper access to information because of the location of their settlements in villages.

Finding 3 – Higher caste people did not share information and relief with Dalit communities.

Finding 4 – Some local aid workers did not pass on information to the Dalit community.

Finding 5 – Dalits generally did not get opportunity for participation in local disaster risk management bodies.

### **Objective 4: Preparations for the Next Earthquake.**

Finding 1 – Some preparations are being made throughout the country that are more generalized and do not focus on specific marginalized communities.

Finding 2 – From the research that we have conducted, to our eyes it seems most of the countries have been put towards rebuilding communities rather than making sure that are prepared for the next time an earthquake strikes.

### **Recommendations:**

While the preparations being made by the Nepali government and other organizations are essential to reduce the damage to the citizens as a whole, they don't focus on helping people access the technologies. Rather, they make the technologies themselves more resilient and assume that the citizens will have access to them, which isn't true in most cases. From our findings our group was able to come up with these recommendations for improving the communication with rural Dalits:

- 1. To address the uneven distribution of aid in rural communities, we recommend international organizations and their workers be educated about the caste system and the discrimination towards the Dalit castes in rural areas.**

**Explanation.** As the relief workers made their way to the more rural groups of earthquake survivors in Nepal, they were often taken advantage of by those in the higher caste. Due to the need of relief workers, many traveled to Nepal to help but it appeared that they were not sufficiently educated on the prevalence of caste discrimination in rural villages. In many cases, the workers would arrive at the village and talk with the village chief who would help set up the aid distribution channels. The problem with this is that the village leader was usually of a higher caste and would prioritize the other castes over Dalits resulting in less aid material for them. Dalits will be passed over for the most part if there is a person of a higher caste who feels that they need more aid. By learning where Dalits traditionally live and the occupations they hold, it should be easier for aid to be distributed fairly to those in the most need of it rather than to those who feel that they deserve more.

**Limitations.** A major limitation is that the degree of discrimination may be different depending on the village. The relief worker would then have to observe and make a judgment based on the opinions they had on the community as a whole. Additionally, organizations and workers will have to take into consideration the views of the higher caste as they may feel offended if relief is provided to those that they believe are undeserving. There is also the time that must be taken to educate the workers before they arrive in the country to consider.

- 2. To increase the flow of information into rural Dalit communities, we recommend Dalits be educated on how they can go about requesting or receiving information from local leaders and get opportunities to participate in local disaster management bodies.**

**Explanation.** Much of the information flow in the communities of survivors depended in a person's caste and the connections they had to those in power. Additionally due to their living spaces in the camps, Dalits tended to be on the fringes, away from the more active areas where information was being distributed. Dalits were also routinely under-represented in the local disaster management groups leaving their communities voice out from the relief planning discussions. Therefore, it is important that Dalits are made aware of how to go about getting information and being involved in the decision making process in the future. There should be designated classes to show where to go to during a disaster to gain relief and information. Additionally, they should be told who would be in charge of any tent camp or group so they have a point of contact during disaster relief. With this there should be continued drills and designated people for getting and distributing information throughout the Dalit communities.

**Limitations.** The recommendations are based on observations gained from reports and may not represent the situation in every village. Also, those in higher castes may refuse to share information with Dalits or withhold it until it is nearly useless. It should also be noted that this recommendation is based on our opinions after reading the reports including interviews, and as we did not interview Dalits ourselves, this may be misrepresentative of their true opinions.

- 3. To avoid rumors being reported in the media following a disaster, we recommend reporters undergo training to learn how to distinguish facts from rumors while gathering information in emergency situations.**

**Explanation.** As relief information and sanitary practices were being broadcast across the television, radio, and newspapers after the earthquakes, there were also many rumors

spread as well. These rumors began to panic survivors, who, after realizing that what was reported was not true, began to become distrustful of news reports. It is important that reporters and editors become able to identify rumors so that they continue to provide lifesaving information to survivors without the risk of people not listening to them for fear of being tricked. The training should include information on how disasters are predicted and how to compare and analyze reports from survivors to pull the facts from the stories. These are especially important since most of the rumors were related to aftershocks and unbelievable experiences during the initial earthquake.

**Limitations.** A major limitation is the time it would take to educate reporters and editors and the cost associated with it. Additionally, the cost would be detrimental to many of the

- 4. We recommend that a WPI project be established focused on educating rural Dalit communities on information technologies and ways to become more involved in village decision making bodies.**

**Explanation.** Our team identified communication difficulties in the month following the earthquakes that affected the rural Dalit communities. Our paper is more of a report on what these problems are and why they occur and doesn't do anything in the way of removing these barriers to information. Therefore it would be important for another team to actually travel to Nepal and interact with these communities and hear people's personal opinions on why communication was such a problem after the earthquakes.

Then there should be targeted education for these communities on what they should do in the aftermath of a disaster and how to make sure they are not excluded from the recovery efforts. This continuation of our project would work towards implementing some of the earlier recommendations in the rural villages as well.

**Limitations.** This project group may be limited by the United States government and WPI as ours was, where they may not be allowed to travel to Nepal. Additionally, some communities may not want to speak with students regardless of if their objective is to help their situation.

### **Program Design Principles:**

We learned the following lessons from this project on the relationship between technology and society:

- 1. It is important to consider the social hierarchy present as it can greatly affect the effectiveness of technical work.**

From our research into Nepal's complicated caste system it has made it extremely apparent that approaching a project without considering the people's opinions will result in failure. It is essential to make sure that each aspect of a project affects each social group positively, which was not the case for relief aid in Nepal. From the example of Nepal, the lower castes were sometimes outright ignored in the relief efforts resulting in uneven recovery rates within communities. This often led to resentment of the higher castes and furthered the discrimination between the groups.

- 2. Economical limitations of a country should always be a significant factor in determining future plans for a project.**

Many countries have limited funds for any type of developmental work. China may be able to spend billions on improving the roads throughout the country where a smaller nation like Nepal has little to no money to spare. Projects should be tailored to the country's specific capabilities, whether it is manpower or funding. Without this foresight,

a project that may be exactly what is needed in the country but is too expensive to fully implement may end up doing more harm than good. For example, the early warning sensors for earthquakes that are being installed throughout Nepal would have been much too expensive for the country to fund by itself so much of the cost is being covered by grants from other countries and organizations.

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