A review of vulnerability, hazard and disasters in southern Humla

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“Increased resilience to natural disasters for remote and vulnerable mountain communities in Humla District, Karnali Zone, Nepal”

Risk Assessment designed and analyzed by Mission East
Implementation by KIRDARC and Mission East
Technical assistance by NSET and Handicap International
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### Introduction

Humla district is one of the poorest in Nepal, with a Human Development Indicator of 0.367 (UNDP, 2007) and ranked by development indicators (2003) 73rd out of the 75 districts of Nepal.

Humla is the most remote district of Nepal with elevation between 1,500 and 7,300 m.a.s.l, bordering Tibetan Autonomous Region of China to the north. It has no road access and only one airport in Simikot. Most of the villages are only accessible after days of walking. Possibility of transport by helicopter is limited to a number of villages and very difficult during the rainy season. Thus creating difficult conditions for humanitarian and development assistance.

The 2001 census indicates that Humla district hosts a population of 40,749 (6,974 households) of which 21,016 (51.6%) is male and 19,633 (48.4%) is female. Average household size is 5.8 with a population density of 7.21 persons per sq. km.

Humla is recovering from the civil war. In the transitional process from emergency to development assistance, efforts by Government, NGOs/INGOs and the UN still need to address a very important issue: the capacity to prepare for and respond to natural disasters.

Natural hazards not only pose threats to communities but also slows down the development efforts by spreading de-motivation, fatalism and despair in communities that sometimes see important financial and human efforts vanished in an instant. Furthermore statistical information on disaster events in Humla district is difficult to find because of poorly developed communication system leaving minor events not reported to District authorities and central level, thus not being mentioned in the DESINVENTAR³ database and on hazards maps produced by UNOCHA.

In this context, Mission East conducted a risk assessment in the frame of the 5th DIPECHO plan of South East Asia. This assessment enabled to collect a large set of data to analyze precisely the risk situation as well as laying the foundations for Community Based Disaster Risk Management actions planned under this grant.

The following information resulted from the assessment that took place in September 2009 in 31 villages of 6 VDC in south Humla as well as among 376 households from 11 villages that live under hazardous environment.

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1 Meter above sea level.

2 Projection for 2009 is 47,229 persons, with average size of household 6.44 – source: A Socio-Economic Development Database of Nepal, Intensive Study and Research Centre, Kathmandu 2008

3 Desinventar is a national-wide database on hazards occurrence from 1971 that has been created and maintained by NSET
Summary: the hidden Disasters

In Humla District two third of disaster events are not reported. The difficulties to access and report disaster events is one cause but also the frontier between death and destruction due to a disaster and “usual” accident of life is unclear. In its strict definition, “disaster” is a serious disruption of the functioning of the society exceeding ability of the affected people to cope with their own resources. In Humla, size of damages is often limited and geographical isolation is so important that affected people have no other choices but to find local resources to recover. So we cannot call these many events that strike the region a “disaster”. But when such events are regular and cumulated together poses visible threat to the whole communities’ development, can we name it a “disaster”? The living condition in Humla being extremely hard, communities will not always inform authorities when death cases or destruction occurred. What is linked to a disaster and what is not is then hard to determine. In such context, we can consider that in this inaccessible part of the country Humla district is confronted to a “hidden disaster”!

Numerous hazards such as landslide, avalanche, mudflow, lethal epidemic diseases, and fires occur every year but still remain unrecorded. Disasters such as landslide / mudflow mostly affect assets such as land and livestock, while humans (especially small children and infant with disability) are mainly affected by epidemic diseases due to low hygienic conditions and limited access to health care facilities that generate heavy death toll among vulnerable population.

Large scale threats also exist. Food scarcity (although addressed by the government and the World Food Program) and earthquake risk can create a catastrophic situation due to the difficult accessibility condition of the area. Finally, the GLOF (glacial lake outburst flood) threat, which seemed inexistent ten years ago, is now looming in Humla.

Living conditions being extreme, each and every member of the community is expected to contribute to maintain the community alive. We observed that women carry an important share of this workload whereas people affected by impairment owe their survival to close family members and are excluded of the community social life. They will be the first to be left behind during a disaster.

Addressing disaster in Humla with an inclusive approach is not an easy task. Communities are too isolated to benefit from central support and resources at district level are too far away, only accessible by long days of hard walk, to be rapidly deployed. Disasters are numerous but of too little scale to draw the attention of the central government. Finally, People with disability are considered useless by other community members.

Each single village in Humla is at risk of natural hazards. Building disaster-resilient communities in Humla cannot be a standalone approach. The cost to deploy emergency equipment and resources, to set up early warning systems, and even to build mitigation work in every village is unaffordable due to absence of transportation facilities. In such conditions, the best way to address it is through mainstreaming inclusive DRR into local development practices.

Encouraging local authorities, civil society and communities to integrate elements of disaster risk reduction in their work and activities and to involve vulnerable groups such as women, Dalits, people with disabilities to take part in such action will ensure a durable effect. Creating or strengthening local DRR knowledge and capacities, at VDC and community level, should start by enhancing self-help and solidarity mechanism between communities.
villages, reducing stigma on people with disabilities, and tackling the attitude of fatalism and despair.

Migration will continue as a livelihoods coping mechanism. Thanks to the distribution of food by the government and WFP, there is the potential for stabilization and decrease, but this will be put into jeopardy if the adverse effects of natural disaster increase due to the effect of climate change and its consequences (drought, food/water scarcity, epidemic disease).

Finally, improving dialogue between district and community level, even if difficult to implement, is an essential tool to increase communication and reduce isolation of the population. Nevertheless the lack of government officials at VDC level and the political instability remain major challenges for Humla to engage in a sustainable process of increasing resilience.

Methodology

The methodology used to perform the risk assessment is based on a Model initially conceived by Mission East, OXFAM GB and Caritas for the mountainous communities of Tajikistan. The survey consists of a 2-phase approach. First, a risk screening aimed at collecting more than 80 indicators on hazards, vulnerability and capacity at the village level, together with a hazard sketch drawn by the target population enables pre-selection of communities at higher risk. Then in the pre-selected villages, a household level survey is conducted aiming at measuring vulnerability of households exposed to hazards. This survey is based on a list of 12 key indicators of vulnerability adapted to the local context. In order to have relevant and “scientific-based” data on hazard, the first phase of the survey was implemented in September 2009 by a group of hazards and disaster specialists with sound experiences in community development in Nepal: NSET (Nepal Society for Earthquake Technology). To assess properly the vulnerability at household level, especially in households hosting people with disabilities, experts from Handicap International assisted the field team in the collection of the data during the interviews. This survey was implemented in October 2009.

The outputs of these processes are:

- A sketch of 31 settlements with indication of surrounding hazards drawn by communities during a participatory hazard mapping;
- A “village passport” that summarizes 86 vulnerability indicators and produces 6 risk indicators, enabling pre-selection of target villages based on a comparative risk ranking model;
- Key GPS information on infrastructures such as school, bridges, helipad, etc…
- Vulnerability indicators of families with mapping of people with specials needs for emergency planning purpose.

Sketches of Natta village, Jaira VDC

Village passport model
Most communities from Humla and the surrounding districts live in a similar environmental context and face the same kind of constraints. We assume that the findings of this study can be valid not only for the surveyed area but also for most of the northern districts of Mid-West region.

Overview of past disaster events

The history of past hazard events, as reported by communities, shows an increase of disasters events in the last decades, with 3 major hazards: Human epidemics, fire, and landslide.

In total, from 1960 until now, 148 disaster events have been reported in the surveyed area. When we compare with official statistic produced by NSET via the Desinventar Database on the same period, and because the population from the surveyed villages represent roughly one third of the total population of Humla, we can estimate that two third of the disasters in Humla have never been reported to central level.

<table>
<thead>
<tr>
<th>Number of events</th>
<th>Death</th>
<th>Houses destroyed</th>
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<td>Desinventar</td>
<td>150</td>
<td>391</td>
</tr>
<tr>
<td>ME survey</td>
<td>148</td>
<td>401</td>
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Comparison between Desinventar data and Mission East survey

As expected, the main hazard is epidemic diseases (mainly cholera and diarrhea), followed by fire and landslide. 16 minor earthquakes with damages...
or casualties were reported but it could have been the same one felt by different neighboring villages. Drought events were reported (11) when they seriously affected the communities, mainly by killing livestock.

These 148 disasters events primarily affected livestock, (c.f. chart below). Since methods of counting varies from communities (especially for land plots, for which the unit of land destroyed by disasters was not measured in the same way) figure have to be taken with some reserve. Nevertheless, from discussion with people, it is clear that livestock as well as land plots, which are both vital assets for the communities, are valued much more than buildings (they can be rebuilt) and surprisingly even human life.

**Human casualties**

Communities report massive percentage of death due to epidemic, mainly diarrhea and cholera, whereas people dying from fire scored in second position.

Human casualties are mainly due to very bad hygienic conditions in the settlements (open defecation is a tradition) which is exacerbated during monsoon when contaminated water can flow into water reserves usually used for drinking, but also during dry season when clean springs go dry and people have to fetch water from open thaw. Above this, the absence of medicines in the Health and Sub-Health Posts, together with the lack of qualified health professionals do not allow proper treatment. During last 2009 diarrhea epidemic, many people died because of absence of medicines in the nearest Health Post.

The 2009 epidemic generated more than 300 casualties in district surrounding Karnali (OCHA - 2009). Nevertheless, none were reported in Kalikot, Jumla, Mugu or Humla.
Based on the above statistics, although we did not check which season the reported death from diarrhea occurred in 2009 and cannot link it specifically to the 2009 epidemic, **18 people died of diarrhea only in 31 communities of 6 VDC from south Humla.** So we can assume that a significant number of people died in Humla and other districts from the 2009 diarrhea epidemic, but this was not reported to central level. We believe that in Humla the death toll on vulnerable population (elderly, children) is so important that the connection with an epidemic disease and a “normal” death rate due to low hygiene and lack of health treatment opportunity is hard to make, and people tend to consider such death as “normal” and won’t necessarily report it to District Authorities.

“**When we have small health problem, we fix it ourselves. If it is more important, we go to the VDC Health Post, and when it is very serious, we go to Heaven!”**
(Old women from Dulli, Saya VDC)

**Fire**

Due to hay storage on roof of houses in the dry season, and manipulation of fire by children while parents are in the field, fire is a serious threat and the main concern of women. Fire not only destroys dwellings but also kills or severely disabled people as we could see in the statistics (22 people died from 1960 until now). Nevertheless, the situation varies among communities, as safe practices could be observed in neighboring districts of Mugu, where hay is stored in special places away from houses.

Women’s group discussion reported that fire hazard is also due to the low quality stove being used and lack of safe way to keep the fire running (moving burning coals from one house to another due to lack of matches).

**Conclusion**

Most of water-induced disasters is linked to the monsoon season, and generates landslide, flood and mudflow, that mainly affect lands and livestock. Whereas the monsoon increases the risk of epidemics and remains the most dangerous season for Humla population, the dry season is also not free from disaster. Epidemics can spread during dry season due to lack of water, fire will threaten animal hay and houses, and of course, although not analyzed here, drought will generate food shortage.

The overall health / hygiene condition and access to health facilities is so poor in Humla that it is difficult to differentiate casualties resulting from disaster with those resulting from “natural” causes.

**Potential hazards identification**

Apart from drawing a history of past events, the assessment included a participatory mapping exercise with the communities as well as transect walks to
identify hazards based on geological/morphological observation of the surrounding landscape. The observation focused on water-induced disaster risks, which could be mapped and anticipated. Disaster risks such as fire, earthquake, drought, epidemic, could not be assessed in this part of the study, on the basis of visual observation of communities.

**ME survey – September 2009**

**Rock fall**

The most critical potential hazard is rock fall, followed by landslide. Rock fall is a serious threat in mountainous area such as Humla, but its magnitude is very difficult to anticipate. Although these are isolated and extremely fast (localized events with low population exposure), they nevertheless represent a real and dangerous threat. As the area is highly seismic, an earthquake will trigger rock falls that will further damage the communities. In some place where the threat was very important, we could observe traditional techniques used by the population to reduce the threat, by setting fire around a large stone and watering it rapidly so that the temperature shock would crack the stone into smaller pieces. Another observed technique consisted in digging a hole above the rock to increase its stability.

**Landslide**

Landslide remains the major threat in Humla. Affecting scarce agricultural land, landslide is one of the major concerns of the population. Our survey showed that the causes of landslides are usually well known by the population who regularly quoted deforestation (for firewood and creation of new agricultural land). Since both firewood and new land plots are vital for the communities, and even if they are well aware of the serious threat they create by deforestation practices, they know of no other alternative.

**Earthquake**

The surveyed area is close to one seismic active fault (MCT-3.2.1/Mg7.6) identified by NSET. The team observed that old traditional buildings used appropriate mitigation measures with wood belt properly assembled. For more recent houses, if the wood belt still exists, its connection isn’t adequate to sustain heavy tremors and people do not know exactly what this belt is for. It seems that traditional knowledge got lost, most probably because the area hasn’t sustained important earthquake in the last 50 years.

Although this survey did not engage in precise assessment of earthquake risk, and people themselves do not see earthquake as an immediate threat as no such event occurred in the last decades, earthquake risk remains important (as for all of Nepal). Should an
earthquake occur in Humla, it would trigger numerous landslides and rock falls, which could lead to flash floods (not to mention GLOF risk in higher altitude). Access to affected communities would become almost impossible by land, and people would remain isolated for a long period.

### Risk Perception and knowledge of surrounding hazards

From a general perspective, the number of people who have no idea of surrounding hazards is important: 40.7%.

![Knowledge of surrounding hazards chart](chart.png)

Note: total percentage is higher than 100 due to multiple response

For those who could name the surrounding hazards we notice that they have a rather correct understanding of the kind of hazards likely to strike their community, including “global” hazards such as drought (hunger being consequences of drought) and fire.

Nevertheless, 2 hazards are minimized compared with their potential threat: earthquake and rock fall. It is due to the fact that others hazard hit regularly the area with numerous but minor adverse impacts, whereas earthquake and rock fall are less frequent, although their impact could be much higher. Rock fall was the first threat identified during phase 1 survey due to the mountainous landscape and geologic constitution of soil.

The threat level as perceived by respondents is either quite important (51%) or unknown (47%). Of those who have an understanding of the threat, 96% consider it important.

![Feeling of threat chart](chart.png)

To assess if the threat feeling is consistent with the real surrounding risk, we compared the threat level and the risk level per village identified during phase 1.

![Big threat feeling vs risk score chart](chart.png)

We found that a rather correct perception of threat exists in 6 villages out of the 11 surveyed one. Respondents in 5 villages, perceived either a higher threat than in reality or a lower threat (see chart above).

Finally, outcomes of a KAP survey and group discussions held in parallel with the data collection
showed that people, even when they have properly identified the hazard that can affect their community, believe they cannot influence and mitigate it because it’s attributed to a “divine intervention”. In few villages we could nevertheless observe pro-active attitude to reduce the risk, such as breaking the heavy stones that could fall on dwellings, or better storage of hay. In conclusion we can see that a large part of the population (40%) are unaware of the surrounding hazards, and 47% of interviewed people do not fully appreciate the threat level that the hazards pose. For the rest of the population, hazards are properly identified. But their perception of risk is not adequate with the assessed risk in almost half of the surveyed community. Finally, the coping attitude is mainly fatalistic as it refers to God’s decision and there’s nothing that can be done against it.

Vulnerability and capacity of households

Literacy

Out of the 2587 persons within the 376 surveyed households, 69% were illiterate and 31% literate.

At national level, the literacy rate is 54.4% for women and 81% for men⁴. Compared to an average literacy rate of 31%, we are confronted in Humla to an extreme low level of literacy that has an immediate impact on knowledge dissemination. Training and IEC material have to be revised in Humla and the length of trainings needs to be short as many days of intellectual and physical presence of participants is very hard to achieve.

People with disabilities

Properly identifying people with disability in Humla has been a major concern for Mission East in order to ensure their full inclusion in the CBDRM process. In a rural area where life is very hard and medical services almost inexistent, lots of people are suffering from various temporary or permanent impairments that are sometimes difficult to name and even to identify by the population itself. Identifying People with Disability during the survey required a specific training for the field staff and the technical assistance of Handicap International.

ME survey – October 2009
PWD = People with Disabilities

120 families (32%) declared having one or more members with disability. 23,2% declared having one member with disability, 6,4% having two and 2,4% 3. The total number of people with disability is then 162, which represent 6% of the total surveyed persons (2587).

When analyzed by type of impairment, hearing impairment comes first (13,3%), closely followed by moving impairment (12,2%),

⁴Nepal Human Development Report (Table 2.7 page 47) – UNDP 2009
which is a serious issue in an environment like Humla. If learning difficulties scored very low (1.6%), we can assume that the real number is likely higher but the limited knowledge of the population on disability, together with low levels of literacy, did not enable them to know exactly if one of their family members has learning disabilities.

A total of 32% of the surveyed household have at least one member of their family in situation of handicap, but it is unlikely that all people with impairment were identified, either because families hide the information or because respondents do not really think at it.

Respondent have few, if no idea, of the difficulties that people with disability are facing in their daily life. If 120 families declared having at least one member in their family with disability, only 8 persons declared that they have difficulties to adapt to the situation.

36.7% of households declared having family members requiring special care (including babies and elderly people), but only 2 person with disability were named, the majority being children and 70% of respondents could not even name what kind of special care was required.

Finally, as part of the KAP survey performed at the same time with the vulnerability assessment, to the question “Do you think that there are categories of people that are more vulnerable to natural disaster than others?” Only 14.6% of the respondents recognized that there are categories of people that are more vulnerable to natural disaster. 35% believe that the risk is same for everybody and 51% have no idea.

During interview with person with disability by HI staff, we realized that due to their difficulties to contribute to the activities of the communities (working on lands, fetching wood and water, bringing incomes), they are highly marginalized and only close relatives take care of them whereas other community members had no contact with them. Finally we could not see any young children with impairment or deformities, as well as mental retardation, which may means that such infant did not survive the harsh environment and lack of care.

**Gender**

![Head of household](image)

**ME Survey – October 2009**

A large number of household are managed by male, whereas only 12.2% of household are lead by women. In total, 21.5% of household are women-headed or co-headed with a male the household. Although we did not engage into specific analysis on the relationship between gender and disaster, it has already been widely observed that women are more vulnerable than men to disaster\(^5\). In other countries where Mission East is running DRR projects and where the inequality between men and women is significant in rural areas (as it is in Humla), we also observed that women have great potential to help efficiently during a disaster thanks to their knowledge of the household context and better attention given to family members, but their lack of self-esteem,

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usually encouraged by the male attitude (women cannot do… women are weak… etc…) lead them to believe they cannot help in case of disaster. In Humla, women have little space for voicing their concerns and all decisions are taken by males. During collective hazard prioritization workshops, women like men identified the same hazards as being their main concern (drought and landslide), but as soon as we separated the women and the men’s groups, their real concerns (fire in house and diarrhea of their children) came up.

**Dalit cast**

32.5% of respondents from survey were from Dalit caste but little reference to specific problems facing by the Dalit Caste was made during the survey. Nevertheless, discussion with Dalits raised the issue of emergency assistance since higher cast people would not come to assist Dalits in case they are stroked by a disaster. It is therefore important to involve Dalits in the CBDRM process so that a process of mutual help can be established from an early stage.

**Migration**

Seasonal migration is a common feature in Humla District and the Karnali region because of serious food shortages that recurrently affect the area. Migration has two contradictory effects on a risk situation. (1) It leaves families with absence of leadership to deal with consequences of disasters, thus increase vulnerability, but (2) it also reduces the number of people exposed to hazard, thus reducing the risk of causalities.

Studies showed that the food distribution programs engaged by the government and WFP have encouraged people to reduce their seasonal migration⁶. We see that 25% of households have mainly one family member leaving for seasonal migration.

Migration tends to occur mainly during the winter season (November to February), during one of the two hunger-gaps; as the exposure to hazards related to monsoon is higher in the summer season, male family members are present at that time and can help their family to cope with disasters.

In conclusion, we can see that migration is not having a significant impact on the exposure to the main hazards that affect the area (landslide, flood, epidemic disease), nevertheless, the reduced male labor during winter time, which is the best season to build some mitigation work and maintain existing ones can be a problem.

**Land and food**

Agriculture, together with livestock, is almost the unique subsistence activity in Humla. Most of people possess lands but the landscape in

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⁶PASSAGE TO INDIA: MIGRATION AS A COPING STRATEGY IN TIMES OF CRISIS IN NEPAL – WFP, NDRI – Nov 2008
Humla does not allow extensive agriculture and the little but numerous landslide and river bank erosion hamper the already meager resources. This leaves people food insecure.

Solar panels were distributed by government with very little instruction on the maintenance and the guarantee that the solar system can last for many years. During discussion with communities, it was observed total ignorance on how to reload / maintain batteries properly. As example, some people exposed the battery directly under the sun, thinking it will reload better!

The possession of a working solar panel and radio devices improves information flow in disaster situation. In Humla, because of the absence of electricity and because the only media is via the radio, these 2 elements are vital for a family. The survey revealed that only half of the population listens to radio FM and only 30% have a working solar system, (ie. individual solar panels provided by the government, enough to power one lamp).

The use of an average vulnerability score per household was devised to compare the average vulnerability level per groups of household based on the hazard mapping. It can reveal a specific vulnerability situation and important discrepancies in levels of vulnerability depending on where people live in the village (such as Dalit groups). It is also useful when devising the Village Disaster Preparedness & Response Plan.

The global scoring result showed that 71.8% of the population are within a high to very high vulnerability level compared to 28.2% of people situated in a level ranging from low to medium.
Conclusion

Because of a very low literacy rate, scarce access to land, regular hazards affecting crops and resulting in low food reserve, the population of Humla is striving to survive. With very limited knowledge and capacities to address disaster consequences, migration remains the main livelihoods coping mechanism. Elderly, and people with disabilities will be the most affected population during disaster since physical barriers are the norm in such “vertical” environment, and the population’s knowledge on disability and how to handle it is extremely low. Finally, women, owing to the high rate of illiteracy and strong male domination, are more vulnerable although they contribute highly to the survival of the community.
Mission East is a Danish international non-governmental humanitarian relief and development organisation working to help the vulnerable through relief aid, development assistance, the linking of relief, rehabilitation and development and through supporting communities’ capacity to organise and assist themselves.

Our ‘Values in Action’ are: honesty, integrity, compassion, valuing the individual, respect for all people.

In Nepal Mission East works for the people of Karnali, one of most remote and poor regions of the country, together with the NGO KIRDARC (Karnali Integrated Rural Development and Research Center).

The projects we are implementing are funded by the European Union (ECHO, DIPECHO, EuropeAid) and DANIDA.

Based on participatory approaches, we support poor rural communities’ ability to take responsibility for their own development.

We work in the following areas:

- provision of safe drinking water and sanitation facilities, hygiene and health promotion through training of community volunteers, FCHV and Traditional Healers; these projects are funded by ECHO, EuropeAid, Tear Fund New Zealand and private foundations
- improvement of irrigation facilities, creation and training of Farmers Groups to improve farming practices, provision of agricultural inputs, with funds from DANIDA and EuropeAid (Food Security Initiative),
- disaster preparedness, to reduce and address the adverse effects of extreme weather events and other natural disasters; with funds from DIPECHO Mission East works with communities to increase their resilience to natural disaster and secure development process, with District authorities to support them in developing disaster response plans.

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