

# Integration of Climate Change Adaptation with Youth Empowerment

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Identifying Opportunities and Challenges by Analyzing  
the Multi-Dimensional Vulnerability to Climate Change  
in Rangtse, Haa Dzongkhag, Bhutan

HANNAH-REBECCA HÖFLE | DIVISION OF RISK MANAGEMENT  
AND SOCIETAL SAFETY | LTH | LUND UNIVERSITY, SWEDEN



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Empowerment**

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**Master's Thesis by  
Hannah-Rebecca Höfle**

**Supervised by  
Misse Wester**

**Examined by  
Mo Hamza**

**Lund 2024**

# Integration of Climate Change Adaptation with Youth Empowerment – Identifying Opportunities and Challenges by Analyzing the Multi-Dimensional Vulnerability to Climate Change in Rangtse, Haa Dzongkhag, Bhutan

Hannah-Rebecca Höfle

Number of pages: 61

Word count: 15.137

Number of illustrations: 14

## Keywords

Climate change adaptation, youth empowerment, vulnerability assessment, exposure, sensitivity, resilience, sustainable tourism, agriculture, financing, Gross National Happiness, Rangtse, Bhutan.

## Abstract

This thesis project aims to research the opportunities and challenges of development projects that integrate climate change adaptation (CCA) with youth empowerment in the rural community of Rangtse, Haa Dzongkhag in Bhutan. A vulnerability assessment was conducted by analyzing the exposure, sensitivity, and resilience of the Rangtse area to climate change through the dimensions of Gross National Happiness covering socio-economics, governance, culture, and the environment. The data to build this case study has been collected through observations and key informant interviews in the field. Opportunities for integrating youth empowerment with CCA to build more resilient livelihoods include developing sustainable tourism practices by diversifying economic activity beyond the prevalent agricultural sector. Moreover, youth can be incentivized to adapt agricultural practices to climate change by modernizing farming approaches. Youth additionally shows interest in accessing education about CCA and vocational training. However, challenges are posed by limited access to financing for development projects, as well as information gaps and hindered flow of information within remote communities and between urban and rural areas. Additionally, the local context calls for a balance of traditional values and modernization through development efforts. It is thus recommended that international donors take an actively decolonized stance towards development work. On the national level within Bhutan and within local administrations, it is moreover suggested to engage youth in decision-making processes concerning CCA measures. Moreover, facilitated access to education for rural youth is an essential step towards leveraging the opportunities of integrating CCA with youth empowerment.

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Lund 2024.

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Riskhantering och samhällssäkerhet  
Lunds tekniska högskola  
Lunds universitet  
Box 118  
221 00 Lund  
  
<http://www.risk.lth.se>  
  
Telefon: 046 - 222 73 60

Division of Risk Management and Societal Safety  
Faculty of Engineering  
Lund University  
P.O. Box 118  
SE-221 00 Lund  
Sweden  
  
<http://www.risk.lth.se>  
  
Telephone: +46 46 222 73 60

## **Acknowledgment**

Thank you very much to OYE's Chairperson Dasho Ugen Tsechup and the Board of Trustees for your trust and goodwill over the past year which made it possible to realize this most remarkable opportunity to experience Bhutan. Your support has been the cornerstone of this thesis project and I wish you all peace, prosperity, and happiness.

I would like to give a special thank you to Nima Gyeltshen for generously supporting and guiding me throughout this project. Your insights on Bhutan were invaluable and your experience and knowledge have been an immense source of inspiration. I also deeply thank Sonam Choden for administering my visa and countless route permits; Sonam Tashi for supporting me throughout my fieldwork and sustaining me with the best Bhutanese food; and Deki Yangden for the adventure of discovering and learning about Bhutan together.

I am also beyond grateful to the community in Rangtse for welcoming me and making this research possible. Your openness, hospitality, generosity, and kindness are something I will cherish far beyond my time in Rangtse. Thank you to all the interview participants and staff at the Dungkhag Administration, Gakiling Gewog Office, and the Rangtse Nye project group. I would also like to thank Tenzin Seldon and your family for welcoming me to Mochu Guest House and your family home. I deeply appreciate your friendship and kindness.

I would especially like to thank Misse for supervising and continuously supporting me throughout this intense semester. Your guidance and compassion helped me to truly make the most out of this unique learning experience. Thank you also to Anni, Sonja, Sarah, Tenko, Tom, Thijs, Rupert, and all fellow DRMCCA students for the amazing friendships and experiences over the last two years.

Thank you to Honorary Consul General Dr. Wolfgang Pfeiffer for supporting me during the logistical preparations for my stay in Bhutan. I would also like to deeply thank my dear friends Bhim from Magnificent Himalayan Treks and Acho Sangay for coordinating my travel itineraries in Bhutan and putting together the most unique travel experience for my family.

Finally, I would like to thank my family for always standing beside me, for your unconditional love, and for traveling all the way from Germany to visit me in Bhutan. The inspiration and strength you give me are what made this experience possible.

**Kadinche la and Tashi Delek!**

### List of Abbreviations

Bhutan Power Company	BPC
Climate Change	CC
Climate Change Adaptation	CCA
Gross Domestic Product	GDP
Gross National Happiness	GNH
Interpretative Phenomenological Analysis	IPA
Organization for Youth Empowerment Bhutan	OYE
South Asian Association for Regional Cooperation	SAARC

### List of Dzongkha Terms

Dungkhag	Sub-District
Dzongkhag	District
Gewog	Municipality
Gup	Municipality Headman
Puja	Buddhist Offering Ritual

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## Summary

*Introduction:* This thesis project aims to research the opportunities and challenges of integrating climate change adaptation (CCA) with youth empowerment in the rural community of Rangtse, Haa Dzongkhag in Bhutan. While previous literature highlighted the health and employment of youth in Bhutan, the focus on CCA in this research sheds light on another facet by integrating youth empowerment within the dimensions of Gross National Happiness indicators. This research is connected to a project set at the Rangtse Nye cave, a remote pilgrimage site, that targets sustainable tourism. Through this project, youth should be empowered to carry out innovative tourism businesses that secure their long-term livelihoods in the area while simultaneously building capacities benefiting the local environment and population to adapt to climate change (CC).

*Methodology:* The qualitative data to build this ethnographic case study has been collected through observations and key informant interviews in the field, including project participants as well as the local government and administration in Rangtse. The data was iteratively coded and analyzed by following an interpretative phenomenological analysis (IPA). Ethical considerations covered informed consent to ensure transparency and integrity, and biases stemming from the individual background and identity of the researcher engaging in ethnographic fieldwork.

*Literature Review:* The literature review defines the relevant concepts of vulnerability, youth empowerment, risk perception, and climate change adaptation. Moreover, the framework for the vulnerability assessment is introduced. This framework analyzes the exposure, sensitivity, and resilience of the Rangtse area to climate change through the dimensions of Gross National Happiness covering socio-economics, governance, culture, and the environment.

*Findings:* The area's exposure to CC covers a variety of components, such as a considerable youth population and remoteness. Spiritual pilgrimage and the unique biodiversity play a central role in developing sustainable tourism, while the agricultural sector currently builds the foundation for most people's livelihood. Exposure is characterized by lacking infrastructure networks. There is limited flow of information within and beyond the area and youth often do not have the resources to complete their formal education. Natural hazards and changes in weather patterns threaten agricultural productivity. This affects sensitivity based on human conditions, as the population faces limited access to economic activity and educational institutions. CCA measures in the area are inhibited by hurdles in accessing

financing. Variations in the perception of cause-and-effect relationships regarding CC moreover increase sensitivity. Environmental conditions such as changes in seasonality severely affect the quality of infrastructure and agricultural activity. Resilience to CC is influenced by current coping strategies, such as developing the farm road network. Buddhist offering rituals are a common measure to ward off natural hazards. Moreover, education about CC and CCA as well as offering employment to youth aim to build resilience. Future adaptation measures include building a CC-resilient infrastructure and offering needs-based vocational training to youth in the area. CCA in the agricultural sector seeks to improve food security and farming for economic activity beyond self-preservation.

*Discussion:* Opportunities for integrating youth empowerment with CCA to build more resilient livelihoods include developing sustainable tourism practices by diversifying economic activity beyond the prevalent agricultural sector. Moreover, modernizing farming approaches can incentivize youth to adapt agricultural practices to climate change. Youth additionally shows interest in accessing education about CCA and vocational training. However, challenges are posed by limited access to financing for development projects, as well as information gaps and hindered flow of information within remote communities and between urban and rural areas. Additionally, the local context calls for a balance of traditional values and modernization through development efforts.

*Limitations and Reflections:* This research reflects on possible limitations, such as the long-term planning required to gain access to the field due to visa and route permit restrictions. The cultural context moreover constituted a language barrier and possible biases when interpreting observational data. Moreover, the nature of a case study limits transferability to a certain degree and does not necessarily establish causal relations. Needs for further research have been identified regarding the water supply network in Rangtse, as well as quantitative documentation of CC in the area. Further reflections on the background of the researcher in relation to the specific local context during the fieldwork have been reviewed.

*Conclusion:* It is recommended that international donors take an actively decolonized stance towards development work. On the national level within Bhutan and within local administrations, it is moreover suggested to engage youth in decision-making processes concerning climate change adaptation measures. Moreover, facilitated access to education for rural youth is essential to leveraging the opportunities of integrating CCA with youth empowerment.

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## Introduction

### ***Background and Relevance***

This thesis project aims to research the opportunities and challenges of development projects that integrate climate change adaptation (CCA) with youth empowerment in the rural community of Rangtse, Haa Dzongkhag in Bhutan. Bhutan is a landlocked country with limited Gross Domestic Product (GDP) growth (Baikady et al., 2020) and high reliance on its domestic agricultural sector (Rinzin, 2020). However, this means that the Bhutanese economy, and with that the livelihoods of the current population and future generations, are built on a foundation that is highly sensitive to climate change (CC). This specifically stems from prevalent consequences of CC in Bhutan such as “landslides and flooding, agricultural productivity, forestry, health security” (Meenawat & Sovacool, 2011, p. 521) across the highly varying geographical structures of the country (Walcott, 2011). CCA is thus a relevant issue for the youth population’s long-term livelihood sustainability.

The integral role of Gross National Happiness (GNH) in Bhutan gives a unique approach to holistic development (Oswald-Spring, 2023), thus establishing an overarching context for this research project. To promote alternative perspectives to the standard approaches that prioritize economic incentives (Eriksson Baaz, 2005), the GNH indicators measure various aspects of the Bhutanese population based on the four aspects of “Good Governance”, “Sustainable Socio-economic Development”, “Preservation and Promotion of Culture”, and “Environmental Conservation” (GNH Centre Bhutan, 2022, The 4 Pillars of GNH) which are based on the values of Buddhism prevalent in Bhutanese culture (Oswald-Spring, 2023).

As previous research of the Bhutanese youth population focuses mostly on the aspects of employment (Lynch et al., 2023) as well as physical and mental health (Lester et al., 2020), the focus on CCA in this research sheds light on another facet by integrating youth empowerment within the dimensions of GNH indicators. As past literature also highlighted the need for more extensive “vulnerability assessments” (Muccione et al., 2016, p. 364), this approach was used as a foundation for this research. More specifically, Phanchung et al. (2022) highlight the issue that remote communities in Bhutan are often overlooked in development processes, as they are not given a platform to convey how CC affects them, which is a research gap that this paper intends to approach in the area of Rangtse.

## ***Project Context***

This research was set in the context of the project “Improvement and Sustenance of the Environmental Integrity of Rangtse Nye’s Surroundings, Haa, Bhutan” that the Organization for Youth Empowerment (OYE) conducted at the time of the thesis research. The project was set at the Rangtse Nye cave, seen in Figure 3, a remote pilgrimage site located in the buffer zone of the Jigme Khesar Strict Nature Reserve in Bhutan’s Haa Dzongkhag, illustrated by Figure 1. The site holds considerable importance in Buddhism, as it is prophesized to have been the sacred abode and meditation site of Guru Rinpoche, who played a central role in establishing contemporary Buddhism, and his consort Khandro Yeshey Tshogyel. The cave and its surroundings recently gained in popularity amongst Buddhists as a pilgrimage site after its inauguration by His Majesty the Fifth King of Bhutan in 2017. However, Figure 2 shows that the site lacked the infrastructure to accommodate the growing number of tourists visiting the area, resulting in negative effects on the environment at Rangtse Nye within and around the cave. Moreover, accessibility to the site was considered dangerous especially for senior citizens as the footpaths were not maintained properly, and wildlife in the area posed a risk to visitors. The project thus aimed to reduce the adverse effects of increased human activity at Rangtse Nye by involving the local youth in CCA measures, thus contributing to the GNH targets (Organization for Youth Empowerment [OYE], 2022).



*Figure 1: Location of Rangtse Village on the Map of Bhutan (own illustration)*

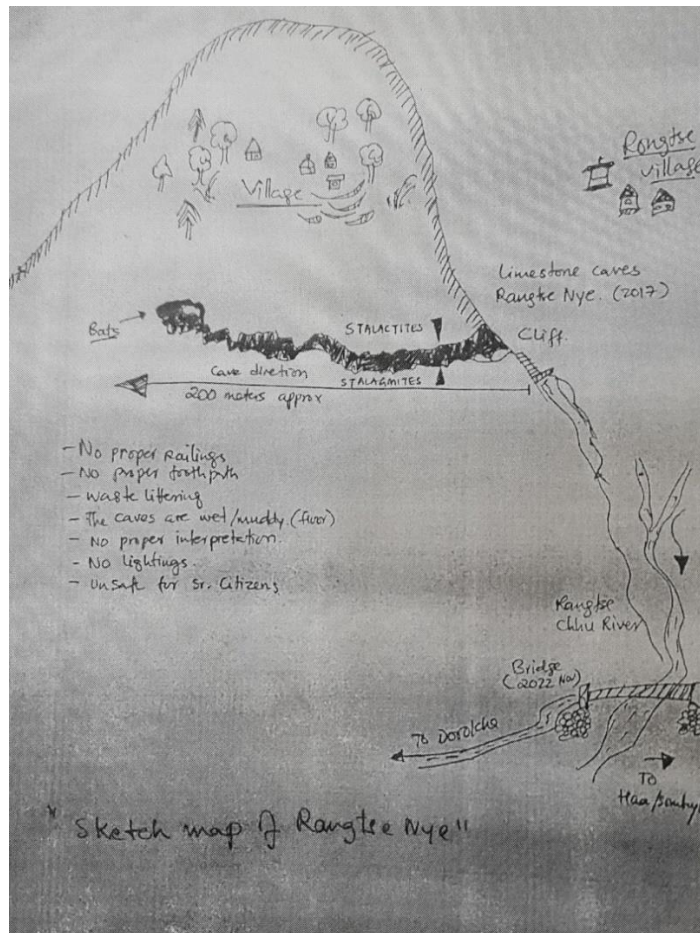


Figure 2: Sketch Map of Rangte Nye (Organization for Youth Empowerment [OYE], 2022)

The project focused on implementing a sustainable infrastructure to cater to visitors to the pilgrimage site, including measures surrounding solid waste management, improved safety measures such as steel footplates and handrails to access the cave, and business opportunities. The suggested businesses should be implemented and carried out by youth, including a sales counter selling local products, pay-to-use toilet facilities, a hot stone bath, and potentially camping sites to be managed by the local youth group. Through these measures, youth should be empowered to carry out innovative business measures that secure their long-term livelihoods in the area while simultaneously building capacities benefiting the local environment and population to adapt to CC (Organization for Youth Empowerment [OYE], 2022).



*Figure 3: Entrance to Rangtse Nye Cave (personal photo)*

### ***Purpose and Research Questions***

This thesis project aims to research the opportunities and challenges of development projects that integrate CCA with youth empowerment in the rural community of Rangtse, Haa Dzongkhag. To conduct such an analysis, the area's vulnerability based on the socio-economic, governance, cultural, and environmental dimensions is assessed. This vulnerability assessment is based on how key informants in Rangtse perceive the risk of CC, as well as their roles when it comes to implementing CCA measures. From this analysis, the results are presented as a set of recommendations to create more effective CCA measures by building on youth empowerment.

To offer such suggestions, the following research questions are outlined:

- 1) How do key informants currently perceive...
  - a. the risk of CC,
  - b. the relevance of CCA measures including the role of youth,
  - c. and the influence of their individual behavior on CC and CCA?
- 2) Which recommendations can be derived for future measures integrating CCA and youth empowerment?

### ***Structure of the Thesis***

This document first clarifies the methodology, followed by a literature review that introduces the relevant concepts and framework, complemented by an overview of the

current research available on the topic. The document then highlights the findings from the conducted field research. These are then discussed to review the opportunities and challenges of integrating youth empowerment into CCA. A reflection on the approach and findings as well as a description of the limitations of this research follow the discussion. The thesis then concludes by presenting recommendations for further CCA measures.

## **Methodology**

### ***Research Strategy***

For the research project, an adapted version of a case study that integrated an ethnographic approach as described by Creswell (2013) was conducted. The case that was studied in the project included gaining a better understanding of how key informants perceive the risk of CC and their role in CCA measures in the area surrounding Rangtse Nye. The ethnographic approach aimed to study a “culture-sharing group” (Creswell, 2013, p. 90), which in this case were the key informants living in Rangtse, by integrating into the daily routines at the project site and local government administration as a researcher to gain a more in-depth understanding of the local vulnerabilities. As the opportunity to conduct fieldwork over four weeks in Rangtse arose, ethnography was deemed suitable as it allowed to find common themes across people’s “ideas and beliefs” (Creswell, 2013, p. 92) and gave a more detailed account of group dynamics within the local community (Creswell, 2013). A triangulation of the findings with academic literature was further necessary to fully understand youth perceptions under consideration of local cultural influences. Such “mutual knowledge” (Blaikie, 2010, p. 90) is necessary to comprehend the underlying interpretations of the described perceptions from the observations and interviews.

To reach such an understanding, the initial phase of the field research in Rangtse was dedicated to settling into the local community, collecting observations, and identifying available key informants by getting an overview of their responsibilities, backgrounds, and involvement in the project. For the next phase, interviews with the key informants in Rangtse were held to gain a more in-depth understanding of the previously made observations. The interviews were semi-structured to balance flexibility and comparability among participants. The findings were then analyzed based on the framework introduced in the literature review and summarized as a set of recommendations for future CCA projects.

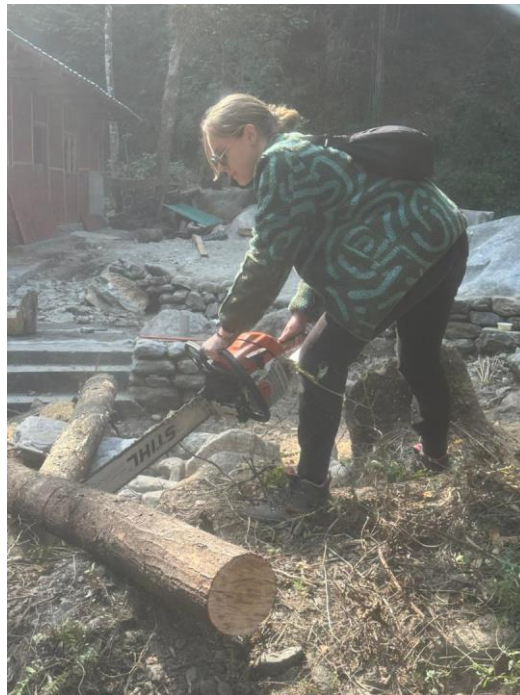
### ***Overall Theoretical Perspective***

As this research project integrated ethnography with a case study, Creswell (2013) referred to a descriptive analysis as appropriate. An abductive approach was deemed suitable to tackle the research questions, as Blaikie (2010) described that this logic of inquiry highlights the individual's values and perceptions of the issue at hand, which was the foundation of the central research question. Wieringa (2014) moreover drew the connection between the case study established in this research approach and the abductive perspective taken to draw conclusions from the collected data. Moreover, an abductive approach gives space for emerging themes in ethnography which are described as "unexpected moments impregnated with potentials for new discoveries" (Skukauskaite & Green, 2023, p. 4), thus supporting the data collection and analysis approach taken in this research project which included the integration of conflicting data points. Moreover, the research was conducted while at the same time integrating into the local conducts of the target community in Rangtse as a researcher, thus aiming toward gaining an in-depth understanding of the research setting by experiencing it and engaging with the local actors (Blaikie, 2010). This research therefore aimed to highlight opportunities and challenges for projects that integrate CCA with youth empowerment in the rural community of Rangtse based on the abductive approach of analyzing the multi-dimensional vulnerability of the community to CC.

### ***Data Collection***

Considering that the research questions focus on the individual informants' perspectives and their subjective views of their role in CCA, qualitative data was most suitable to fully capture these stances. The primary data was collected through two methods building up on each other over four weeks in the field. First, observations guided the initial data collection within ethnographic fieldwork (Creswell, 2013) in Rangtse to gain an overview of the informants' roles in the project, as well as to understand the main opportunities and challenges the area is facing concerning CCA. These findings were recorded in the form of written field notes, which were used as a foundation to plan and conduct the interviews in the second data collection phase. The data was collected while living in the context and being fully integrated into the community and key informants' lives. This means that the lines between professional and personal were expected to get blurred during the data collection in the field. Collecting and processing the research data as well as personal accounts from this experience thus required untangling those perspectives to a certain degree. However, to build trust and

understanding with the community, the researcher needed to balance between a “participating” (Creswell, 2013, p. 166) and “observer” (Creswell, 2013, p. 167) stance by taking part in the everyday activities of the informants and participating partly in the work at the project site, as shown in Figure 4, while documenting the observations made during this process. Collecting data in such “semi-natural settings” (Blaikie, 2010, pp. 166f.) was in line with the case study research design (Blaikie, 2010). It must be considered however in this setting, that most participants spoke three languages (English, Dzongkha, and their local languages and dialects) to varying degrees, thus requiring additional flexibility from both sides when it came to communicating in the field.



*Figure 4: Participative Research on Site (personal photo)*

Secondly, to get a more in-depth understanding and clear up specific points from the observations for triangulation, individual interviews were conducted (Creswell, 2013) with relevant available key informants that were identified during the observation process. Creswell (2013) supports this perspective, as it is described that this form of data in research is appropriate when collecting data in the participant’s natural environments and allows for highlighting their personal experiences and views. The participants were selected through the “non-probability method” (Blaikie, 2010, p. 178) of “purposeful sampling” (Blaikie, 2010, p. 178), combined with “reputational sampling” (Blaikie, 2010, p. 179) to gain a diverse overview. Slovic (1987) points out that it is essential to include both professionals and laypeople in the risk conduct to gain a realistic and balanced view of how the risk is perceived. This was



considered in the identification of interviewees during the data collection process. These covered the headman (Gup) of Gakiling Gewog, highlighted in Figure 5, the head of the local Range Office, as well as two project participants. These interviews were carried out in a semi-structured approach, as the predefined set of questions gave some structure to the discussion and enabled a certain degree of comparability between the answers, while still allowing for flexibility to discover arising aspects relevant to the participants when discussing the topic of CC perception. The first interview was recorded, which was however decided against for the other interviews after a consultation with the interviewees to create a more comfortable and open atmosphere for the interviewees. This development was also described by Bucerius (2013) during the interview process, illustrating that interviewees talked more openly and authentically when handwritten notes instead of audio recording devices were used. One of the interviews was conducted with the help of a local translator. However, it must also be considered that through language barriers and translations, the questions may not have been translated exactly from English to Dzongkha, as the language structures and levels of expression vary greatly between the two languages. The interviews were set to take around 45-60 minutes per interview, with participants receiving a briefing in advance to prepare them for what to expect from the interview setting to build trust.



Figure 5: Facebook Post by the Gakiling Gewog Office after Interview with the Gup (personal photo)

### ***Data Analysis***

The field observations were reviewed iteratively to assist in the process of “identifying related artifacts of learning events” (Skukauskaite & Green, 2023, p. 94). To create “an ethnographic interpretation” (Creswell, 2013, p. 198), these findings were then triangulated through a comparison of common themes between the observations and interviews, as well as the framework for the vulnerability assessment. For this process, coding was necessary which followed the approach of an “interpretative phenomenological analysis (IPA)” (Smith, 2004, p. 39). IPA was deemed suitable for this research, as it specifically focused on individual accounts as a data source by prioritizing the interviewee’s perception of their identity in a certain research context before connecting it to a more general framework (Smith, 2004). Walby (2013) established a case for utilizing IPA in the context of ethnography, making it possible to apply individual accounts to general frameworks. The analysis started by coding the transcripts and fieldnotes according to relevant “themes” (Walby, 2013, p. 145). These themes were then documented in a list and structured according to a suitable hierarchy. While coding the transcripts and fieldnotes, the list of themes was revisited and adapted iteratively, developing a coding structure.

### ***Ethical Considerations***

The interviewees gave their informed consent in advance of the interviews (Social Research Association [SRA], 2021) and agreed to their job position being included in the analysis and presentation of the data. Alternatively, they had the option to decide that the data would be treated anonymously (SRA, 2021), and participation was voluntary (Creswell, 2013). To ensure transparency during the observations, the project group was informed before as well as upon the researcher’s arrival in Rangtse by OYE’s Executive Director about the conducted research. Trust was built in advance of the interviews to foster honesty and open communication by choosing a suitable location for the individual interviewees, as well as introducing the researcher’s background at the beginning of the interview (SRA, 2021). Throughout the data collection process, integrity was a core value to ensure that the data was reliable and accurate based on the replies of the interviewees. In preparation for the data collection process, all participants received a briefing explaining the background and purpose of the research, as well as how the data collection and analysis were conducted, with the opportunity to withdraw their written consent at any point in time (SRA, 2021).

As this research included working with youth populations, it was important to consider that underage participants would not be able to give such informed consent themselves (Creswell, 2013), and parental consent would have to be given. To address this issue, the participants were older than 18 years. Moreover, OYE was an essential stakeholder in the research facilitating the identification of participants through their project work and thus helping to ensure ethical compliance. It was also considered that an unbalanced power dynamic between the researcher and the participants may arise (SRA, 2021), which is why integrating into the local community was considered a vital part of the research process.

It was also relevant to consider personal subjectivity and biases throughout the whole research process (Creswell, 2013), as the researcher's studies came from a context of mostly Western academic literature and teaching staff. At the same time, the researcher was working closely with OYE in a novel cultural context that was researched and lived in at the same time. It was also important to further reflect on potential subjectivity biases that came with the chosen sampling methods (Blaikie, 2010) in the development of the research project. These limitations were detailed further in the corresponding sub-chapter of this thesis.

## **Literature Review**

### ***Concepts and Framework***

This research project bases findings on the perspectives and risk perceptions of key informants in Rangtse through a case study. Thus, to understand the local context the case is set in, this section reviews relevant literature on the context in Bhutan as a foundation to discuss the findings in the setting of international academic literature later in the text. The key concepts of this research are vulnerability, youth empowerment, risk perception, and CCA.

### **Vulnerability**

To capture the complexity of integrating youth empowerment with CCA, this paper focuses on the "vulnerability of coupled human-environment systems with diverse and complex linkages" (Turner et al., 2003, p. 8074). Vulnerability for this matter describes the likelihood for the researched system to be influenced negatively by a threat (Turner et al., 2003). Thus, a perspective on vulnerability is assumed that views the interrelation between a certain set of hazards, the "exposure to hazards" (Turner et al., 2003, p. 8074) as well as the "sensitivity and resilience" (Turner et al., 2003, p. 8074) the system of interest displays in relation to the analyzed hazards. It is thus relevant to note that people are not inherently

vulnerable but made vulnerable based on their circumstances and environment (Wisner, 2014).

### **Youth Empowerment**

Youth empowerment in this context can be viewed through a lens of capacity development specifically targeting Bhutan's youth population. CADRI (2011) demonstrates the definition of capacity development as the ability to reach defined targets by managing the available resources on various levels. This entails a sustainable, future-oriented perspective with internal change actors on a higher level. Moreover, it considers that there may already be capacities available that can be used as a starting point (CADRI, 2011).

### **Risk Perception**

It is necessary to establish that actual risk and the way that people perceive risk differ, as "the notion of 'risk' is a human invention" (van der Linden, 2015, p. 112). Researching CC from the perspective of risk perception demonstrated that the culture and experiences of people have a greater influence on risk perception than "cognitive or socio-demographic characteristics" (van der Linden, 2015, p. 112). To define the concept of risk perception, Slovic (1987) points out that it is essential to include both professionals and laypeople in the risk conduct to gain a realistic and balanced view of how the risk is perceived. According to Hansson (1999), risk implies that the probabilities are mostly known, which however needs to be balanced with uncertainty factoring into risk perception (Hansson, 1999). This connects to the aspect that risk is highly subjective and does not necessarily exclude the possibility of positive outcomes while also touching upon rationality as humans are not purely rational decision-makers (Doorn, 2015).

### **Climate Change Adaptation**

Many sources define CC as a "wicked problem" (Incropera, 2015, p. 14), with CCA being an approach to tackling CC under the assumption that while it is too late to avoid its consequences, the effects can be reduced (Incropera, 2015). In the context of CC, this means that it is not possible to clearly define or solve the problem, it involves multiple interdependent actors that create path dependencies along the problem-solving process, and displays uncertain and complex developments (Incropera, 2015). Downing (2023) moreover highlights that responsibilities to deal with the problem are dispersed or not recognized, and that time pressure impacts the process of problem-solving.

## Vulnerability Assessment

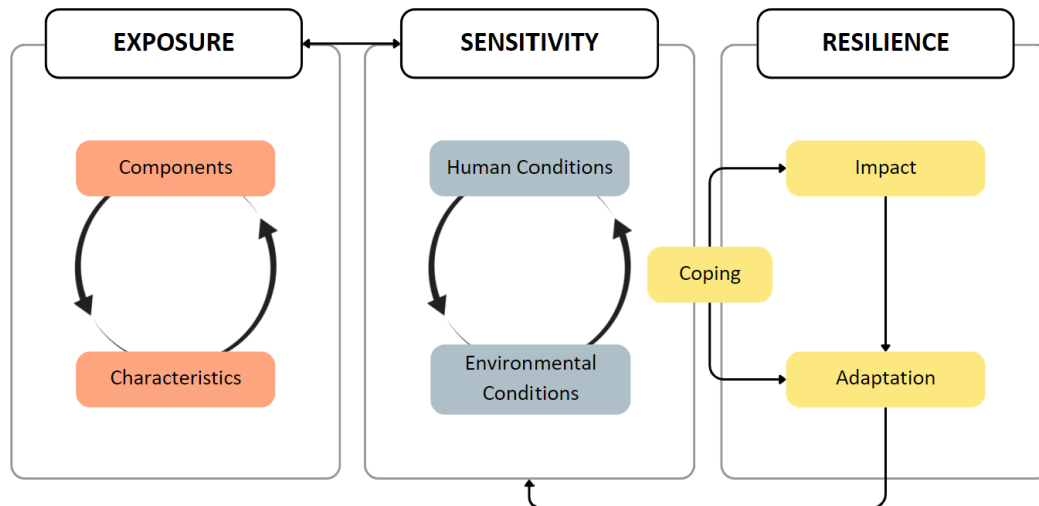


Figure 6: Framework for the Vulnerability Assessment (own graph based on Turner et al. (2003))

To structure the approach to analyzing vulnerability in the target system, an overarching framework is needed as presented by Turner et al. (2003) and illustrated in Figure 6. On the geographical scale of a certain “place” (Turner et al., 2003, p. 8076), the framework analyzes the interconnection of the system’s “exposure to hazards”, its “sensitivity”, as well as “resilience” (Turner et al., 2003, p. 8074). The objective of using the framework in the context of this research project is to incorporate the learnings for practical implementation as outlined by Turner et al. (2003) by taking a multi-dimensional stance and building a set of recommendations for decision-makers to incorporate in future CCA measures. For this matter, it is necessary to highlight that the extent of complexity within the target system requires a certain degree of simplification by limiting the geographical scope and the variables to be measured (Turner et al., 2003). It is moreover noted that the suggested approach to vulnerability expands on widely used “pressure-and-release (PAR) models” (Turner et al., 2003, p. 8074) by emphasizing the importance of the interaction between humans and their environment. It is included that the framework builds on the “experience” (Turner et al., 2003, p. 8077) of actors regarding the analyzed aspects of the system, whereas it does not aim to explain the vulnerability of a particular place. Turner et al. (2003) moreover describe that a vulnerability assessment can be enhanced by integrating qualitative and quantitative data. As this research focuses on qualitative risk perception, it can build the foundation for future enhancement with quantitative CC research from the specific target area.

## ***Current Research***

### **Local Context in Bhutan**

Religion and spirituality are presented as a central aspect of the identity of Bhutanese people which makes it critical to include them in capacity-building projects, as spirituality builds a sense of community belonging within Bhutan (Walcott, 2011). The importance of Buddhism moreover explains why traditional agricultural and tourism practices rooted in these Buddhist values have such a big influence on the local economy (Meenawat & Sovacool, 2011). This can be connected to Jenkins' (2020) findings, which further illustrate this interrelation, as they establish the unique importance of Bhutan's spiritual and natural environment for Buddhist pilgrims. Religious sites are thus presented as viable locations for research assessing the effects of developments such as CC on local cultures (Jenkins, 2020). Moreover, including vulnerable groups in the development and operationalization of CCA measures, based on Buddhist values applying to all Bhutanese citizens, improves general "community wellbeing" (Meenawat & Sovacool, 2011, p. 529) on a local level. This connects to GNH, as it takes an integrative approach considering "poverty and gender streamlining" (Meenawat & Sovacool, 2011, p. 529) in CCA measures.

Traditional knowledge by indigenous groups and the importance it still holds in Bhutanese culture today incentivize sustainable biodiversity management in Bhutan, claiming that traditional resource management rules are beneficial to communities as they focus on sustainable conflict resolution (Nepal, 2022). However, some policies and guidelines that currently guide the water management practices in Bhutan for instance are still based on outdated regulations that do not reflect the growing need for water used when Bhutan is expanding its agricultural production. With irrigation water being a limited resource for Bhutanese communities, there are cases of misuse and conflicts between the affected stakeholders (Gurung et al., 2006). Moreover, since Bhutan is part of the Himalayan Mountain chain, the local ecosystems are suffering from deforestation and land degradation (Dhyani, 2023). This is exemplified in the case of agricultural practices, as the expansion of agriculturally used land causes 14% of deforestation in Bhutan (Dhyani, 2023). These measures affecting the soil led to an increase in landslides in Bhutan, while development projects aiming to widen and weatherproof roads led to further deforestation in the Himalayan areas (Dhyani, 2023).

## **Youth Empowerment in Bhutan**

Current academic literature highlights the main challenges faced by youth in Bhutan, which poses an essential foundation for potential youth empowerment endeavors. Walcott (2011) argues that Bhutan has a proportionally high youth population, in turn showing the relevance of youth empowerment and the untapped potential of this population group that is vulnerable due to limited access to education and high numbers of unemployment. It is also found that youth from rural areas in Bhutan prefer being employed rather than earning an income through their independent business endeavors (Rahut et al., 2017) even though the value of entrepreneurship is integrated into the GNH principles, as it considers the potential of entrepreneurship to build wealth for the Bhutanese population as a whole (Valliere, 2014). Moreover, this can be connected to the finding that youth in Bhutan prioritize acquiring new skills and identifying opportunities for personal growth which they seek to find in urban areas, over gaining an income in rural environments (Dorji et al., 2022).

These findings establish a need for “guidance” (Dorji et al., 2022, p. 399) for Bhutanese youth from relevant stakeholders. This is also supported by Khatun and Saadat (2020), who establish that the effect of modern technology on the job market calls for building the skills and capacities of youth to cope with these developments, as well as Valliere (2014) calling for the importance of integrating modern entrepreneurship values into youth employment activities in Bhutan. However, Wangchuk et al. (2013) challenge these recommendations by emphasizing the importance of passing on traditional knowledge to youth in Bhutan for the preservation of unique cultural heritage over rapid technological developments.

## **Governance in Climate Change Adaptation**

There is an awareness in Bhutan that sustainable and effective CCA measures are integral to livelihoods in the country (Nepal, 2022), resulting in a National Environment Strategy that specifically integrates “the preservation of culture, traditions, values, and lifestyles” (Nepal, 2022, p. 319). On the one hand, this strive for sustainable development based on Buddhist values is implemented in the form of CCA measures such as the extensive forest coverage which plays an essential role in the carbon-negative footprint of Bhutan (Nepal, 2022). On the other hand, the population in Bhutan is considered highly vulnerable considering the current state of development in the country. This disproportionately affects informal settlements and people living with limited financial resources, as they face a “higher climate risk with low adaptive capacity” (Pandey et al., 2023, p. 1). While Shushant et al. (2019)

determine that local governments are most suitably equipped to conserve biodiversity and natural resources in Bhutan, Parashar and Saxena (2019) illustrate the potential for international cooperation to address CC vulnerability in Bhutan. From the perspective of international donors, Becker and Sieberichs (2023) describe with the example of Germany as an aid donor that more financial resources need to be allocated to international development projects while prioritizing CCA in the context of financing efforts.

### **Findings**

The collected data has been structured into four interrelated clusters describing socio-economic, governance, cultural, and environmental factors based on the GNH pillars. For the matter of analyzing the data, the socio-economic cluster covers aspects such as infrastructure, which includes aspects such as transportation, communication, and electrical infrastructures. Moreover, population demographics and migration trends are part of this definition, as well as economic aspects such as access to market activity and financing. Governance encompasses relevant practices in the government and administration structure, information flows, decision-making processes, as well as aspects relating to government funding and budgeting. The cultural cluster includes aspects of spirituality, family networks, education, tourism, and traditional heritage found in the area. Finally, the environmental cluster is defined by natural phenomena such as seasonality, (micro-)climate, natural hazards, agricultural activity, biodiversity, as well as natural resources.

### ***Exposure***

To give an overview of the relevant exposed factors identified in the area of Rangtse Nye, the framework first describes the relevant components that are present within the system to then connect them to the characteristics of hazards and CC effects these components are exposed to. Following the vulnerability assessment by Turner et al. (2003), the identified components and characteristics are interdependent and thus influence each other as described in the following section.

### **Components**

On a socio-economic level, the Gup of Gakiling Gewog describes that the Gewog covers several villages and is in total comprised of 271 households and 2148 people, of which there is a considerable youth population. The area is moreover known to be one of the most remote in the country, with extensive distances between villages also within the Gewog, as can be



seen in Figure 7. As an effect of development initiatives in recent years, at this point, 90% of the Gewog population is connected to the road and electricity network. As was observed in the field and confirmed through interviews, most of the population engages in agricultural activity as a foundation for their livelihoods, mainly for self-sustenance. The participants balance project work during the week and then various domestic activities on Sundays, such as agriculture, involvement in small family businesses, and caretaking activities. Another interviewee highlighted that during the times they were not engaged in working on the family farm, they would go outside of the Gewog to find occupation in construction in urban areas. One project participant noted that the main driver for work is to gain income.



*Figure 7: View from Rangtse Village (personal photo)*

It is observed that the GNH principles give an overarching guidance structure to governance in Bhutan, within the setting of administrative offices as well as CCA projects for instance. In the context of this specific project, the balance between the different GNH pillars becomes evident in the observation that decisions regarding the project activities have to be approved by the central and local governments. Additionally, there is an overlap with the cultural sphere as the local priest is involved significantly in the decision-making regarding the preservation of the sanctity of the project site at Rangtse Nye. Generally, governance practices are centralized within the Gewog office in Rangtse, from where information concerning official Gewog matters is disseminated through the five village heads to the corresponding villages.

Moreover, the Gup described that the Gewog office sends out representatives twice a year to visit the individual households and discuss any concerns or problems the population is facing regarding their livelihoods. There are a few institutions present in the area, such as the Dungkhag administration which, amongst others, includes land and engineering services; the Gewog agriculture and animal extension; and some service providers such as the Bhutan Power Company (BPC), but no bigger offices.

From a cultural perspective, observations showed that there has been growing interest in the area from short-term tourists, especially domestic weekend travelers visiting the Rangtse Nye pilgrimage site. During the time of the fieldwork, these visitors ranged from families and youth to senior citizens seeking prayers at the cave in Rangtse Nye, as well as one group aiming to stay at the cave for a long-term meditation practice. Over the last six years, one interviewee illustrated that more residents moved into the area in addition to national and some international visitors at the pilgrimage site. For this matter, some guest houses opened in the surrounding area to accommodate the visitors.

Considering the environmental cluster, the Rangtse Nye cave lies in the buffer zone to the Jigme Khesar Strict Nature Reserve which comprises a biodiversity of flora and fauna unique to the area, as described by the Gakiling Range Office. The Amo Chu River runs through the Gewog, with a suspension bridge for walking and a more recently constructed road bridge for crossing the river by car or truck, shown in Figure 8. Further upstream, the river crosses into Bhutan over the border with China. Moreover, the Gup illustrated that there are seven lakes in the higher elevated mountain areas of the Gewog. It is assumed in the community that the villages located towards the valley are supplied with water from these lakes through springs that emerge below the lakes, but there is no formal evidence to trace back this connection. The areas between the villages in the Gewog are covered by thick forest, while the farmland in the area is used for cash crops such as cardamom and oranges, as well as food crops for self-sustenance such as maize, buckwheat, and various vegetables. Especially cardamom has been noted and observed to be an essential product for sale in the agricultural sector in the area.



*Figure 8: Road Bridge Crossing Amo Chu River (personal photo)*

### **Characteristics**

In a socio-economic context, the characteristics of vulnerability have been observed across various infrastructural aspects in the Gewog, as the population raised concerns about access to drinking water and the reliability of the electricity network to the Gewog office. Moreover, the interviews displayed that the limited road network and the limited amount of asphalt coverage make it difficult to access sources of income and goods from the remote villages, increasing vulnerability, especially during food shortages based on fluctuations in agricultural productivity in the locality. The Rangtse Nye pilgrimage site also used to be very difficult to reach before the project improved and expanded the footpath accessibility.

Characteristics of cultural exposure are mostly evident considering the access to education and interaction between the villages due to remoteness. While the interviews showed that people between the villages hardly interact with each other, networks within families in the villages are observed to be closer, such as several generations living together under one roof. Project participants described that younger generations thus tend to assume

the responsibility of taking care of their parents in addition to financially supporting the family through income. This often requires youth in the area to drop out of formal education systems due to insufficient funds for further studies and instead finding employment.

Considering environmental exposure, a variety of natural hazards was highlighted by the interviewees and observations, including erratic rainfall patterns in recent years, earthquakes, flash floods, landslides, as well as soil erosion and flooded streams, especially during the summer. Additionally, the summers are characterized by heavy rainfall, floods, hailstorms, and winds. Especially the severe impacts of landslides on the quality of the road network in the area are observable. Moreover, the farm road, which is observed to be an important connection between Rangtse village and the rest of the Gewog, is crossed by a riverbed that floods during the monsoon season, as exemplified by Figure 9. Information on the usual timing and duration of the monsoon season varied between interviewees, with the beginning ranging from April until mid-June and the end of the season varying between September to mid-October. On the one hand, two interviewees described the general climate in the area as having gotten warmer, with more severe rainy and dry seasons. On the other hand, a project participant living in the area described that they experienced a constant seasonality throughout the years with another not particularly knowing how they would perceive or describe their environment.



*Figure 9: One of the Streams Crossing Road Access to Rangtse (personal photo)*

## ***Sensitivity***

Based on the previously described exposure to hazards, the sensitivity element of vulnerability can be categorized into “social and biophysical capital” (Turner et al., 2003, p. 8077). These are interdependent, while at the same time influencing the system’s exposure and vice versa (Turner et al., 2003).

### **Human Conditions**

From a socio-economic perspective, infrastructure has a considerable influence on the area’s sensitivity. Across the interviews, it was established that the difficult road conditions, which are illustrated by Figure 10, in combination with far distances to market areas limit access to markets and employment opportunities. These conditions also make it difficult to reach the closest educational institution for continued studies according to the Gup. Especially youth living in the area thus face restricted access to formal education, and limited prospects of employment. At the same time, the Range Office noted that there are labor shortages in the local agricultural sector. While being engaged in the local project activities, high hurdles for Civil Society Organizations to access financial aid for CCA and capacity development projects have been observed, which was also confirmed in interviews. This combination of socio-economic factors leads to difficult living standards and income shortages. While more detailed quantitative documentation of income levels or distribution in the area was not available, interviews showed that it is perceived that all people living in the local village have financial problems, whereas higher educational qualifications make it possible for some locals to migrate to urban areas in search of better economic opportunities. However, there is a recurring social norm that local youth should stay in their rural home villages and remote communities should retain their local youth populations.



*Figure 10: Sinking Road on the Drive to Rangtse (personal photo)*

On a bigger scale regarding governance, the responsibility for CCA is perceived to be unevenly distributed. It was highlighted by the Gup that bigger nations that are responsible for the negative effects of CC also have more responsibility regarding CCA, with smaller nations such as Bhutan trying to control the local effects of CC in various ways within their realm of possibility. This also shows differences in the perception towards environmental issues, as another interviewee noted that they do not perceive CC-related hazards in the specific target area, but more towards the Southern Belt of Bhutan. This focus on local cause-and-effect relationships was further described where responsibility was seen to lay with individuals, as people should know their limitations regarding CC, according to one interviewee. As an example, it was described that people should limit the pollution of the environment through car emissions, however, it was also noted that such measures are not required in the local area as residents do not use cars a lot as a method of transportation. This shows that within the administration, perceptions vary in the extent to which local versus global processes bring CC effects to the area, which in turn may influence the perceived necessity for CCA measures in the local community.

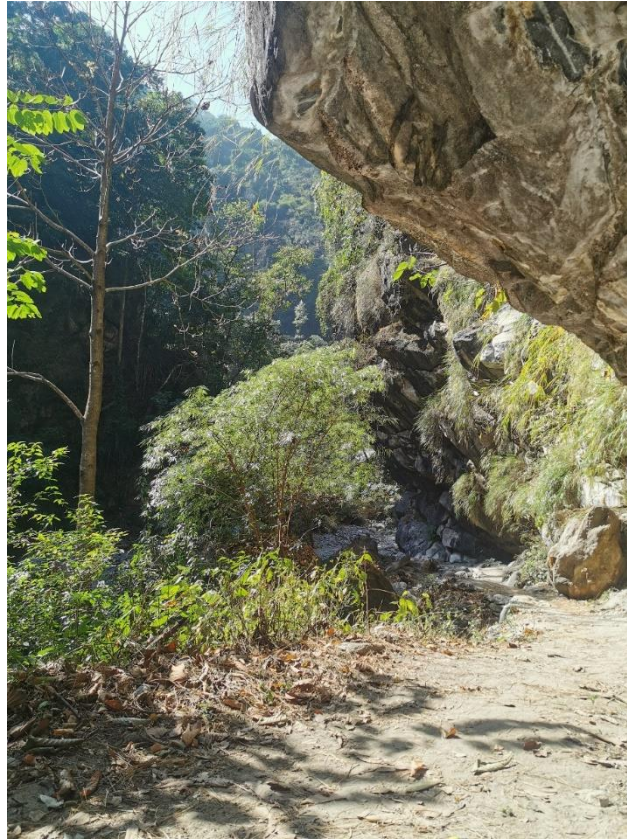
On the cultural level, observations establish the high relevance of spirituality in the populations' everyday practices. Because of this high degree of spirituality, Rangtse Nye as a

pilgrimage site is especially important to locals and visitors. In the context of family networks, there is a high number of divorces in the area which leads to single mothers supporting their children, in turn leading to increased vulnerability in combination with the identified income shortages and limited access to formal education systems. There is moreover a reliance and responsibility for children to secure their parent's future retirement, while it is observed that there seems to be a preference for sons for this matter. Young sons are thus observed to face the pressure of supporting their families financially to fulfill this societal expectation. Working close to their parents is considered a priority and during times of employment outside of the community, money is sent home to support the family. It has also been noted in an interview that irregularities in weather patterns disrupt family harmony, as it becomes increasingly difficult for family businesses in the agricultural sector to plan their farming activities.

The environmental cluster is influenced by human conditions, as an interview with the Gup illustrated that agricultural practices are inhibited during the monsoon season due to unfavorable weather conditions for outdoor labor. Interviews moreover show that the weather in the area is considered to be difficult to predict, and variations between microclimates in the area are apparent even within 7-8 km. There is however a lack of formal documentation and records of changes in weather patterns and climate in the area over the years. The Gup described that such gaps in the knowledge base are also evident in the access to drinking water, as the area lacks information on how the lakes and downstream water springs are connected.

### **Environmental Conditions**

Aside from human conditions being affected by the exposure to hazards in a system, the environment is sensitive to such socio-economic developments as well. As noted above, accessibility and infrastructure quality are heavily influenced by seasonality. A participant described that heavy rainfall made it dangerous to access the thick forest area around Rangtse Nye as there was only one footpath available before the project was initiated, which was improved as shown in Figure 11. The project intended to implement solar energy lighting as a sustainable way to make the cave easier and safer to access. However, this measure was overruled by the local priest, as lighting the cave would disturb the bat population in the cave as well as negatively impact the sanctity of the cave. This in turn creates a connection between the socio-economic aspect of the area's electricity network and the cultural aspect of spirituality.



*Figure 11: Improved Footpath Leading to Rangtse Nye (personal photo)*

Culturally, access to education is limited due to the weather conditions and remoteness of the Gewog. This point is illustrated by the Gup describing that education facilities in Haa are located at higher elevations, with cold weather conditions in combination with the quality of the roads making it expensive to travel to the boarding school in Haa. During the rainy season, an interviewee described that the number of visitors at Rangtse Nye is moreover highly limited due to the hazard of traveling through the forest area on foot. This leads to the consequence of limited access for visitors to spiritual traditions, as well as inhibited economic activity regarding tourism on site.

The Range Office raised the concern of increasing moisture levels in the area due to warmer climates and heavy rainfall during the monsoon season, leading to conventional crops not growing properly in the area anymore and harmful insects damaging crop harvests. At the same time, the lakes located on higher elevations dry up during the dry seasons which affects the streams on lower elevations close to villages according to the Gup, resulting in limited access to water for agriculture and irrigation. While one interviewee concluded that the heavy rainfall in summer has been continuous throughout the last years, another interviewee described irregularities in weather patterns, meaning that extreme weather events such as



flash floods became more unpredictable. Such contradictions in the perception of CC and its cause-and-effect relationships were also found between interviewees assuming a more international versus local perspective. On the one hand, dependence on human activity beyond Bhutanese borders has been illustrated, such as animals migrating into Bhutan from China and India, as well as the observed water quality of Amo Chu River, seen in Figure 12, which is influenced by upstream activity across the Chinese border. On the other hand, there was mention of the perception that the local area at Rangtse is not much affected by CC, as the communities have an emphasis on using organic fertilizers and only a few people use cars, thus limiting emissions in the local environment. This shows in my opinion that there are differences in the perception of sensitivity to CC based on the scale of interventions causing CC. While some interviewees emphasize the dependence of Bhutan and the local community on international practices accelerating CC, others feel that CC does not concern them in their immediate environment based on the lifestyle of the local community which results in reduced pressure on the environment through low emissions and traditional farming practices for instance.



*Figure 12: Water Quality at Amo Chu River (personal photo)*

## ***Resilience***

### **Impact**

The aforementioned exposure in combination with the area's sensitivity results in a set of impacts to the socio-economic facets of the area. On the socio-economic level, it is observed that the dirt roads that are not blacktopped are only accessible with four-wheel drive, not smaller cars, which makes it expensive for local farmers to transport their produce to market according to the Gup. The interview expanded that especially during the rainy season, economic activity is further limited due to bad conditions of the transportation infrastructure caused by landslides and floods, as they block roads within and between Gewogs. This shows the substantial impacts of flash floods in the area which were mentioned several times throughout the data collection process. A main impact of a recent flash flood was the destruction of the original suspension bridge structure stretching over the stream, which gave access to Rangtse Nye during the rainy season.

The issue of road development is moreover creating an overlap between the socio-economic and governance spheres, as it was perceived to have a strong influence on the outcome of the recent government elections.

Interviews showed that CC is perceived to bring about warmer dry seasons in the area which leads to the drying out of the local lakes. While it was observed that limited irrigation water access makes it difficult to grow patty during the dry season, it has also been noted by a project participant that cash crops such as cardamom are negatively affected by rain, with heavy rainfall limiting the work on both the fields as well as the project site. Current weather patterns spoil harvests sometimes, making it difficult to sell the produce.

### **Coping**

Coping measures describe activities that are currently used by the local population to adapt to CC, based on the impacts experienced in the area (Turner et al., 2003). To cope with CC effects on the road infrastructure, observations showed that farm roads have been broadened to improve access to remote villages in the area. In turn, infrastructural development such as the broadening of roads and clearing of fields for agricultural use on slopes may also increase the risk of landslides and promote soil erosion. However, an improved road network also makes economic activity in the area easier, as interviews showed that it increases traffic and thus makes it possible to sell local produce on the side of the highway instead of transporting it to external markets. Projects for youth empowerment, such

as the one at Rangtse Nye illustrated in Figure 13, moreover facilitate coping on a socio-economic level, as participants described how individuals benefit from steady incomes to support their families and get an opportunity to learn about better living standards from other people involved in the project.



*Figure 13: Sales Counter and Hot Stone Bath under Construction at Rangtse Nye (personal photo)*

The coping methods regarding CC and CCA measures around Rangtse Nye are influenced from a governance perspective as well. The Gup described that this includes for instance decision-making processes within the community, where youth are encouraged to join Gewog meetings as their older parents are perceived to think inside existing processes and attitudes. Considering decision-making processes further, the local administration believes that youth should be involved in decision-making and that the youth also shows an interest in being involved. This is however challenged by the finding that small community meetings do not entertain the youth perspective and younger citizens under the age of 18 are not involved in decision-making at all. Another interviewee illustrated however that the youth population participates in Gewog meetings to raise general issues that they are concerned about. Governance processes are also reflected on an environmental level, as farming

machinery is provided through government grants as community property to the local villages. This means that everybody in the community has the right to use the machinery, as well as the responsibility to maintain it. Education and access to training were moreover a prominent sub-theme in the field of governance, with the local administration raising awareness about CC in the area to bring lifestyle changes. According to the Gup, the local government moreover supports training activities for local youth to promote skill-building in the fields of farming to implement new cash crop varieties, produce local goods, and carry out electrical work. Moreover, homestay business opportunities are promoted among youth.

Culturally, spiritual offering rituals (called puja) were observed to take place to appease local deities and spirits for safety in the workplace and successful harvests in the community. Such rituals also take place annually to protect the area against damage from wind- and hailstorms, as well as promote timely rainfall during times when there is continuous sunshine for too long, with interviewees highlighting a high success rate in bringing about the desired intention. Moreover, the local administration and project participants aim to build the tourism sector in the area around Rangtse Nye. By expanding tourist activity through a planned eco-trail and campsite, for instance, the area seeks to attract long-term tourists. By taking part in the project work, youth participants illustrated that they intend to gain more independence and develop the capacity to take care of and support their parents.

These coping techniques can be connected to environmental aspects, with a strong focus on agriculture. On the one hand, traditional knowledge is used in predicting rainfall based on changes in the environment. As such, a local project participant noted that less rainfall is anticipated during years when red pandas come into the village, and more rainfall is anticipated with birds migrating into the village. On the other hand, the local administration is approaching CCA through innovation by implementing improved seed varieties in agriculture as well as non-local seeds, such as new crop varieties that grow well in warmer climates. Simultaneously, agricultural CCA such as the terracing of fields also aims to reduce land erosion. These measures intend to improve food security by increasing the resilience of the agricultural sector against CC. Through such improved adaptation, it is also intended to increase the retention of youth in rural communities of the Gewog by supporting youth in building their livelihoods in their hometowns within an improved agricultural sector.

## **Adaptation**

Adaptation measures cover all activities that are necessary in the future to create sustainable livelihoods under CC in the local area (Turner et al., 2003). Education and information dissemination play an integral role in CCA, as project participants describe how information from a previous CCA training can be implemented in the area, as well as construction and carpentry skills acquired through the project work on site. However, more training opportunities are necessary to expand the youth's skillsets, such as training in the field of traditional handicrafts or disaster response and rescue as suggested by the Range Office. Socio-economically, however, financing for such activities has been identified as a recurring factor across the data sources limiting the control that communities perceive to have over CCA measures. Such funding is also necessary to implement learnings on CCA on a household level, as an attendant of CCA training who is involved in the project at Rangtse Nye described that there is not enough income on an individual level to build bigger and stronger walls protecting her house from more severe floods. Thus, only small changes for CCA are possible on this level. Connected to this, another project participant explained the need for financial support from the government or companies to start a small business or access training opportunities to build a more secure livelihood. Adapting the local infrastructure was moreover a common concern, as building a suspension bridge crossing the path to Rangtse Nye could extend access to the site throughout the year. This in turn makes it possible for the small business on site to generate income through visitors during the dry- and rainy seasons. For the project participants, it is thus seen as necessary to bring more project work into the area to secure continuous work, not only during the dry season. Improving the roads with asphalt in the surrounding area also facilitates access to the remote areas during monsoon season for visitors to Rangtse Nye, while interviews showed that this measure would also make external markets more accessible for locals to sell produce.

In the governance cluster, adaptation is reflected within the project, the local community, as well as on the international level. After the project activities have been executed, the local government and the project participants are expected to take over responsibility for maintaining the tourist site at Rangtse Nye to profit from the project's long-term benefits. However, participants noted that more help from the Gewog or the government will be needed for bigger projects. For future opportunities, information flow has been highlighted by the Gup as affecting decision-making processes, including access to

information from the Gewog level, people from urban areas, and information about agriculture. The local administration aims to develop a variety of skills within the community for youth to build businesses, with youth intending to implement such skills by improving housing and flood protection structures.

From a cultural perspective, such vocational training opportunities are observed to also aim to sustain the local cultural heritage of the area while supporting small businesses at the same time, for instance through youth finding work as nature guides or running businesses in the culinary arts, weaving, and tailoring. A project participant illustrated for instance that they intended to gain more work experience outside of their family businesses through the project and hope to create more income by implementing similar projects in the future, thus increasing the achieved benefits. In combination with an interest in accessing more education on CCA and CC to gain insights into innovative ideas, this in my opinion could indicate that youth in the area are taking over more responsibility based on empowerment through CCA projects. These businesses go hand in hand with the further development of the tourist site at Rangtse Nye, pulling potential clients into the area and thus reducing the cost of transporting products to external markets. Future developments to make the area more attractive for long-term tourism include the establishment of a campsite and the development of a sustainable hiking trail. Such measures would also make it possible to expand into the field of international tourism, according to the Range Office.

CCA in the agricultural sector can be operationalized through a variety of measures from an environmental perspective. For instance, the implementation of greenhouses and patty field agriculture that was observed during the fieldwork aims to improve food security, as the Gup confirmed that greenhouses provide the opportunity to grow produce in harsh weather conditions all year round. Water tanks for small-scale farming also aim to create more resilience against lack of rainfall during the dry season, especially in combination with land terracing which minimizes the force of running water and helps reduce the effect of landslides. There is moreover a slow encouragement from the Gewog Office for farmers to engage in commercial farming activities and expand their businesses using modern machinery for agriculture and food processing.

## Discussion

In the following section, the previously described findings from the vulnerability assessment based on risk perception will be compared and contrasted with academic literature to highlight the opportunities and challenges of integrating youth empowerment in CCA efforts. Kamei et al. (2021) support this approach, as they find that it gives direction to “develop place-based visions for sustainable societies” (p. 1).

### ***Opportunities***

Based on the vulnerability assessment, the local community has considerable interest in exploring the opportunity of **expanding the tourism sector as a source of income**. Dendup et al. (2021) found that tourism in rural nature reserve areas of Bhutan improves the livelihoods of the population by reducing vulnerability, thus supporting this development effort. In the long-term, such measures can diversify the youths’ sources of income beyond the agriculture business, which is sensitive to CC, and thus help create more resilient livelihoods. In Rangtse, OYE’s project primarily aimed at promoting sustainable tourism in the area to sensitize the local youth to preserve biodiversity which is also supported by Dendup et al. (2021), as the initiative relieves the use of natural resources as a foundation for the populations’ livelihoods through increasing the participant’s purchasing power. Moreover, it can be concluded from the vulnerability assessment that an additional benefit of the project is creating alternative income streams for the local youth and their families to promote poverty reduction and sustainable development in the context of CCA, thus contributing to the GNH targets. Especially to realize the project’s long-term benefits, it is relevant to extend access to Rangtse Nye throughout the year as it intends to attract a more extensive and continuous influx of visitors and thus create a local job market that can retain youth in the surrounding communities. Creating a job market through business opportunities in Rangtse may thus counteract the urban migration of rural youth. Hermawan et al. (2023) researched youth involvement in the development of sustainable tourism in Indonesia, supporting the approach to building successful tourism businesses in villages by giving local youth a central role, as it enables a holistic integration with socio-economic and cultural aspects. Additionally, they present the finding that the local community in this context benefitted from educating youth in the fields of digitalization and business to further develop the tourism industry (Hermawan et al., 2023). By implementing such projects that develop the local economy, the vulnerability assessment shows that people living in the area can gain increased purchasing

power, improve their living standards to live a more comfortable life, and earn a steady income to support their families. Educating youth on these interrelated aspects of CCA and overarching economic benefits for the community enables them to play a central role in CCA by disseminating the acquired information and educating their local communities.

Moreover, **youth can play an integral role in CCA through the adaptation of farming practices** in Rangtse. On the one hand, Khatun and Saadat (2020) describe a conflict between youth education and development in technology regarding their effects on economic opportunities for youth in South Asia. In this region, they are viewed as competing factors as technology creates hurdles for youth to find employment, requiring adequate education to offset these challenges (Khatun & Saadat, 2020). In Rangtse, this may include educating youth on how to utilize modern farming equipment to leverage its full potential, as solely providing the equipment without proper training on how to use and maintain it is likely insufficient to maximize agricultural productivity in the long term. On the other hand, the vulnerability assessment builds the foundation for the case of synergies between technological developments and education to create more viable job opportunities. By implementing agricultural machinery and educating youth on how to use it, the interviews showed that the agricultural sector in Rangtse can be made more interesting for youth. This also follows the finding by Rahut et al. (2017) suggesting the inclusion of youth interests in policymaking for agricultural developments. Kansanga et al. (2019) however call for caution when implementing modernized farming techniques in their study of Ghana. While the interviews showed that the population in Rangtse currently produces relatively low emissions, modern farming equipment could for instance negatively affect these emission levels in the future, in turn demonstrating the need to balance the socio-economic and environmental GNH pillars in the context of development projects. Through the modernization of farming machinery, it was moreover found that CCA in Ghana suffered from shifting away from traditional crops and farming practices. Such potential negative effects from a “cultural” and “social” (Kansanga et al., 2019, p. 11) perspective have not been taken into consideration before implementing modern farming practices. From a cultural stance in the case of Rangtse, it has been found that the local community copes with the pressures of CC on a spiritual level through puja rituals, which is in line with Phanchung et al. (2022) describing how rural Bhutanese communities practice spiritual rituals that intend to support their farming activities. Walcott (2011) supports this finding, as Buddhist values intend to bring the goodwill of deities in



Bhutan. Buddhist traditions furthermore build a foundation of values closely connected to the concept of circular economies which is implemented in Bhutan's agricultural sector (Nepal, 2022). Such an approach to circular economies in the agricultural sector can complement CCA efforts by the Gewog and government that support the distribution of new crop varieties. The vulnerability assessment shows that these developments support CCA by expanding local agriculture and making it more resilient against CC, thus increasing the self-reliance of the local community. Dorji et al. (2022) support this as it is suggested to introduce youth to modern farming techniques and give them access to seed money for investing in these practices as an integral mechanism to build jobs for youth in the Bhutanese agricultural sector. This development is also promoted through the Gewog development grant allocated by the national government, which is used to provide farming equipment to the local communities to become more self-sufficient.

**Education establishes another overarching opportunity** to integrate youth empowerment with CCA. This is based on the finding from the vulnerability assessment that youth show a desire to expand their skills through vocational training. Moreover, there was an expressed and observed interest in learning more about resilient livelihoods based on CCA and gaining insights into different living standards. For this matter, it is relevant to highlight the impact of cause-and-effect chains on local as well as global levels. In this context, the vulnerability assessment framework by Turner et al. (2003) is in line with Singh and Kumar (2021) researching the South Asian Association for Regional Cooperation (SAARC) region, as they describe that adaptation has a considerable influence on an area's vulnerability in addition to "sensitivity" (p. 3). This may in turn indicate that also incremental change influences the system as a whole to reduce vulnerability. This can be transferred to the findings from applying the vulnerability assessment framework in Rangtse, showing the interrelated effects of local youth empowerment initiatives on system-wide CCA. Within the project work, for instance, the youth participants were observed to take the initiative of ownership over their work, as they assigned responsibilities and committed to timeframes to finish the designated tasks within the team. Such soft skills can be transferred to other efforts benefiting CCA, in addition to participants describing that they learned vocational skills throughout the project that they can now also apply in other areas. Moreover, this can be connected to the finding that youth in Bhutan prioritize acquiring new skills and identifying opportunities for personal growth. However, they prefer to seek such opportunities in urban

areas over gaining an income in rural environments (Dorji et al, 2022). However, Walcott (2011) highlights the risks of youth getting confronted with harmful content from social media during such modernized education developments, with Wangchuk et al. (2013) expressing concern over losing traditional culture within Bhutanese communities over contemporary developments. As there is an interest in training local youth in traditional handicrafts as a foundation to build businesses around the sale of local goods to visitors of Rangtse Nye, it could thus be an opportunity to create synergies instead of conflict. This opportunity is also in line with Dixit et al.'s (2023) research on tourism in a rural Indian community, which leveraged its cultural heritage by expanding its tourism sector to benefit "holistic development" (p. 41).

### ***Challenges***

Observations from the fieldwork showed that one of the main challenges in operationalizing CCA projects is **access to financing from Bhutanese as well as international donor agencies**. As one interviewee highlighted, many of the youth in the area live under the poverty line, meaning that the communities depend on external financing to implement CCA projects. There are a variety of potential project ideas that constitute follow-up opportunities building on the described project efforts. Such a continuation of the initiative at Rangtse Nye would ensure long-term opportunities for the project participants from the surrounding area who would otherwise have to seek new ways of securing their livelihoods. This is also in line with reviewed literature, as on a national level, Saito (2013) highlights that access to financing from within Bhutan is limited, which constitutes a hurdle to "mainstreaming efforts" (p. 825). This thus creates a reliance on external donors to implement CCA measures (Saito, 2013). However, this can create a challenging power dynamic from an international perspective when connecting such financial dependence to the findings presented by Browne (2010), calling for aid donors to aim for a more productive involvement in the Global South. For this matter, the importance of aligning the interests of the "donor" and "recipient" (Basak & van der Werf, 2019, p. 297) of international development aid in the context of CCA has been noted. It has also been found that such power dynamics affect project effort's efficiency in protecting "those most vulnerable to the impacts of climate change" (Sovacool et al., 2017a, p. 1250). Fezeka and Stella (2020) contextualize this challenge in a South African community that developed tourism practices based on the adjacent natural reserve. However, consequently, it has been found that vulnerable groups were excluded from economic activity and thus did not get access to the anticipated benefits. This was also connected to lacking inclusion of local

needs as well as ineffective financing mechanisms (Fezeka & Stella, 2020). CCA projects moreover face the challenge of donors prioritizing “lower-risk projects” (Basak & van der Werf, 2019, p. 297) over maximizing their impacts. This gives another perspective on an identified opportunity earlier in the text describing that also incremental change influences the system as a whole to reduce vulnerability. This is in line with Sovacool et al. (2017b) also supporting the claim that funding focuses less on “more radical or systematic transformations” (p. 210), suggesting that CCA projects should prioritize a “multidimensional” (p. 210) approach. Considering the approach taken in the analysis of the conducted vulnerability assessment in combination with adding the dimension of youth empowerment to CCA, these findings can at the same time be integrated into an opportunity for future CCA projects.

Another challenge in this context is the **limited flow of information within the area, as well as from the outside** for inspiration, following findings such as a project participant stating that once he had more access to information about various living standards through the project, it changed their attitude towards employment opportunities. An interviewee also highlighted the need for education from other countries about CCA and how to respond to CC developments. Connecting this to the previously described challenge which illustrated dependence on external support for financing CCA projects, it may raise the question however if this would create a dependence on external support instead of focusing on opportunities to foster self-sufficiency through youth empowerment in the field of CCA. Rahut et al. (2017) however also highlight the importance of cooperating with external donors on an international level to drive the outlined developments, thus reflecting the interviewee’s perspective. Such dynamics on a global scale are also exemplified in conflicting findings from the interviews. One interviewee illustrated the perception that CC does not affect the area of Rangtse, as the local population minimizes engaging in activities that produce emissions. However, another interviewee viewed CC risk on a wider scale, describing that smaller nations such as Bhutan are struggling with the effects of CC even though bigger nations hold more responsibility for the actual causes of CC. For this matter, McNaught et al. (2024) found that in the context of Australia, improved access to CC-related information in affected areas based on specific local needs is relevant to improving CCA. These discrepancies in risk perception from varying information flows are also found in formal education systems, with the collected data in Rangtse reflecting similar challenges as compiled in academic literature. Khatun and

Saadat (2020) explain that the limited access to education for Bhutanese youth is caused by financial aspects and family circumstances. A common pattern is described by Dorji et al. (2022), in that Bhutanese youth from vulnerable backgrounds, such as limited access to education and economic activity which is also highlighted by Walcott (2011), move from rural to urban areas to pursue opportunities in cities. This trend of moving to urban areas is occurring even though the migrating youth usually have farmable land available in their hometowns, but the movement of youth leads to a limited workforce in the agricultural sector available to utilize this available farmland (Dorji et al, 2022). On the one hand, a main issue described by the youth population growing up in rural areas is a “lack of irrigation” (Dorji et al., 2022, p. 390) as well as changes in weather patterns due to CC which pose critical challenges to farming practices. The fieldwork illustrated the same trend, as youth leave the rural areas to migrate towards urban centers, leaving agricultural farmland behind unused and the agricultural sector suffering from a reduced production capacity. It is also anticipated that youth may decide to migrate away from hazard-prone areas if CCA is neglected. On the other hand, Rahut et al. (2017) show that the trend of youth leaving farming activities can cause considerable instability in the growth of the national economy in Bhutan, which in turn demonstrates the importance of a strong agricultural sector for the sustainable development of the country.

The Bhutanese **cultural context and values, as well as their effects on the role of youth in Bhutanese society**, bring possible challenges to consider when integrating youth empowerment in CCA. In the case of Rangtse Nye, the general infrastructure in the area poses a challenging circumstance to expanding livelihood projects for local youth, as access to the pilgrimage site is difficult. According to the GNH, it is important to balance sustainability and economic development (GNH Centre Bhutan, 2022, The 4 Pillars of GNH), which becomes specifically evident when developing the local tourism sector in Rangtse Nye. When integrating the findings from the vulnerability assessment, it can be found that road improvements in the area facilitate access to the pilgrimage site and in turn improve economic activity for the local community. However, increasing traffic and visitor numbers may also pose the risk of disturbing the local natural environment around the site. Anup et al. (2021) highlight that while sustainable tourism in Nepal improved the living standards and environment in the respective areas, it also brought various negative effects to the affected local communities. These included raised prices for living necessities, issues with increased

waste through visitors, as well as youth being influenced by modern developments (Anup et al., 2021). Moreover, business development through youth in Rangtse is influenced by Bhutanese culture. In this regard, Valliere (2014) presents “a mix of supportive and adverse conditions” (p. 140) for youth entrepreneurship in Bhutan. Specifically, the values that are passed on to youth in Bhutan promote stability of current employment situations over a risk-taking mindset, negative perceptions of having to accommodate external changes, as well as modesty, while nevertheless promoting entrepreneurship to earn comparatively higher wages (Valliere, 2014). However, youth is generally perceived by older generations to show low levels of self-initiative in their work ethic while observations from the field document contrary impressions. This could either indicate a generational gap, or possibly that CCA projects promote attitude shifts in youth. Even though it is stated by local administration that youth notice the changes in their environment and realize the need for CCA, this contradicts a youth key informant who found it challenging to describe their perception of changes in the environment.

## **Limitations and Reflections**

### ***Limitations and Validation***

Creswell (2013) presents a list of criteria aiming to validate ethnographic research and case studies, as well as some challenges that are commonly encountered during the research process of these methods, of which the main points are discussed in the following section.

Firstly, a valid research project must give context to the collected data (Creswell, 2013). This is done in this thesis by giving the background to the project and a context analysis based on a literature review on the context in Bhutan before presenting the data, as well as context from a broader international perspective when discussing the findings. To gain a better understanding of the local context, spending a longer period in the specific cultural context also helped deepen this understanding. However, this “access” (Creswell, 2013, p. 171) is noted as a main challenge, which was also considered in this research as the administrative processes required planning the project a year in advance. This also connects to validity through an extended data collection period with recurring observations (Creswell, 2013). This simultaneously poses a challenge for ethnography, as ethnography requires longer timeframes for data collection but also gives access to more authentic data than through interviews alone (Creswell, 2013). In this research project, time restraints came from route permit limitations which expired after one month of travel according to standard immigration

procedure. To gain some distance to the field experience after the initial data collection as suggested by Creswell (2013), two follow-up field visits to the site took place later during the research process for data validation.

For ethnographic research, developing the research focus and data collection material continuously during the time in the field is relevant to increase validity (Creswell, 2013). As ethnographic fieldwork was conducted for a month to collect data with two shorter follow-up site visits to see the progress and reflect on the dataset after the initial collection, the research approach developed during the time in Bhutan. The data collection methods and the detailed documentation forms were developed and revised during the time in the field, as is exemplified in Figure 14. The selection of the framework and questions for the interview guides was developed based on initial observations made in the field and iteratively revised throughout the process based on the learnings described in the reflections section of this thesis.

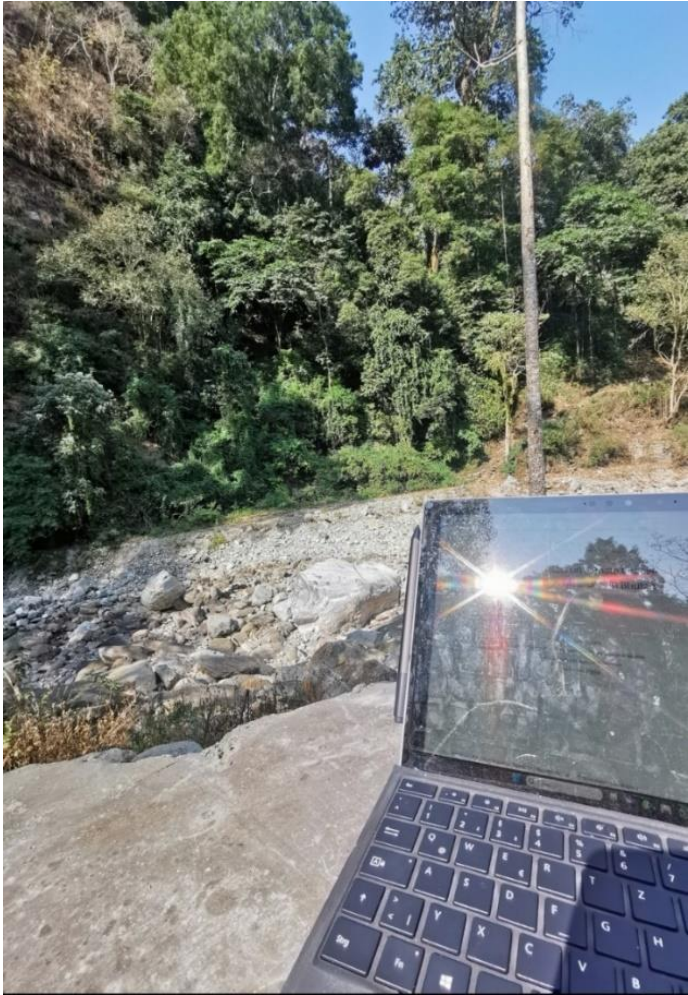


Figure 14: Field Note Documentation on Site (personal photo)

Triangulating the research results to reflect the perspective of the local community is moreover a criterion for valid ethnography (Creswell, 2013). Being integrated as a part of the “culture-sharing group” (Creswell, 2013, p. 90) can challenge the data collection based on the researcher’s self-perception as well as the local community’s perception of the researcher, which was also reflected by Bucerius (2013). The observations made in the field were thus triangulated with interviews and relevant literature from previous academic research. The factor of transferability can be seen as a limitation of this research project, as approaching it as a case study inherently comes with a context-specific nature. However, as the discussion compares and contrasts the findings from the local context with academic literature from an international perspective, accounting for this drawback has been approached by setting the findings into a broader context.

To follow a “systematic” (Creswell, 2013, p. 263) data collection, detailed field notes were taken based on the observations made in the field which were later systematically coded according to the same themes as the interviews. The identification of key informants and development of individualized interview guides took place iteratively in the field to adapt to the local context, thus integrating the identified structure of the vulnerability assessment with recurring themes from the observations. While ethnographic research “makes explicit what is implicit” (Creswell, 2013, p. 263), it must however be considered that correlation does not imply causation (Shove, 2010). Specifically, this means that when researching and making assumptions about attitudes, behaviors, and choices, they may be connected but not necessarily through causal influences. Moreover, as this research focuses on the inherently subjective perceptions of key informants, the collected data sometimes showed considerable variations between respondents in addition to respondents highlighting that they are themselves not always sure whether they recall or articulate their perceptions adequately. During the collection and analysis, this called for flexibility and explicit consideration from the researcher’s side to identify and contrast such contradicting data points with each other.

To avoid skewing the data through the way that the interview questions were formulated (Creswell, 2013), the interview guides have been peer-reviewed in advance. Moreover, when a question was deemed challenging to the interviewees (Creswell, 2013), the semi-structured approach enabled shifting the focus and reformulating the question. This was for instance necessary on the topic of how CC is perceived by various key informants, as the terms CC and CCA were not commonly used among some of the project participants. Due to

language barriers, understanding conversations among the participants when conducting observations in the field was moreover limited for the researcher. At the same time, it may also put the project group at greater ease to have a shared language among each other that is not accessible to the researcher, as they can openly communicate with each other in my presence and actively decide through their language register which data to give me access to, thus giving the participants control over the observations I was included in.

Transparency about the involvement of the researcher as a central criterion for valid research moreover connects to ethical considerations and challenges, making it necessary to reduce the effects of “power asymmetry” (Creswell, 2013, p. 173). During the interview setting, the informed consent regarding notes and recordings was made explicit through a signed consent form to ensure transparent and consensual conduct. However, to ensure the value of safety and not risking the infliction of any form of harm, the data from observations has been reviewed carefully during the analysis process and included only in this thesis when it was deemed that it does not pose a risk to the local community to stay in line with Creswell’s (2013) recommendations on ethically utilizing observational data.

### ***Needs for Further Research***

Based on the previous analysis and discussion, recommendations in the field of academia reflect the need for further research on the topic of CC and CCA. Specifically in the area of Rangtse, the water supply network and access to drinking and irrigation water show potential for further research, as the natural water supply from the water source to the consumer has not been formally researched yet. Such research would help to improve resilience within the agricultural sector, in turn facilitating youth in remote areas to expand on sustainable farming practices and continue agricultural family businesses. Moreover, there is currently limited to no quantitative documentation and research on the effects of CC in the area. While meteorological datasets are available on a national and Dzongkhag level, the area around Rangtse is influenced by variations in microclimates which would limit the transferability and comparison of data from other regions due to big differences in elevations and the natural environment for instance. To further enhance the presented vulnerability assessment from this thesis, quantitative data modeling CC can be integrated with the qualitative findings on perceived CC risk. For such further research, it is highly encouraged that the research is led by Bhutanese researchers as the shared culture and language is a strong foundation for the data collection and analysis.



## ***Reflections***

While the overarching goal for this project was to be as objective as possible in the role of a researcher writing this report, it requires consideration that during the month in the field, I have also fulfilled other roles on various levels within a hierarchical structure that was completely novel to me, which meant that I frequently switched between roles during this time. This stance of subjectivity is supported by ethnographic literature stating that “No research is objective or neutral” (Skukauskaite & Green, 2023, p. 5). This is also reflected in the central concept of risk perception for this research, which is inherently subjective. From the collected data it became clear that there was no objective monitoring available regarding the actual development or risk of CC, which is what made the local key informants’ perceptions even more relevant for this research project. However, future research may focus on a more quantitative analysis of CC risk and vulnerability to establish a baseline for comparison of actual and perceived CC risk.

Moreover, various challenges arose from the way I was perceived as a researcher in the field. Bucerius (2013) highlights the experience of being “a female researcher of different socioeconomic and ethnic background” (p. 690) than the key informants, which comes with benefits and challenges. Even though Bucerius’ (2013) research is in a different field and cultural context than this thesis, being “an outsider trusted with “inside knowledge”” (p. 691) is closely related to my personal experiences in the field. Gaining access to the data from key informants under the given cultural context required a more open setting for the interviews, including holding some of the interviews outside together with a translator. Working with a translator may have skewed the wording by translating from English to Dzongkha and vice versa, especially because the interviewee and translator knew each other in advance. This was probably beneficial to make the interviewee and translator more relaxed, but the interview was thus filtered through the language of the translator. One key informant additionally had previous experience with news interviews, which made it important to explain the difference from a research interview. However, some of the answers may have still been influenced by the interviewee’s previous familiarity with news interviews. Moreover, as a female researcher in the field, all interviews were scheduled through the project officer depending on the availability of key informants, which resulted in the interviews being held with usually less than 24 hours’ notice.

As I come from a different ethnic and socioeconomic background, it should also be considered that the participants' expectations for the effect of my research based on how they perceived me may also skew the way that the interview questions were answered. Specifically, some of the interviewees seemed to expect that I would have access to funding and that the interview was directly related to future project activities. I clarified that my activity as an intern is separate from my research in that regard, but reflecting on the collected data, I still had the impression that the answers they gave were influenced by the hope that there would be future funding for projects. To account for this, this aspect is thus treated as part of the risk perception of the local community and reflected in the challenges that CCA measures face in this regard. Bucerius (2013) moreover supports my experience as the way I was perceived in the field depended a lot on the situational circumstances which varied a lot during my time in the field. The language barrier moreover influenced the access to data based on how I was perceived, as one potential key informant for instance decided to drop out of the interview process at the last minute as the language barrier made them feel uncomfortable.

Through conversation with the local community, I also discovered that I was the only foreigner to visit the area within the last five years and the first European to visit and conduct research there. This meant that not only was the process of settling into the community new to me, but also a novel situation for the local community and project team I was working with. However, coming into the field as an external researcher from a different background may also give access to data that would have otherwise not been shared with a local or male researcher (Bucerius, 2013). Moreover, coming from an external point of view can also be seen as a benefit when approaching the fieldwork setting with an open mind that is not shaped by presumptions that may be deeply woven into existing group dynamics, as such presumptions can skew the way that observations are made and interviews are conducted (Bucerius, 2013). While this meant that there were some insecurities from both sides involved in the process of integrating, I perceived mostly interest and curiosity about my research work and background from the community. This was connected to an immense openness and culture of hospitality, meaning that I was invited to local homes and community events such as national holiday celebrations, puja rituals, homecooked dinners, and a baby shower, which all together gave me unique insights into the everyday workings of the community I was researching. Bucerius (2013) also supports this observation, noting that key informants

reacted very positively to their perceptions and lives being reported on by an external researcher. I also noted that there was minimal to no age gap between most of the project participants and myself, which from my perspective facilitated building trust and understanding when working with the group on the project site. The specific location of OYE's project moreover affected the access to study participants and observations which may have varied (Bucerius, 2013) in other parts of Bhutan considering the diverse ethnic groups in rural areas throughout the country.

### **Conclusion**

This thesis project aimed to research the opportunities and challenges of development projects that integrate CCA with youth empowerment in the rural community of Rangtse. For this matter, the research questions looked into how key informants from this area currently perceive the risk of CC, the relevance of CCA measures including the role of youth, and the influence of their individual behavior on CC and CCA. To answer these questions, a vulnerability assessment was conducted to discuss the opportunities and challenges of integrating CCA with youth empowerment. Based on these perceptions, recommendations for further CCA measures integrating youth empowerment were derived.

The first sub-question focused on the key informants' perception of the risk of CC. It seems that youth on an individual level prioritize socio-economic pressures over the risk of CC, as a central interest for youth in Rangtse is economic growth through developing skills to build businesses and increase employment opportunities. Culturally, this aims to create a capacity for youth to fulfill their responsibility of supporting their families. The environmental factor still plays a role, instead of environmental conservation however the main themes that have been identified include CCA within the agricultural sector to ensure self-sufficient food security in remote areas. This circles back to the socio-economic aspect based on the role of transportation infrastructure in accessing markets to sell agricultural products. Additionally, protection from CC-related natural hazards can be related to developing skills such as carpentry and construction as it enhances the ability of local communities to build more resilient structures.

The second sub-question illustrates how the relevance of CCA measures including the role of youth is perceived. The project proposal outlining the activities at Rangtse Nye focuses on the immediate natural surroundings at Rangtse Nye when talking about CCA, including solid

waste management and protecting the local ecosystem from the negative effects of tourism. CCA measures are thus seen as environmental conservation, with youth engaging as implementors and information disseminators to sensitize the local community and visitors. This however interferes with the findings where project participants exemplify inhibitors on CCA, such as financial limitations. Moreover, the need and interest for more information on CC and CCA in the area has been expressed.

The third sub-question targets how key informants perceive the influence of individual behavior on CC and CCA. Empowering youth with skills for economic development in combination with a sensibility for sustainable practices may foster an understanding of how individual behavior influences CC and CCA on a greater scale in complex systems. Involvement of youth in CCA can make youth in rural areas more proactive in identifying their own needs for future development while showing them how CCA benefits their individual future ambitions for economic development. This can drive the self-reliance of youth in rural communities while promoting locally-led adaptation and sustainable livelihoods that benefit on an individual, community, and national level, in turn supporting Bhutan's GNH efforts. Exposing youth to new ideas and innovation in this process can bring inspiration for youth to expand their skills into developing their own initiatives for CCA.

### ***Recommendations***

From an international perspective, financial support of CCA projects should be approached with an actively decolonized stance. When international donors seek to support CCA projects in Bhutan and call for project proposals, such processes should de-emphasize agendas and vocabulary prioritized by the Global North. Funding for CCA development projects should thus be made accessible independently of the interests of the Global North to minimize the power dynamic of dependence between donors and agents. Instead, it is recommended to give access to seed money and small-scale investments on a local level for communities to utilize according to their own self-identified needs. Specifically in the context of Rangtse, such investments could be aimed toward vocational training and measures that facilitate the youth's access to markets and economic activity. As such, infrastructure improvements would make it faster and cheaper for youth entrepreneurs and farmers to sell their local products, thus empowering them to create more resilient livelihoods and reduce their vulnerability towards CC.

On the national level in Bhutan, decision-making processes and policymaking could further aim to actively promote youth participation. By giving youth a platform to discuss their current and future needs across rural and urban environments, they can be empowered to take initiative over CCA developments and cooperate with each other, as well as with local and national administrations to implement innovative solutions. Moreover, by actively involving youth in decision-making processes, they can act as an incubator and disseminator for information on CCA within the country. By bridging the gap between youth and administration, youth can be empowered to advocate for their interests and in turn foster an upcoming generation that has the tools to take self-initiative in the long term. By creating such a cooperative platform between administration and rural youth, the infrastructure in Rangtse can be improved in the future based on local needs, such as the road network to improve access to markets as well as a suspension bridge which extends the season for sustainable tourism at Rangtse Nye throughout the year.

Youth in the local community can be further empowered through education and an improved flow of information within the Gewog as well as to outside areas. Knowledge and skills that can be leveraged for youth to develop resilient businesses are available within the Gewog, but financing is needed to make such education accessible for youth. Expanding vocational training opportunities in cooperation with existing businesses could help to improve self-reliance and self-sufficiency within the communities. For such measures, it is integral to balance economic development with CCA, similar to the initiative at Rangtse Nye. Moreover, introducing national and international tourists to the remote areas in Bhutan on the one hand serves as a source of income, while on the other hand also building a platform to exchange ideas and perspectives on CCA and development. This however requires managing the potential risks and negative effects of introducing tourism in the target area. Moreover, if implemented in a balanced manner, the tourism sector may also limit the urban migration of youth, as a viable and dynamic job market is created in their local communities based on sustainable tourism. To improve job prospects further, digital tools and innovations could be leveraged to make the agricultural sector more attractive to youth.

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## **Annex**

### ***Interview Guides***

The interview guides were used as a foundation to conduct the interviews during the data collection process. However, as the interviews were set out to be semi-structured, these guides were adapted during the interviews to follow the flow of the conversation. The questions were moreover adapted for the interviews to reflect the specific expertise and background of the individual interviewees. Detailing points in cursive were only used as notes for the researcher to facilitate connecting the data from the interviews to the previously made observations, so as to avoid asking leading questions.

### **Project Participants**

Time of interview:

Date:

Place:

Interviewer:

Interviewee:

Briefing:

- Introduce myself and my background
- Introduce the topic of my research and how it is connected to the OYE project
- Disclaimer
  - Go over the consent form together and clarify any questions
  - Get consent to record the interview
  - Make sure the consent form is signed

## Part 1: Human Conditions

**Please describe the way you experience your current work and living situation.** Feel free to go into as much detail as you are comfortable with.

- Could you describe your current living situation? *E.g. do you live by yourself or with other people? Who do you live with? What kind of building structure do you live in (e.g. brick house, wood house, tent, etc.)? What is your level of formal education? Which mode of transportation do you use to access points of interest in the area?*
- What occupation did you have before being involved in the project with OYE?
- Which role and responsibilities do you have at the project site in Rangtse Nye with OYE?
- Could you describe the roles and responsibilities you are fulfilling outside of the project work? *E.g. do you have household responsibilities, additional jobs, or other sources of income?*
- In what way will your responsibilities and living situation change after the project is completed this spring? *E.g. are you planning to continue working at Rangtse Nye? Do you have other jobs or sources of income you will pursue? Will you move to a different housing situation?*
- Could you describe to what degree your environment (e.g. family and friends, natural resources, financial situation, spirituality) influences you in taking on responsibilities?

## Part 2: Environmental Conditions

**Please describe the way you experience the environment in the area, especially describing any changes that happened in the area in the long-term (over the past few years) and also changes happening during each year.** Feel free to go into as much detail as you are comfortable with, be subjective, and give your personal impressions and perceptions.

- Could you describe to me how you perceive the environment you live in? *This can include anything from nature (plants, animals, geography) in the surroundings, the way that land is used, seasons and climate, etc.*
- Could you describe to me how you experience the climate in the area? *E.g. how does the weather change during the seasons? How does that influence your daily activities such as access to infrastructure, social activities, and food?*

- Do you experience changes in the environment during the time you have lived in the area? If yes, could you describe them in more detail? How do these changes affect you?

### Part 3: Resilience

**Please describe how the changes in your environment influence your situation, considering your current work and living situation as well as possible future plans you may have.** Feel free to go into as much detail as you are comfortable with.

- Do the seasons (rainy / dry season) influence your living situation?
- How do you adapt to the changes between the seasons?
- What is your intended goal with the adaptations you described?
- Could you describe to what degree your environment (e.g. family and friends, natural resources, financial situation, spirituality) influences you in adapting your living situation?
- Does your participation in the project at Rangtse Nye influence the way you perceive your ability to adapt to changes in the future? If yes, could you describe how?

### Wrap-up:

- Are there any aspects you would like to add that were not discussed before in the interview?
- Do you have any more questions regarding the interview or my research project?

## **Gakiling Range Office**

Time of interview:

Date:

Place:

Interviewer:

Interviewee:

Position of Interviewee:

Briefing:

- Introduce myself and my background
- Introduce the topic of my research and how it is connected to the OYE project
- Disclaimer
  - Go over the consent form together and clarify any questions
  - Get consent to record the interview
  - Make sure the consent form is signed



## Part 1: Sensitivity

**Please describe the kind of environmental conditions that constitute the surroundings at Rangtse Nye.**

- What does it mean that this area is a Strict Nature Reserve?
- Can you explain the biodiversity found in this place? In what ways is it unique?
- Can you explain what natural resources are found in this place? In what ways are they unique?
- What kind of climate and seasonal conditions affect the area?
- How do people in the area perceive this natural environment? Is there a difference between youth and non-youth populations?

## Part 2: Exposure

**Please describe the environmental challenges and natural hazards that the area is exposed to.**

- What kind of natural hazards affect the area? When do these usually occur? How long and frequently do they occur? How severe are they? Which components of the system (*e.g. who and what*) is affected by them?
- How do people living and working in the area perceive these natural hazards? Specifically youth population?
- Have there been changes in the environmental factors you described above? If yes, what are they? *E.g. changes in climate, seasonality, biodiversity, water access*
- How do people in the area perceive these changes in their environment? Specifically youth population?

## Part 3: Resilience

**What kind of impacts do the environmental changes in the area have on the local ecosystem?**

- Have the changes influenced livelihoods in the area? *E.g. loss of life, destruction of infrastructure, economic activity*
- Is there a difference in the effects on youth populations? If yes, what are they and why?

### **How does the local ecosystem cope with changes in the environment?**

- What kind of existing / currently ongoing processes are observed in the local ecosystem to cope with changes in the environment?
- Are these processes natural or do they require human intervention? How much control do you have over the interventions?
- What is the intended goal of the coping processes?
- What role does youth play in these processes?

### **How does the local ecosystem adjust to changes in the environment?**

- What kind of new processes are expected or needed in the local ecosystem to adjust to environmental changes?
- Are these processes natural or do they require human intervention? How much control do you have over the interventions?
- What is the intended goal of the adjusting processes?
- What role does youth play in these processes?

### **Wrap-up:**

- Are there any aspects you would like to add that were not discussed before in the interview?
- Do you have any more questions regarding the interview or my research project?

## **Gup**

Time of interview:

Date:

Place:

Interviewer:

Interviewee:

Position of Interviewee:

Briefing:

- Introduce myself and my background
- Introduce the topic of my research and how it is connected to the OYE project
- Disclaimer
  - Go over the consent form together and clarify any questions
  - Get consent to record the interview
  - Make sure the consent form is signed

## Part 1: Sensitivity / Human Conditions

**Please describe social structures that are present in the local area, specifically regarding the youth population.**

- What is the population distribution like?
- What professions are prevalent in the area?
- What kind of housing structures do people live in?
- How would you describe the setting within and between the villages?
- What kind of institutions are present in the area? How do they interact with each other?

## Part 2: Exposure

**Please describe the challenges that the area is facing.**

- What kind of changes have occurred in the area? *E.g. young people moving to cities, natural hazards, etc.*
- How would you evaluate the level of education of youth in the area?
- How does climate change and seasonality affect people's livelihoods?
- How would you say does youth perceive these challenges?
- How much control does the community, and specifically youth, have over these challenges?

## Part 3: Resilience

**What kind of impacts do the challenges in the area have on the local community?**

- Have the changes influenced livelihoods in the area? *E.g. loss of life, destruction of infrastructure, economic activity*
- What role does youth play in this regard?

**How does the local community cope with these challenges?**

- What kind of existing / currently ongoing processes are observed in the local community to cope with challenges?
- How much control do you have over the interventions?
- What is the intended goal of the coping processes?
- What role does youth play in this regard?

### **How does the local community adjust to the challenges?**

- What kind of new processes are expected or needed in the local community to adjust to the challenges?
- How much control do people have over the interventions?
- What is the intended goal of the adjusting processes?
- What role does youth play in this regard?

### **Wrap-up:**

- Are there any aspects you would like to add that were not discussed before in the interview?
- Do you have any more questions regarding the interview or my research project?

## **Consent Form**

### **Participation in Master's Thesis Research on the Integration of Climate Change Adaptation with Youth Empowerment in Rangtse, Haa Dzongkhag**

1. I confirm that the researcher informed me about the topic and aim of the research project which is conducted in cooperation with the Organization for Youth Empowerment. I have understood what the project entails and had the opportunity to ask questions and have these answered.
2. My participation in this study is voluntary and I am not obligated to answer any questions I do not want to answer, without giving any reason and without any consequences.
3. I can withdraw from participating in the study at any time, without giving a reason. This means that all recorded information from the interview will be deleted immediately and not included further in the research project. To do so, I can contact the researcher via email at ha7055ho-s@student.lu.se
4. The information or quotes shared as part of this interview will be collected, analysed, presented and published in connection with my job title. In case I do not agree to this, I have informed the researcher in which case my data will be treated anonymously, which means that it will be published in the master's thesis without presenting my personal information.
  - I request for my data to be treated anonymously.
5. I agree to the documentation of this interview in the form of written notes and audio recordings, which will then be transcribed for further use in the research project. I moreover agree to photos being taken during the interview which may be published as part of the thesis.
6. After the project is concluded, the audio recordings from this interview will be deleted. During the course of the research project, the collected data from this interview will only be accessed by the researcher and used only for research purposes in the context of this specific research project.
7. I confirm that I am above the age of 18 years old at the time of the study.
8. By signing this form, I agree to take part in the above study and consent to the described use of the data given in this interview.

#### **Participant**

Name:

Signature:

Date:

#### **Researcher**

Name: Hannah-Rebecca Höfle

Signature:

Date: