Brief communication

"Loss and Damage from a catastrophic landslide in Nepal"

Dr. Kees van der Geest[1], Markus Schindler[1]

[1]United Nations University Institute of Environment and Human Security, Bonn, 53113, Germany

Correspondence to: Dr. Kees van der Geest (geest@ehs.unu.edu)

Abstract. This brief communication reports key findings of a recent research that studied the impacts of the 2014 Jure landslide in Sindhupalchok (Nepal) and the effectiveness of household preventive and coping measures. The people-centered methods reveal not just what is lost in disasters, but also how and why. A key finding of the household survey is that non-poor households incurred higher losses in monetary terms, simply because they had more to lose. By contrast, poor households lost more in relative terms: The value of their losses amounted to 14 times their annual earnings. Many poor households will never fully recover from this blow to their livelihoods and well-being. The findings have important implications for discussions on loss and damage valuation, compensation and relief.

1 Introduction

1.1 What happened?

On 2 August 2014, a major landslide struck in a densely populated area 80 km northeast of Nepal's capital Kathmandu, in Sindhupalchok District. With a death toll of 156, it was one of the deadliest landslides in Nepal's history. The landslide had a length of 1.26 km and was 0.81 km wide at the bottom. It destroyed all land, houses, properties and infrastructure in its path and created a 55m-high dam in the Sunkoshi River. Behind the debris dam, a 3 km long lake inundated houses, farms and a hydropower plant. The Araniko Highway, Nepal's only road connection to China, was severely damaged, leading to nation-wide impacts.

Our research aims to test a new toolbox for assessing loss and damage (van der Geest & Zeb, 2015). We attempt to answer which losses and damages the landslide caused to households in the area and how effective their preventive and coping measures were. Loss and damage is defined as "adverse effects of climate-related stressors that have not been or cannot be avoided through mitigation and adaptation efforts" (Warner & van der Geest, 2015).

1.2 Climate Change Attribution

To what extent can landslides, such as the one we investigated, be attributed to anthropogenic climate change? On the one hand, landslides are often triggered by extreme rainfall events (Dahal and Hasegawa, 2008). On the other hand, a causal relationship with climate change has yet to be established (Huggel et al., 2012). While climate change alters the conditions that underlie the region's weather, other factors that caused the Jure landslide were unsustainable land use, the absence of effective water-channelling mechanisms, a weak geology

and steep slopes. Thus, although anthropogenic causes may have increased the likelihood of a landslide event, anthropogenic climate change cannot be pinpointed as its definitive cause.

2 Results

2.1 Household Profile

The findings presented in this article are based on 234 questionnaire interviews. Households in the research area were found to be headed predominantly by males (81.5%). The vast majority of households have at least three sources of income (94.4%), one of which was usually farming (98.7%). Land ownership amounted to a median of 3,200 m². Approximately three out of every four households (76.8%) live below a poverty line of $1.25 per capita per day. The median income of the area is even lower, with a daily per capita income of $0.6. Nearly a third of respondents (28.2%) has never been to school.

2.2 Preventive Measures

Most of the respondent households took preventive measures against landslides and other extreme events (74.4%). Among these households, 41.6% attempted to diversify their livelihoods by engaging in different economic activities, and 37.6% placed physical barriers, mostly gabions, on the hillsides. The most successful measures, however, proved to be house adjustments and pro-active migration (see dots in Figure 1). Placing physical barriers and land-use adjustments, on the other hand, were the least successful measures. We generally found that respondents did not expect a landslide of this scale, which limited the effectiveness of preventive measures taken by organizations or households.

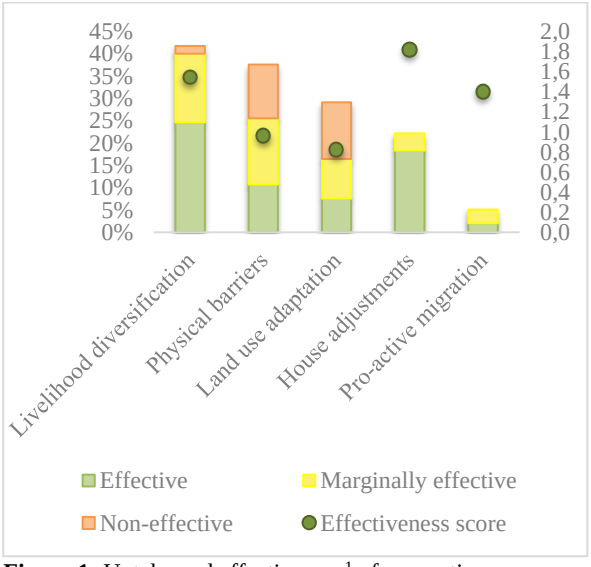

Figure 1: Uptake and effectiveness[1] of preventive measures

2.3 Impact

Likely due to the high prevalence of farming, the most common impact types were loss of crops (79.9%) and land (79.1%). Mental stress was reported by a majority of respondents (68.4%) and consisted of post-event trauma and fear of new landslides. In monetary terms, loss of land was the most severe impact type. For two thirds of the sample (67%), it exceeded $1000.

Households in the lowest income group were most severely affected by the landslide. The value of their losses amounted to 14 times their annual earnings (see Figure 2). Their potential for recovery is low: They may never return to the level of assets, livelihood security and well-being they had prior to the landslide. Households in the higher

[1] *Effectiveness scores were calculated as 'effective'*2 + 'marginally effective'*1 + 'non-effective' *0'.*

income group had higher absolute losses (median: $10,300), but the value of losses was much less in relative terms (three times the annual earnings). While wealthier households may eventually recover from the impacts of the landslide, it will still take them years to restore their pre-landslide status.

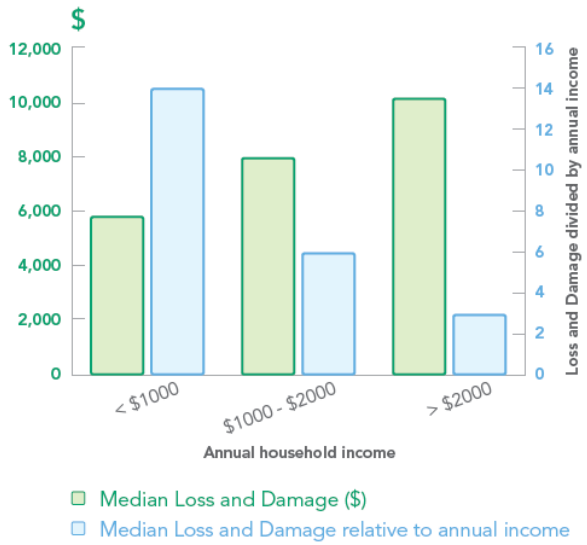

Figure 2: Monetary L&D by income group

2.4 Coping

More than three quarters of households adopted coping measures after the landslide (91.5%). Among these, households mostly received relief from organizations or the government (73.0%), survived on stored food or savings (63.2%) and engaged in migration (58.3%).

Selling assets and relying on social networks, loans, stored food and savings were the most effective coping measures (see figure 3). While some measures aided recovery, 54.5% said they will never recover from the impacts of the landslide.

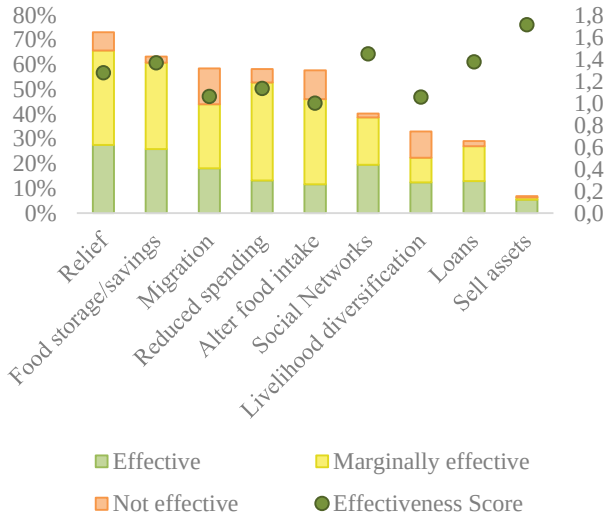

Figure 3: Uptake and effectiveness[2] of coping measures

3 Conclusion

The results of our research indicate that attempts to prevent the landslide and minimize its impacts were suboptimal. At the same time, the difficulty in predicting where and when landslides will occur acts as a disincentive for households and organizations to commit scarce resources to prevention. Post-disaster relief, on the other hand, was heavily supported by organizations.

Besides loss of life, houses and land, people in the area suffered a wide range of impacts from the landslide, particularly on their livelihoods. For discussions on loss and damage valuation and compensation, the household impact analysis has an important conclusion: The people who are in direst need of support for survival and recovery

[2] *Effectiveness scores were calculated as 'effective'*2 + 'marginally effective'*1 + 'non-effective' *0'.*

would end up receiving the least because their losses are lower in monetary terms.

For the first time, this study assessed both what people did to prevent and cope with disasters and how effective the individual measures were. The new methods toolbox used for this study was a valuable resource for understanding not just what is lost in disasters, but also how and why.

References

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