Empowering Marginalised Communities
स्वयंसेवी अभियान नेपाल
Volunteers Initiative Nepal

2023

Disaster Risk Reduction (DRR) Research Report

Results of the Interviews in the Ward Thulachhap, Okhaldhunga District, Nepal.

Patricia-Anne Flaam

Acknowledgements

I would like to thank everyone who contributed to this study. Starting with Volunteers Initiative Nepal (VIN), who gave me the opportunity to conduct this study, to all the interviewees for sharing their experiences and giving us insight in their everyday life and whose invaluable contributions eventually made this study possible. My special thanks goes to Sunita Ghimire, who was always by my side and spent more than 80 hours walking with me, tirelessly translating 160 interviews with all the amazing villagers.

About the author

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Suggested citation

Flaam, Patricia-Anne (2023): *Disaster Risk Reduction (DRR) Research Report: Results of the Interviews in the Ward Thulachhap, Okhaldhunga District, Nepal.*

Editing, layout & design

Patricia-Anne Flaam

Figure 5: On the right side a hazardous staircase of stone steps and on the left side is a narrow path that connects the houses past the fields.
Last photo: Valley in the north of Thulachhap with wheat fields.

This study was conducted as part of the Volunteers Initiative Nepal (VIN) programs. To ensure academic standards, the author of this paper, Patricia-Anne Flaam, worked independently on the data collection of this study. In order to benefit from the background knowledge of the local VIN staff, the interpretation of the results was additionally discussed collaboratively. Therefore, most of the responsibility for the content of this report lies with Patricia-Anne Flaam and partially with VIN.

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List of Acronyms

CCA	Climate Change Action
CRI	Climate Risk Index
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
GLOFs	Glacier Lake Outburst Floods
GNI	Gross National Income
HDI	Human Development Index
STD	Sexual Transmitted Disease
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
VIN	Volunteers Initiative Nepal

1. Introduction

As climate change is inevitable coming forward, the whole world faces new challenges regarding extreme weather events and slowcast catastrophes. Nepal is facing a multi-hazardous reality, as more than 80% of its population is constantly exposed to natural risks such as earthquakes, droughts, floods, landslides, extreme temperature, and glacier lake outburst floods (GLOFs) and must therefore prepare to deal with growing challenges in the future.[1] But while several programmes[2] are being set up in the South Asian country on a national level, necessary research on the exposure and vulnerability of the local population still remains scarce.

One indicator that measures the exposure and vulnerability to extreme events of 180 countries worldwide, is the Global Climate Risk Index (CRI) by GermanWatch. Although it is highlighted that the index is solely based on past data and should therefore be regarded carefully for future predictions in terms of political decision making, global warming increases the probability in occurrence and intensity of such extreme weather events. Every country and especially Nepal, as the 10th of the most affected countries from 2000 to 2019, *„should understand [the CRI] as warnings in order to be prepared for more frequent and/ or more severe events in the future“*.[3] As the CRI measures only quantitative impact and losses, ranking high in number can mean either that the country has been impacted by one extraordinary severe event or that extreme weather events happen on a regular basis. From 2000 to 2020 Nepal has been among the 20th most affected countries showing its regular exposure to weather-related natural disasters such as floods and droughts in the past and therefore, also very likely in the future. Constantly being impacted by extreme weather events heavier the burden to the country and its inhabitants, setting back its economy and slowing down sustainable development. Also, regarding Nepal's Human Development Index (HDI)[4], the South Asian country stands with a high vulnerability and low coping capacity, meaning in case of an occurring disaster the *„[l]oss of life, personal hardship and existential*

[1] UNDRR, 2019, p. 6
[2] E.g. a cooperation between USAID and the Nepalese government on Promoting Action for Disaster Risk Governance and Working to Achieve Preparedness for Risk Reduction through Technical Assistance in Nepal' – PARIWARTAN project funded by United States Agency for International Development/Bureau for Humanitarian Affairs (USAID/BHA) officially commenced from 15 August 2019.
[3] Eckstein, Künzel, Schäfer, 2021, p. 3
[4] The HDI is an *„index measuring average achievements in three basic dimensions- a long and healthy life, knowledge, and a decent standard of living“*, created by the United Nations Development Programme (UNDP) and first introduced in 1990 (UNDP, 2022b, p. 303).

threats are […] much more widespread"[5] than in high-income countries. Additionally to weather-related events, being located at the edge of the tectonic plate makes Nepal prone to geological incidents like earthquakes. Earthquakes followed by floods have the most socio-economic impact on the country in terms of deaths, people injured and affected as well as the total damage balance.[6] In 2015, the country was largely devastated by the Gorkha earthquake with a magnitude of 7.6, killing around 9,000 people, injuring over 100,000 people, and causing an economic loss of approximately US$7.1 billion.[7] The economic impact of natural disasters plays a huge obstructing role for the development of the country. The latest large-scale disasters negatively affect the expansion and improvement of critical infrastructures such as a reliant transportation system and electricity. This results in a higher dependency on agriculture and the further delay of development of other industries.[8] Additionally, these circumstances make the country seem more risky and therefore unattractive for foreign investment and tourism.

Also, the South Asian country is dealing with several factors that increase the social vulnerability to disasters. *„Limited domestic economy, geographically dispersancy, unconnected population, as well as diverse groups belonging to various castes"* [9] create difficult circumstances for high resilience in catastrophic situations. For example, Nepalese women are still suffering from inequality and dependency on men especially in rural regions. Their limited access to education, employment and other opportunities increases their vulnerability before, during and after disaster displays.[10]

As Nepal is one of the most affected countries worldwide, a range of policies and adaptation plans have been introduced by the government to strengthen the resilience of the disaster-prone country. In terms of climate change action (CCA), the South Asian nation is one of the signatories to the Paris Climate Agreement[11] in 2015. Reducing their emission by investing in renewable and clean energy in the electricity and transportation sector, Nepal has e.g. made huge investments in building dams to produce and rely mainly on hydropower energy by using its natural water resources.[12] Further long-term plans address different

[5] Ibid., p. 14
[6] EmDat, 2019 cited in UNDRR, 2019, p. 7
[7] UNDRR (2023a): Nepal. Gorkha Earthquake 2015. Available at https://www.preventionweb.net/collections/nepal-gorkha-earthquake-2015 (1 Feb 2023)
[8] International Labour Organization, 2017 cited in UNDRR, 2019, p. 8
[9] UNDRR, 2019, p. 6
[10] Ibid.
[11] The Paris Climate Agreement is a legally binding treaty on climate change adopted by 196 parties at the UN Climate Change Conference (COP21) in 2015. Its goal is to limit the global temperature increase to 1.5 to 2°C of pre-industrial levels. UNFCCC (2023): The Paris Agreement. Available at https://unfccc.int/process-and-meetings/the-paris-agreement (28 Feb 2023)
[12] UNDRR, 2019, p. 14

sectors like agriculture and food security but also gender equality and social inclusion has also been introduced, of which there is the National Adaptation Programme of Action (NAPA) in 2010 or the recent National Adaptation Plans (NAPs) by the Ministry of Forest and Environment to focus especially on climate change adaptation. To work especially in the field of preventing and mitigating disaster risk, the Disaster Risk Reduction and Management Act of 2017 and the National Disaster Risk Reduction Policy of 2018 are important to mention. Aligned with the Sendai Framework[13], they aim to build more resilient communities and sustainable infrastructures, shifting their attitude from being responsive to being prepared. However, as they are still quite new, it will take time to put local disaster risk management plans into action. Also sharing unclarified roles of responsibilities and decentralising decision making power between the federal, provincial and local governments along with miscommunication has led to confusion over jurisdiction. Additionally, ministries as well as municipalities lack financial, technical and human resources to establish local action plans. This leaves huge challenges to the actual implementation of DRR and CCA measures.[14]

All in all, recurrent natural disasters pose a permanent threat to the wellbeing of Nepalese inhabitants and the further development of infrastructure and economy.

The Nepalese organisation Volunteers Initiative Nepal (VIN) acknowledges the challenges Nepal faces in regard to natural hazards and its imminent lack of coping capacity. The goal of their DRR programme is *"to minimise the risk of natural disaster and provide relief and safety to vulnerable communities"*.[15] In order to thoroughly design and implement future DRR-related programs in ward 2 Thulachhap of the rural municipality Chisankhugadhi, Okhaldhunga district, Nepal, a needs assessment of the affected community has to be conducted first. The results provide a scientific basis for VIN to shed light on the current situation and enable them to further develop holistic DRR programs adapted to the specific needs of the affected communities.

Therefore, this research aims to identify and prioritise intensive and extensive risks at community level for the targeted population of Thulachhap, Okhaldhunga. The key research questions to this report are as followed:

[13] The Sendai Framework on Disaster Risk Reduction (2015-2030) has the overall goal to effectively reduce disaster risks and losses from disasters. It recognises that the government of each country plays a key role to achieve that goal. Further, it sets 4 priorities for action and 7 global targets to substantially reduce disaster risk. UNECE (2023): Sendai Framework. Available at https://unece.org/sendai-framework (28 Feb 2023)
[14] Climate & Development Knowledge Network (CDKN), 2022, pp. 2
[15] Volunteer Initiative Nepal (2023): Disaster Risk Reduction. Available at https://www.volunteersinitiativenepal.org/disaster-risk-reduction-program/#goal (14 Mar 2023)

1. What kind of intensive risks do the people of Thulachhap, Okhaldhunga district, face regarding natural hazards?
2. What kind of extensive risk do the people of Thulachhap, Okhaldhunga district, face regarding everyday hazards?
3. What kind of health-related risks are the people of Thulachhap, Okhaldhunga district, exposed to?

The survey took the form of interviews and included mainly quantitative questions with a few open-ended response formats. The results are analysed on the basis of the United Nations Office for Disaster Risk Reduction's (UNDRR) (2022a) risk analysis for humanitarian planning and further placed in the local context.

1.1 Local Background of Nepal

Graph 1: Nepal´s geographical location on a world map. Source: Greattibettour, 16 June 2023

Nepal is located in Southeast Asia, sharing its borders in the north with China and the eastern, southern and western borders with India. The growing population of 30.4 million in 2019, with a birth rate of 2.1 children per woman, has an age structure with a high proportion of people under 30, which steadily decreases with age (IHME, 2023).

With a Human Development Index (HDI) of 144 in 2021, Nepal is classified as one of the nine developing countries in South Asia and falls into the medium human development group[16].[17]

In Nepal, life expectancy at birth is 68.4 years.[18] While the expected number of years of schooling for a Nepali child is 12.9 years, the average number of years that people over 25 receive an education is only 5.1 years as of 2021. Gross National Income (GNI) per capita lies at $3,877 in 2017. In comparison, the average GNI per capita in medium human development countries is $6,353. Nevertheless, Nepal has achieved steadily increasing improvements in all three dimensions of life expectancy, years of schooling and GNI since the 1990s through 2020.

In terms of gender inequality, Nepal ranks 113th in the world, representing a large gap in equality between men and women. This is especially true for reproductive health and empowerment. Concerning education for example, male Nepalese go to school on average two years longer than female Nepalese. Also, 44.7% of the male population ages 25 and older has at least some secondary education, whereas the percentage for females stands at only 28.8%. Surprisingly, the labour force ratio of females (78.7%) and males (80.8%) is very similar in 2021, meaning that both genders of the working-age population are almost equally engaged in money earning. Additionally, men earn only slightly more than women, which is unusual when comparing all groups from very high to low human development. Still, the population living below the international poverty line of $1.90 a day amounts to 15%.

1.2 The Organisation Volunteers Initiative Nepal (VIN)

The following chapter was written by VIN and does not necessarily represent the view of the author.

Volunteers Initiative Nepal (VIN) is a non-religious, not political, non-governmental and non-profit organization founded in 2005 to improve the health and socioeconomic status of Nepal's marginalized communities, especially women and children. As women perform pivotal but unrecognized roles as agriculturalists and primary caregivers, improving the conditions of life for women and children is crucial to alleviating poverty in Nepal.

VIN piloted its first program in Jitpurphedi Ward of Kathmandu District, which is 12 km away from main ring road to Balaju. It is a marginalized and shadowed community even though it is so close to the capital. Feasibility and preliminary studies revealed that despite being

[16] The human development groups are divided into four groups: Very high human development, high human development, medium human development and low human development.
[17] UNDP, 2022b, p. 294
[18] Ibid., pp. 294

within proximity to Kathmandu, the education level and the living standards of the people were very low. VIN chose this site and has been working there since the beginning of 2007.

VIN's mission is to empower marginalized communities by focusing primarily on women and children through enhanced educational programs and community training; promoting equality, economic well-being and human rights.

VIN adopts an integrated, participatory development approach for the well-being of the community. It works with both local and international volunteers, implementing different kinds of programs and activities under its four major projects:

1. Women's Empowerment (WE)
2. Child Development (CD)
3. Youth Development (YD)
4. Community Health and Environment

VIN aims to give people the right tools and knowledge to help themselves. The focus is on helping women and children through special educational programs and community training projects conducted independently and/or in association with like-minded organizations. VIN has adopted an integrated community development approach through voluntary services by welcoming overseas and local volunteers.

1.3 Purpose and Key Research Questions

The overall objective of this research is to strengthen the climate resilience of affected and marginalised communities in the wards Thulachhap, Bhadaure and Taluwa through effective disaster risk management. This report focuses on the Thulachhap community, and aims to highlight the key risks and challenges that the ward faces.

Based on the results of the reports on Bhadaure, Thulachhap and the previous one on the Taluwa community, VIN aims to build a special task force permanently installed in affected areas to address natural and everyday risks and support marginalised communities. VIN's approach to disaster preparedness contains the following: developing a strategy and plan for disaster preparedness at communities and households; raising awareness through campaigns on disaster preparedness and training on safety and rescue during disasters; and workshops on disaster mitigation.

For a holistic approach, researching exposure and vulnerability of the communities is an important factor to understand the current situation.

The key research questions are as followed:

1. What kind of intensive risks do the people of Thulachhap, Okhaldhunga district, face regarding natural hazards?
2. What kind of extensive risk do the people of Thulachhap, Okhaldhunga district, face regarding everyday hazards?
3. What kind of health-related risks are the people of Thulachhap, Okhaldhunga district, exposed to?

Although health risks are among the everyday risk factors, they have been treated separately here. This was done because, following discussions with the local health post staff, it offered the opportunities to assess recurring health problems in more detail.

1.4 Relevance

This report lays the groundwork for future VIN actions to form a dedicated DRR task force and develop DRR-related programs and projects to be implemented in this region. By identifying and analysing key risks and issues, the results provide insight into priorities within communities and help with risk-informed decision-making and planning. The study conducted is the first in the field of DRR for Thulachhap, Okhaldhunga district.

1.5 The Structure of this Report

This report is divided into six chapters. Chapter 1 introduces the main purpose and content of this report. It also provides an overview of the current situation in Nepal and introduces the VIN organisation. In terms of theoretical background, Chapter 2 explains the theoretical construct that forms the basis for this research. Chapter 3 explains the methodology of data collection and analysis and identifies the limitations of the study. Chapter 4 describes the results of each section of the questionnaire and illustrates the most prominent findings. The core risk analysis for the main challenges observed in Thulachhap in terms of likelihood and impact is presented in Chapter 5. Finally, the results are discussed in Chapter 6 along with the observations from the interviews and embedded in the local context.

2. Theoretical Background

2.1 Definition of Terms

For a coherent understanding of the results, the key terms and their application are explained below.

Capacity: *"The combination of all strengths, attributes and resources available within an organization, community or society to manage and reduce disaster risks and strengthen resilience."*[19]

Risk: *"Risk is the probability of an outcome having a negative effect on people, systems or assets. Risk is typically depicted as being a function of the combined effects of hazards, the assets or people exposed to hazard and the vulnerability of those exposed elements."* [20]

Vulnerability: *"The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards."* [21]

DRR: *"Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development."* [22]

2.2 Theoretical Construct of Disaster Risk

The following chapter sheds light on the concepts of disaster risk, disaster risk management (DRM) and disaster risk reduction (DRR). It aims to bring an understanding to the terms itself as well as their interlinkages. To grasp these concepts means to be able to use them in identifying, understanding and measuring risks and finding entry points for counteraction in one's own social and environmental context.

[19] UNDRR, 2022b
[20] Ibid.
[21] Ibid.
[22] Ibid.

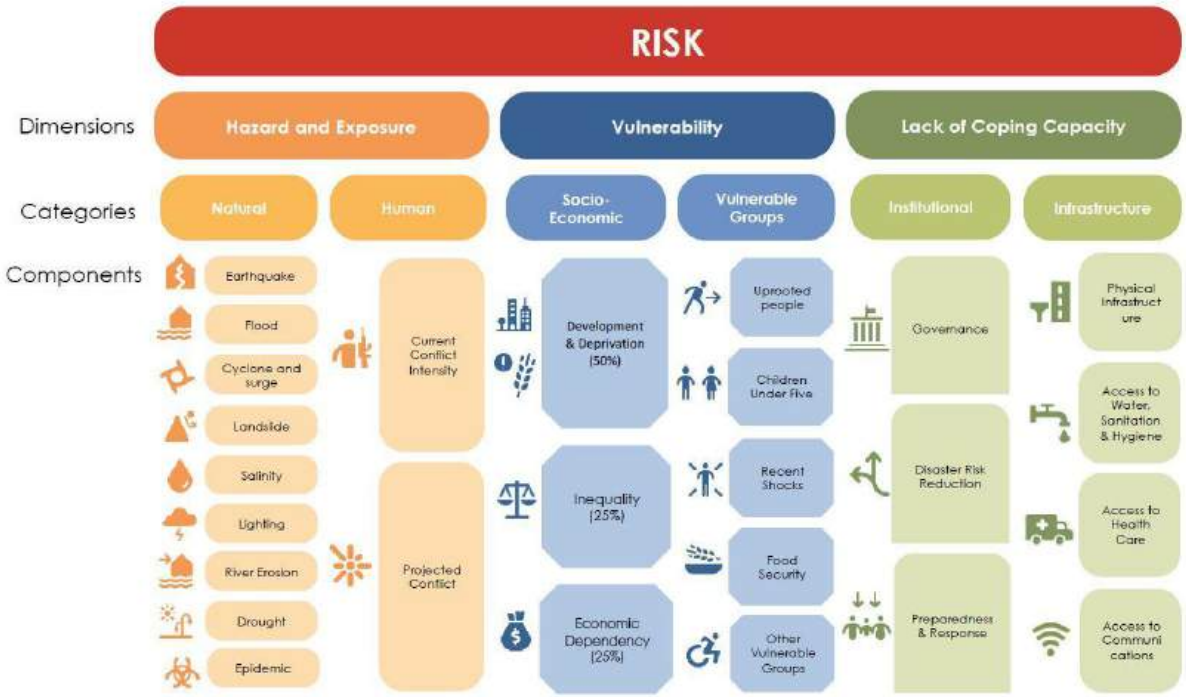
Starting with disaster risk, it is defined by the UNDRR *"as the likelihood of loss of life, injury or destruction and damage from a disaster in a given period of time."*[23] The severity of the risk is influenced by the interaction of a hazard (natural or man-made), the exposure of people, their properties or infrastructures etc. and vulnerability.

Graph 2: Understanding risk. Source: UNDRR, 16 June 2023

Therefore, disaster risk is not understood as an external problem that cannot be changed or mitigated. It rather is seen as a consequence of choices we make concerning our development. Further, disaster risk is attributed with a few characteristics: It is forward looking in terms of likelihood of loss, with dynamic behaviour according to our ability to reduce vulnerability, invisibility of some underlying risks that are growing slowly over time, that it is not distributed evenly over the globe and, lastly, emergent and complex meaning that the creation of new risks is inevitable.

While defining disaster risk as a choice, it is also seen as *„an indicator of development failures".*[24] The 3 key dimensions hazard, vulnerability and exposure are extended by one more: the lack of coping capacity. Failing to cope with disasters means leaving the most vulnerable groups at loss and raising the inequality and poverty in societies or countries. On the other hand, succeeding in protecting itself from disasters is an indicator for sustainable development and is known as resilience.

[23] UNDRR Global Assessment Report, 2015, as cited in UNDRR, 2023b
[24] UNDRR, 2023b



Graph 3: Risk dimension, categories and components. Source: UNDRR, 16 June 2023

So how do we make sure that hazards do not turn into catastrophic disasters? Hazards are often external and natural-induced, so the main focus to reduce risk lies on the reduction of exposure and vulnerability to certain hazards. Both are *"particularly related to poor economic and urban development choices and practices, degradation of the environment, poverty and inequality and climate change [...]"*[25]. Therefore, the aim is to identify and reduce the underlying risk drivers of the two dimensions of exposure and vulnerability. By modelling future risks, reducing existing risks and promoting the resilience of societies, DRR plays a major role in preventing severe negative impacts. But creating a safe environment resilient to all kinds of hazards can only be achieved with a comprehensive risk assessment, a people-centred and multi-sector approach and the understanding of the importance of DRR and active involvement by every part of the society including businesses, the public sector and the civil society.[26]

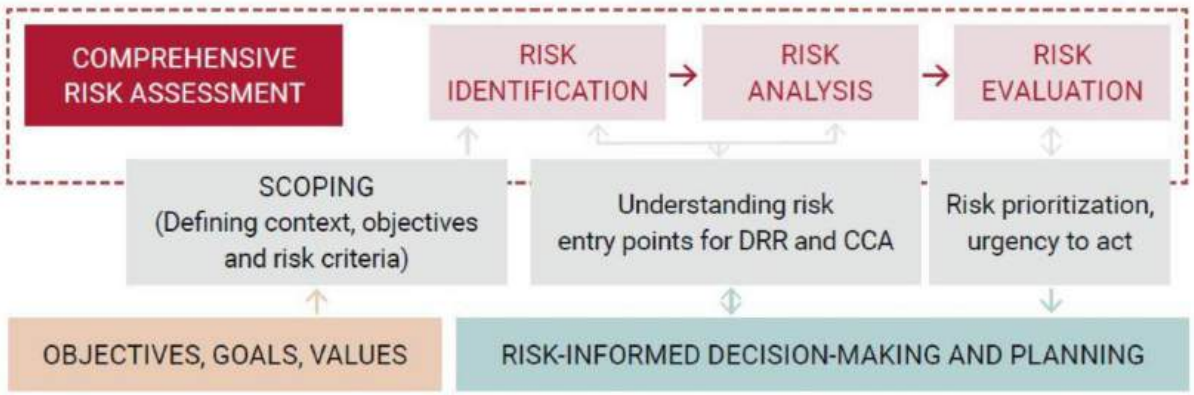
The implementation of DRR measures is called disaster risk management (DRM). It seeks to successfully accomplish good results in four sectors: The **prevention** of losses due to existing or new disaster risks (e.g. relocating households in an hazardous area), **mitigation** aka the limitation of adverse impacts of hazards (e.g. reforestation to prevent landslides), **transfer** in terms of shifting financial hardship to another party in case of an disaster (e.g.

[25] UNDRR (2023b): *Understanding Disaster Risk*. Available at https://www.preventionweb.net/understanding-disaster-risk/component-risk/disaster-risk (28 Feb 2023)
[26] Ibid.

insurance), and **preparedness** or knowledge and capacities by any layer of society to anticipate, respond to, and recover from disastrous events. Those measures can be divided into structural (mostly physical e.g. planning of land use or construction of buildings) and non-structural activities (e.g. awareness raising).

2.3 Assessing Disaster Risk

As this report aims to identify and prioritise risks, the following graph shows the steps for comprehensive risk assessment.



Graph 4: Phases of risk assessment. Source: UNDRR, 16 June 2023

To assess risk for the Thulachhap community, the UNDRR's *"Strengthening Risk Analysis for Humanitarian Planning - Integrating disaster and climate risk in the Humanitarian Programme Cycle"* (2022a) guideline is used to evaluate the results of the interviews in Chapter 5. *Risk Analysis*. Therefore, Step 4 *"Assess risk severity"* of the Guidelines is used in its step-by-step approach because the preliminary work, such as determining the scope of the survey and collecting data, has already been done.[27] Further steps, such as finding solutions to address the challenges, are not part of this report and therefore will not be addressed.

The assessment of risk severity is carried out in three steps: First, the **likelihood** is assessed, then the **likely impact** and an impact assessment, and finally the **overall risk score** is calculated on this basis.

On a scale of 1 - very unlikely to 5 - very likely, the **assignment of a likelihood** means that an event will occur in a certain period of time, e.g., in the next 12 months. The basis for this type of assessment is usually historical data. **Assessing the potential impact** of hazards is the next step. Here also, historical losses and loss trends from the past can be used as a

[27] UNDRR, 2022a, pp. 23-28

basis to estimate how many people are potentially affected and how severe the hazard is. Again, a number is assigned on a scale of 1 - negligible to 5 - critical. The final step is to multiply the two assigned numbers for likelihood and potential impact to arrive at a **final risk score**. This process helps organise, categorise, and prioritise different types of hazards for a given area or project and should therefore be included in program planning.

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3. Methodology

This report takes an explorative approach to assess intensive and extensive risks that the people living in ward 2 Thulachhap in the municipality Siddhicharan, Okhaldhunga district, Nepal, face. It is the first case study in these communities but the second one conducted in Okhaldhunga and therefore, partially builds on the report and experiences of earlier field research in ward 1 Taluwa in the municipality Siddhicharan, Okhaldhunga district, Nepal.[28] Apart from the mostly quantitative questions, 6 out of 42 questions work with a qualitative approach for a more nuanced understanding of local circumstances and customs.

3.1 Case Selection

To extend the working location/site VIN has selected three wards of Okhaldhunga District (Ward 1 Taluwa, ward 2 Thulachhap and ward 6 Bhadaure) as they are comparatively less developed than other wards of Okhaldhunga. The wards Thulachhap and Bhadaure are located in the mountainous and hilly regions in Okhaldhunga district, Nepal. Regarding their disaster risk profile, the risk of landslides is far greater than the risk of seasonal floods due to the monsoon rains being comparatively lower than the ones in the Terai plains. Additionally, though the hazard of earthquakes affects the whole country, especially in the mountain regions the risk of landslides following seismic activities is high. A baseline survey[29] was conducted on each ward to gain insight into family and economic status of the households divided by gender, details about WASH and more in-depth health-related information (e.g. women's health, STDs, and mental health). Further, awareness about and domestic violence itself as well as child development and environment was studied.
Research on DDR in Taluwa has already been conducted by two french volunteers in November 2022. Therefore randomly selected households in the remaining two wards Tulachhap and Badaure will be interviewed for this report. To analyse a representative

[28] To read the research report on Taluwa please contact VIN.
[29] To read the baseline surveys please contact VIN.

amount of data, at least 10% of the households will be covered during the research. Based on the information given by the ward leader's office on 28 February 2023,[30] there are 900 households in Thulachhap and 700 households in Bhadaure. This report presents the results of the interviews in Thulachhap.[31]

3.2 Data Collection Methods

Research was carried out from December 2022 to March 2023. It involved field visits in the communities of Thulachhap and Bhadaure with VIN staff. To create the online questionnaire[32] the online survey tool SoSci Survey[33] was used. Altogether 155 interviews were conducted in person in Thulachhap and Bhadaure.[34] The answers of the interviewees were translated on the spot and saved online. To ensure confidentiality, the names and affiliations of the interviewees are kept anonymous in this report.

3.3 Data Analysis Methods

After the completion of the interviews, the raw data was downloaded from SoSciSurvey as an excel file. For the analysis of the data and the designing of graphs and tables the programmes Microsoft Excel and Microsoft Word were used. The quantitative data will be presented through tables and diagrams to visualise frequency distributions and central tendencies. Also, depending on the test item, similarities and differences as well as suitable statistical parameters such as the mean, meridian or similar are highlighted.
The qualitative data are subjected to content analysis and coded. Depending on the answers to the respective questions from the questionnaire, semantic categories are deductively formed and analysed.

3.4 Limitations

This report contains 4 limitations.

[30] The information was given via mobile phone and it has been pointed out that official numbers on governmental websites might vary from the ward office's numbers.
[31] To read the research report on Thulachhap please contact VIN.
[32] To read the questionnaire see Annex 1.2.
[33] The website of SoSci Survey can be accessed here: https://www.soscisurvey.de/. Since it is a website developed by a German company, at this point it can only be recommended to german-speaking users.
[34] A complete overview of the interviews, as well as on which day and in which village of the respective ward they were conducted, is deposited in Annex 1.1.

First, having representative results can only be reached by interviewing 100% of the households in the two wards. This research lacks resources and time to do so. Therefore, this report is meant to be offering an average insight as well as a general impression of the risks that the communities face.

Secondly, interviews were done face-to-face and often involved third parties as listeners as the village life is a very close one and privacy to scientific standards is not given. Therefore, the probability of interviewees giving answers that are according to social norms and might not match their actual reality must be taken into consideration. This limitation is an often recurring challenge in interviews.

Third, it can be assumed that an unknown part of the information is lost in translation. Neither the translator nor the interviewer are native to the English language, thus the means of communication are restricted.

Fourth, as stated before, the interviews were conducted in a stranger language to the interviewer. So the alteration of questions during the interviews - whether for better or worse - by the translator or the language-based attitude of asking questions to the respondents and thereby also the possible alterations of answers that were received could only be supervised to a limited amount by the interviewer based on facial reactions or body language.

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4. Results

Chapter 4. *Results* presents the descriptive analysis and frequency distribution of the collected data. Important to highlight is that only the most relevant assessments are described in the continuous text below. The results are mostly presented in percentage of the total. However, for a better understanding, the net number of respondents is always indicated in brackets behind.[35] At appropriate points, comprehensibility is further supported by visual representations or tables. The complete display of distributions and tables can be found in Annex 2. At this point, no connections or conclusions are drawn between the individual question items. The interpretation and embedding in the local context is carried out in chapter 6. *Conclusion*.

[35] For example, out of 70 interviews 50% of respondents (35) responded positively.

4.1 General Information

This chapter presents general information on respondents.

A total of 85 interviews were conducted in Thulachhap. The age distribution[36] shows an even balance with a slight peak among respondents aged 26 to 35 years (22 respondents). At 60% (51), the female share of respondents predominates. Regarding the level of education, 39% of interviewees (33) say they never went to school. 24% (20) have attended *"Primary school"* and 29% (25) *"Secondary school".* 8% (7) of interviewees have entered a higher level of education such as a bachelor's or master's degree. 39% (33) of respondents reported being illiterate. Among them, the highest share of 82% (27) goes to the female population. The majority of respondents (78% / 65) reported being engaged in *"Agriculture"*. 6% of respondents (5) are students and the same number works as a teacher. The average household consists of *"4 - 6"* members.

When asked if respondents know what to do in the event of an earthquake, forest fire, or landslide, 92% (78) responded affirmatively. When respondents were asked to explain what they would do, the answers became more nuanced. In the case of an earthquake, 82% of respondents (70) would *"Run out of their house into an open area"*, often characterised by the absence of trees or power lines. If they stayed indoors, 9% (8) would *"Hide under a stable structure"* such as tables or beds. In the case of a forest fire, 51% of respondents (43) would *"Extinguish the fire with water"* and, if water is not available, 33% (28) would also use other means such as *"Green leaves, soil or sand [to extinguish the fire]"*. 27% (23) would additionally *"Inform other people"* of the hazard and gather them to face the danger together. In the event of a landslide, 38% of respondents (32) would *"Run away to a safe area"* that is not affected by the landslide. But 37% (31) also said they do not know what to do in the event of a sudden landslide.

Table 1: Measures named by respondents when asked what they would do in case of an earthquake, forest fire, or landslide.

Measure	**Number of interviewees**
Earthquake	
Move swiftly to an open area/ field. *(Specified as free from houses, trees or electricity wires)*	70
Hide under a table or bed.	8

[36] The youngest respondent is 15 years old and the oldest respondent is 86 years old.

(When inside (6), stay inside at night (1), when trapped inside (1))	
I don't know.	2
Forest fire	
Extinguish the fire with water.	43
Extinguish the fire with soil, sand and/ or green leaves.	28
Inform other people/ the other villagers.	23
I don't know.	15
Cut a fire line. *(A fireline is established to contain and control the flames by cutting potentially flammable materials, such as grass or trees, around the existing fire.)*	4
Inform authorities. *(Forestry (1), nepali government (2), nepali police (3), nepali army, nepali firefighters (1))*	9
Run away to a safe area. *(Specified as a not-forest fire area)*	1
Landslide	
Run away to a safe area. *(Specified as a not-landslide area)*	33
I don't know.	31

4.2 Climate Change

This chapter presents the results of the climate change section.

At 74%, the majority of respondents (63) were unaware of the term climate change itself. Because of a misunderstanding, 34 interviews are lost to the following questions. This means that the following assessment of the content of climate change should be taken with caution. After explaining the meaning, a total of 39% (33) recognized the patterns and, together with the 21% of respondents (18) who knew about climate change, named an average of two consequences of climate change on their lives. The most frequently mentioned consequences are as follows: *"Less rain"* (34), *"More droughts"* (22), *"More insects"* (18), and *"Increased temperatures"* (14).

35% of interviewees (30) said they have changed their agricultural methods due to climate change. Of these, 11% (9) use *"Pesticides"* primarily for corn, sometimes for millet, one to three times per season. The vast majority who use pesticides started applying the chemicals less than 5 years ago. In addition, 35% of respondents (30) use *"Fertilisers"* for their crops (mainly corn). Two-third of the respondents who use fertilisers have been using the chemicals for 6 years or more.

Table 2: Actions mentioned by respondents when asked about changes in their agriculture methods because of climate change.

Measure	**Number of interviewees**
Pesticides ***(Mostly on corn, sometimes on millet 1 to 3 times every season)***	**9**
Unknown period of time	1
Since 1 - 5 years	8
Since 6 years or more	0
Fertilisers ***(Mostly on corn, sometimes also on millet 1 to 3 times every season)***	**30**
Unknown period of time	4
Since 1 - 5 years	4
Since 6 years or more	22
Total number of interviewees using pesticides and/ or fertilisers	*30*

4.3 Intensive Risks (Here: Natural Risks)

This chapter presents the results of the intensive risks, which are characterised as risks with low frequency but high impact.

74% of the respondents (63) have never been confronted with a forest fire, 19% (16) only *"Once"* in their life. Of these, the main consequences mentioned are *"Forest destruction"* (20) and *"House destruction"* (13). At 80%, the majority (68) believe that most wildfires in their

area are due to *"Man-made causes"*. Risky behaviours include smoking cigarettes and carelessly discarding the remains, as well as children playing with fire unsupervised or people making fires in the forest, with the wind eventually blowing into the flames and causing the forest fire. *"Natural causes"* were voted for by 7% (6).
76% of respondents (65) indicated that they had never faced a landslide in their lifetime, but also 13% (11) reported having faced it more than five times. These respondents experience landslides regularly during the monsoon season due to heavy rainfall. The consequences mainly include *"Fields and crops destruction"* (13) and *"Roads destruction"* (7).
All respondents had been affected by an earthquake on average three times in their lives. 89% (76) stated the *"House destruction"* as the only consequence.

4.4 Extensive Risks

This chapter presents the results of the extensive risks, which are characterised as risks with high frequency but low impact.

In total, 77% of interviewees (65) stated to be aware of the risks they are exposed to on a daily basis. Regarding having encountered an indoor fire within their homes, 81% of respondents (69) responded negatively. 93% (79) have also never been bitten by a snake.
Of the 64% of respondents (54) who said they had seen new snakes or insects compared to 10 years ago, 32 persons named the *"Fall Armyworm"*[37] and 5 persons named the *"Gorman snake"* in particular.

Out of 85 interviews, 86% of respondents (73) report having regular encounters with monkeys. Of these, 99% (72) state *"Harvest destruction"* as the main issue with 50 to 100% of their crops destroyed due to monkys. 49% (36) additionally mention *"Supply destruction"* as the monkeys come to their homes and eat the stored corn on the outside walls of their houses or that the primates even enter their attics to get to the food stored in there. When asking about a successful method to protect their property against the monkeys, just 11 persons gave a positive response. Among their successful methods mentioned were, for example, *"Guarding their fields the whole day"* (3).

[37] This destructive pest species of maize crops, also called American Fauji Keera in Nepali, is native to southern America. It was firstly recorded in Nepal in May 2019 and a few months later officially declared as an invasive species by NPPO Nepal. Since then, the Fall Armyworm has spread to different districts, including Okhaldhunga, and represents a huge threat to the emerging economy and food security.

Ministry of Agriculture and Livestock Development (2019): *Surveillance Protocol for Fall Armyworm, Spodoptera frugiperda for Maize in Nepal.* Accessed on 11 Dec 2023 on http://www.npponepal.gov.np/downloadfile/Surveillance_Protocol_Final_1603000715.pdf

When asked why the number of monkeys has increased over the past 15 years, 92% of respondents (78) indicated that they have indeed noticed an increase in the monkey population. Of these, 92% (78) had a hypothesis as to why this was the case. 29% (25) stated that due to continued migration, abandoned fields are becoming wasteland. The affected areas are reverting to forest, which in turn is driving the increase in the monkey population. With more monkeys and fewer farmers producing crops, the remaining agricultural workers faced a greater onslaught of primates in search of food. This type of explanation was given by 25 respondents, with more or less detail from interview to interview. An equal number of interviewees saw increased forest cover in general as the reason for increased monkey populations. A very different reason given by 7% (6) respondents was the relocation of the monkey population from Kathmandu to Okhaldhunga. They stated that a few years ago or a year ago, depending on the interview, jeeps with monkeys came from the capital to reduce the high number of monkeys there, and that an unknown actor released the monkeys in that area. 5% (4) had *"No knowledge"* about neither the increase nor decrease of the monkey population and not one interviewee stated a *"Decrease"*.

Also, 93% respondents (79) stated having mice or rats at their homes. Among them, all report *"Food destruction"* (mice and rats contaminate stored food by cutting through the bags) (79) and *"Clothes, furniture, wires, etc. damaging"* (91% / 72). Additionally, 88% of respondents (75) reported having problems with other kinds of animals. Mentioned were mostly *"Deers"* (64), *"Porcupines"* (56), both of them coming to their fields at night and eating different kinds of vegetables, and *"Jackals"* (11) who feed on chicken.

4.5 Health-related Risks

This chapter presents the results of the health-related risks.

Of the 85 respondents, 41% (35) reported getting sick *"Every day",* followed by 39% (33) who are sick *"A couple of times a year"* and 11% (9) *"Once a month"*. The five most common illnesses are *"Fever"* (35), *"Headache"* (32), *"Throat pain"* (23), followed by *"Gastritis"* (16) and *"Joint pain"* (13). When asked what preventive measures they know that keep them from getting sick, 9 positive responses were received, representing 11% of the total. For example, preventive measures include *"Boiling water"* (6) and *"Turmeric"* (3) for better digestion and as presented in table 3 below. It is worth mentioning that most of the respondents indicated measures that help them get well again, rather than those that are preventive. In case of illness, 75% of respondents (64) mentioned using medicine from natural sources such as

"Turmeric boiled with water for throat pain" (10) or the *"root of ginger for cough and fever"* (5). In addition, 18% (15) would visit either a hospital or health post and take medicine such as *"Paracetamol for headache or fever"* (11).

Table 3: Selective overview of the preventive and non-preventive measures mentioned by respondents during their interviews. A complete list of all answers can be found in Annex 2.5.

Number of interviewees	**Measure** English name *Scientific name / Nepali name*	**Medical use**	**Preparation**
76	**He/ she doesn't know about preventive measures.**		
Preventive: 9			
6	Boiled water	Throat pain	Boiling Boiling with salt (2)
3	Turmeric *Curcuma / Haledo*	Throat pain (1)	Boiling with water.
Non-preventive natural medicine: 64			
10	Turmeric *Curcuma / Haledo*	Throat pain	Brewed with hot water
5	Ginger *Zingiber officinale / Aadhuwa*	Cough, fever	Put root in fire for a few minutes, then eat it afterwards (1) Brewed with hot water (1)
4	Basil plant *Ocimum basilicum / Sabja, Tulasi*	Throat pain (2), cough (2)	Brewed with hot water
4	Calamus *Acorus calamus / Bojho*	Throat pain, cough	Cut the root, boil it or eat raw.
Medicine: 15	Paracetamol (11)	Fever (Paracetamol)	

20% of respondents (17) *“Always”* boil their water or *“Most of the time”*. In contrast, 77% (65) *“Never*” or *“Very rarely”* boil their drinking water. Of these, 30 interviewees stated to boil their drinking water in winter only.

Washing their hands before eating *“[...] with water and soap”* is the most common practice with 74% of respondents (63), followed by the use of *“[...] ashes”* with 12% (10). The same is true for washing hands after going to the toilet. The majority of interviewees with 86% (73) washes their hands *“[...] with water and soap”*. Only 4% (3) each use *“[...] ashes”* or *“[...] water”* to clean their hands.

Regarding falling from heights, 61% of interviewees (52) responded positively. They mostly fell down from *“Trees”* (21), *“Terraces”* (12) or *“Stumbled”* (9). The consequences of the falls mostly included *“Pain in affected areas for over a week”* (26), *“Long-term pain (1 year or more)”* (8), *“Some body pain and bruises”* (8), or *”None”* (5). 34% of respondents (29) did not fall or cannot remember falling from heights.

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5. Risk Analysis

Chapter 5 presents the identification and evaluation of risks in detail. The evaluation is based on the results of the interviews and observations of the living conditions of respondents during the field visits (houses and the surrounding area). The final risk score of each hazard is composed of the likelihood that a hazard occurs and its subsequent impact on the communities of Thulachhap. The in-detail classifications of the two components are presented in chapter 5.1 *Likelihood* and 5.2 *Impact*.

5.1 Likelihood

The following table shows the estimated probability of the hazard to occur again in the next 12 months.

Table 4: Categories of likelihood of a disaster for the Thulachhap community.

1- Very unlikely	**2 - Unlikely**	**3 - Moderately likely**	**4 - Likely**	**5 - Very likely**
<10%	10 - 33%	34 - 66%	67 - 90%	>90%
Once a year or less.	Twice a year.	Once every 3 months.	Once a month.	Once a week up to every day.

Hazard/ shock type	Hazard/ shock identified	What makes it likely?	What makes it less likely?	Likelihood assessment
Meteorological	**Forest fire**	- Area with a high coverage of forest. - Higher risk of forest fires because of more droughts and increased temperature in the future due to climate change. - 21% of respondents report having faced a forest fire once or more times in their life	- 82% of respondent know what to do in case of an forest fire (extinguish with water, inform and gather other people to help) - 80% of respondents think that most wildfire are due to careless behaviour of humans, raising awareness and therefore also the probability of preventive behaviour	1
Hydrological / water-related	**Landslide**	- Heavy rainfalls once a year from July to September in monsoon season increase the probability of landslides. - 13% of respondents report facing landslide regularly during monsoon season	- The majority of houses are secured with walls both uphill and downhill. - Reforestation programs are set by the government. - 82% of respondents report not having faced landslides or maximum twice in their life.	1
Geo-hazard / Seismogenic	**Earthquake**	- High at risk area: placed at the edge of the indian and eurasian tectonic plates - Last major earthquake with a magnitude of 7.6 occurred 8 years ago in 2015. - 100% of respondents state they have faced earthquakes 3 times on average in their lifetimes.		1
Behavioural	**House fire**	- An estimate of 85-90% of households are cooking over open fires.	- Walls and floors are made of non-flammable mud. - Most homes are not filled with a lot of	1

		- 14% of respondents state having experienced an indoor fire.	furniture and belongings, so the likelihood of setting something on fire is relatively low. - 81% of respondents state not having experienced an indoor fire.	
Environmental	**Snake bites**	- There are 89 species of snakes known to live in Nepal, especially in the southern parts and in the low mountain regions. 17 of them are venomous and therefore dangerous. In certain regions, snakebites are one of the most neglected public health problems.[38] - 4% of respondents state they have experienced a snake bite in their lifetime.	- 93% state not having experienced snake bites in their lifetime.	1
Behavioural, hydrological, environmental	**Food insecurity /** **Failure or loss of crop**	- Nepal faces an increase in droughts and less rain due to climate change threatening the food security of farmers. - 77% of respondents are involved in agriculture and obtain most of their food from their own harvest. This makes them very sensitive to changes in the weather. - 86% of respondents report regular encounters with monkeys. The hordes destroy 50-100% of their crops and 42% of respondents additionally reported destruction of their supplies (e.g. stored	- 35% of respondents report using pesticides (30%) and/ or fertilisers (100%) to maximise their harvest. - 13% of respondents report having	4

[38] Sharma, S.K., Pandey, D.P., Shah, K.B., et al. (2013):Venomous snakes of Nepal. A photograph guide. Available at https://www.researchgate.net/publication/235758972_Venomous_Snakes_of_Nepal_A_photographic_guide_English_ed (16 Mar 2023)

		corn). - 69% of the affected population state they do not have a successful method to protect their property from monkeys. - 93% of respondents report having mice or rats at home that contaminate their food. - 88% of respondents also reported having problems with other species such as deer and porcupines reducing their crops or livestock.	successful methods of protecting their property from monkeys, but 77% of these methods are only effective in the short term and consume many resources or manpower that cannot be used in any other way.	
Behavioural, environmental	**Health risks**	**Illness - 4** - 41% of respondents report being sick every day, 39% of respondents report being sick a couple of times each year. - 89% of respondents report not knowing about preventive measures that will keep them from getting sick.	- 11% of respondents state they know about preventive measures. - 75% of respondents state using medicine from natural sources to treat illnesses. - 18% of respondents state using medicine to treat illnesses.	3
		Contaminated drinking water - 4 - 77% of respondents report not or very rarely boiling or filtering their drinking water.	- 20% of respondents state boiling their drinking water always or most of the time.	

		Cross-contamination - 2 - Livestock mostly has access to areas where food is prepared and cooked	- 74% of respondents report washing their hands with water and soap before eating. - 86% of respondents report washing their hands with water and soap after going to the toilet.	
		Falling down - 3 - 61% of respondents reported falls. - Farmers will often climb trees without security to cut leaves for their livestock to eat. - Paths are often difficult to walk on, bumpy and narrow, slippery as soon as they get wet and with stones in the way. They pose a great risk of stumbling and falling.	- 34% of respondents did not report falls.	

5.2 Potential Impact

The following table shows the evaluation standards for the impact of a hazard. Assessing impact contains first the number of people potentially affected[39] and second the severity of the hazard with regard to the coping capacity of communities or individuals.[40] Important to mention is that no valid statements about the coping capacity of the government or local authorities can be done at this point. But they also help support local communities, which in turn also rely on their help.

Thulachhap has a number of 900 households with 4 - 6 members per family on average. Therefore the highest number of people affected is an estimated number of 5.400 persons.

Table 5: Categories of the impact of a disaster for the Thulachhap community.

1- Negligible	2 - Minor	3 - Moderate	4 - Severe	5 - Critical
Minor additional humanitarian impact, 100-500 people affected Individual or household capacity is sufficient to deal with the situation.	Minor additional humanitarian impact, 500-1.000 people affected Ward resources sufficient to cover needs beyond individual or household capability.	Moderate additional humanitarian impact, 1.000-2.700 people affected Beyond ward capacity - support from district level is required to cover needs.	Substantive additional humanitarian impact, 2.700-5.400 people affected Beyond ward and district capacity - governmental support is required.	Massive additional humanitarian impact, >5.400 people affected Beyond ward, district and government capacity - international assistance required. L3-scale emergency.

[39] To estimate the number of people potentially affected, historic losses and damage trends as well as the impact of past similar hazards can be taken into consideration.
[40] UNDRR, 2022a, pp. 25

Hazard/ shock identified	Impact	Vulnerability	Capacity	Impact assessment
Forest fire	- Low population density in most areas of Thulachhap. 5-20% of the population would potentially be affected. - 16 reported forest fires in Okhaldhunga district in 2022 with a loss of 18.866.000 Nepali rupees.[41] - Decrease in air quality.	- **Environmental:** The villages are highly exposed to the danger zones: Thulachhap is generally an area with large forest cover. In addition, ongoing migration is causing more and more trees to grow back near the houses. - **Environmental:** Seasons with high temperature and general drought favour the development of forest fires.	- Firefighter department in Okhaldhunga City available. But looking at logistical infrastructure, the trucks would need at least 1-2 hours to reach Thulachhap. - Limited access to resources such as water to extinguish the fire for the villagers themselves.	3
Landslide	- 10-70% of the population would potentially be affected by, e.g., blockages of roads or destruction of fields and crops. - Logistical infrastructure like roads are blocked. - 2 reported landslides in Okhaldhunga district in 2022 with a loss of 1.200.000 Nepali rupees.[42]	- **Environmental:** Mountainous regions with a high risk of landslides. Most houses are built on steep hillsides. - **Physical:** Almost all houses are secured by stone walls up- and downhill. - **Physical:** Roads and fields are not properly secured against landslides.	- Depending on the scope of the landslide the villagers may not be able to move the rocks as they own no big machines.	3
Earthquake	- Up to 100% of the population	- **Physical:** 81.2% of houses in	- Most households generate little	5

[41] Government of Nepal (2023): *Disaster Risk Reduction Portal*. Available at http://drrportal.gov.np/ (17 April 2023).
[42] Ibid.

	would potentially be affected. - An earthquake of a 7.8 magnitude struck Nepal in 2015. 97% of the population in Okhaldhunga district reported house damage and 87% were displaced because of damaged or destroyed houses and in fear of aftershocks.[43]	Okhaldhunga are made of mud, stone or wood and have been rated by ward leaders as most vulnerable to earthquakes.[44] **- Physical:** Almost all houses in Thulachhap that survived the great earthquake of 2015 show signs such as cracks or old repairs from earthquake damage.	income from their agricultural produce or livestock, leaving them without sufficient savings to cope with the severe effects of earthquakes and highly dependent on external assistance.[45]	
House fire	- The potentially affected population consists of a few individuals or households at a time.	- **Physical:** Over 90% of households still cook with firewood and have open fireplaces.	- Most house fires can be extinguished by the owners themselves.	1
Snake bites	- The potentially affected population consists of a few individuals or households at a time.	- **Behavioral:** People often wear sandals or flip flops, especially during the warm monsoon seasons when snake occurrence is particularly high. - **Physical:** The paths and trails frequently used by the villagers are often very narrow and overgrown with grass.	- In the case of rare venomous snakebites, options for getting timely treatment are certainly limited. (Way to the hospital, identification and antidote).	1
Food insecurity / **Failure or**	- 50 -100% of the population would potentially be affected.	- **Economic:** High reliance on agricultural products for household consumption in Okhaldhunga district: 100% of	- 35% (potentially more) of households in Thulachhap use fertiliser or/and pesticides to increase their harvest.	4

[43] Shelter Cluster, 2015, pp.1
[44] ACTED, 2015, pp. 32
[45] Ibid., p. 76

loss of crop		households grow most of their own food and rely on crop cultivation.[46] This makes them highly vulnerable to weather changes such as less rain leading to droughts, or other hazards such as wild animals. - **Social:** Poverty rate of 25.2% below the national poverty line in 2009-2019.[47] The purchasing power to replace possible crop losses is low. - **Environmental:** climate change: Rise in temperature over the last two decades increases the probability of droughts, invasive pests etc. further worsening food insecurity.	- After the earthquake in 2015, 73% of households in Okhaldhunga district received food assistance in the form of rice. Less than 20% also received sugar, salt and lentils.[48]	
Health risks	**Illness - 2** - Depending on the source of illness, the potentially affected population ranges from a few individuals to as much as 50% of the population, since contagious diseases can spread quickly.	- **Behavioural:** Only 11% of Thulachhap's population is aware of preventive measures that keep them safe from disease. - **Behavioural:** Over 90% of the population in Thulachhap cooks with firewood and exposes themselves and their family	- No governmental health insurance. - Health post for minor injuries or not severe illnesses usually reachable in less than an hour with an average distance of 2.3 kilometres in Okhaldhunga district.[49]	2

[46] ACTED, 2015, p. 54
[47] UNDP, 2022, p. 296
[48] ACTED, 2015, p. 50
[49] Ibid., p. 70

		members to high levels of household air pollution. - **Social:** No or very limited savings for expensive treatments when needed.	- Medicaments and treatment are available for free or for a small amount of money. - Hospital in Okhaldhunga City available and reachable within 1-2 hours of driving.	
	Contaminated drinking water - 3 - Depending on the source of contamination, the potentially affected population ranges from a few individuals to as much as 50% of the population, since the same water sources are generally used.	- **Physical:** The government does not provide clean water and sanitation systems. A system of gravity water supply schemes carries well water to municipal or private taps of 90% of all population in Okhaldhunga district. The rest one tenth use springs or streams.[50] - **Behavioral:** 77% of households in Thulachhap always or almost always drink potentially contaminated drinking water.	- Little acknowledgement of the importance of clean drinking water.	
	Cross-contamination - 2 - The potentially affected population consists of a few individuals or households at a time.	- **Behavioral:** High level of interaction of all family members with livestock.	- Awareness about washing hands before eating and after going to the toilet seems high. - Soap in most households available.	
	Falling down - 1	- **Physical:** Paths or the working	- Health post for minor injuries or	

[50] ACTED, 2015, p. 46

	- The potentially affected population consists of a few individuals or households at a time. - Impacts of falls in Thulachhap mostly included minor injuries such as pain in affected areas for over a week or some body pain and bruises.	area such as terraces and fields usually have uneven surfaces. - **Behavioral:** Individuals often climbed trees to cut branches to feed their livestock, collect firewood, etc.	not severe illnesses usually reachable in less than an hour with an average distance of 2.3 kilometres in Okhaldhunga district.	

5.3 Final Risk Score

The final risk score is calculated by multiplying the assigned numbers of likelihood and impact. As shown in the figure below, this can be used to assign a risk rating eventually.

Graph 5: Categories of the risk rating for hazards.

The table below summarises the hazards identified in the interviews and their assigned scores. The listing further provides an overview of the types of hazards that pose the highest risks to villagers and a chain of associated shocks in case of an occurrence.

Table 6: Result of the risk analysis for the main hazards in the community of Thulachhap.

Main Hazard ***and associated shocks***	**Likeli-hood**	**Impact**	**Risk score**
Food insecurity *> lack of food and income > malnourishment, financial/ existential crisis*	4	4	16
Health risks - Contaminated drinking water *> epidemic/ sickness > lack of workability/ employment > existential crisis*	4	3	12
Health risks - Illness *> disability, lack of workability/ employment > financial / existential crisis*	4	2	8
Health risks - overall score *> Lack of quality of life, disability, lack of workability/ employment > financial/ existential crisis*	3	2	6
Earthquake *> destruction of infrastructure, personal property, loss of life, injuries etc. > financial/ existential crisis*	1	5	5
Health risks - Cross-contamination *> sickness > lack of workability/ employment > financial/ existential crisis*	2	2	4
Landslide *> destruction of infrastructure, personal property > financial crisis*	1	3	**3**
Forest fire *> destruction of infrastructure, personal property > financial crisis*	1	3	**3**

Health risks - Falling down *> injuries, loss of life > disability, lack of workability/ employment > financial/ existential crisis*	3	1	**3**
House fire *> destruction of personal property, injuries > financial crisis*	1	1	**1**
Snake bites *> injuries/ loss of life > disability, lack of workability/ employment > financial/ existential crisis*	1	1	**1**

Based on the risk analysis, the hazards to the Thulachhap community can be classified into four different categories: **High risks** (food insecurity), **medium risks** (contaminated drinking water and illness), **low risks** (health risks - overall score, earthquake, and cross-contamination) and **very low risks** (landslide, forest fire, falling down, house fire, and snake bites).

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6. Conclusion

This study aims to identify and prioritise the natural and man-made risks at community level faced by the affected population of ward 2 Thulachhap in the Okhaldhunga district, Nepal. In order to understand the extent of their exposure and vulnerability to these risks, and how the affected population confront the hazards in their own ways, this chapter brings together the main findings of the interviews. Important to highlight is that the findings only present past and current circumstances which can be further used to make future predictions and plan accordingly.

Also, the findings only represent the views and opinions of 9.4% of the households in Thulachhap. To continue the good work of VIN, the independent discussion of the result with, e.g., focus groups or otherwise are recommended so as to ensure the needs of the community are correctly addressed.

6.1 Discussion

The following chapter sheds light on the results and their embedment in the local context of the Thulachhap community. Important to understand is that effective disaster risk management (DRM) does not start after severe events but plays a crucial role in preventing them. Therefore the understanding of the main risks as well as their underlying risk factors

that amplify them is crucial for successful DRM. By organised and careful planning of DRR measures, the prevention and mitigation of disasters becomes more manageable.

The conducted research reflects a representative cross-section of the Thulachhap community in terms of age and local distribution with a slightly higher number of female respondents. 62% of the interviewees received mostly no education or attended only primary school and 39% to be illiterate. Regarding their livelihood, the majority of the population depends exclusively on their agricultural products to support their on average 4 to 6 member families. This makes them extremely vulnerable to several consequences of the constantly progressing climate change, the consequences of which are also reflected in the survey results.

As for natural disasters, Thulachhap villagers, who experience such an event on average three times in their lives, are well acquainted with what to do in the event of an earthquake: 82% of respondents would run to an open field with no obstacles that could harm them by falling down. However, almost every house showed signs of previous earthquakes. The consequences of seismic disruptions were visible through cracks or holes of varying sizes in the wall. Open structures such as windows or doors tended to warp or could not be closed later. Residents repaired the holes in their walls with new stones and mud. They also covered the cracks with earth and paint, which puts a thin aesthetic layer over the aftermath but does not repair the damage itself. All in all, the remnants of earthquake-induced damage to walls, windows, and doors, observed on several occasions, pose an even greater risk to the houses and their occupants in future earthquakes. In some cases, even more serious dangers were observed due to extremely unstable and leaning structures that could give way at any time.

Figure 1: Examples of damaged houses after the Gorkha earthquake in 2015.

As for wildfires, there are remarkably few incidents near residential areas: only 19% of respondents had themselves been affected once or twice in their lifetime. At the same time, 81% of the affected respondents reported that their houses were damaged, which could have a negative impact on their livelihoods. Given the small number of incidents and relatively low consequences, wildfires are generally rated as a very low risk. However, there is widespread awareness of wildfires and that human behaviour plays a central role in their occurrence. Of 80% of respondents who pointed to man-made causes of wildfires, the majority cited careless behaviour such as discarded cigarette butts or unattended fires in the forest as responsible for ignition. The surveys also revealed a basic knowledge of countermeasures in the event of fire. Responses primarily included extinguishing the fire with water and informing others to take action.

Figure 2: Example of a landslide on the road from Bhadaure to Okhaldungha city.

Compared to Bhadaure, only a small number of 13% of respondents regularly face landslides during the monsoon season, which occurs once a year for about three months from July to September. Extreme rainfall increases the likelihood of landslides, which, for example, damages logistical infrastructure. For the affected respondents, the destruction of their crops by landslides was the most common event. All in all, landslides pose a low risk looking at the small number of affected persons.

Of the 85 respondents, a majority of 74% were unfamiliar with the term climate change itself. Due to misunderstanding, 34 interviews (40%) are lost to the remaining questions in the climate change section. This means that the following results here are less representative of the villagers' needs analysis, as they represent only 60% of respondents in Thulachhap. However, of those (n=51), two-thirds reported less rain and nearly half reported more droughts. Farmers are extremely vulnerable to increasing weather variability, such as more

intense droughts, which affect the water supply for people and their livestock and threaten the growth of their crops. This puts a severe strain on their crops and reduces their production. The use of chemical fertilisers and pesticides has therefore become very widespread in recent years. In order to increase their harvest, 59% of villagers reported using especially fertilisers but also pesticides to combat increasing difficulties with water scarcity and, more recently, pests such as the American armyworm, which has been shown to have invaded Nepal since 2019 due to the rise in temperature. But there's another side to this. Chemical mixtures such as pesticides have long been known for their negative effects on human and environmental health, and the current scientific consensus is aware of the urgency of organic solutions. Several solutions have already proven successful in Nepali agriculture (see link in footnote[51]). There are several nature-based recipes, most of which contain ingredients that farmers can harvest from their farms (e.g., cow pee), are made from native plants (e.g., rosemary), or are readily available at local markets.

But not all challenges can be addressed with chemical solutions. For example, mice and rats contaminate food and other items stored in 93% of homes. 88% of respondents also mentioned other forest animals, especially deer, monkeys, porcupines and jackals, that eat their crops. Among them, monkeys in particular pose a great threat to the villagers' successful harvests due to their particularly destructive effect. A concerning high number of 86% of respondents said they are regularly losing 50% to 100% of their crops primarily due to monkey hordes, and 49% additionally mentioned that monkeys would enter their homes and eat supplies, especially stored corn. Only 13% of respondents claimed to have successful methods to deal with the monkeys, including guarding their fields throughout the day and using slingshots to chase the animals away. None of these methods provide a long-term solution, and they are not efficient uses of resources such as time and labour. Only in one household was a successful measure to protect the supplies observed. Installing a wire mesh screen in front of the upper windows leading into the attic (see Figure 3) kept the monkeys out while providing the necessary ventilation to keep the supplies dry. In addition, two individuals mentioned successful methods of protecting the fields that could be easily replicated but did not guarantee 100% protection. First, setting up straw men dressed in normal clothing and second, setting up a monkey trap, which was described as similar to a football net.

The burden of monkeys has increased over the past 15 years, as indicated by 92% of respondents. Villagers primarily named ongoing migration, as a result of which forest is

[51] Poudel, S. (2020): Native Knowledge: Organic Pest Management in Nepal. Available at https://agrilinks.org/post/native-technical-knowledge-organic-package-insect-pest-management-nepal (20 Apr 2023)

regrowing on former farmland, which increases monkey habitat and leads them to the fewer remaining farmers and fields in search of food. Negative population growth in the mountain districts has also been observed statistically in recent years. *„Poverty, lack of economic opportunities and the absence of basic amenities in the rural regions are some of the numerous push factors […] which encourage domestic and international migration".*[52] Within the borders of Nepal, people migrate mainly to the Terai plains, the districts of Latipur, Bhaktapur and Kathmandu. These observations and experiences were not unique to Okhaldhunga. Elsewhere in rural Nepal, such as in Syangja's Putalibazaar, farmers are also struggling with monkeys, with no long-term solutions to protect their livelihoods.[53] Nepali authorities are currently unable to provide solutions or support to address these problems, leaving villagers to fend for themselves.

Figure 3: Wire mesh construction in the windows of the attic to protect the stored supplies.

In summary, the contamination and destruction of food by wildlife in the Thulachhap community is one of the main risk factors contributing to the food insecurity of farmers.

The most important health issues, each mentioned by half of the respondents, are fever, headache and one third also reported throat pain. These illnesses can have many causes: Infectious diseases, not drinking enough, contaminated food or water, or others. This study has only evaluated the symptoms, but cannot make clear statements about the causes.

However, regarding underlying risk drivers of health issues, it was found that 77% of the respondents do not use clean drinking water. They never or very rarely use purification techniques such as boiling or filtering their drinking water, including 30 interviewees who boil

[52] Ishtiaque, et al., 2017 cited in UNDRR 2019, p.11
[53] Kathmandu Post (2022): Monkey, maize and man. Available at https://kathmandupost.com/investigations/2022/03/26/monkey-maize-and-man (26 Apr 2023)

their water only in winter. These observations are roughly in line with World Bank data, which states that by 2020, only 18% of Nepal's population will have access to a safe drinking water supply, and as low as 16% in rural areas.[54] According to the UN, waterborne diseases remain a major public health concern, as evidenced by the recent cholera outbreak in Kapilvastu district in western Nepal in 2021.[55] With access to safe drinking water in Thulachhap still not reaching desirable standards, the risk of contracting diseases from contaminated drinking water is one of the biggest health challenges. Furthermore, observation during interviews revealed inadequate separation of the kitchen from domestic animals such as chickens and goats. In most cases, animals had easy access and were often observed entering the areas where food was prepared for people.

Figure 4: Simple wooden constructure to keep the livestock out of the house and kitchen.

On the other hand, the results of the interviews show that the level of hygiene awareness and washing routines is remarkably high: 74% of respondents state that they wash their hands before eating, and 86% also do so after going to the toilet, mostly with soap and water. Whether these statements are actually always implemented in this way cannot be verified within the scope of this study, but it does show a high level of consciousness among the villagers as to what behaviour is generally preferable in terms of hygiene.

General knowledge about the concept of preventive health measures and their actual implementation is concerningly low. Only 11% of the respondents mentioned preventive measures, including, for example, boiling their water and the use of turmeric. Among the 81% of respondents who stated treatment methods in case of illness, the interviews revealed a wide range of local knowledge about the use and preparation of natural medicines from

[54] The World Bank (2023): People using safely managed drinking water services (% of population) - Nepal. Available at https://data.worldbank.org/indicator/SH.H2O.SMDW.ZS?locations=NP (20 Apr 2023)

[55] https://nepal.un.org/en/168973-safe-water-every-home

local flora. The preparation of various herbs and plants is known to 75% of respondents, such as boiling turmeric for throat pain, ginger or basil plant tea for cough and fever. In addition, 18% of respondents usually go to the health post or hospital when they need treatment. The use of paracetamol for fever is common among 13% of respondents.

Another risk factor for health is falls and their consequences. 61% of respondents answered positively to this question. Of the affected respondents, 40% stated that they had fallen from trees. In Nepal, it is very common for men in particular to climb trees to cut the branches as fodder for their goats or to stack their hay. The lack of safety measures such as ropes increases the likelihood and severity of falls. The second most common response, given by around 20% of affected respondents, was falling from the terraces during work and stumbling in general. Observations during the interviews showed that the paths between houses in the community are steep, uneven, full of stones or overgrown with grass. Most houses have stairs built into the hillside, with uneven steps and no safety features such as handrails. The current condition of the existing infrastructure poses a high risk of stumbling and falling for anyone, but especially for the elderly. Half of the respondents who had fallen in one way or another reported pain in the affected areas for more than a week, followed by 15% who experienced either just some minor injuries. Thus, the consequences were mostly treatable by the victim or by the local health post. However, 15% also reported more severe consequences such as long-term impairment or disability. In summary, the assessment indicates that both behaviour and the physical setting in the Thulachhap community can be improved to ensure a safe environment for inhabitants.

Figure 5: On the right side a hazardous staircase of stone steps and on the left side is a narrow path that connects the houses past the fields.

6.2 Main Findings

The following chapter summarises the results of the DRR research conducted in the Thulachhap community. It specifically addresses the three main risks that have been assigned a high to medium risk rating and are therefore assigned high priority.

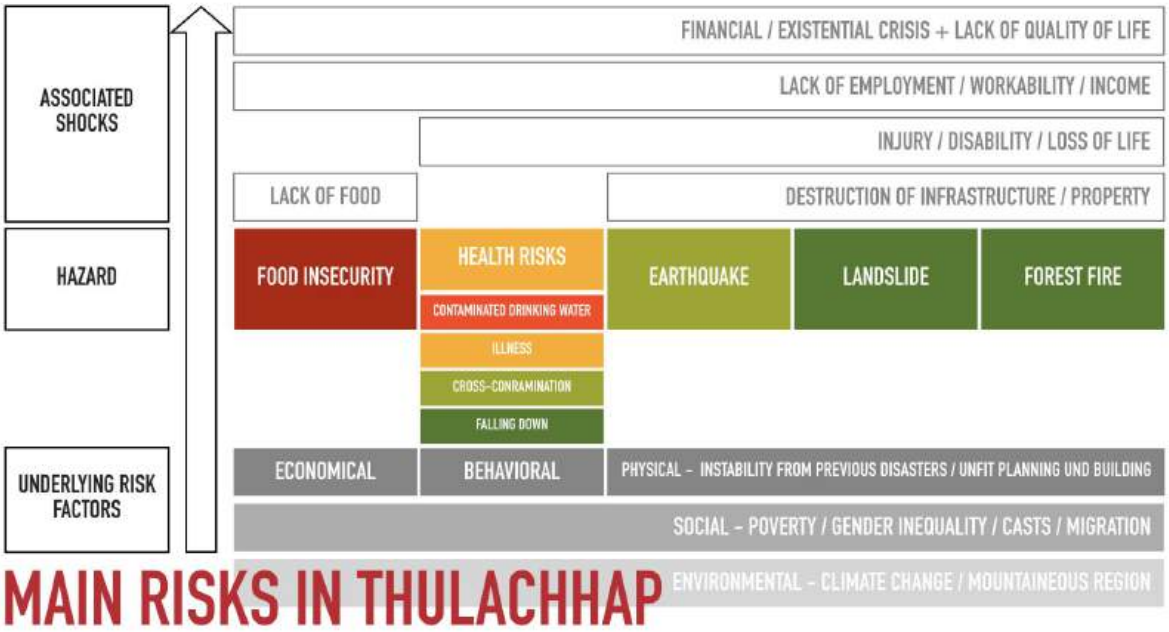
1. The main hazard with a high risk rating for the Thulachhap community is **food insecurity**. Underlying risk factors for food insecurity include two locally observed aspects. The first aspect is environmental changes due to climate change. Less rain and more droughts are leading to water scarcity, which threatens the prosperity of crops. Second are the damaging effects of animals foremost monkeys in the fields, but also mice in the home, or invasive insects such as the American fall armyworm that possibly contaminate or completely destroy food. Humans are virtually powerless against both hazards. The use of chemical fertilisers and pesticides to increase production is used by at least 35% of respondents, probably more. However, projections for the future indicate a steady rise in temperature and an increasing likelihood of droughts, invasive pests, etc., further exacerbating food insecurity. In addition, farmers are highly vulnerable to crop failure, as 78% rely on agricultural

products for their livelihood and income. In the event of crop failure, the coping capacity of the local community remains weak in terms of social factors.

2. In a medium risk assessment, the second main hazard is health risks due to **contaminated drinking water**. The most important risk factor here is the behaviour of the local population. 77% of interviewees in Thulachhap always or almost always drink potentially contaminated water that comes from mountain streams because the Nepalese government does not provide clean water and sanitation systems. Objectively, every household is capable of purifying water by at least boiling it over an open fire. Whether a lack of awareness or other factors prevent the community from decontaminating their water has not been studied, but observation has shown that people do not prioritise clean water because they often have little time due to their field work.

3. Also with a medium risk assessment health risks due to **illnesses** in general are observed. Here the risk lies more with the dealing of health issues. Only 11% of respondents were aware of preventive measures such as boiling their drinking water that keep them safe from diseases. Further, over 90% of the households in Thulachhap are cooking with firewood, exposing themselves and their family members to PM2.5 matter pollution. Due to no governmental health insurance system, general low income especially in the rural areas, no or very limited savings for treatment in case of a sickness is available. The restraints here lie within behavioural but also social challenges.

4. In terms of **natural disasters**, earthquakes are of the most concern to villagers in the Thulachhap community. In terms of earthquakes, Nepal itself is a high-risk area due to its location on the edge of the Indian and Eurasian tectonic plates. The frequency of seismic disruptions is low, with respondents having experienced them an average of three times in their lifetime, with the last severe event occurring in 2015. However, the potential impact is very devastating and can affect up to 100% of residents, and the community of Thulachhap is particularly vulnerable and exposed. In particular, the physical structures on the steep slopes of Okhaldhunga district are at risk, as most of the houses are built of mud and stone and are currently often still destabilised from the last earthquake. In the event of a disaster, the insufficient infrastructure (logistics, electricity, etc.) also makes people highly dependent on external aid.



Graph 6: Main risks of the Thulachhap community, their underlying risk factors and their associated shocks.

Since the interviews were conducted in both Thulachhap and Bhadaure districts at the same time and under the same conditions, the comparison between the two neighbouring districts is obvious. In the evaluation, it is noteworthy that the results of the interviews in Thulachhap and Bhadaure are very similar. However, the most striking differences are in the following two themes:

First, the occurrence of landslides, or the percentage of the population affected, differs. In Bhadaure, a very high number of people are regularly affected, 37%, while in Thulachhap only 13% described being affected. Second, the occurrence of monkeys invading farmers' fields and destroying crops. In Thulachhap, this is twice as common, with 86% of interviewees affected, while in Bhadaure only 44% are regularly affected. The monkey problem in Thulachhap thus poses a greater threat than in Bhadaure. The same is true for the destruction of supplies: again, almost 50% are affected in Thulachha, while only 20% are affected in Bhadaure.

6.3 Questionnaire Improvements

The questionnaire is available for free use in other communities and settings. It can be extended or in any other means be changed to fit its new purpose. However, during the interviews a few noticeable points occurred that did not quite go well along with the received answers. With the experience of the current research, the following adjustments for the attached questionnaire are being proposed:

1. Question 6.: Separate the number of family members to single numbers instead of ranges.
2. Question 8. + 9.: Consider dividing this question into three, one for each natural risk and a free text option to capture the answers.
3. Question Nr. 10: Many interviewees might not know about the term „climate change“ itself as it is a new expression in Nepali. But they mostly know about the construct and its consequences as it has a direct impact on their lives. That was only released after 34 interviews in Thulachhap, so there is potential data loss on what respondents think the consequences of climate change are. So even if question number 10 „Do you know about climate change?“ was answered with no, this only refers to the term itself. That is only the case, if respondents locked one or multiple answers for the next question. A small percentage knew neither about the term nor about the consequences itself.
4. Question 14. + 17.: Extend the answers by adding one choice which says: “Yes, each year recurring.”
5. Question 16.: Add a free text option for the interviewees to explain why they chose a specific answer.
6. Question 34.: Extend the answers by adding one choice which says: “Every day.” or specify the question by excluding chronic diseases.
7. Question 37.: Separate clearly between boiling and filtering water as for this research almost all interviewees boiled their water but only few had the means to filter it.
8. Question 38. + 39.: Change these to multiple choice questions.
9. Question Nr.40 - 42: If they respond positively to the question whether they had fallen down, it might be interesting to ask additionally if they went for treatment to a hospital, a local doctor or others.
10. Question 42.: Extend the answers by adding one choice which says: “Pain in affected areas is still recurring after several years.” and/ or “Long-term impact: >insert free text<.”

Please keep in mind that many people are busy during the day and they might not have as much time or patience to answer a whole amount of questions. The current questionnaire took about 20 - 30 minutes.

Annex 1: Evaluation Resources

1.1 Chronologic List of Interviews conducted 2022/ 23

Date	Name of village[56]	Number of interviews conducted
2022	**Thulachhap**	**85**
21 Dec	Chapabhaang	6
23 Dec	Chapabhaang	8
26 Dec	Kudule	6
28 Dec	Chunhanchhap	6
2023		
2 Jan	Khanikhark	10
4 Jan	Keureni	6
6 Jan	Baniyachhap	5
9 Jan	Dandagaum	7
3 Feb	Kalika Primary School Siddicharan	2
7 Mar	Nishanke	6
9 Mar	Jhordhara (4) / Sharki Gau (4)	8
11 Apr	Nishanke	6
12 Apr	Syaban (2) / Dharapani (4)	6
13 Apr	Nishanke	3
	Bhadaure	**70**
15 Jan	Bhoje	2
16 Jan	Bhoje (1) / Dovantar (3) / Thulohahaj (2) Kuwapaani (1)	7
17 Jan	Dhamitole (3) / Ranatule (2) / Kuwapaani (1)	6
24 Jan	Gairigaum (6) / Bohure (1)	7
31 Jan	Pukhare-ii	4
2 Feb	Pukhare-i (5) / Pukhare-ii (1)	6

[56]In cases where interviews were conducted in more than one village per day, the number of interviews in each village is indicated in brackets after each village.

6 Feb	Bohure (4) / Gairigaum (2)	6
10 Feb	Romashing	7
13 Feb	Kamigaum	6
16 Feb	Chhatrapragati	6
1 Mar	Pukhare-i (5) / Pukhare-ii (2)	7
2 Mar	Gairigaum (4) / Pokhare-i (2)	6

1.2 Online Questionnaire: *Disaster and recurrent key risk assessment questionnaire for communities in Okhaldhunga, Nepal.*

Disaster and recurrent key risk assessment questionnaire for communities in Okhaldhunga, Nepal.

To assess risks that the communities of Okhaldhunga, Nepal, face, this questionnaire addresses several hazards both natural and man-made in order to understand the link between risk, vulnerability and exposure.

ओखलढुङ्गा, नेपालका समुदायहरूले सामना गर्ने जोखिमहरू मूल्याङ्कन गर्न, यो प्रश्नावलीले जोखिम प्रकोप र खतरा बीचको सम्बन्ध बुझ्नको लागि प्राकृतिक र मानव निर्मित दुवै किसिमका खतराहरूलाई सम्बोधन गर्दछ।

Namaste, / नमस्ते,
My name is Patricia and this is Sunita. We work as volunteers for Volunteers Initiative Nepal (VIN).

In collaboration with VIN, we have developed a questionnaire about natural and man-made risks. Do you mind if we ask you a few questions? It will take about 30 minutes. All answers will be treated anonymously. So personal information will not be shared.

मेरो नाम प्याट्रिसिया हो र उनी साथी सुनीता हुन । हामी स्वयंसेवी अभीयान नेपालमा (VIN) स्वयंसेवकको रूपमा काम गर्छौं।

VIN सँगको सहकार्यमा, हामीले प्राकृतिक र मानव निर्मित जोखिमहरूको बारेमा प्रश्नावली विकास गरेका छौं। यदि मैले हजुरलाई केहि प्रश्न सोधें भने हजुरले मलाइ केहि समय दिएर जवाफ दिन सक्नु हुन्छ? यसको लागि ३० मिनेटको समय लाग्न सक्छ।तँपाइको परिचय गोप्य रहनेछ। त्यसैले हजुरको विवरण अरूलाई जानकारी गराइने छैन।

Thank you very much! / मुरी मुरी धन्यवाद!

1. General information / सामान्य जानकारी

1. In which community of Okhaldhunga, Nepal, do you live?
तपाइ ओखलढुङ्गा कुन समुदायमा बस्नुहुन्छ ?

- ◯ Thulachaap / ठुलाछाप
- ◯ Bhadaure / भदौरे
- ◯ Others: / अन्य :

2. How old are you?
तपाईं कति वर्षको हुनुहुन्छ ?

3. What is your gender?
तपाईको लिङ्ग के हो?

- ◯ Male / पुरुष
- ◯ Female / महिला
- ◯ Others: / अन्य :

4. What is your education?
तपाईको शिक्षा के हो ?

5. What is your occupation?
तपाईको पेशा के हो ?

6. How many family members live in your household?
तपाईको घरमा कति सदस्यहरू छन् ?

- ◯ 1 / १
- ◯ 2 / २
- ◯ 3 / ३
- ◯ 4 – 6 / ४ – ६
- ◯ 7 – 9 / ७ - ९
- ◯ 10 or more / १० भन्दा बढी

7. Can you read Nepali?

के तपाई नेपाली पढ्न सक्नुहुन्छ?

- ◯ Yes / सक्छु
- ◯ No / सक्दीन

8. Do you know what to do in case of an earthquake, forest fire, or landslide?

भूकम्प, जङ्गलमा आगलागी वा पहिरो गएमा के गर्ने भन्ने थाहा छ?

- ◯ Yes / छ
- ◯ No / छैन

9. If yes, please explain what!

यदि छ भने, कृपया जानकारी दिनुहोस।

2. Climate change / मौसम परिवर्तन

10. Do you know about climate change?
के तपाईलाई जलवायु परिवर्तन बारे थाहा छ ?

- ○ Yes / छ
- ○ No / छैन

11. If yes, what are the consequences of climate change?
यदि हो भने, जलवायु परिवर्तनका असरहरू के हुन् ?
Multiple answers are possible. / एक भन्द बढि पनि छनोट गर्न सकिन्छ।

- ☐ Increased temperature / बढदो तापक्रम
- ☐ More droughts / बढदो खडेरी
- ☐ More forest fires / बढदो जंगलमा आगलागी
- ☐ More floodings / बढदो बाढी
- ☐ More rain / बढदो पानी
- ☐ Less rain / कम वर्षा
- ☐ More landslides / झन बढि पहिरो
- ☐ More insects / अझ बढि कीरा फट्याङ्ग्रा
- ☐ Others: / अन्य:

- ☐ I don't know. / मलाई थाहा छैन।

12. Is there any change in your agriculture methods because of climate change?
जलवायु परिवर्तनका कारण तपाईको कृषि विधिमा कुनै परिवर्तन आएको छ ?

- ○ Yes / छ
- ○ No / छैन

13. If yes, how?
यदि छ भने, कसरी ?

3. Intensive risks (Here: natural risks) / गहन जोखिम (यहाँ: प्रकोप जोखिम)

The following questions adress intensive risks. Intensive risks are defined as risks with high severity but medium to low frequency that can cause high mortality and asset losses.

उच्च-गम्भीरता तर मध्यदेखि कम-फ्रिक्वेन्सी जोखिम जसले उच्च मृत्युदर र सम्पत्ति हानि निम्त्याउन सक्छ।

14. Have you ever faced a forest fire?

के तपाईंले कहिल्यै जंगलको आगोको सामना गर्नुभएको छ?

- ○ No. / छैन
- ○ Yes, once. / छ, एक पटक।
- ○ Yes, twice. / छ, दुई पटक।
- ○ Yes, three times. / छ, तीन पटक।
- ○ Yes, four times. / छ, चार पटक।
- ○ Yes, five times. / छ, पाँच पटक।
- ○ Yes, more than five times. / छ, पाँच पटक भन्दा बढी।

15. What are the consequences of the forest fire?

जंगलको आगोको परिणाम के थियो ?

Multiple answers are possible. / एक भन्द बढि पनि छनोट गर्न सकिन्छ।

- ☐ House destruction / घर विनाश
- ☐ Culture destruction / संस्कृतिको विनाश
- ☐ Person injured or deceased / घाइते वा मृतक व्यक्ति
- ☐ Livestock injured or deceased / पशुधन घाइते वा मृतक
- ☐ Destruction of wealth / धनको विनाश
- ☐ Others: / अन्य:

- ☐ I don't know. / मलाई थाहा छैन।

16. What do you think is the cause of most forest fires in your area?

तपाईको विचारमा तपाईको क्षेत्रमा धेरैजसो जंगलमा लागेको आगोको कारण के हो ?

- ○ Natural causes / प्राकृतिक कारणहरू
- ○ Man-made causes / मानवीय कारणहरू

- ○ I don't know. / मलाई थाहा छैन।

17. Have you ever faced a landslide?

के तपाईंले कहिल्यै पहिरोको सामना गर्नुभएको छ ?

- ○ No. / छैन
- ○ Yes, once. / छ, एक पटक।
- ○ Yes, twice. / छ, दुई पटक।
- ○ Yes, three times. / छ, तीन पटक।
- ○ Yes, four times. / छ, चार पटक।
- ○ Yes, five times. / छ, पाँच पटक।
- ○ Yes, more than five times. / छ, पाँच पटक भन्दा बढी।

18. What are the consequences of the landslide?

पहिरोको असर के थियो ?

Multiple answers are possible. / एक भन्द बढि पनि छनोट गर्न सकिन्छ।

- ☐ House destruction / घर विनाश
- ☐ Road destruction / सडक विनाश
- ☐ Culture destruction / संस्कृतिको विनाश
- ☐ Person injured or deceased / घाइते वा मृतक व्यक्ति
- ☐ Livestock injured or deceased / पशुधन घाइते वा मृतक
- ☐ Destruction of wealth / धनको विनाश
- ☐ Others: / अन्य:

- ☐ I don't know. / मलाई थाहा छैन।

19. Have you ever faced an earthquake?

के तपाईंले कहिल्यै भूकम्पको अनुभव गर्नुभएको छ ?

- ○ No. / छैन
- ○ Yes, once. / छ, एक पटक।
- ○ Yes, twice. / छ, दुई पटक।
- ○ Yes, three times. / छ, तीन पटक।
- ○ Yes, four times. / छ, चार पटक।
- ○ Yes, five times. / छ, पाँच पटक।
- ○ Yes, more than five times. / छ, पाँच पटक भन्दा बढी।

20. What are the consequences of the earthquake?

भूकम्पका असरहरू के थिए ?

Multiple answers are possible. / एक भन्द बढि पनि छनोट गर्न सकिन्छ।

- [ ] House destruction / घर विनाश
- [ ] Road destruction / सडक विनाश
- [ ] Culture destruction / संस्कृतिको विनाश
- [ ] Person injured or deceased / घाइते वा मृतक व्यक्ति
- [ ] Livestock injured or deceased / पशुधन घाइते वा मृतक
- [ ] Destruction of wealth / धनको विनाश
- [ ] Others: / अन्य:

- [ ] I don't know. / मलाई थाहा छैन।

4. Extensive risks / व्यापक जोखिम

The following questions address extensive risks. Extensive risks are defined as risks with low severity but high-frequency risks that can cause physical damage and asset loss.

कम-गम्भीरता तर उच्च आवृत्ति जोखिमहरू जसले भौतिक क्षति र सम्पत्ति हानि गर्न सक्छ।

21. Are you aware of the risks you are exposed to on a daily basis?
के तपाई दैनिक रूपमा आइपर्ने जोखिमहरू बारे सचेत हुनुहुन्छ ?

- ○ Yes / छ
- ○ No / छैन

22. Has your house ever encountered an indoor fire?
के तपाईको घरमा कहिले आगो लागि भएको छ ?

- ○ Yes / छ
- ○ No / छैन

- ○ I don't know. / मलाई थाहा छैन।

23. What was the origin of the fire?
आगो कसरी लाग्यो ?

Multiple answers are possible. / एक भन्द बढि पनि छनोट गर्न सकिन्छ।

- ☐ Kitchen / भान्सा
- ☐ Heater / हीटर
- ☐ Electricity / बिजुली
- ☐ Cigarette / चुरोट
- ☐ Voluntary / कसैले जानि जानि लगाएको
- ☐ Others: / अन्य:

- ☐ I don't know. / मलाई थाहा छैन।

24. Have you ever been bitten by a snake?
के तपाईलाई कहिल्यै सर्पले टोकेको छ ?

- ○ No. / छैन।
- ○ Yes, once. हो, एक पटक।
- ○ Yes, twice. / हो, दुई पटक।
- ○ Yes, three times. / हो, तीन पटक।
- ○ Yes, four times. / हो, चार पटक।
- ○ Yes, five times. / हो, पाँच पटक।
- ○ Yes, more than five times. / हो, पाँच पटक भन्दा बढी।

25. Have you seen any new snakes or insects compared to 10 years ago?
के तपाईंले १० वर्ष पहिलेको तुलनामा कुनै नयाँ सर्प वा कीराहरू देख्नुभएको छ ?

- ○ Yes / छ
- ○ No / छैन

- ○ I don't know. / मलाई थाहा छैन।

26. If yes, which kind of snake or insect?
यदि छ भने, कुन प्रकारको सर्प वा कीराहरू ?

27. Have you ever encountered monkeys?
के तपाईंलाई बाँदरले (दुःख दिन्छ) सताउँछ ?

- ○ Yes / छ
- ○ No / छैन

28. What is the impact of the monkeys?
बाँदरको बाट हुने क्षतीहरू के के हुन ?
Multiple answers are possible. / एक भन्द बढि पनि छनोट गर्न सकिन्छ।

- ☐ House destruction / घर विनाश
- ☐ Harvest destruction / बालीनालीको विनाश
- ☐ Person injured or deceased / घाइते वा मृतक व्यक्ति
- ☐ Livestock injured or deceased / पशुधन घाइते वा मृतक
- ☐ Wealth destruction / धनको विनाश
- ☐ None / कुनै पनि छैन
- ☐ Others: / अन्य :

- ☐ I don't know. / मलाई थाहा छैन।

29. Do you have a successful method to protect your property against monkeys?
के तपाईंसँग बाँदरहरूबाट आफ्नो सम्पत्ति जोगाउन सफल विधि छ ?

30. Do you think the numbers of monkeys increased in the past 15 years, and if yes, what are the reasons?
के विगत १५ वर्षमा बाँदरको सङ्ख्या बढेको जस्तो लाग्छ। यदि हो लाग्छ भने त्यसको कारण के होला ?

31. Do you have mice or rats at home?
के तपाईको घरमा मुसा वा छुचुन्दा छन् ?

- ○ Yes / छन
- ○ No / छैन

32. What is the impact of mice and rats?
मुसा र छुचुन्दाको असर के हुन्छ ?
Multiple answers are possible. / एक भन्द बढि पनि छनोट गर्न सकिन्छ।

- ☐ Food destruction / खाद्य विनाश
- ☐ Water contamination / पानी प्रदूषण
- ☐ Clothes, furniture, wires, etc. damaging / कपडा, फर्निचर, तार आदि नोक्सान गर्ने
- ☐ None / कुनै पनि छैन
- ☐ Others: / अन्य :

- ☐ I don't know. / मलाई थाहा छैन।

33. Do you have trouble with any other kind of animal and if yes, what is their impact?
के तपाईलाई कुनै अन्य प्रकारको जनावरसँग समस्या छ र यदि छ भने, तिनीहरूको प्रभाव के हुन्छ ?

5. Health-related risks / स्वास्थ्य सम्बन्धी जोखिमहरू

34. How often do you get sick?
तपाई कति पटक बिरामी हुनुहुन्छ ?

- ○ Once a week. / हप्तामा एक पटक।
- ○ Once a month. / महिनामा एक पटक।
- ○ Twice a month. / महिनामा दुईपटक।
- ○ A couple of times each year. / प्रत्येक वर्ष एक दुई पटक।
- ○ Never. / कहिल्यै छैन।
- ○ Others: / अन्य :

- ○ I don't know. / मलाई थाहा छैन।

35. What type of illness do you get sick with? Please specify a maximum of three.
तपाई कुन प्रकारको रोगबाट बिरामी हुनुहुन्छ ? कृपया बढिमा ३ वटा छान्नु होस।
Multiple answers are possible. / एक भन्द बढि पनि छनोट गर्न सकिन्छ।

- ☐ Respiratory diseases (e.g. asthma or COPD) / श्वासप्रश्वाससम्बन्धी रोगहरू (जस्तै दम वा COPD)
- ☐ Gestities / गेस्टिटीहरू
- ☐ Diarrhea / पखाला
- ☐ Worm infection / कीरा संक्रमण
- ☐ Headache / टाउको दुख्ने
- ☐ Throat pain / घाँटी दुख्ने
- ☐ Cough / खोकी
- ☐ Common cold / सामान्य चिसो
- ☐ Others: / अन्य:

- ☐ I don't know. / मलाई थाहा छैन।

36. What kind of preventive measures do you know that will keep you from getting sick?
हजुरलाईकस्तो किसिमको रोकथामका उपया थाहा छ जसले तपाईलाई बिरामी हुनबाट जोगाउँछ ?

37. Are you boiling or filtering your drinking water?
के तपाईं आफ्नो पिउने पानी उमालेर वा फिल्टर गरेर पिउनु हुन्छ। हुनुहुन्छ ?

- ◯ Yes, always. / हो सँधै।
- ◯ Yes, most of the time. / हो, अधिकांश समय।
- ◯ Very rarely. / धेरै विरलै।
- ◯ No, never. / होइन, कहिल्यै गर्दिन
- ◯ Others: / अन्य:

- ◯ I don't know. / मलाई थाहा छैन।

38. Do you wash your hands before eating?
के तपाईँ खाना खानु अघि आफ्नो हात धुनुहुन्छ ?

- ◯ No. / धुदिन
- ◯ Yes, with water. / पानीले मात्र धुन्छु।
- ◯ Yes, with water and soap. / साबुन पानीले धुन्छु।
- ◯ Yes, with ashes. / खरानी पानीले धुन्छु।
- ◯ Yes, with mud. / माटो पानीले धुन्छु।
- ◯ Yes, with sanitizer. / हो, सेनिटाइजरको साथ।
- ◯ Others: / अन्य :

- ◯ I don't know. / मलाई थाहा छैन।

39. Do you wash your hands after going to the toilet?
के तपाइ शौचालय गएपछि हात धुनुहुन्छ ?

- ◯ No. / धुदिन
- ◯ Yes, with water. / पानीले मात्र धुन्छु।
- ◯ Yes, with water and soap. / साबुन पानीले धुन्छु।
- ◯ Yes, with ashes. / खरानी पानीले धुन्छु।
- ◯ Yes, with mud. / माटो पानीले धुन्छु।
- ◯ Yes, with sanitizer. / हो, सेनिटाइजरको साथ।
- ◯ Others: / अन्य :

- ◯ I don't know. / मलाई थाहा छैन।

40. Have you ever fallen from heights?

के तपाईं कहिल्यै लड्नु भएको छ ?(जस्तै: रूखबाट ,पहिरोबाट, भिरबाट, चिप्लो)

- ○ Yes / छ
- ○ No / छैन

- ○ I don't know. / मलाई थाहा छैन।

41. Where did you fall from?

काँहाबाट लड्नु भयो ?

Multiple answers are possible. / एक भन्द बढि पनि छनोट गर्न सकिन्छ।

- ☐ Chair / कुर्सी बाट
- ☐ Terrace/ balcony / काँल्ला वा बालकनीबाट
- ☐ Stairs / सीढीबाट
- ☐ Tree / रुखबाट
- ☐ Others: / अन्य :

- ☐ I don't know. / मलाई थाहा छैन।

42. What were the consequences of the fall?

लड्नु भए पछि के भयो ?

Multiple answers are possible. / एक भन्द बढि पनि छनोट गर्न सकिन्छ।

- ☐ None. / केही पनि भएन
- ☐ Some body pain and bruises. / केहि शरीर दुखाइ र दरफरयाएको
- ☐ Pain in affected areas for over a week. / ठोकिएको ठाँउ हप्ता भन्दा बढीको घाउ।
- ☐ Broken bones. / हड्डि भाच्चिएका ।
- ☐ Severe physical and mental impact. / गम्भीर शारीरिक र मानसिक असर।
- ☐ Others: / अन्य :

- ☐ I don't know. / मलाई थाहा छैन।

Thank you for completing this questionnaire!

Thank you for helping us!
With your input, we can improve the community for the benefit of all.

हामीलाई मद्दत गर्नुभएकोमा धन्यवाद ।
हजुरले दिनुभएको जवाफलाई हाम्रो अनुसन्धमा समेट छै र नतिजाको बारेमा जानकारी गराउछै। फेरी पनि हजुरले दिनु भएको अमुल्य समयको लागि धेरै धेरै धन्यवाद दिन चाहान्छ।

If you have any questions or comments, please contact VIN.
यदि तपाईँसँग कुने प्रश्न वा टिप्पणीहरू छन् भने, कृपया VIN लाई सम्पर्क गर्नुहोस्।

Your answers were transmitted, you may close the browser window or tab now.
तपाईका जवाफहरू प्राप्त भयो अहिले ब्राउजर विन्डो वा ट्याब बन्द गर्न सक्नुहुन्छ।

1.3 DRR Observation Guidelines

1. The observed area/ household belongs to the following Village Development Commities (VDC's) of Okhaldhunga, Nepal:

- ○ Thulachhap
- ○ Badaure
- ○ Others:

AA01 Residency
1 = Thulachhap
2 = Badaure
3 = Others:
-9 = Not answered
AA01_03 Others
Free text

Natural risks

2. Earthquake – outdoor

	Yes, completely.	Yes, but with residual risk remaining.	No, considerable risk is observed.	No, not at all.	Not assessable.
Is the house located in a safe and secure area? The environment displays no possible hazards in the immediate vicinity, such as steep slopes or large trees.	○	○	○	○	○
Is the house constructed in a earthquake resistant manner? The house is built earthquake-proof.	○	○	○	○	○
Is there a stable foundation anchored in the ground?	○	○	○	○	○
Are the buildings free from visible effects of a previous earthquake? No cracks in the walls or other signs of instability are visible due to the impact of an earthquake.	○	○	○	○	○
Others:	○	○	○	○	○

3. Earthquake – indoor

	Yes, completely.	Yes, but with residual risk remaining.	No, considerable risk is observed.	No, not at all.	Not assessable.
Are shelves and furniture properly fixed to the wall?	○	○	○	○	○
Are heavy items placed on lower shelves?	○	○	○	○	○
Are heavy objects removed from beds and sofas?	○	○	○	○	○
Others:	○	○	○	○	○

AN03_01 Are shelves and furniture properly fixed to the wall?
AN03_02 Are heavy items placed on lower shelves?
AN03_03 Are heavy objects removed from beds and sofas?
AN03_05 Others: %input:AN08_01%
1 = Yes, completely.
2 = Yes, but with residual risk remaining.
3 = No, considerable risk is observed.
4 = No, not at all.
-1 = Not assessable.
-9 = Not answered

4. Landslide

	Yes, completely.	Yes, but with residual risk remaining.	No, considerable risk is observed.	No, not at all.	Not assessable.
If applicable, do stable walls secure the household area from landslides?	○	○	○	○	○
If applicable, do stable constructions secure the buildings from sliding downwards?	○	○	○	○	○
Others:	○	○	○	○	○

5. Flooding

	Yes, completely.	Yes, but with residual risk remaining.	No, considerable risk is observed.	No, not at all.	Not assessable.
Is the household outside the range of flooding?	○	○	○	○	○
If applicable, do the flood protection measures protect the household from flooding?	○	○	○	○	○
Others:	○	○	○	○	○

AN12_01 Is the household outside the range of flooding?
AN12_02 If applicable, do the flood protection measures protect the household from flooding?
AN12_05 Others: %input:AN13_01%
1 = Yes, completely.
2 = Yes, but with residual risk remaining.
3 = No, considerable risk is observed.
4 = No, not at all.
-1 = Not assessable.
-9 = Not answered

6. If you have anything to add to this section, please insert it here.

AN10_01 [01]
Free text

Household risks

7. Household – Outdoor

	Yes, completely.	Yes, but with residual risk remaining.	No, considerable risk is observed.	No, not at all.	Not assessable.
Are the livestock kept in a setting that does not pose a health risk to the owners? - The livestock are kept in a separated shelter. - The livestock do not have access to areas where food is prepared and where persons eat or sleep.	○	○	○	○	○
Are the pathways to the fields, to the toilet, to the livestock, etc. built safely? - Paths are free of grass, stones, or other obstacles that a person might trip over or that provide shelter for dangerous species such as snakes. - The material (e.g., stones or soil) does not become slippery during the monsoon season.	○	○	○	○	○
If there are stairs, are they build safely? - The steps are no higher than 10 inches and large enough to place your whole foot on. - A handrail is provided. - The stairs are no steeper than 45 degrees.	○	○	○	○	○
Others:	○	○	○	○	○

8. Household – Indoor

	Yes, completely.	Yes, but with residual risk remaining.	No, considerable risk is observed.	No, not at all.	Not assessable.
Does the cooking situation provide a healthy environment for all family members? Smoke is led outside, e.g. via a pipe.	○	○	○	○	○
Are food supplies safely stowed away? - It is stored safely in, for example, metal boxes or similar resistant materials, so that vermin such as mice and rats have no access. - It is stored safely so that it does not run the risk of mould and so on.	○	○	○	○	○
Are the tools for farming safely stowed away? - Safely stowed in a way that does not pose a danger to the residents by, for example, falling down or tipping over.	○	○	○	○	○
If there is electricity, are the wires securely installed? - Wires are build into the wall. - Children are not in danger of coming in contact with electricity through protruding wire.	○	○	○	○	○
Is there a hygienic toilet available in the household? - The lavatory is located in a separate room. - Water or other adequate means for cleaning and washing the body and hands afterwards are provided.	○	○	○	○	○
Is the roof made of non-flammable materials? - Non-flammable materials would be e.g. corrugated sheets. - Whereas roofs made of straw and bamboo are highly flammable.	○	○	○	○	○
Others:	○	○	○	○	○

9. If you have anything to add to this section, please insert it here.

BH03_01 [01]
Free text

Last Page

Thank you for completing this questionnaire!

We would like to thank you very much for helping us.

Your answers were transmitted, you may close the browser window or tab now.

Annex 2: Descriptive Evaluation Results - Thulachhap

The following table shows the total number of interviews conducted in both wards Thulachhap and Bhadaure.

Total interviews	**155**
Complete interviews	150
Incomplete interviews[57]	155

2.1 General Information

Question 1 (AG01): In which community of Okhaldhunga, Nepal, do you live?

Community	**Number of interviewees**	**Percentage of total**
Thulachhap	**85**	
Bhadaure	70	
Others	0	

Please note that the results of question 2 (AG02) *"How old are you?"* and all that follows reflect only the responses of respondents from Thulachhap!

Question 2 (AG02): How old are you?

Age	**Number of interviewees**	**Percentage of total**
15 - 25	9	
26 - 35	22	
36 - 45	15	
46 - 55	5	
56 - 65	17	
66 - 75	11	

[57]The incomplete interviews are the result of a group interview with 5 people where not everyone answered every question or the answer was not understandable on the recording.

76 +	6	

Question 3 (AG03): What is your gender?

Gender	Number of interviewees	Percentage of total
Male	34	
Female	51	
Others	0	

Question 4 (AG11_01): What is your education?

Education	Number of interviewees	Percentage of total
No education	33	
Primary school (Grade 1 - 5)	20	
Secondary school (Grade 6 - 12)	25	
Bachelor	4	
Master	3	

Question 5 (AG04_01): What is your occupation?

Occupation	Number of interviewees	Percentage of total
Agriculture	65	
Student	5	
Teacher	5	
Business (small shop)	4	
Police (retired)	4 (2)	
Caretaker	2	
Health worker	2	
Basket and instrument maker	1	
Nepali army, retired	1	

Three people stated two occupations: Agriculture and business (3).

Question 6 (AG05): How many family members live in your household?

Family members	**Number of interviewees**	**Percentage of total**
1	1	
2	9	
3	18	
4 - 6	50	
7 - 9	7	
10 or more	0	

Question 7 (AG06): Can you read Nepali?

Literacy	**Number of interviewees**	**Percentage of total**
Yes	52	
No	33	

From 33 illiterate people in total 27 are female and 6 are male who also didn't attend school at all.

Question 8 (AG07): Do you know what to do in case of an earthquake, forest fire, or landslide?

Emergency plan	**Number of interviewees**	**Percentage of total**
Yes	78	
No	3	
Not answered	*4*	

Question 9 (AG08_01): If yes, please explain what?

Measure	**Number of interviewees**	**Percentage of total**
Earthquake		
Move swiftly to an open	70	

area/ field. *(Specified as free from houses, trees or electricity wires)*		
Hide under a table or bed. *(When inside (6), stay inside at night (1), when trapped inside (1))*	8	
I don't know.	2	
Forest fire		
Extinguish the fire with water.	43	
Extinguish the fire with soil, sand and/ or green leaves.	28	
Inform other people/ the other villagers.	23	
I don't know.	15	
Cut a fire line. *(A fireline is established to contain and control the flames by cutting potentially flammable materials, such as grass or trees, around the existing fire.)*	4	
Inform authorities. *(Forestry (1), nepali government (2), nepali police (3), nepali army, nepali firefighters (1))*	9	
Run away to a safe area. *(Specified as a not-forest fire area)*	1	
Landslide		
Run away to a safe area. *(Specified as a not-landslide area)*	32	
I don't know.	31	
Inform authorities. *(Nepali police)*	1	
Do nothing	1	

2.2 Climate Change

Question 10 (CC02): Do you know about climate change?

Knowledge	**Number of interviewees**	**Percentage of total**
Yes	21	
No	63	
Not answered	*1*	

Important note: Because of a misunderstanding 100% of the following questions in the climate change section are counted with -34 interviews.

Question 11 (CC03): If yes, what are the consequences of climate change?

Consequence	**Number of interviewees**	**Percentage of total**
Total number	**51**	
Increased temperature	14	
More droughts	22	
More forest fires	0	
More floodings	3	
More rain	12	
Less rain	34	
More landslide	2	
More insects	18	
Others *(Decreased temperature (3), harvest seasons change (1), less crop production (1), less water (1), air pollution (1), Decreasing oxygen level (1))*	8	
I don't know	2	

Respondents selected an average of 2 climate change consequences.

Question 12 (CC04): Is there any change in your agriculture methods because of climate change?

Change	Number of interviewees	Percentage of total
Yes	30	
No	19	
Not answered	*35*	

Question 13 (CC05_01): If yes, how?

Measure	Number of interviewees	Percentage of total
Pesticides ***(Mostly on corn, sometimes on millet 1 to 3 times every season)***	**9**	
Unknown period of time	1	
Since 1 - 5 years	8	
Since 6 years or more	0	
Fertilisers ***(Mostly on corn, sometimes also on millet 1 to 3 times every season)***	**30**	
Unknown period of time	4	
Since 1 - 5 years	4	
Since 6 years or more	22	
Organic pesticides ***(mixture of rosemary, cow urine, and angelic fall)***	1	
Total number of interviewees using pesticides and/ or fertilisers	*30*	

2.3 Intensive Risks (Here: Natural Risks)

Question 14 (DD01): Have you ever faced a forest fire?

Number of times	Number of interviewees	Percentage of total
No.	63	
Yes, once.	16	
Yes, twice.	0	
Yes, three times.	0	
Yes, four times.	1	
Yes, five times.	0	
Yes, more than five times.	1	
Not answered	*1*	

Question 15 (DD02): What are the consequences of the forest fire?

Consequences	Number of interviewees	Percentage of total
House destruction	5	
Culture destruction	0	
Person injured or deceased	1	
Livestock injured or deceased	1	
Destruction of wealth	3	
Others *(Forest destruction (20), none (3), wildlife deceased (1))*	14	
I don’t know.	1	

Respondents selected an average of 1 forest fire consequence.

Question 16 (DD03): What do you think causes the most forest fires in your area?

Causes	Number of interviewees	Percentage of total
Natural causes	6	

Man-made causes	68	
I don't know.	6	
Not answered	*1*	

Question 17 (DD04): Have you ever faced a landslide?

Number of times	**Number of interviewees**	**Percentage of total**
No.	65	
Yes, once.	3	
Yes, twice.	2	
Yes, three times.	0	
Yes, four times.	0	
Yes, five times.	0	
Yes, more than five times.	11	

Respondents who reported having encountered a landslide more than five times indicated that they were regularly affected during the monsoon season.

Question 18 (DD05): What are the consequences of the landslide?

Consequences	**Number of interviewees**	**Percentage of total**
House destruction	1	
Road destruction	7	
Culture destruction	0	
Person injured or deceased	0	
Livestock injured or deceased	0	
Destruction of wealth	0	
Others *(Field and crop destruction (13), none (7))*	11	
I don’t know.	0	

Respondents selected an average of 1 landslide consequence.

Question 19 (DD06): Have you ever faced an earthquake?

Number of times	Number of interviewees	Percentage of total
No.	0	
Yes, once.	13	
Yes, twice.	26	
Yes, three times.	19	
Yes, four times.	8	
Yes, five times.	5	
Yes, more than five times.	13	
Not answered	*1*	

Respondents face an earthquake an average of 3 times in their lives.

Question 20 (DD07): What are the consequences of the earthquake?

Consequences	Number of interviewees	Percentage of total
House destruction	76	
Road destruction	0	
Culture destruction	0	
Person injured or deceased	0	
Livestock injured or deceased	1	
Destruction of wealth	0	
Others *(None (6), cottage destruction (2), water decrease (1))*	9	
I don't know.	1	

Respondents selected an average of 1 earthquake consequence.

2.4 Extensive Risks

Question 21 (ER01): Are you aware of the risks you are exposed to on a daily basis?

Awareness	Number of interviewees	Percentage of total
Yes	65	
No	17	
Not answered	*2*	

Question 22 (ER02): Has your house ever encountered an indoor fire?

	Number of interviewees	Percentage of total
Yes	12	
No	69	
Not answered	*3*	

Question 23 (ER03): What was the origin of the fire?

Origin	Number of interviewees	Percentage of total
Kitchen	1	
Heater	0	
Electricity	0	
Cigarette	2	
Voluntary	1	
Others *(Accidently (2): Children playing with fire (1), lighting (1))*	4	
I don't know.	4	

Question 24 (ER04): Have you ever been bitten by a snake?

Number of times	Number of interviewees	Percentage of total
No.	79	
Yes, once.	3	
Yes, twice.	0	
Yes, three times.	0	
Yes, four times.	0	

Yes, five times.	0	
Yes, more than five times.	0	
Not answered	*1*	

Question 25 (ER05): Have you seen any new snakes or insects compared to 10 years ago?

	Number of interviewees	**Percentage of total**
Yes	54	
No	24	
I don't know.	5	
Not answered	*2*	

Question 26 (ER06_01): If yes, which kind of snake or insect?

Species	**Number of interviewees**	**Percentage of total**
New insects in general *Respondents said they had seen new insects, including descriptions of their appearance or feeding behaviour, but they did not know their names.*	**75**	
American army worm *Fauji keera*	32	
Mosquitoes	6	
New snakes in general *Respondents said they had seen new snakes, including descriptions of their appearance but they did not know their names.*	**21**	
Gorman snake	5	

Question 27 (ER07): Have you ever encountered monkeys?

Monkey encounter	**Number of interviewees**	**Percentage of total**
Yes	73	
No	11	
Not answered	*1*	

Question 28 (ER09): What is the impact of the monkeys?

Consequences	**Number of interviewees**	**Percentage of total**
House destruction	0	
Harvest destruction	72	
Person injured or deceased	0	
Livestock injured or deceased	0	
Wealth destruction	0	
None	1	
Others *(Supply destruction (13))*	36	
I don't know.	0	

Question 29 (ER10_01): Do you have a successful method to protect your property against monkeys?

Method	**Number of interviewees**	**Percentage of total**
None	**59**	
Harvest and supplies protection method	**11**	
Staying on the field the whole day	4	
Using a slingshot or dhunk bhanduk to chase monkeys away	3	
Yelling and throwing stones	2	
Erect straw men	1	
Set trap for monkey *(described similar to a football net)*	1	
Supplies protection method	**2**	

Close all windows to protect the supplies	1	
Installing a mesh wire in front of the windows	1	

Question 30 (ER11_01): Do you think the number of monkeys increased in the past 15 years, and if yes, what are the reasons?

Reason	**Number of interviewees**	**Percentage of total**
Yes, the monkey population increased.	**78**	
Yes, through massive migration in the last years, many fields turned into wasteland. The forest regrow on these lands, which also increased the monkey population. In search of food, the monkey hordes come to the remaining farmers and their fields.	25	
Yes, because the forest grew bigger and so did the monkey population	25	
Yes, but I don't know why.	13	
Yes, because of the high monkey population in Kathmandu, an unknown stakeholder caught and transferred an amount of monkeys to Okhaldhunga in jeeps. Here, they were set free.	6	
Yes, a forest fire destroyed the natural habitat of the monkeys and that drove them towards their village.	3	
Yes, the prohibition of shooting wildlife from 15 years ago increased the monkey population.	2	
Yes, because tigers chase the monkeys uphill.	2	

Yes, the construction of new roads destroyed the natural habitat of the monkeys and that drove them towards their village.	1	
He/ She doesn't know.	**4**	
No, the monkey population did not increase.	**0**	
Not answered	*2*	

Question 31 (ER12): Do you have mice or rats at home?

	Number of interviewees	**Percentage of total**
Yes	79	
No	3	
Not answered	*3*	

Question 32 (ER13): What is the impact of mice or rats?

Impact	**Number of interviewees**	**Percentage of total**
Food destruction	79	
Water contamination	0	
Clothes, furniture, wires, etc. damaging	72	
None	0	
Others *(Floor destruction (5), book destruction (1), field damage (1), person injured (1))*	9	
I don't know.	0	

Respondents selected an average of 2 consequences.
Question 33 (ER14_01): Do you have trouble with any other kind of animal and if yes, what is their impact?

Species / *Nepali Name*	**Number of interviewees**	**Percentage of total**
Yes	**75**	
Deer *(Eats several vegetables, e.g., lentils, corn, sweet potatoes etc.)*	64	
Porcupine *(Eats several vegetables, e.g., lentils, corn, sweet potatoes etc.)*	56	
Rabbit *(Eats several vegetables, e.g., lentils, corn, sweet potatoes etc.)*	33	
Jackals *(Eats chicken)*	11	
Forest hen / *Kaalis* *(Eats several vegetables, e.g., lentils, corn, sweet potatoes etc.)*	11	
Tiger *(Eats goats)*	9	
Squirrel	5	
Bird *(Eats several vegetables, e.g., lentils, corn, sweet potatoes etc.)*	3	
Yellow-throated Marten	3	
Dog	1	
Peacock *(Eats several vegetables, e.g., lentils, corn, sweet potatoes etc.)*	1	
No	**5**	
Not answered	*4*	

2.5 Health-related Risks

Question 34 (HR01): How often do you get sick?

Number of times	**Number of interviewees**	**Percentage of total**
Once a week.	0	

Once a month.	9	
Twice a month.	2	
A couple of times each year.	33	
Never.	1	
Others *(Everyday (35), three time a week (1))*	36	
I don't know.	0	
Not answered	*3*	

The 36 respondents stated being sick every day have an age average of 57 years and 28 of them reported to experience either joint pain (17) uterus problems (4) or a long-lasting disease (high blood pressure (3), diabetics (2)).

Question 35 (HR02): What type of illness do you get sick with? Please specify a maximum of three.

Illness	**Number of interviewees**	**Percentage of total**
Respiratory disease (e.g. asthma or COPD)	2	
Gastritis	16	
Diarrhoea	1	
Worm infection	0	
Headache	32	
Throat pain	23	
Cough	9	
Common cold	2	
Others *(Fever (35), joint pain (13), chronic disease (11), stomach pain (11), unspecific body pain (5), uterus problem (3), eye problem (2), circulatory problem (1))*	64	
I don't know.	0	

Not answered	*1*	

Respondents selected an average of 2 diseases.

Question 36 (HR03_01): What kind of preventive measures do you know that will keep you from getting sick?[58]

Number of interviewees	**Measure** English name *Scientific name / Nepali name*	**Medical use**	**Preparation**
76	**He/ she doesn't know about preventive measures.**		
9	**Preventive**		
6	Boiled water	Throat pain	Boiling Boiling with salt (2)
3	Turmeric *Curcuma / Haledo*	Throat pain (1)	Boiling with water.
2	Medicine *(Paracetamol (1))*	-	Swallowed with water.
1	Cumin *Cuminum cyminum / Jeera*	-	Mix with water.
1	Basil plant *Ocimum basilicum / Sabja, Tulasi*	Throat pain	Put leaves into hot water.
64	**Non-preventive natural medicine**		
10	Turmeric *Curcuma / Haledo*	Throat pain	Brewed with hot water
5	Ginger *Zingiber officinale / Aadhuwa*	Cough, fever	Put root in fire for a few minutes, then eat it afterwards (1) Brewed with hot water (1)

[58] Some respondents stated more than one answer.

4	Basil plant *Ocimum basilicum / Sabja, Tulasi*	Throat pain (2), cough (2)	Brewed with hot water
4	Calamus *Acorus calamus / Bojho*	Throat pain, cough	Cut the root, boil it or eat raw.
3	Chiretta *Swertia chirayita / Chiraeto*	Fever	Grind the root (in the monsoon season also the leaves), mix the juice with a little water and finally filter through a cloth (boil in winter).
3	Rosemary *Salvia rosmarinus / Muttha*	Fever Gesticities	Crushed up the leaves, mixed with water, filtered through fabric and then drunken
2	Cumin *Cuminum cyminum / Jeera*	Throat pain, Headache	Mixed with hot water
2	Unknown *Unknown / Gurjo*	High blood pressure	Cut the root, boil it or eat it raw.
2	Black myrobalan *Terminalia chebula / Harro, Myrobalan*	Throat pain	Put fruits into fire for a few minutes, clean and then eat them
1	Asiatic pennywort *Centella asiatica / Ghodtapre*	Throat pain	Crushed up the roots, mix the juice with a bit of water and lastly filtered through fabric
1	Bitter melon *Momordica charantia / Tite karela*	High blood pressure	Eating raw
1	Black pepper *Piper nigrum / Marich*	Covid-19	Mixed with water
1	Persimmon *Diospyros kaki / Haluaabed*	Allergic reaction	-
1	Needlewood tree *Schima wallichii / Chilaune*		Crushed up the bark, mixed with water, filtered through fabric and then drunken
1	Common guava *Psidium guajava / Guava*	Throat pain	Crush leaves, mix juice with a few

			drops of water, lastly filter through fabric, no boiling
1	Black berry *Rubus subg. Rubus / ?*	Stomach problems	Crush roots, mix juice with a few drops of water, lastly filter through fabric
1	Garlic *Allium sativum / Lasum*	-	-
1	Fenugreek *Trigonella foenum-graecum / Methi*	-	-
1	Mix of chilli and lemons with cold water	Throat pain	
15	**Medicine** (Paracetamol (11))	Fever (Paracetamol)	

Question 37 (HR04): Are you boiling or filtering your drinking water?

Time	**Number of interviewees**	**Percentage of total**
Yes, always.	15	
Yes, most of the time.	2	
Very rarely.	11	
No, never.	24	
Others *(Boiling water only in winter (30))*	30	
I don't know.	0	
Not answered	*2*	

The majority of respondents boil their water. Only 3 respondents stated that they filter their water in summer and boil it in winter.

Question 38 (HR05): Do you wash your hands before eating?

	Number of interviewees	**Percentage of total**
No.	0	

Yes, with water.	7	
Yes, with water and soap.	63	
Yes, with ashes.	10	
Yes, with mud.	0	
Yes, with sanitizer.	0	
Others *(Sometimes water and soap, sometimes with ashes (2))*	0	
I don’t know.	0	
Not answered	*2*	

Question 39 (HR06): Do you wash your hands after going to the toilet?

	Number of interviewees	**Percentage of total**
No.	0	
Yes, with water.	3	
Yes, with water and soap.	73	
Yes, with ashes.	3	
Yes, with mud.	2	
Yes, with sanitizer.	1	
Others *(sometimes water, sometimes soap, sometimes ashes)*	0	
I don’t know.	0	
Not answered	*2*	

Question 40 (HR07): Have you ever fallen from heights?

	Number of interviewees	**Percentage of total**
Yes	52	
No	29	
I don't know.	0	
Not answered	*3*	

Question 41 (HR08): Where did you fall from?

	Number of interviewees	**Percentage of total**
Chair	0	
Terrace/ balcony	12	
Stairs	7	
Tree	21	
Others *(stumbling (9), boat (1), swing (1), pushed by water (1))*	15	
I don't know.	0	

Question 42 (HR09): What were the consequences of the fall?

Consequences	**Number of interviewees**	**Percentage of total**
None.	5	
Some body pain and bruises.	8	
Pain in affected areas for over a week.	26	
Broken bones.	9	
Severe physical and mental impact.	0	
Others *(long-term pain (1 year or more) (8), scars (3))*	13	
I don't know.	0	

Annex 3: List of Useful Resources

Understanding Disaster Risk:

https://www.preventionweb.net/understanding-disaster-risk/component-risk/disaster-risk

https://www.preventionweb.net/understanding-disaster-risk/key-concepts/intensive-extensive-risk

Technical Guidance on comprehensive risk assessment and planning in the context of climate change:

https://www.undrr.org/publication/technical-guidance-comprehensive-risk-assessment-and-planning-context-climate-chang

Research and climate resilience in the Himalayan regions:

https://mountainresearchinitiative.org/news-content/asia/hicap-adaptation-to-climate-change-in-the-himalaya

Glossar

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