

Public perception towards disaster relief efforts following the April 2015 Nepal earthquake

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Abstract

Nepal suffered a devastating 7.8 magnitude earthquake on April 25, 2015 (also referred to as the Gorkha earthquake 2015) that killed almost 9,000 people and injured nearly 17,000 others. Following the devastation, a nation-wide relief and recovery effort was launched to aid the affected communities in their recovery. The aim of this paper is to understand the perception of the affected communities towards the effectiveness of the disaster relief efforts led by various governmental and non-governmental organizations. We analyze a survey of 1400 members of the affected communities that was conducted five to six months after the earthquake hit Nepal. In order to understand the affected communities' perception and to investigate whether or not there was any demography-based discrimination while distributing relief materials, we run an ordered logit model to regress demographic factors such as age, gender, occupation, etc. on multiple survey questions which are answered by the affected people on a scale of 1 to 5, with 1 meaning 'not satisfied at all' and 5 meaning 'completely satisfied.' Our results indicate that leaving a few anomalies aside, people's age has no significant role to play in their satisfaction level towards the relief efforts. Women seem to be responding higher (more positive) on most questions compared to men, but looking at the current male-dominated structure of Nepali society, it's less likely a sign of discrimination against men and more likely an emblem of women's relatively calmer nature in the face of adversity compared to men. We find that farmers and laborers felt significantly worse about most of the aspects of the relief efforts. Farmers and laborers also constitute the most destitute and

the least empowered group, so their lack of education, access to information, remote location, etc. might have a role to play in them not getting proper access to the relief materials. The main problem after the earthquake is reported by more than 80% of the dataset to be short-term or long-term shelter. Farmers and laborers are clearly not as happy with the government’s role in addressing their main problem of shelter. In majority of the survey questions, the district people belonged to really made a difference on how they felt about the relief efforts. This makes sense, because firstly, the extent of damage and destruction is highly correlated with location simply because of the nature of the catastrophe, and secondly, the relief efforts are mostly targeted disproportionately in different districts for various reasons like destruction level, access, availability of resources, geographic complication, etc.

Keywords: 2015 Nepal earthquake, relief and recovery, community perception.

1. Introduction

A 7.8 magnitude earthquake struck Nepal in April, 2015 resulting in a loss of over 9,000 lives and many thousands more in casualties (Fitzpatrick & Koontz (2015)). More than 600,000 structures were damaged and destroyed in and around the epicenter, Gorkha, most of it concentrated on the densely populated capital city of Kathmandu (Rafferty (2015)).

We are interested in understanding the sentiments of the affected communities in the post-earthquake period, especially in relation to the effectiveness of the response put forward by the government and non-governmental organizations to help restore the physical and psychological damages inflicted by the disaster. Hence, we focus our analysis on the impact of demographic factors such as age, gender, occupation, caste/ethnicity, etc. on public perception towards the recovery efforts.

Answers to the survey questions are recorded on a Likert scale of 1 to 5, with 1 meaning ‘not satisfied at all’, 2 meaning ‘very little’, 3 meaning ‘neutral’, 4 meaning ‘somewhat satisfied’, and 5 meaning ‘completely satisfied’. Since

ordering of the answer matters, we build an ordered logit model to analyze the survey responses. We look at seven different survey questions. Our model takes into account various demographic as well as geographic factors that might influence how the affected communities respond to the survey.

2. Literature Review

Nepal is located in one of the most active seismic belts in the planet. The Himalayan range in northern Nepal includes some of the highest mountains in the world, including the highest peak Mount Everest, which are formed by the collision between the Indian Plate and Eurasian Plate which began 50 million years ago and continues today. Naturally, this seismic geological event is of immense importance to subsurface geologists who are interested in studying subsurface deformation and tectonics of the Himalayan fault system. Consequently, a significant number of studies in the literature concerning the Nepal 2015 earthquake have been focused on the geological and tectonic aspects of the quake (Bilham (1995), Grandin et al. (2015), Yagi & Okuwaki (2015)). Similarly, some engineering studies have focused on the structural damage inflicted by the quake (Goda et al. (2015), Brando et al. (2017), Gautam et al. (2016)).

We do see some studies in the literature that are concerned with the public perception aspect of the earthquake rather than geological and structural aspects. Some examples of the work done in this area are analyzing public perception of the risk of an earthquake (Upreti & Poudel (2012)) and developing school disaster education (Shiwaku et al. (2007)). These are mostly geared towards coming up with ways to ensure better preparedness in the event of another disaster like this in future. Radianti et al. have studied the public sentiment in Nepal in the post-earthquake recovery period qualitatively using twitter analysis. (Radianti et al. (2016)). Finally, Su et al have also studied disaster response and relief following the 2015 Nepal earthquake, however mainly focusing on the flow of funds and resources. Towards the end of their paper, they take into account some surveys of affected citizens to capture the efforts

of the international and local organizations and governments; however, this is not their primary goal (Su et al. (2016)). In this paper, we will focus entirely on public perception of the affected communities in the months following the disaster. We will not investigate any financial aspect of the recovery process. We are solely interested in understanding how the affected communities felt towards the relief efforts and if there was any bias based on demographic factors like age, gender, occupation, location, etc.

3. Data Source and Handling

Following the catastrophic earthquake of 2015, Accountability Lab and Local Interventions Group, as part of the Inter Agency Common Feedback Project, conducted a Community Perception Survey of 1400 respondents in 14 priority affected districts of post-earthquake Nepal with an aim to capture and represent the perceptions of earthquake affected communities within the response and recovery effort led by both governmental and non-governmental organizations. The dataset is shared publicly by Humanitarian Data Exchange on the website data.world with the title “Community Perception in Earthquake Affected Nepal”. There is some that preprocessing involved while handling the data. The original dataset is available in csv format and has ordinal variables encoded as strings that default to randomly ordered values when imported to gretl. Since the ordering of the survey answers matters to us, we clean the data and map the strings to correct numeric values before importing the data to gretl.

4. Model: Ordered Logit

Since we are dealing with a multi-class categorical output where the different categories are ordered, we decide to use the ordered logit model which is the generalization of the binary logit model for ordered multi-class target variable

(Koop (2008)). Equation 1 shows the ordered logit model that we use.

$$\begin{aligned}
y_i^* = & \beta_0 + \beta_1(female)_i + \beta_2(age\ 40\ plus)_i + \beta_3(farmer/laborer)_i + \\
& \beta_4(health\ issue)_i + \beta_5(asteNGTJ)_i + \beta_6(asteDalit)_i + \\
& + \beta_7(asteOthers)_i + \beta_8(distLalit)_i + \beta_9(distMakwan)_i + \\
& + \beta_{21}(distOkhal)_i + \epsilon_i \quad (1)
\end{aligned}$$

where

$$\begin{aligned}
y_i^* &= \text{latent variable for ordered logit,} \\
female_i &= \text{dummy for gender} \\
age\ 40\ plus_i &= \text{dummy for age greater than 40} \\
farmer/laborer_i &= \text{dummy for occupation farmer/laborer} \\
health\ issue_i &= \text{dummy for having health issues} \\
asteNGTJ_i &= \text{dummy for caste Newar, Gurung, Tamang, Janjati} \\
asteDalit_i &= \text{dummy for caste Dalit} \\
asteOthers_i &= \text{dummy for caste Others} \\
distLalit_i &= \text{dummy for district Lalitpur} \\
distMakwan_i &= \text{dummy for district Makwanpur} \\
&\vdots \qquad \qquad \qquad \vdots \\
distOkhal_i &= \text{dummy for district Okhaldhunga} \\
\epsilon_i &= \text{random error.}
\end{aligned}$$

In the model shown, all explanatory variables are dummy variables. There are dummy variables for gender, age, health issue, occupation, and location. There are 14 sets of dummy variables for 14 affected districts. A few examples such as Makwanpur and Okhaldhunga districts are shown in the model where others are omitted here to avoid clutter.

There are a few important concepts we need to clarify about the model. Firstly, this is not a linear regression model, so the interpretation of coefficients

is altogether different in this case. Instead of interpreting the coefficients themselves as marginal effects, we see them as a measure of change in log odds of answering the survey question in a certain way.

Secondly, our observations are discrete. We are using use a latent variable y^* to understand the survey results where our actual categorical observations notated by y are ordered categories from 1 to 5. Simply speaking, we never observe y^* . We need a way to connect the latent variable y^* with the actual observations y .

$$y = \begin{cases} 1 & y^* \leq cut_1 \\ 2 & cut_1 \leq y^* \leq cut_2 \\ 3 & cut_2 \leq y^* \leq cut_3 \\ 4 & cut_3 \leq y^* \leq cut_4 \\ 5 & y^* \geq cut_4 \end{cases}$$

The parameters cut_1, cut_2, cut_3 , and cut_4 are externally imposed endpoints of the observable categories. Using this idea of latent variable with cutoff points, we can build the ordered logit model by interpreting the observations on y as a restricted subspace of the latent variable y^* .

Determining the marginal effects for a logit model requires an extra step, because in a logit model, the latent variable y^* needs to be mapped into a probability space (0 to 1) before any meaningful interpretation can be made. Sometimes, researchers use the slope at the mean to simplify this calculation a little bit. In this work, we will not make those precise calculations for marginal effects. We will interpret the coefficients of independent variables directly as the amount by which the latent variable increase or decreases when a particular independent variable changes by 1 unit. Since higher value of the latent variable is more likely to translate to a greater score in the Likert scale, even though this method is not precise, it will help us gauge the effect of each demographic factor on public's response.

5. Results and Discussion

Respondents in the survey were asked several questions, some completely qualitative and some quantitative on a Likert scale. We focus on seven of these questions where the respondents responded on a Likert scale of 1 to 5. Figure 1 shows the average score of all respondents for each of the seven survey questions.

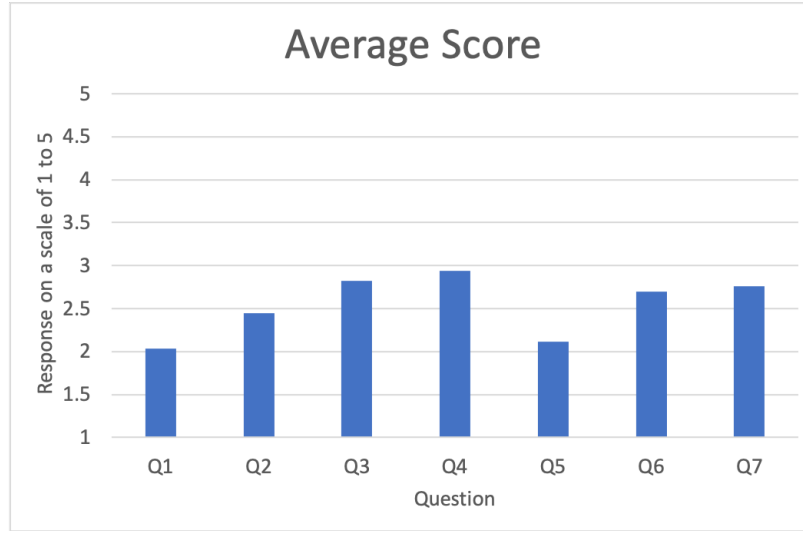


Figure 1: Mean survey score for different survey questions

where,

Q1 = Are your main problems addressed?

Q2 = Are you satisfied with government support?

Q3 = Are you satisfied with NGO's support?

Q4 = Do you think the support is fair?

Q5 = Do you think you have been heard?

Q6 = How is the progress in relief efforts?

Q7 = Do you have proper information about government support?

From Figure 1, we can see that on average, the ratings are mostly between 2 meaning 'very little' to 3 meaning 'neutral'. On average, the affected communi-

ties at best felt neutral towards various aspects of the relief efforts. This means there might be a place for improvement; however, in times of disasters like this, it would be expected that people who are suffering are more likely to be upset and negative about their situation no matter how much aid they are receiving for their recovery.

After the preliminary inspection of the data, we analyze each of the seven survey questions with the ordered logit model that we develop in Section 4. In Figure 2, we show as an example the model result for one of the seven questions (Q2: How satisfied are you with the government’s response?). In order to avoid clutter, regression results for the rest of the seven questions are attached in the appendix to the paper; some of them will be referenced while discussing the results.

description	coefficient	p-value
female	0.491	0.0004 ***
age 40 plus	0.175	0.0941 *
farmer/laborer	-0.237	0.0361 **
caste NGJT	-0.223	0.0452 **
caste Dal	-0.254	0.6512
caste Other	0.282	0.2512
health issue	-0.413	0.0029 ***
dist2_Lalit	0.098	0.7133
dist3_Makwan	0.055	0.8435
dist4_Bhakta	1.365	1.85e-07 ***
dist5_Rasuwa	1.979	1.21e-10 ***
dist6_Kavre	-0.467	0.0745 *
dist7_Dhading	1.038	7.50e-05 ***
dist8_Sindhu	0.214	0.4112
dist9_Sindhuli	1.429	1.06e-07 ***
dist10_Rame	0.167	0.5534
dist11_Gorkha	1.612	7.40e-11 ***
dist12_Dolakha	0.313	0.2388
dist13_Nuwakot	0.010	0.9718
dist14_Okhal	0.837	0.0016 ***

Figure 2: Ordered logit regression result for survey question Q2

Coefficients above cannot be interpreted directly until we have the cutoffs for the latent variable y^* which tell us what range of y^* values refer to which ordinal choice. Since there are five ordinal choices, there will be four cutoffs. These cutoffs are important while interpreting the coefficients as they help convert these coefficients into meaningful probabilities while determining the marginal effects.

description	cutoffs	p-value
cut1	-0.334	0.1106
cut2	0.965	4.50e-06 ***
cut3	1.5596	3.15e-13 ***
cut4	2.874	7.80e-37 ***

Figure 3: Cutoffs for ordered logit on Q2

Ordered logit model like the one shown here is built for each of the seven survey questions. The results from gretl are included as an appendix at the end of this paper. As we have mentioned in the model description section, we will not determine the precise marginal effects of the independent variables. We will look at the coefficients as marginal change in the latent variable to roughly gauge the kind and size of the effect a particular independent variable has on the dependent variable. Figure 4 might help clarify this picture.

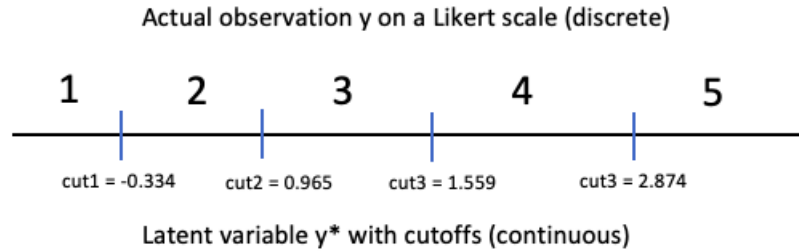


Figure 4: Latent variable, actual observation and the role of cutoffs

In Figure 4, we see that the predicted value of the latent variable along with the cutoffs will give us the actual output on a Likert scale with some intermediate probability calculation steps. A positive coefficient in the logit model increases the value of the latent variable and hence is more likely to push the predicted score towards a higher value, and a negative coefficient will do vice-versa. This is the logic we will use to analyze the effects of these coefficients on public perception.

Since there are 7 different survey answers regressed on same set of demographic variables, it's a good idea to organize our discussion by different demographic aspect/s that we are analyzing.

5.1. Age and Gender

We found no consistent evidence of age bias in the relief aid distribution process apart from one case where older people were slightly more unhappy when they are asked whether they think they have been heard or not. We did observe that for most of the survey questions, females answered more positively than males at statistically significant levels. There is no compelling reason to believe that men were discriminated against in the relief efforts, because in the male-dominated Nepali society, women are usually the ones left behind. We think higher satisfaction ratings by women might be due to their softer nature than due to them getting better treatment.

5.2. Occupation

Since a huge proportion of Nepal's workforce are in farming and labor, we group occupation into two categories; farmers/laborers and not farmers/laborers. This grouping also captures the dichotomy in Nepali society in terms of the gap in education and empowerment. Farmers/laborers are the least educated and the least empowered class who do the most labor-intensive jobs for the lowest wages. They are the ones who are most affected by disasters like earthquake. Not surprisingly enough, our results show that on 5 of the 7 survey questions, everything else held constant, farmers/laborers rated consistently lower compared to their counterparts in other occupations like public service, private industries, etc. Holding other things constant, farmers/laborers are less satisfied with both the government's and NGO's relief efforts. They feel they have not been heard as much by the government as others.

One particularly strong grievance that farmers/laborers had was regarding their shelter situation after the earthquake. When asked 'Are your main problems addressed?' (Q1), they report that they feel much worse about this

compared to others. With shelter being the main problem for more than 80% of the dataset, this means that farmers/laborers felt that they were not getting as much support with building materials and other forms of housing assistance or temporary shelters. This can be due to the fact that farmers/laborers usually live in remote areas which makes it more challenging to provide them shelter-related assistance due to road and transportation issues. Their lack of education and inability to gather proper information might have a role to play here as well.

We think that the government can definitely learn a lesson from these results to improve their planning of post-disaster relief efforts in the future. It's not very surprising that farmers/laborers who are the least educated and the most struggling class are the ones that are left behind during the relief efforts. The government needs to allocate more resources for these people. It needs to reach out to them and listen to them more to understand how it can help them better.

One cruel fact about Nepal is that it is in a seismically very active region and earthquake like the one in 2015 are only a matter of time. The government must plan ahead and be ready for a response when a disaster like this eventually strikes, since we know it will happen sooner or later. In case of a disaster, they should have an action plan and resources ready to go, especially for people like farmers/laborers who are struggling the most in the society.

5.3. Caste and Ethnicity

We did not find a consistent or systematic discrimination against any particular caste or ethnicity; however, we did see a few instances where people belonging to certain caste group gave statistically significantly lower scores. For example, when asked if your main problems are addressed (Q1), NGTJs (Newar, Gurung, Tamang, Janjati) and Dalits gave a lower score. Similarly, when asked about the relief efforts progress (Q6), all minority caste people grouped in 'Others' are clearly more unhappy compared to others. We can safely say that there is no obvious and rampant caste discrimination going on during the recovery process, but there definitely are areas for improvement, if we can listen to people who are in minority castes.

5.4. Health Issues

People with health issues consistently responded more negatively, however this must be due to the fact they are a more vulnerable group with more urgent needs rather than them being discriminated against.

5.5. Location

Districts have a really important role in determining how people feel about the relief efforts after the earthquake. This makes sense, because different locations are expected to have different levels of damage, different administrations, presence of different NGOs, etc. Since most of the relief efforts are targeted by location, what kind of relief materials and assistance you get depends on where you are located. Total fourteen affected districts in Nepal are surveyed. In the logit model we develop, districts are represented by dummy variables. Kathmandu, which is the reference level for all districts, is omitted to avoid multicollinearity.

Gorkha, the district where the earthquake's epicenter is located and after which we refer to this catastrophe as the Gorkha 2015 earthquake, seems to have gotten more attention and resource compared to some other districts. For most of the survey questions, people from Gorkha have responded more positively at statistically significant levels. At first, this seems counter intuitive as we would expect the district that is most hardly hit to respond more negatively towards recovery efforts, but if we think about it, even though they were closer to the epicenter, they received significantly more media coverage and immediate attention in the aftermath, which might have brought more resources to their relief.

Sindhuli is another district that gives a more positive response to the relief efforts. On the other hand, Kavre's response is mostly more negative, so they must not have received as much assistance as their neighboring districts. Some other districts like Ramechhap and Makwanpur show mixed response depending on what specific question they are asked. In the rest of the districts, location is sometimes statistically significant and sometimes not, and the responses are

sometimes more positive, and sometimes more negative depending on the survey question.

We observe an interesting phenomenon in Rasuwa. In Rasuwa, the responses are overly positive for most of the survey questions. When asked if the support was fair (Q4), the coefficient for `distRasuwa` is 3.91. When asked about relief efforts progress (Q6), the coefficient is 4.37. NGOs seem to have done really good in Rasuwa; when asked about NGOs (Q3), the coefficient is 3.22. Even though these coefficients can't be directly interpreted as the marginal effect, given the cutoffs for our latent variable y^* in our logit models, these values of the coefficient do tell us the effect size is pretty large and significant. For some reason that we haven't been able to determine yet, people in Rasuwa felt statistically significantly better than all other districts when it comes to their satisfaction with the relief efforts.

6. Conclusion

We analyze a survey of the affected communities after the 2015 Nepal earthquake to understand public perception towards the relief efforts shown by the government and other non-governmental organizations. The survey has responses from 1400 people from 14 different affected districts in post-earthquake Nepal. Since responses are recorded on a Likert scale from 1 to 5, we use an ordered logit model to investigate how demographic factors like age, gender, occupation, location, etc. affect people's response towards the effectiveness of the relief efforts.

We find no evidence of age bias in the relief efforts. While there are some survey questions where women feeling more positive about certain aspects of the recovery efforts than men, we do not believe this reflects discrimination against men. Nepal's society has always been dominated by men and still is to a good degree, especially in government administration and public service sectors. Higher satisfaction scores by women might just be reflecting their more enduring nature compared to men in the face of adversity.

We find that farmers and laborers responded statistically significantly more negatively towards majority of the seven questions surveyed. Rather than labeling this as occupation bias, we believe this is closely related to the fact that farmers and laborers are the least educated and informed and financially most vulnerable group in the entire population. Their main grievance was regarding finding a proper shelter after the earthquake, which was the main problem for the majority of the affected communities. Even though getting building materials to remote villages in a short notice can be tricky in a place with Nepal's geography, the government can definitely try to be prepared for disaster management ahead of time, especially when we know that Nepal's location in one of the seismically most active zones in the world makes it prone to these disasters.

We find no evidence of consistent discrimination against any particular caste or ethnicity. There are however a few anomalies here and there where people belonging to a certain caste respond slightly differently compared to others. Similarly, people with health issues respond more negatively across the board. We believe more than government discrimination, this has to do with their increased vulnerability due to health problems that causes them to have more urgent and important health needs and perhaps higher expectations too.

Location is definitely a big factor. People from different affected districts clearly have different perception towards the relief efforts. Some of them stand out. For instance, Gorkha, even though being at the epicenter of the quake, seems to be significantly more positive towards the assistance it received than others. We think this is because they received more media attention in the immediate aftermath of the earthquake, and hence more recovery assistance. In most districts, people's responses seem to be mixed depending on what specific question they are asked. Overall, location is an important variable that certainly plays an important role in dictating how someone felt about the relief efforts.

One interesting result appears in Rasuwa district where the responses are overly positive for no apparent reason. We couldn't yet come up with a reasonable story that can explain this. This can be a good question for future research. Another research direction that can be taken from here is to gather data on par-

ticular districts and analyze survey responses in that individual district in the presence of district data.

Even though we have tried our best to come with a robust model, there are some issues that should be mentioned. One such issues is the fact that all of our variables are dummy variables. To avoid the dummy trap, it is better to have at least one continuous variable, but the survey data doesn't contain any continuous variable. For the same reason, an ordered logit model has been employed instead of an OLS regression model. One other possibility for future is to analyze the same data using other methods that can handle multiple ordered categories as output, for instance, a probit model.

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Dependent variable: are_main_problems_addressed
Standard errors based on Hessian

	coefficient	std. error	z	p-value	
female	0.226465	0.111787	2.026	0.0428	**
age_40_and_abov	0.0814758	0.109292	0.7455	0.4560	
farmer_laborer	-0.697975	0.117730	-5.929	3.05e-09	***
caste_NGTJ	-0.219867	0.114985	-1.912	0.0559	*
caste_Dal	-0.540658	0.239335	-2.259	0.0239	**
caste_Other	-0.362911	0.272843	-1.330	0.1835	
health_issue	-0.519191	0.127895	-4.060	4.92e-05	***
dist2_Lalit	0.438378	0.265685	1.650	0.0989	*
dist3_Makwan	0.491911	0.286765	1.715	0.0863	*
dist4_Bhakta	0.695326	0.268320	2.591	0.0096	***
dist5_Rasuwa	1.68780	0.316563	5.332	9.73e-08	***
dist6_Kavre	-0.507810	0.281276	-1.805	0.0710	*
dist7_Dhading	0.844707	0.264148	3.198	0.0014	***
dist8_Sindhu	0.709032	0.264059	2.685	0.0073	***
dist9_Sindhuli	0.460530	0.285311	1.614	0.1065	
dist10_Rame	-0.615611	0.302187	-2.037	0.0416	**
dist11_Gorkha	1.31861	0.273691	4.818	1.45e-06	***
dist12_Dolakha	0.0663692	0.272044	0.2440	0.8073	
dist13_Nuwakot	0.306555	0.277249	1.106	0.2689	
dist14_Okhal	1.20270	0.273770	4.393	1.12e-05	***
cut1	-0.331811	0.218329	-1.520	0.1286	
cut2	0.933001	0.219380	4.253	2.11e-05	***
cut3	1.47310	0.222599	6.618	3.65e-11	***
cut4	2.96315	0.246235	12.03	2.36e-33	***

Figure 5: Ordered logit for Question 1: Are your main problems addressed?

Dependent variable: satisfied_with_ngos
Standard errors based on Hessian

	coefficient	std. error	z	p-value	
female	0.370724	0.108636	3.413	0.0006	***
age_40_and_abov	-0.0100084	0.105932	-0.09448	0.9247	
farmer_laborer	-0.226559	0.114121	-1.985	0.0471	**
caste_NGTJ	-0.0636462	0.111668	-0.5700	0.5687	
caste_Dal	-0.311765	0.227042	-1.373	0.1697	
caste_Other	-0.155998	0.263156	-0.5928	0.5533	
health_issue	-0.101555	0.122761	-0.8273	0.4081	
dist2_Lalit	0.631784	0.251394	2.513	0.0120	**
dist3_Makwan	-1.15379	0.280901	-4.107	4.00e-05	***
dist4_Bhakta	0.687449	0.258756	2.657	0.0079	***
dist5_Rasuwa	3.22108	0.304168	10.59	3.32e-26	***
dist6_Kavre	-0.707256	0.255608	-2.767	0.0057	***
dist7_Dhading	0.505550	0.254215	1.989	0.0467	**
dist8_Sindhuli	0.826006	0.253916	3.253	0.0011	***
dist9_Sindhuli	2.14884	0.270708	7.938	2.06e-15	***
dist10_Rame	0.850278	0.285965	2.973	0.0029	***
dist11_Gorkha	1.13346	0.238343	4.756	1.98e-06	***
dist12_Dolakha	0.265446	0.258608	1.026	0.3047	
dist13_Nuwakot	-0.435604	0.261321	-1.667	0.0955	*
dist14_Okhal	0.462756	0.267695	1.729	0.0839	*
cut1	-0.837166	0.202829	-4.127	3.67e-05	***
cut2	0.342655	0.199921	1.714	0.0865	*
cut3	0.961095	0.202080	4.756	1.97e-06	***
cut4	2.40690	0.214544	11.22	3.30e-29	***

Figure 6: Ordered logit for Question 3: How satisfied are you with the NGO's?

Dependent variable: is_support_fair
Standard errors based on Hessian

	coefficient	std. error	z	p-value	
female	0.237917	0.111605	2.132	0.0330	**
age_40_and_abov	-0.0286072	0.108825	-0.2629	0.7926	
farmer_laborer	-0.0621976	0.119127	-0.5221	0.6016	
caste_NGTJ	-0.113254	0.114141	-0.9922	0.3211	
caste_Dal	-0.0482638	0.227345	-0.2123	0.8319	
caste_Other	-0.00420700	0.259077	-0.01624	0.9870	
health_issue	-0.296482	0.125786	-2.357	0.0184	**
dist2_Lalit	-0.125371	0.266799	-0.4699	0.6384	
dist3_Makwan	-0.541579	0.286272	-1.892	0.0585	*
dist4_Bhakta	0.964860	0.265169	3.639	0.0003	***
dist5_Rasuwa	3.91021	0.316681	12.35	5.03e-35	***
dist6_Kavre	-0.372535	0.261342	-1.425	0.1540	
dist7_Dhading	2.52586	0.285543	8.846	9.09e-19	***
dist8_Sindhu	1.08574	0.261550	4.151	3.31e-05	***
dist9_Sindhuli	2.22365	0.277719	8.007	1.18e-15	***
dist10_Rame	2.75274	0.293568	9.377	6.80e-21	***
dist11_Gorkha	2.57063	0.257758	9.973	2.00e-23	***
dist12_Dolakha	0.298736	0.264054	1.131	0.2579	
dist13_Nuwakot	-0.116662	0.268391	-0.4347	0.6638	
dist14_Okhal	0.712043	0.268938	2.648	0.0081	***
cut1	-0.506845	0.208567	-2.430	0.0151	**
cut2	0.702001	0.208039	3.374	0.0007	***
cut3	1.18758	0.210801	5.634	1.76e-08	***
cut4	2.91129	0.227051	12.82	1.23e-37	***

Figure 7: Ordered logit for Question 4: Do you think the support is fair?

Dependent variable: have_been_heard
Standard errors based on Hessian

	coefficient	std. error	z	p-value	
female	0.204234	0.113166	1.805	0.0711	*
age_40_and_abo~	0.248632	0.111093	2.238	0.0252	**
farmer_laborer	-0.542368	0.118714	-4.569	4.91e-06	***
caste_NGTJ	-0.0229901	0.117513	-0.1956	0.8449	
caste_Dal	0.141008	0.236873	0.5953	0.5516	
caste_Other	-0.00875685	0.284123	-0.03082	0.9754	
health_issue	-0.685807	0.131260	-5.225	1.74e-07	***
dist2_Lalit	0.170993	0.264873	0.6456	0.5186	
dist3_Makwan	0.0657949	0.278396	0.2363	0.8132	
dist4_Bhakta	0.611434	0.268574	2.277	0.0228	**
dist5_Rasuwa	1.12393	0.313576	3.584	0.0003	***
dist6_Kavre	-0.135281	0.276565	-0.4891	0.6247	
dist7_Dhading	0.896572	0.290622	3.085	0.0020	***
dist8_Sindhu	0.465601	0.263919	1.764	0.0777	*
dist9_Sindhuli	1.91200	0.286980	6.662	2.69e-11	***
dist10_Rame	-1.37837	0.337211	-4.088	4.36e-05	***
dist11_Gorkha	1.97819	0.263855	7.497	6.52e-14	***
dist12_Dolakha	-0.479825	0.285218	-1.682	0.0925	*
dist13_Nuwakot	0.449263	0.277865	1.617	0.1059	
dist14_Okhal	1.03693	0.282242	3.674	0.0002	***
cut1	-0.295159	0.220159	-1.341	0.1800	
cut2	1.13267	0.222414	5.093	3.53e-07	***
cut3	1.87072	0.227301	8.230	1.87e-16	***
cut4	3.36545	0.251103	13.40	5.83e-41	***

Figure 8: Ordered logit for Question 5: Do you think you have been heard?

Dependent variable: relief_effort_progress
Standard errors based on Hessian

	coefficient	std. error	z	p-value	
female	0.343528	0.111575	3.079	0.0021	***
age_40_and_abov	0.128895	0.108208	1.191	0.2336	
farmer_laborer	-0.0605598	0.120418	-0.5029	0.6150	
caste_NGTJ	-0.110044	0.114669	-0.9597	0.3372	
caste_Dal	-0.205494	0.218501	-0.9405	0.3470	
caste_Other	-0.803548	0.276846	-2.903	0.0037	***
health_issue	-0.498622	0.124980	-3.990	6.62e-05	***
dist2_Lalit	-0.345895	0.276288	-1.252	0.2106	
dist3_Makwan	0.396866	0.270783	1.466	0.1428	
dist4_Bhakta	0.264036	0.283865	0.9301	0.3523	
dist5_Rasuwa	4.37346	0.321534	13.60	3.90e-42	***
dist6_Kavre	-0.0845778	0.261590	-0.3233	0.7465	
dist7_Dhading	0.786592	0.266151	2.955	0.0031	***
dist8_Sindhu	0.657567	0.275524	2.387	0.0170	**
dist9_Sindhuli	1.20499	0.283329	4.253	2.11e-05	***
dist10_Rame	1.98550	0.295879	6.711	1.94e-11	***
dist11_Gorkha	2.93936	0.273183	10.76	5.34e-27	***
dist12_Dolakha	0.138458	0.278440	0.4973	0.6190	
dist13_Nuwakot	0.0138639	0.275439	0.05033	0.9599	
dist14_Okhal	1.60281	0.278437	5.756	8.59e-09	***
cut1	-0.537511	0.219391	-2.450	0.0143	**
cut2	0.886376	0.219700	4.034	5.47e-05	***
cut3	1.55067	0.223220	6.947	3.74e-12	***
cut4	3.66254	0.249282	14.69	7.22e-49	***

Figure 9: Ordered logit for Question 6: How is the progress in relief efforts?

Dependent variable: information_about_gov_support
Standard errors based on Hessian

	coefficient	std. error	z	p-value	
female	0.0653954	0.109790	0.5956	0.5514	
age_40_and_abo~	-0.0672282	0.105463	-0.6375	0.5238	
farmer_laborer	-0.412964	0.115182	-3.585	0.0003	***
caste_NGTJ	-0.177588	0.113040	-1.571	0.1162	
caste_Dal	-0.240523	0.223345	-1.077	0.2815	
caste_Other	-0.403675	0.263460	-1.532	0.1255	
health_issue	-0.639361	0.126657	-5.048	4.46e-07	***
dist2_Lalit	0.182473	0.252680	0.7222	0.4702	
dist3_Makwan	0.0759424	0.268413	0.2829	0.7772	
dist4_Bhakta	0.408458	0.254463	1.605	0.1085	
dist5_Rasuwa	2.00009	0.316591	6.318	2.66e-10	***
dist6_Kavre	-0.975109	0.258733	-3.769	0.0002	***
dist7_Dhading	1.36985	0.265353	5.162	2.44e-07	***
dist8_Sindhu	0.0355032	0.257713	0.1378	0.8904	
dist9_Sindhuli	1.60273	0.263193	6.090	1.13e-09	***
dist10_Rame	-2.23723	0.308051	-7.263	3.80e-13	***
dist11_Gorkha	1.48410	0.248967	5.961	2.51e-09	***
dist12_Dolakha	-0.993749	0.260876	-3.809	0.0001	***
dist13_Nuwakot	-0.579295	0.267715	-2.164	0.0305	**
dist14_Okhal	0.254453	0.264005	0.9638	0.3351	
cut1	-1.59650	0.210729	-7.576	3.56e-14	***
cut2	-0.317441	0.204115	-1.555	0.1199	
cut3	0.0351383	0.204267	0.1720	0.8634	
cut4	1.73445	0.215133	8.062	7.49e-16	***

Figure 10: Ordered logit for Question 7: Do you have proper information about gov. support?