

Una Tveit Hauan

Risk perception and the role of experience: A qualitative study of individuals' reactions to the disaster on the 30th of July 2019 in Jølster, Norway.

Master's thesis in Natural Resources Management

Supervisor: Haakon Lein

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Abstract:

Intergovernmental Panel on Climate Change (IPCC) databases indicate increasing incidents of natural hazards due to more extreme weather events (Bye et al. 2013). The increasing risk of natural hazards rises the attention for improving current adaptation strategies in order to reduce social and economic costs the disasters may pose to communities. It is well established that adaptation strategies are improved when looking at environmental issues from a social perspective.

This study examines individuals' reactions and experience with disaster and shows how individual risk perceptions are linked to place identity and emotional response driven by disaster. Additionally, whether experience effect attitudes on current adaptation and recovery strategies, and beliefs in climate change, is central question in this thesis. I will particularly be focusing on the 30th of July disaster that occurred in Jølster, Norway, in 2019. The empirically research is based on qualitative in-depth interviews. I have also developed a Risk Perception Model (RPM) in order to give a better overview of how emotional response and place identity can be linked to individuals risk perception before and after experience. The RPM is based on relevant litterateur research and is used as a tool to enhance the result of my empirical research.

The study finds that the respondents had experience the disaster in Jølster both direct and indirectly, with and without damaging effect. The respondents' reactions mostly depend on how they experience disaster: those who experience the disaster directly, with more damaging effect, report stronger emotional response. This result indicates an increased effect on risk perception, compared to indirect experience. Also, there is a disconnect between the experiences effect on high level of place identity. However, this study suggests a link between place and risk perception: people underestimate the physical risk to a place they identify with before disaster and may be overestimating the risk after experience.

Furthermore, the cost-benefit analyses in adaptation and recovery policy is highly criticized and does not depend on the respondents' experience. Also, this study shows that people seems to believe in anthropogenic climate change and that there is a link between climate change and natural hazards. Lastly, the respondents are critical of the current climate change policies, regardless of their experience, partly because these polices do not satisfy local lifestyle.

Sammendrag

Ifølge Bye et al. (2013) har antall naturkatastrofer økt de siste tiår, først og fremst på grunn av klimarelaterte hendelser. Intergovernmental Panel on Climate Change (IPCC) rapport fra 2012 indikerer at økte gjennomsnittstemperatur grunnet menneskeskapte klimaendringer er en av grunnene til flere naturkatastrofer (Bye et al., 2013). Naturkatastrofer kan forårsake store ødeleggelser på samfunn som befinner seg i områder med høy risiko for flom og skred, og hensiktsmessige tilpasningsstrategier er vesentlig. Personlige og menneskelige perspektiver er sentrale ved utvikling og planlegging av disse strategiene.

Denne studien undersøker enkeltmenneskers reaksjoner ved naturkatastrofer; risikooppfatning knyttet til stedsidentitet, og hvordan individer er blitt mentalt berørt av opplevelsene. I tillegg vurderer jeg om erfaring påvirker individuelle syn på de nasjonale tilpasnings- og restaureringsstrategiene, og på klimaendringer. Erfaringer tar hovedsakelig utgangspunkt i Jølster, Vestland, i Norge, og naturkatastrofen den 30. juli 2019. Oppgavens empiri er basert på kvalitative dybdeintervju. Jeg har også utviklet en risikovurderingsmodell for å gi et oversiktlig bilde av hvordan man kan knytte mental påvirkning og stedstilhørighet opp mot individuell risikooppfatning. Risikovurderingsmodellen er basert på relevant litteratur.

Funn fra studien viser at respondenter opplevde naturkatastrofen den 30. juli både indirekte og direkte, med og uten skadepåvirkninger, på infrastruktur og private landområder. Det kommer frem at den enkeltes reaksjon er avhengig av hvordan de opplevde katastrofen; respondenter med direkte erfaring, spesielt med skadepåvirkning, rapporterte å ha blitt sterkere mentalt berørt. Studien indikerer at direkte erfaring har større effekt på individuell risikooppfatning, enn indirekte. Det kommer frem en sammenheng mellom individuell risikovurdering og høy stedsidentitet: en tendens til å undervurdere risiko ved høy stedsidentitet før erfaring, og økt risikooppfatning etter direkte erfaring med naturkatastrofe, spesielt ved skadepåvirkning. Videre kritiserer respondentene kost-nytteanalyser i sammenheng med tilpasning og gjenoppbyggingsstrategier. Alle respondentene gir uttrykk for å tro på at klimaendringer er menneskepåvirket, og at det er en sammenheng mellom klimakrisen og naturkatastrofen den 30. juli. I tillegg er respondentene kritiske til den nåværende klima- og miljøpolitikken, ettersom de opplever at den ikke er tilpasset lokale områder i Norge, slik som Jølster.

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A big thanks to my respondents who made this study possible, who I named after individuals who gave me valuable feedback. These friends also deserve a thank you, and I hope you enjoy seeing your names throughout the documents. Also, Ida for letting me borrow your computer, and Nick, for fostering inspirational thoughts to complement this study.

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Thank you for all your help and for always being there!

Trondheim 14.11.2020

Una Tveit Hauan

*"Ja, jeg længes nu virkeligt bort fra Vestlandet
dette evig sure og regnende klima - her blir jo verre for hvert aar"*
Nikolai Astrup, 1920

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FRONTPAGE FIGURE:

Soleienatt – Nikolai Astrup (before 1915).

(Photo: Nasjonalmuseet/Ivarsøy, Dag Andre) Source:

https://www.nasjonalmuseet.no/samlingen/objekt/NG.K_H.1998.0235

List of Acronyms

CEST – Central European Summer Time

Ev – Europavei (European Road)

E39 – Europavei 39 (European road 39)

Fv – Fylkesvei (County Road)

GHG – Greenhouse gas

IPCC – Intergovernmental Panel on Climate Change

NRK – Norges Riks Kringkasting

NTNU – Norges Teknisk Naturvitenskapelige Universitet (Norwegian University of Science and Technology)

NVE – Norges Vassdrag- og Energidirektorat

RPM – Risk Perception Model

UNISDR – United Nations Office for Disaster and Risk

UNFCCC – United nations framework Convention on Climate Change

WoWW – World of Wild Waters

Introduction

Background for research

Environmental processes like flood, landslides, or snow avalanches appears naturally in landscapes with specific geographical and hydrological characteristics (Bye et al., 2013). These natural processes may endanger communities living in exposed areas where floods, landslides, snow avalanches are rather classified as ‘disaster’ due to the risk they pose to societies (Bye et al., 2013; Brown, 2017).

Throughout the last decade, there has been a measured increase of incidents of disasters world-wide, that have caused social loss, environmental damage and economic costs (Bye et al., 2013; Field, 2014; Brown, 2017). It is impossible to identify the drivers of each disaster, however, anthropogenic climate change, population growth in areas more exposed to physical risk, are some of the main drivers for the social and economic cost of disasters. The rising intensity of extreme and increasingly unpredictable weather events linked to climate change is likely to increase the frequency and the effects that such events have to society (Bye et al., 2013).

Local communities of Norway are to expect an increasing effect on incidents of flash floods due to their landscape and predicted changes in climate (Bye et al., 2013); rising temperatures that exceeds average units, leads to more unpredictable and extreme precipitation due to Norway’s long coastline and northern location (Lawrence, 2016) where these factors are the main drivers for flash flood hazards. These trends support reason for improving current adaptation strategies in order to protect societies from undesirable impacts from hazards in the coming future (Bye et al., 2013; Field, 2014)

Adaptation strategies are most effective when not only seen through environmental perspectives, but also integrate social perspectives, such as: how individuals react to disasters (emotional response to their experience) and how experiences impact an individual’s perception of risk to a specific place.

Risk perception can be defined as different types of attitudes regarding disasters, and the way individuals judge these disasters (Brown, 2017; Breakwell, 2014; Wachinger et al., 2013). Risk perception is, however, a complex field of study where many different variables influence an individual’s reactions to and judgement of disasters (Wachinger et al., 2013).

This thesis focuses on individual's experiences with disaster and how experience may indicate changes in risk perception, linked to place identity and emotional response driven by disaster. Particularly, the 30th of July disaster 2019 in Jølster, Norway.

Significance of the study

This thesis uses a multidisciplinary approach, combining geography and environmental psychology (EP), focusing on people's interactions on the environment, e. g level of cognition regarding decision-making processes and portrayals of action and behavior change models (Klößner, 2015).

Empirically research of this thesis is based on qualitative, in-depth interviews of inhabitants, or previously inhabitants, of Jølster, Vestland, Norway. Due to the climate and geography of this area, Jølster's is considered to be more vulnerable to natural hazards compared to other local places in Norway. This thesis will pay extra attention to the disasters that occurred on the 30th of July 2019, where a significant weather event caused landslide- and flash flood disasters that had a damaging effect on the local community (Varsom, 2019). This disaster stands out as a memorable day and seemed to be fresh in mind for all the respondents of this thesis research. Figure 1 illustrates some of the damage the 30th of July disaster caused in Jølster.

This thesis set out to give a deeper understanding of individuals risk perception and impacts from experiences and raise awareness to the importance of combining psychology and geography. Hopefully, I will provide a useful tool for improving adaptation and recovery strategies or give information that could be valuable in the development of support initiatives for individuals that have experienced disasters.

Studies aim and research question

The aim of this thesis is to discover individual's reactions to experience with disaster, particularly the 30th of July disaster in Jølster 2019. I will focus on how experience impact the respondents' emotions, and how these emotions are linked to risk perception. I will also evaluate the inhabitant's levels on place identity and investigate whether experience lead to changes in individual's perception of risks linked to living in the area. Furthermore, I will study individual's attitudes to current adaptation and recovery strategies, beliefs in climate change, and whether experience have an effect on these attitudes and beliefs.

Thesis research questions particularly concerns the 30th of July disaster in 2019.

These are:

1. How did the respondents experience the disaster, and what emotional response did the experience cause?
2. Does the respondents' emotional response, from the experience with the disaster, indicate changes in individual risk perception?
3. What is the respondents' level of place identity, and did the experience have a changing effect on level of place identity?
4. Did the experience lead to changes in individual's perception of risks linked to living in the area?
5. What are the respondents' attitudes to adaptation and recovery strategies, and beliefs in climate change, and did they change after the experience with the disaster?

The first question portrays the respondents' stories of experience on the 30th of July 2019, and what emotional response the disaster caused: Investigating if there is a relationship between experience and emotional response. In the second research questions I will investigate the link between respondents' emotional response and risk perception: If emotional response indicates changes in individual's perception to risk. The third research question identifies the respondents' level of place identity, and whether this level has changed after experience: Experience effect on individual's attachment to a particular location. The fourth question aims to portray the link between risk perception and place: How the respondents risk perception is linked to Jølster. The last and fifth question describes whether experience had an effect on current adaptation and recovery strategies, and beliefs in climate change.



Figure 1. NVE fieldwork; inspecting damaged area from the 30th of July disaster (photo: NVE, 2019) Source: <http://fotostrom.nve.no/fotoweb/archives/5007-Alle-bilder/?q=J%C3%B8lster>

Cooperation partner: World of Wild Waters (WoWW)

World of Wild Waters (WoWW) is an on-going project at the Department of Psychology at the Norwegian University of Science and Technology (NTNU) (Woww, 2020). Their aim is to develop a virtual reality (VR) game in order to give a holistic understanding of the drivers and impacts of climate change-driven natural hazards in local areas of Norway. According to Markowitz and Bailenson (2019 p.1), VR is “a communication medium that makes virtual experiences feel real and appear unmediated”. VR games have been used through simulations in different settings and fields, where studies results show that people react similar to the experience of VR games as if they would outside of a VR (Markowitz and Bailenson, 2019)

WoWW will use the game as a communication tool with visions to foster pro-environmental behaviors; behaviors are motivated to do good for the environment and reduce actions that have negative impacts to the environment (Klößner, 2015). The game is constructed on real data and realistic scenarios and simulations (Woww, 2020). This is also where this thesis finds its part in the WoWW project: collecting real data which possibly can be added to the game by investigating people’s behaviors and attitudes through risk perception on local scales in Norway (Woww, 2020).

Research area

This section presents general information about the thesis study area. I will also present the 30th of July disaster, that occurred in Jølster in 2019: using secondary data from Varsom and Norge's Riksringkasting (NRK).

Jølster; location, nature and culture

This section seeks to provide background information about Jølster. Particularly, location, nature, culture and main economic resources.

Box. 1 Jølster

Surface area: 620 km²

Population number: 3047 (2019)

Administration centre: Skei

Municipality: Sunnfjord

(Thorsnær & Askheim, 2020)

Jølster is an area in Norway located in Sunnfjord Municipality within the county of Vestland (Fremtidsfylket, 2020; Thorsnær & Askheim, 2020). The environmental surroundings are rural and defined by the lake Jølstravatnet, where you find Vassenden and Skei on each sides of the lake (Thorsnær & Askheim, 2020). The length of Jølstravatnet is about 30,5 kilometers and is enfolded by steep mountains. The highest mountain reaches 1827 meter above sea level (Thorsnær & Askheim, 2020). The valley also contains glaciers that covers Jølster's surrounding mountains, e. g Haugedalsbreen and Jostedalsbreen (Thorsnær & Askheim, 2020). Figure 2. gives a better overview of Jølster; Jølstravatnet and Kjøsnesfjorden.



Figure 2. Map of Jølster: Jølstravatnet and Kjøsnestfjorden

(Jølsterarefest, 2020) Source: <https://jolsterarefest.no/om-jolster/>

Farming and tourism are currently two of Jølster’s main economic resources. Additionally, Jølster is well known for its culture of art, as Jølster was home to the paint-artist Nikolai Astrup in Sandalstranda – southside of Jølstravatnet. The municipality has retained this home as a pride of an art museum (Fremtidfylket, 2020) which is, in addition to Jølster’s nature, another tourist attraction (shown in Figure 3). Thesis front page picture portrays one of Nikolai Astrup paintings, ‘Soleienatt’. This painting illustrates Jølster and was finished somewhere before year 1915.



Figure 3. Astruptunet and Eikaasgalleriet in Jølster

(photo: Ommedal, 2020) Source: <https://jolsterarefest.no/om-jolster/>

From the first of January 2020, the Norwegian government adopted changes to local governmental structures by merging previous counties and municipalities: changed the counties of ‘Sogn and Fjordane’ and ‘Hordaland’, into the county of ‘Vestland’ (regjeringen, 2019). Additionally, they merged the municipalities of ‘Jølster’, ‘Førde’, ‘Gaular’ and ‘Naustdal’, into ‘Sunnfjord municipality’ (regjeringen, 2019; Thorsnær & Askheim, 2020). This information may be useful as I am using relevant literature from before year 2020.

The 30th of July disaster:

This section portrays the 30th of July disaster, based on Varsom and NRK’s news-updates.

Drivers and impacts:

This section gives a deeper description on drivers and impacts of the 30th of July disaster, based on Varsom. Varsom is a service developed by Norges Vassdrag- og Energidirektorat (NVE), in cooperation with Statens Vegvesen and Metrologisk Institutt (Varsom, 2019).

On the 30th of July 2019, several flash floods and landslides occurred due to extreme weather in Jølster. These caused damage to infrastructure and the surrounding environment, where also a man lost his life. National and local newspapers describe disaster as unforgettable and shocking due to the unusual extreme precipitation that stressed the release of the flash floods and landslides, and its critical outcomes it had to the communities. According to Varsom (2019), heavy precipitation over a short time of period is a key factor for all the large damages, closed roads and evacuations that occurred in Vestland on 30th of July 2019. Jølster and Førde incurred the greatest impacts. The precipitation was very local and lasted from 15 to 22 CEST. Precipitation measurements at stations Botnen in Førde, of Vassenden in Jølster, were 33 mm/hour and 92 mm in one day (nychthemeron). However, Varsom (2019) assumes the numbers may have been higher, since there were no measurement stations in the area of Vassenden. As a consequence, smaller creeks increased to become rivers leading to debris floods and landslides.

An overview of all the events caused by the heavy precipitation the 30th of July 2019 are portrayed in Box 2., with following location, classification (landslides, floods etc.) and what impact it caused. The box aims to portray a better overview of all the damage the extreme weather event caused. Figure 4. Illustrates one of the floods that occurred same day.

Box 2. Overview of all the events caused by the heavy precipitation the 30th of July 2019, Vestland, Norway:

Slåtten, Jølster, Sogn og Fjordane: Flash Flood (2), evacuation and damage on infrastructure.

Svidalsneset, Jølster, Sogn og Fjordane: Landslide on Ev39, damage on infrastructure and traffic stop.

Årnes, Jølster, Sogn og Fjordane: Landslide, one car observed in the landslide deposit, searching operation.

Årdal, Jølster, Sogn og Fjordane: Landslide on road and traffic stop.

Årsetelva, Vassenden, Jølster, Sogn og Fjordane: Flash flood and damage on infrastructure.

Gjesdalelva, Vassenden, Jølster, Sogn og Fjordane: Flash flood and damage on infrastructure.

Movika, Førde, Sogn og Fjordane: Landslide on Ev39 and traffic stop.

Stokkevika, Modalen, Hordaland: Landslide on Fv 569 and traffic stop

Slottsportentunnelen, Modalen, Hordaland: Landslide on Fv 569, traffic stop and evacuation.

Hyefjorden, Gloppen, Sogn og Fjordane: Landslide over Fv 615

Fv 691 to Ommedal (Hyen in Nordfjord) Tverralva Bru (bridge) buried by flood and damages on road further up in the valley.

Holsen on Rv 13 north of Røyrvikfjellet (Vadheim) Sunnfjord, bridge covered by flash flood deposit, and road closed.

Fv13 close to Holsen Skole (school) in Førde closed due to flash flood.

Local Flash floods have affected local grocery shop Gullgruven in Åsane (Bergen)



Figure 4. Flood from the 30th of July disaster in Jølster

(Photo: NVE, 2019) Source: <http://fotostrom.nve.no/fotoweb/archives/5007-Alle-bilder/?q=J%C3%B8lster>

Police-tweets

This section presents the disasters at 30th of July 2019 in Jølster, where literature is found through NRK online news station, based on the national police's tweets. A 'tweet' is an online message distributed through Twitter, which is a social network service (Twitter, 2020). In this context, people were constantly able to get updates from the police, whenever the police had messages to share.

On 30th of July 2019, 16: 53 CEST, the Norwegian police sent out a message on Twitter that there had been a flash flood over E39 (European road), north of Vassenden in Vestland, due to the ongoing extreme weather event with heavy precipitation. Three houses are evacuated. No people or animals are reported taken by the flood. Five minutes after the post was announced, a cabin was taken by the mass of a landslide close to E39 in Vassenden. Helicopters began to research areas but were not able to reach Vassenden where the landslide went off, due to heavy rain and lightning.

Almost one hour after the first landslide in Vassenden, the police posted another message: (17: 16 CEST), another flash flood in the north at Moskog in Jølster. At the same time, Sunnfjord Energi reported to the police that there had occurred a power cut in Førde and Vassenden in Jølster, which meant that some of inhabitants in these areas did not have any electricity, nor an overview of the situation. The weather continued stressing soil and pushing river flows, where smaller debris flows and slides. This was being reported less than 15 minutes after the previous post on Twitter about electricity failure. These landslides appeared in Jølster close to the previous events the same day, still no people or animals were seen to be missing.

Later that day - four hours after the previous post, the police reported another flash flood (20: 45 CEST), where there had been observed a car in its mass, illustrated in Figure 5. The landslides were measured to be about 40 or 50 meters wide. Later, the police confirmed this observation through another post (21: 19 CEST). However, they also referred to another observation which had not yet been confirmed, by one man in Jølstravatnet during the flood. Due to these avalanches, more than 150 people had been evacuated in areas between Førde and Skei in Vestland. Locals, volunteer organizations and professionals like police and NVE, through emergency plans and crisis management, began investigating areas with helicopters, and executing evacuation centers in Gjethella ungdomshus and Skei Hotell.



Figure 5. The landslide who caused the greatest loss on human life the 30th of July (Photo: NRK, 2019) Source: <https://www.nrk.no/nyheter/jordras-ved-e39-i-jolster-kommune-1.14643300>

At 22: 57 CEST and 23: 16 CEST police posted another message on twitter where they explained that helicopters had to return back to Florø due to bad weather, and that they had begun to investigate areas with the use of boats instead. However, a new important message was posted, explaining that there had been observed a man in the same flash flood that took the car. However, the risk of investigating close to that area became too dangerous due to the massive speed and size of the ongoing flood. 01: 39 CEST the next morning, investigations in the area of Jølstervatnet were finished for the night, as there was no proper evidence of a missing man though the flash flood. But as the conditions were undetermined, a new research was scheduled for next day when the areas were predicted to be much safer.

The next day, 31 July, roads were still closed, however she continued to help to assist the police with evacuations and medical help, but the electricity had not yet been restored. The next morning, helicopters began a new investigation in order to get a better overview of the situation. they also are cancelled all the commercial flight over area Jølster to not be disturbed.

A new update from the police revealed that a man was missing. They believed it was the man that had been where the car was taken. At 17:17 CEST, the police reported that the

mand had deceased. The situation was critical, and the search operation for the missing man was launched, with boats and min-submarines, illustrated in Figure 6. On 1. August 18: 02 CEST, the police released the outcomes to the press, explaining that the man nor the car were recovered due to the substantial mass in the deep fjord.



Figure 6. Marine evacuation; the day after the 30th of July disaster

(Atle Ness, 2019) Source: <https://www.firda.no/jolster/nyheiter/samferdsel/fleire-evakuerte-i-vassendenomradet-kan-fa-reise-heim/s/5-15-853398>

Theory

This chapter provide more detailed information of terms, definitions and concepts presented in this thesis. It is divided in three sections: Concepts of Environmental Studies, (ii) A Model of Risk Perception (iii) Adaptations and Recovery.

The first section, ‘Concepts of Environmental Studies’, gives an introduction to relevant terms and concepts concerning classifications, vulnerability and climate change, which are important for a deeper understanding of what disaster and natural hazards are. The second section, ‘A Model of Risk Perception’, gives a more psychological approach to this thesis: Defines risk perception, emotional response, and terms and concepts presented in the Risk Perception Model (RPM). These are important for understanding factors that imply changes in individual’s risk perception before and after experience. The final section, ‘Adaptation and Recovery’ provides terms and concepts that are important for understanding adaptation and recovery strategies, in regard to disasters, natural hazards and climate change.

Concepts of Environmental Studies

Information relevant to this section can be found in Bye et al. (2013), Kristensen et al. (2015) and the Intergovernmental panel on Climate Change (IPCC) Annexes’; Allwood (2014); Field (2012); and IPCC (2019).

Natural hazard

A ‘natural hazard’ refers to a threat or a potential for damage, rather than something that has actually happened. In other words, a hazard is not a physical event, or the consequences of it (Bye et al., 2013 p. 24), but “a condition with the potential for causing an undesirable consequence” (Kristensen, 2015 p. 10). Field (2012 p. 560) defines natural hazards as “the potential occurrence of a natural or human-induced physical event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihood, service provision, ecosystems and environmental resources”. Importantly, it describes that hazards are both natural and human-induced events. Both definitions are appropriate for this thesis’s use of the term and find its relevance through its relationship to risk perception, climate change and adaptation. e.g. ‘increasing risk of natural hazards due to climate change’, or ‘adapt to reduce natural hazard’.

Disaster

Unlike hazard, disaster is a term that refers to something that actually have happened. United Nations Office for Disaster and Risk (UNISDR) defines disaster as a “serious disruption of the functioning of a community or a society involving widespread human, material, economy or environmental losses and impact, which exceeds the ability of the affected community or society to cope using its own resources” (Vandemoortele, 2012 p. 9)

In context of thesis, floods, and landslides occurring the Jølster 30th July 2019 can be classified as a disaster due to its impact on society.

Flood, landslides and snow avalanches

Different classifications of natural processes depend on an area’s physical formation, what shape, surface and type of materials that are involved, mechanics of slope and thickness of moving mass (Blong, 1973). My chosen research area is particularly vulnerable to floods, landslides and snow avalanches due to the geography of the Jølster’s natural environment.

Kristensen et al. (2015, p. 5) defines *floods* as “the temporary covering by water of land not normally covered by water. This shall include flood from rivers, mountain torrents, ephemeral water courses and floods from the sea in coastal areas”. Additional terms of ‘debris flood’ and ‘water stream flow’ specifically describe flooding that occurs in mountainous areas (Wilford et al., 2004). A *flash flood* is another classification often mentioned and of importance to this thesis. Kristensen et al. (2015 p. 12) defines flash floods as floods occurring in steep catchments. These are stressed by heavy or excessive rainfall in a short period of time, generally less than six hours in small and predominantly steep catchments (Bye et al., 2013). Different reports from NVE indicated mostly an increasing effect on flashflood events on the Norwegian west coast due to impacts of climate change (Bye et al., 2013). Globally, flash flooding has caused the greatest loss of human life compared to other events, due to its unpredictable occurrences in space and time, and how that impairs the ability to forecast flash floods events (Bye et al, 2013).

Dai et al. (2002 p. 1) defines *landslides* as “the movement of a mass of rock, debris or earth down a slope”. Landslides are stressed by heavy weather events, or other external factors like earthquake shaking or rapid stream erosions (Dai et al., 2002). Landslide events have had enormous damaging impacts for different societies worldwide, such as damage on infrastructure or even loss of human lives (Dai et al., 2002).

Snow avalanches can be defined as snow masses that run off steep slopes. There is variation in types of snow avalanches, dependent among other factors such as shape of

mountains, snow quality and snowpack, and seasonal changes (Mitterer et al., 2003).

Although events are influenced and triggered by climate and weather events, human activity is currently the main stressor for snow avalanches (Schweizer & Jamieson, 2001).

Kristensen et al. (2015) links relevant classifications up to different hazard: Landslide or snow avalanche hazards: “The probability that a landslide or a snow avalanche, of a given magnitude, will occur in a given period and in a given area” (Kristensen et al. 2015 p.19), and flood hazard: as “...an event extensive enough to cause damage to infrastructure and/or buildings” (Kristensen et al., 2015 p.19).

Vulnerability

United Nations Office for Disaster and Risk (UNISDR) defines ‘vulnerability’ as “the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effect of a hazard” (Bye et al. 2013 p. 21). This definition includes an area’s population and social characteristics like level of welfare and culture (Bye et al. 2013). Vulnerability is often considered in anthropogenic climate change studies and climate change-based hazards, but also in undeveloped countries of poverty (Bye et al. 2013).

Risk

Risk can be defined as the degree of exposure to natural hazards and the potential of such hazards to impact human values, such as losses or damage to society, individual’s health etc. (Bye et al. 2013; Aven & Renn, 2009); “the potential for damage and vulnerability” (Bye et al., 2013 p. 26). This definition is similar to Allwood’s (2014 p. 1270) definition of risk: as “the potential for adverse consequences where something of value is at stake and where the occurrence and degree of an outcome is uncertain”. Risk measurements on local scales in Norway are Norwegian organization NVE, Jernbaneverket, and Norges Vegvesen, which develop risk assessments in order to protect societies from such hazards (Kristensen et al., 2015). Measuring risk and understanding human vulnerability to natural hazard play an important part in developing adaptation strategies.

Climate Change: Definition and relation to disasters and natural hazards

‘Climate’, is often defined as the average weather, were ‘climate change’ defined as changes in the state of the climate; “changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer” (Allwood,

2014 p. 544) Changes in climate occurs due to natural internal processes and external forcing such as modulations of the solar cycles, volcanic eruptions and anthropogenic drivers like increase in emissions of dangerous climate change gasses or changes in land use (Allwood, 2014).

The United Nations Framework Convention on Climate Change (UNFCCC), Article 1, defines climate change as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods” (Onyeneke & Madukwe, 2010). The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition and climate variability attributable to natural causes.

Climate change is a complex field but finds its relevance in this thesis when speaking of disasters and natural hazards. However, it is not possible to identify each event, whether is driven by human activity or if it is naturally occurred. Also, movements or impacts of disaster do not necessarily explain its driver (Bye et al., 2013). Yet, there is a relationship between the increasing global average temperature, incidents of extreme weather events, which may cause disaster, especially flash flood (Bye et al., 2013).

A Model of Risk Perception

This section seeks to provide information to thesis psychological approach. Firstly, presenting the Risk Perception Model (RPM), then go on to define ‘risk perception’. Secondly, give a more detailed explanation on terms and concepts presented in the RPM.

Risk Perception Model (RPM)

I have developed the RPM in order to give a better overview of factors influencing individuals risk perception, and trough what contexts. The model is divided in three parts: before experience, experience and after experience. Each of them includes an information box that portrays factors that influences individuals risk perception. These factors are based on relevant research literature. Additionally, the model corresponding with thesis research question; presenting ‘place identity’, ‘emotional response’ and way of experiencing a disaster. The RPM is illustrated below, in Figure 7.

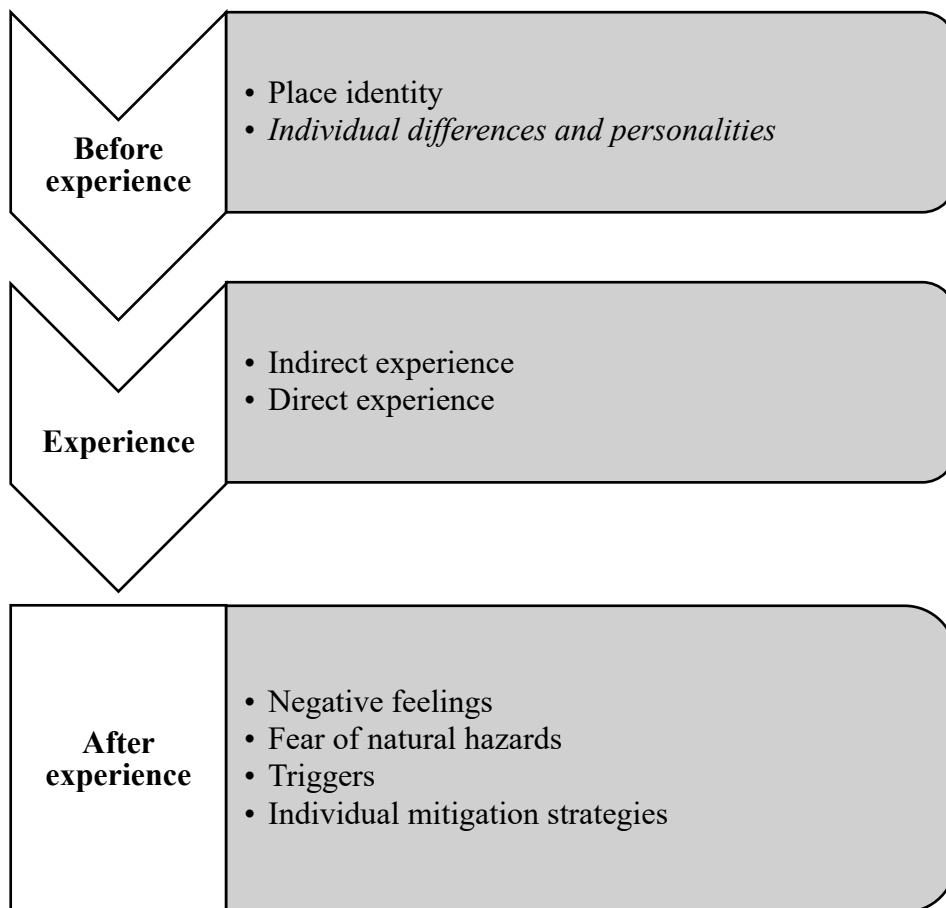


Figure 7. The Risk Perception Mode: Factors influencing individuals risk perception.

All the factors presented in this model are described below, except for ‘individual differences and personalities’, written in ‘Before experience’. This factor is included as a reminder of the individual diversity, and how it is difficult to evaluate people’s cognitions as people behave and act differently.

Risk perception

Risk perception can be defined as an individuals’ beliefs of risk. IPCC Annexes from 2018 defines risk perceptions as “the subjective judgment that people make about the characteristics and severity of a risk” (Allwood 2014 p. 1270). Risk perception can also be explained as an emotional and cognitive process affecting individual’s and societies perceptions, e. g. people’s behaviors to climate change (Van Der Linden, 2014) or judgments of natural hazards (Breakwell, 2014).

In regard to this thesis, risk perception embraces individuals’ attitudes regarding disaster and how they after experience judge these disasters. Individuals’ risk perception becomes relevant in regard to cope with an increasing risk of natural hazards though

improving adaptation strategies in order to reduce environmental risks (Bye et al. 2013) e. g improve policy management to promote better solutions for a safer society, or acknowledging individual's needs after experiencing disaster to support their health and wellbeing.

Experience

'Experience' can be explained as an event that leaves an impression on an individual (Lexico, 2020). In context of this thesis, 'experience' is defined as the respondents' impressions of a disaster. Though this thesis I am dividing experience in two groups, 'direct' and 'indirect' experiences. 'Direct experience' can be explained as when individual observe or being personally affected by an event. 'Indirect experience' is when individuals experience comes through other's people's experiences, through news or personal stories. 'with' or 'without' damaging effect refer to whether the respondents personally suffer damage to their infrastructure, environment or property, or was personally harmed. Figure 8 illustrates the second part of the RPM 'Experience' and categorize experience with disasters as either direct or indirect.

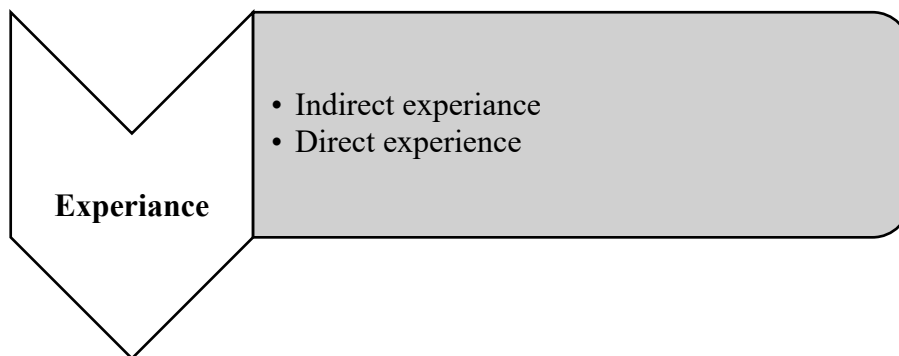


Figure 8. RPM Experience: Indirect and direct experiences

Emotional response driven by experiences

'Emotional response' is defined by how people emotionally react to their experience with disaster. According to Palm et al., (2004) experiencing disasters have a powerful effect on individual emotions. Additionally, Van Der Linden (2014) research studies examines a conceptual relationship between 'affect' (emotional response), risk perception and experience (Van Der Linden, 2014). He explains his research to be important in regard to shapes public perception to climate change by improving knowledge about emotional cognitive processes (Van Der Linden, 2014). Similar to my research, I seek to improve

knowledge on emotional cognitive processes from experiencing disaster, as an important tool in regard to improve adaptation, recovery and climate change policy.

In order to discuss the respondents' reactions to experience, I incorporate different factors of emotional cognitive processes that are affected by experience that cause additional changes in risk perception. Such factors are discussed below, and illustrated in Figure 9, the last part of the RPM: 'After experience'.

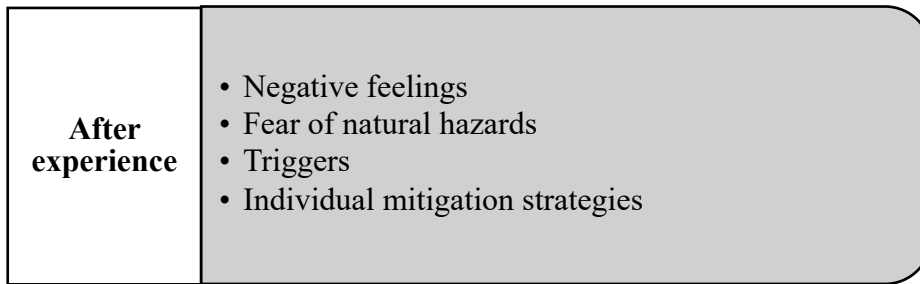


Figure 9. RPM After experience: Factors indicating emotional response affected by experience.

'*Negative feelings*' defined as undesirable feelings, like concern and anxiety, or badness and hate (Slovic et al. 2014; Van Der Linden, 2014); threatening or unwanted feelings that an individual is not in control of due to an incident of experiencing a disaster. Such individuals may feel distressed about or concerned for the possibility of future events after their experience of a natural hazard (Van Der Linden, 2014) further influencing their risk perception. This factor is defined as '*fearing hazards*'.

During interviews and throughout the discussion and conclusion, we refer to '*triggering effects*', which mean that a respondent explains through which situations or contexts where negative feelings are driven by experience; theorizes that feelings related to specific memories from experiencing a natural hazard are caused by a new experience. Both direct and indirect experiences with a disaster may evoke memories of previous experiences and cause negative feelings (Wachinger et al., 2013). This may be brought about by witnessing disaster with characteristics similar to their original experience, or by having nightmares and reliving their original experience. We may explore the feeling brought about by such occasions and evaluate whether they are negative or not (Wachinger et al. 2013).

Another mental impact presented in RPM is '*Individuals mitigation strategies*', which is in this context individuals act to reduce negative feelings or memories in order to increase control of potential hazards. The term mitigation essentially means to 'make something bad less severe, serious or painful': reducing negative feelings driven by experiences of disaster.

If these behaviors are adopted after experience, it also mirrors individual's behavioral change after experience - signs of changing risk perception.

Emotional response and risk perception

Personal reactions to experience may reveal judgments of environmental risks. Böhm & Pfister (2015) studies finds that people may feel uncomfortable to portray their own emotions. However, these descriptions are powerful, and should be used for investigations individual risk (Böhm & Pfister, 2015; Bostrom et al. 2018).

According to Wachinger et al., (2013) there are numerous factors that may change in risk perception due to an experience with disasters. Additionally, the link between emotions and risk perception is a complex field of study, but there are however studies that show that there is a relationship between emotions driven by experience and changes in risk perceptions. I have tried to illustrate this relationship in Figure 10.

Individual's may response differently depended on how they experience a disaster. Raaijmakers et al., (2008); Wachinger et al. (2013); and Van Der Linden (2014) finds that the stronger emotionally response from experience, the stronger change in risk perception; e. g people that has experienced a direct damaging effect tend to overestimate the impacts of their experience (Wachinger et al., 2013). Particularly, increased threatening stimuli tend to overestimate subjective experiences (Ishikawa and Okubo, 2016). By overestimate, estimate risk to a higher value than before experience; perception of increased risk. Additionally, Raaijmakers et al., (2008) studies find that people who have not experienced damaging effect underestimated the impacts of their experience.

In this thesis I am interested in investigating changes in individuals risk perception by evaluating respondents reactions, and discuss whether reaction indicate changes in risk perception; comparing individuals experience towards emotions, and how this gives an idea of individuals changes in risk perception based on experience with disaster (Wachinger et al., 2013)

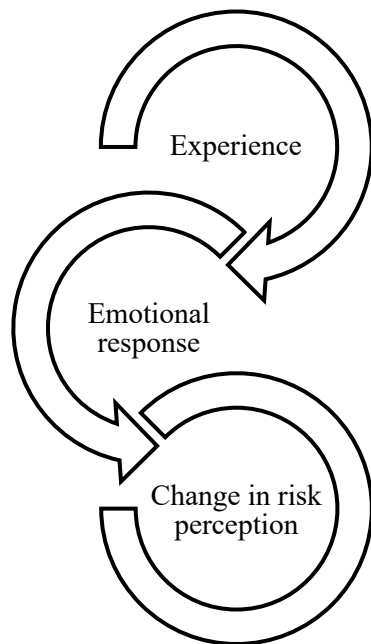


Figure 10. Relationship between emotional response from experience and changes in risk perception.

The concept of place identity

There are varying definitions of ‘place identity’: in essence, it is ‘how humans identify themselves with a place – cognitive emotional element’ (Dale & Berg, 2013). Their definition explains that place is a part of individuals identity and does not explain a places identity in itself; e.g. a place’s environmental characteristics. Individual place identity is rather how inhabitants of Jølster identify themselves with the place, e.g. traditions, family, friends, work, culture, nature etc. and also relate to what expectations individuals put into their surroundings, based on feelings and experiences (Dale & Berg, 2013).

An individual’s relationship to a physical setting can be described by analyzing the strength and quality of place identity (Najafi & Shariff, 2011); individual’s degree of attachment to place. Evaluating the level of place identity is done qualitatively, as respondents’ own explanation of their values of or connection to a place vary. Factors affecting place identity are suggested by Dale & Berg (2013) studies: growing up in an area increases quality of place identity; more ambivalent relationship to place for those who did not grow up, compared to those who did, e.g. ‘the born and bred narrative’: when people feel connected to an areas due to places roots though family generations (Dale & Berg, 2013) Hence, portraying, ‘elective belonging’, meaning individuals choosing to live in an area that

fits their identity, individual feel a need to live in a similar place as where they grew up in. Last, Dale & Berg (2013) compares inhabitants of urban and rural areas, explaining that people in rural area have a highly attached to local, smaller particular places, though memories and previous experiences. Whereas inhabitants of urban areas express a higher attachment to the whole city, like its culture, city associations etc. (Dale & Berg, 2013).

Place identity and risk perception

Level of place identity is linked to individual's perception to risk (Hansla et al., 2008); This is illustrated in Figure 11., the first part of the RPM, 'Before experience'. First of all, place identity can be described as an *optimistic bias* to risk perception; "people's tendency to think their risk is less than that of their peers" (Klein & Helweg-Larsen, 2002 p. 438). In other words, people don't believe they are in risk (or less risk) of experiencing negative events, and that concept influence individuals risk perception when they underestimate environmental risk due to measuring likelihoods (Weinstein, 1989; Sharot, 2011). According to Weinstein (1989), people have an optimist bias concerning personal risk to disasters. Meaning, people believe that others a more likely to be affected than themselves. Peoples understand factors of risk in a biased manner, meaning that they downplay physical risk.

Lujala et al., (2015) and Spence & Pidgeon (2010) research suggest that people tend to underestimate the risk from where they live. Additionally, people's connections to a place is linked to risk factors as it forms parts of their identity (Wachinger et al. 2010). In other words, high level of place identity increases the barrier for changing risk perception (Hansla et al., 2008). This effect occurs more likely when people are not experienced with harm or what they believe they are not expecting to experience; not expecting negative events in future period (Weinstein, 1987). This is seen in Wachinger et al. (2010) studies, showing that 90 % of his respondents did not feel threatened by disaster before experience. However, this changed drastically after experiencing a flood event: "The majority of people, namely almost 70%, now can indeed imagine that such a 'bad' or an even 'worse' event could occur again in the respective area" (Wachinger et al. 2010 p. 40).

High level of place identity refers to strong beliefs and expectations gives increased perception of control and awareness of consequences and may work to decrease the 'fear of the unknown or new'. Having expectations or a perceived understanding of a place based on experience causes a decreasing effect on risk perception: if respondents have a high understanding/knowledge of a place, e.g. knowledge concerning a place's natural dynamics,

when nature is threatening or not; or the effect on the environment of their own actions (Hansla et al., 2008,).

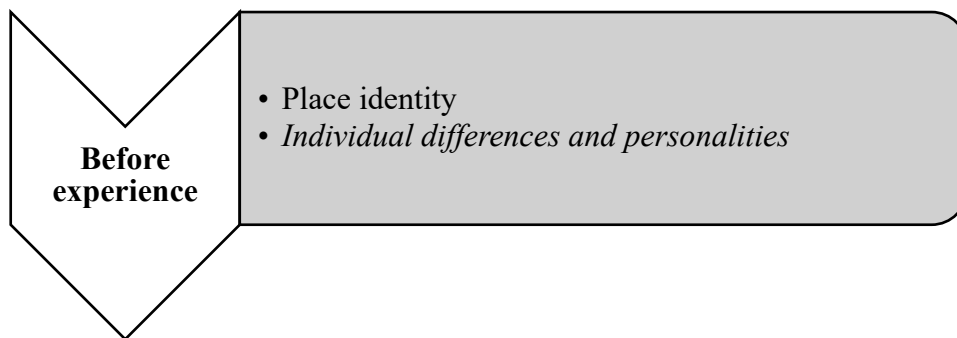


Figure 11. RPM Before experience: Factors influencing individuals risk perception

Adaptation and recovery

This section describes terms and concepts of adaptation and recovery strategies.

Adaptation and recovery: Definitions and relation to climate change

The IPCC Annexes from 2014 defines adaptation as: “In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effect; human intervention may facilitate adjustment to expected climate and its effect” (Allwood, 2014 p 1251). Climate change adaptation refers to efforts to reduce climate change impacts.

The IPCC Annexes from 2018 has divided the definition as either, ‘incremental adaptation’ and ‘transformational adaptation’. Transformational adaptation ‘maintains the integrity of a system or process at a given scale’ (IPCC, 2018 p. 542), such as building resilience in areas of high vulnerability. Transformational climate change adaptations are often physical adaptations that are put in place to reduce the impact of natural hazards to society in a scenario of increasing frequency and severity of natural hazard events, such as localized flash flooding in Norway. Equally, transformational adaptations include predictive mapping, effective forecasting, management and emergency procedure to natural hazards. For example, NVE manages adaptation strategies in Norway, where they implement strategies for flood and landslide hazards such as mapping of affected areas, emergency and flood warning systems, flood management systems and guidelines for land use, as well as aforementioned physical flood protections (Statens Vegvesen, 2019).

‘Incremental adaptation’ is an indirect method aimed to decrease vulnerability of natural hazards, like improving policy innovations or encouraging people to act more environmentally friendly, e. g. recycle or use electrical cars (Loginova & Batterbury, 2019). According to Bye et al. (2013 p. 23), it is possible to adapt, not only before an event, but also after a natural hazard, which for this thesis will be presented as ‘recovery’. Recovering after an event includes among other things restoring damaged areas and rebuilding or repairing infrastructures like roads or houses.

NVE have developed strategies for adaptation, where they NVE areas of responsibility, especially in regards of Norway’s topography as climate change impacts will act very differently throughout the country. According to Hassen-Bauer et. al (2015 p. 14): “these strategies include both physical measures and measures to produce sufficient knowledge about climate change to provide a sound foundation for decision”. Meaning, both incremental and transformational climate change adaptation. The NVEs document of these strategies they summarize that “basic trends are clear, giving us enough formation to act now” (Hassen-Bauer et al., 2015 p. 2).

Cost-benefit analysis

Cost benefit analysis is often mentioned through the interviews and can be defined as:

“...monetary assessment of all negative and positive impacts associated with a given action. Cost–benefit analysis enables comparison of different interventions, investments or strategies and reveals how a given investment or policy effort pays off for a particular person, company or country. Cost–benefit analyses representing society’s point of view are important for climate change decision-making, but there are difficulties in aggregating costs and benefits across different actors and across timescales”. (Allwood, 2014 p. 1258).

The cost benefit analysis become relevant in terms of people’s judgments of current incremental adaptation strategies; the policy of the extension of action to avoid degradation and damage from disasters.

Mapping processes

Mapping vulnerable areas is essential to be able to adapt and to protect society and the environment in case of hazards. National mapping processes are presenting areas exposed to a

hazard and also sometimes an assessment of consequences: “warning level indication that a danger (flood, landslide or snow avalanche) is imminent in a specific area at a specific time, and that it may cause danger to life or widespread disruption to infrastructure”; the colors and/or numbers indicate the level of vulnerability (Kristensen et al., 2015 p.9).

Risk maps characterize different zones and measure probabilities of impacts of landslides or flood incident, like human, economic or environmental loss (Kristensen et al. 2015). Risk maps define probabilities of damage in specific areas on a scale with measurements of high, moderate, low or no risk (Kristensen et al., 2015). There are also specific natural hazard maps for adaptation, portraying specific hazards, like landslides, floods snow avalanche etc., and its level of risk, with given period of time and possible size and volume (Kristensen et al., 2015)

Social support

A general definition to social support is defined by Berkman & Glass (2000): “concerns help, aid or assistance with tangible needs” (Berkman & Glass, 2000 p.145). Social supports concerns human distress and wellbeing and can be divided in among others ‘psychological support’ and ‘service provider’ (Vaux, 1988). I will be using ‘social support’ instead of service provider. Social support includes support for practical issues and peoples need guidance; helping someone resolve an issue though giving information. Social support becomes relevant in order to explore respondents need after experiencing disaster. Whereas, psychological support concerns individuals need for clinic care; provision of healthcare...dealing with health and illness overtakes...which health means a state of complete physical, psychological and social well-being” (Wahass, 2005 p. 63).

These terms become relevant, as they can be seen as ‘social adaptation and recovery strategies’, e. g social recovery after experiencing a disaster, or adapt/facilitate for people involved with disasters, or exposed to a high risk of natural hazards.

Research methodology

The following chapter present the thesis methodological choices.

Firstly, I will portray the background of my studies; how I found my research objectives and who I am cooperating with. Secondly, I will dive more deeply into the thesis' use of method where I am presenting the reason for my choice of research design, including a description of thesis interviews, respondents and fieldwork. Last, I will present method for the data analysis, and thesis limitations and ethical conditions.

Background for chosen method

This study was first initiated though my interest of combining fields of psychology and geography, which became possible after advices from Christian A. Klöckner in January 2019. The idea of combining these fields was motivated by a NTNU course, 'Environmental Communication', where I saw the importance of involving more psychology into the field of geography in order to e. g. improve communication techniques aimed at giving people pro-environmental behaviours. This course is initiated by Christian A. Klöckner, together with among others Amanda Lai. They are both working on the WoWW (World of Wild Waters) project. This project is developing a VR game that aims to communicate and give knowledge about climate change and natural hazards in local areas in Norway. My part in their research is to collect data for WoWW and for my own research project, aiming to investigate in individuals changes in risk perception after experiencing disaster in a Norwegian local area. This aim becomes suitable for both my research areas as a geography student and the WoWW project's research objectives. Additionally, it fulfills my interest in combining fields of both geography and psychology.

I have chosen to use qualitative in-depth interviews in order to explore new patterns to individuals' reactions and judgments on risk after experiencing disaster. In-depth interviews can be explained as unstructured personal interview with one respondent and one interviewer (Morris, 2015). This method allows me to dive more deeply into individual perceptions. According to Baxter & Eyles (1999 p.309) qualitative method leads you "to understand the role of deeper issues, like community values and ways of life, which are recognized as important in the risk literature but are rarely studied directly" (Baxter & Eyles, 1999 p. 309).

The interviewing technique is suitable for the thesis as I am reaching after the essentials of each individuals' experience and for discovering new patterns/ unexpected

issues. It allows “single respondents to talk freely and to express detailed beliefs and feelings on topic” (Stokes & Bergin, 2006 p. 28). The technique also gives the opportunity to develop a high level of trust between the interviewer and the respondent, as it may unveil detailed information that may be easier explained by talking freely, and because individuals’ perceptions after experience may involve information that can be noticed as sensitive.

The chosen method is also inspired by an ‘inductive research design’, which can be explained as a ‘bottom-up’ approach where conclusions may have more than just one result; “involves the search for patterns from observations and...theories for those patterns through a series of hypotheses” (Bernard, 2011 p.12). Such a research design suits this thesis’ aim as it focuses on understanding individuals’ behaviors, the social and environmental resilience (Bernard, 2011). Hence, the design becomes an interesting example for further studies within the field of geography (Baxter & Eyles, 1999).

Field work

I have chosen to do the interviews in Jølster, as it is a small place in Norway with a high incident of landslides, floods and snow avalanches, and more specifically due to their experience with the 30th of July disaster, that occurred in Jølster in 2019. This experience allows me to look more into topics like events with damaging effect, personal experiences with adaptation strategies, or climate change as flash flood are more relatable to climate change. These experiences may also be fresh in mind as it occurred almost a half year after the interviews.

Doing fieldwork in the Jølster was also convenient as I knew I could arrange a place to live in Sogndal, (Jølster’s neighbour municipality). Having a base area in Sogndal made me flexible in order to adjust the respondents preferred meeting time and place, where I ended up interviewing different respondents in both Jølster, Førde and Sogndal. All the respondents were either inhabitants or previously inhabitants of Jølster.

In Sogndal I was able to enter the library at the university high school, where I prepared and transcribed interviews. Here I could also take time to find respondents and group rooms for interviews. Bus and car rentals gave me the ability to be flexible in terms of where the respondent wanted to meet up and do the interviews.

The fieldworks time-period went over three weeks, between the 20th of February to the 10th of March, and all the interviews were arranged between the 3-9 of March 2020. Time and place for the interviews were organized after the respondents’ preference.

Interviews

This section presents the interviews, ‘notification form’ and ‘interview guide’. Additionally, gives an explanation of the process, how I developed qualitative in-depth interviews, and exemplifying some questions.

In order to be allowed to do the interviews a notification form to Norsk Senter for Forskningsdata (NSD) was developed (see Appendix I and II). This contained a description of what I wanted to write about, the chosen target group and the developed interview guide. NSD is a “national, archive and centre for research data... and a tool for research and offer service which aim to free up resources and capacity for research” (Norwegian centre for research data, 2020). Following NSD guidelines of research gives a security for the interviewer and the respondents in order to secure sensitive information. The notification form presented for the respondents includes information about what type of information I am interested to collect, the aim of the thesis, research questions, the process of my fieldwork and how I will use the information. It also, explains that the respondents are able to choose time and area for interview, and that they are able to change their mind about being a part of the investigation project, even after the interviews are finished. It also includes my supervisor, NSD and my contact information in case of questions or reconsiderations.

I have developed an interview guide (see Appendix III and IV). This starts with an introduction where I introduced myself and talk shortly about my master program and thesis. Then about how the interview works, time, type of questions and how I will use the data. Here, I also explain the thesis’ definition of ‘experience’. I divided the guide in two parts, ‘Priority’ 1 and 2, in order to secure the most important questions within a particular time. Priority 1 questions includes core areas, like individuals’ stories of experiencing flood, avalanche or landslide, and impacts. Priority 2 includes a more political specter of adaptation and climate change. All the questions in both priority one and two are questions regarding risk and risk perception. e. g if experience changed risk perception and why and whether climate change or adaption and renovation of nature events changes risk perception. Additionally, I developed an interview guide for the respondent that works in Norge’s Vassdrags- og Energidirektorat (NVE) (Appendix V and VI). This interview gave more room for more freely talks about his job which is relevant for this thesis. Information became useful as it gave me better knowledge about natural processes and dynamics in hazard situations. However, the respondents were highly concerned with being presented as a private person in addition to being experienced with adaptation to previous and future flood events.

The questions in the interview guide correlate with the thesis aim and research questions. Questions are presented as ‘open ended’ and ‘process -orientated’ questions. Open ended questions invite the respondents to talk freely about his/her experience. This have been useful because of the variation in the respondents’ role in experience (job, volunteering or type of personal experience) and also concerning the respondents place identities. ‘Process-orientated’, means questions that are open for changes during the fieldwork in aspiration of ‘learning by doing’ mentality; respondents raising new issues in the interviews that could be interesting to add in the next interview, for the next respondent.

Below, I have presented some of the questions I have used in all the interviews. These are also written in the notification form, to give the respondents an understanding of what questions I would ask, and thesis topic.

1. “Do you fear hazard more after your experience?”
2. “Do you experience situations in your everyday that would trigger your emotions due to your experience?”
3. “...any situations that would bring back memories from your experience?”
4. “Have your perspective on ‘home’ changed after your experience?”
5. “Do you believe there is a relationship between increased floods or landslides and anthropogenic climate change?”

The thesis ended up having five different interviews and the average time for all the five interviews was 53 minutes. However, the initial goal of research was finding between 7 and 8 respondents. The reason for why I had to stop my research was due to the corona virus. The restriction made due to corona virus made it impossible to do more interviews in that period (more in limitations).

All the individual interviews were recorded with two different microphones in order to secure data from being lost. The interviews were saved and locked on recorder and mobile phone, to protect personal and sensitive information. In the beginning, the interviews / participants were named by numbers and given coloured codes in order to present data and analyse in a tidy way. Afterwards, in the finale text, the have been given numbers. Later, interviews were deleted to ensure the data to be protected. The interviews have been given fictive names in the text, first of all to anonymize, but also in an attempt at making the text more interesting to read.

After the interviews, I transcribed all the sound files. The transcription was later translated from Norwegian to English. While translating, I focused on keeping the essences of their languages; individuals' lingoes, which are important in regards of analysing reaction to experiences, which can be challenging when translating from one language to another.

Interviews respondents

The respondents are the informants providing primary data. Respondents does need to match the specific target group which are based on thesis research objectives. According to Stokes & Bergin (2006 p. 27) a target group can be defined as “a group of individuals selected and assembled by researchers to discuss and comment upon, from personal experience, the topic that is the subject of the research”. In this thesis the target group are defined as ‘people experienced with the 30th of July disaster’, both directly and indirectly.

In the process of finding respondents, I used ‘Snowball sampling’. This type of sampling respondents is also called chain sampling, which means when a person suggests other people with same characteristics to join the same research project. It is also described by (Flowerdew & Martin, 2005 p. 117) as a technique where “one contact helps you recruit another contact, who in turn put you in touch with someone else”, like friends, family, neighbour etc. In addition, I have been contacting people in local newspapers, Firda Avis, that have already been open for giving information about their experience with hazards within their home area. I found all the respondents to be openminded and some more grateful for being invited to interviews. Most of them hoped their knowledge and experience with disaster can be helpful for future events and wanted to give their impression and suggestions to decision-makers as regards of changing current adaptation systems.

Data analysis

The goal of this thesis analysis is to discuss and give answers to the thesis' research questions and to target new themes and patterns. This is better done by looking more careful and critically at thesis empirical research (Crang & Cook, 2007). However, thesis topics are complex, and I have had to narrow down research area through classifying factors for changing risk perception wisely (factors presented in RPM). Classifications are mostly thesis empirical research and inspired by previous relevant studies. In order to classify factors, I have used NVivo 12. The results of the thesis' research questions are found through discussing secondary research in relation to my empirical research.

Most studies concerning risk perception and natural hazards have used quantitative interviews for method, this thesis chosen method is rather untraditional. In regard to that, I have used previous research results to compare upon this thesis' empirical research with, finding similarities, differences or correlations, with a lack of a more a holistic analysis. Last, I have used End Note in order to save and portray my references.

Limitations

This thesis has some limitations. First of all, I started my fieldwork when the Covid-19 virus was spreading in Norway. The Norwegian governmental initiated restrictions for shut down in order to reduce the spread of the virus. This circumstance, and personal uncertainties questioning how to behave and meet other people, made it difficult to collect more data. I also had to travel back home before they canceled the bus transportations from Førde to Trondheim. As a consequence, the thesis is based on rather few interviews. It also led to that I missed out on the advantages of interviewing other relevant people. I have used a lot of time searching for suiting places to study as the libraries and universities had strict opening hours. They did not recommend being on campus, and it has rather been challenging to work at home living in a student collective over a long master-period. However, I did get a student office two months before delivery.

Independent of the pandemic, there were some limitations in regards of traditions of chosen methods: data from in-depth interviews in given local languages (Norwegian) and dialects, whereby translating interviews from original language to English may have led to loss of important information. There are also some limitations in the relationship between thesis topic and interview guide. Particularly, the interview guide for experts seems to overstate topics like climate change, whereas the interview mostly concerned an expert perspective of experience, hazards and impressions on current adaptation and recovering strategies. Also, in the interview guide it is described that I am looking for 3-4 respondents, whereas I changed this detail after the fourth interview as I planned to include 2-4 more. However, this was not possible due to the restrictions of the pandemic.

Due to chosen research method, results may portray individuals risk perception only for thoughts given at one specific time (interview), whereas risk perceptions and emotions are dynamic through time and space; "Research traditions of qualitative in-depth interviews affects respondents to give hypothetical risk situations rather than what they face and feel in daily lives" (Baxter & Eyles, 1999). Also, the RPM does not illustrate to what degree that risk perception changes (high to low, etc.). Last, there are limitation in regard to thesis analysis,

where I reminded more or less an outsider in regard of making the best understanding of their stories, critiques and ‘way of seeing the world’. Particularly, because of my origin from urban city, contacting locals of smaller rural areas. Although, the thesis is objective, it may have had an impact in regards of how to interact with locals through interview, how to analyze, what factors to focus on etc.

Despite these limitations, I have worked to present collected data clear and concise in order to give an honest and truthful picture of what the respondents’ present. Additionally, I have aimed to be adaptable through challenging times. Even though the pandemic has had some impact on my working process, it has unconditionally been for the better. National restrictions have never been more important, and I feel lucky to be able to live and write my thesis within a country that are truly following restriction to reduce infection to protect human lives.

Ethical conditions

“The protection of human subjects through the application of appropriate ethical principles is important in all research study. In a qualitative study, ethical considerations have a particular resonance due to the in-depth nature of the study process” (Arifin p. 1, 2018). As Jølster has a rather small population, anonymizing respondents becomes challenging and important. In a smaller area with a small population, inhabitants seem to have a better indication of who is who and who has experienced what. In regard to that I have only shared information that does not indicate who the respondents are, and by deleting personal details, like the respondents’ names.

The thesis also confronts sensitive subjects, combining field of psychology: in searching for information that portrays respondents’ reactions and emotions. These topics are for some relatively personal or hard to express. Particularly for those who have gone through traumatic experiences. Throughout the interviews I have tried to be clear that respondents could control the interview if it becomes uncomfortable and emphasized that they could withdraw their participation whenever they like to. The thesis also concerns respondents’ perspectives on policy, giving support or critique to current authorities, adaptation strategies and climate policy, thereby making anonymizing essential in order to ensure that respondents does not experience any consequences of telling their stories and their statements (Crang & Cook, 2007).

Local Stories of Experience

This chapter presents thesis empirical research. Particularly, portraying the respondents' relevant life experiences, and how experiences may have shaped their attitudes and behaviors; giving attention to stories of different events, like experiences with floods and landslides, and the 30th of July disaster. Additionally, portraying respondents' attachment to place, opinions on adaptation and recovery strategies, and climate change beliefs. I have divided chapter in five topics: (1) Story of Experience; (2) After Experience; (3) Place Identity; (4) Attitudes on Adaptation and Recovery Strategies; and (5) Climate Change Beliefs. These topics are based on the respondents' own reflections and the interview's questions.

Story of Experience

This section presents the respondents' stories of experiences with events such as floods, landslides and snow avalanches, and the 30th of July disasters.

Different experiences may impact individuals differently. Karoline gives attention to one of her experience with a snow avalanche that made great impact on her. She did not experience the avalanche personally, however, she participated in an emergency team aimed to care for people involved by the avalanche. The experience made her realize the power of nature, and that horrifying memories from this disaster still remains. She believes that natural hazard may play unpredictable, especially in areas of previous even. Now, she usually wont expose herself to areas where she believes there is a high risk of hazard and fails to see the reason for why people want to ski in areas exposed to snow avalanches, as the impacts may be devastating.

- "I have experienced a snow avalanche. I was not in the avalanche. I was together with another emergency team, and they had to be fast. That made a great impression on me" – Karoline

Anders have also made some experiences with different disasters through other emergency activities; he is working within the NVE, where he seeks events like floods and landslides in order to protect the communities from the protentional damages it may cause. Additionally, tasks in relation to adaptation and recovery strategies. Anders first started

describing a flood disaster in Flåm, in 2014. He explains that throughout this disaster, they mostly had control of the situation, even though the impacts were devastating: 5-6 houses drifted away with the flood's deposits.

Furthermore, Anders portrays his experience with the 30th of July disaster, by linking the event to his experience in Flåm: He explains that the 30th of July disaster was much more unpredictable than the disaster in Flåm, which made it particularly challenging for the emergency team to secure important areas, and predict its outcomes. The frequent and heavy precipitation then stressed the soil into numerous unpredicted floods and landslides. Most of them had a damaging effect. They even lost the telephone connections due to the extreme precipitation. The disaster occurred to him right after he finished his shift, on his way home from work. When Anders arrived Vassenden, he was not able to drive any further due to the heavy precipitation.

- "I was traveling from Førde to Skei, on my way home from work, and suddenly I was stuck in traffic at Vassenden. There was no electricity. Luckily, I had a security radio in the backseat of my car. I was able to get in touch with my boss who had a day off. He was in the shower when I called". – Anders

He explains that he never had experienced a heavy rain like that before, and that he realized how damaging and terrifying the disaster was. People surrounding him were stressed out. It seems like there was no other alternative for him other than get involved in the situation.

- "I remember there was a bus 30 meters in front of me. I could hardly see anything. It was not fog, but rain. And when I came further up, rivers colored with brown water running downwards the hills. This is when I understood that something is wrong. When I came up to Vassenden, it was not possible to drive any further. I stopped the car and asked a guy, "what was going on?". He answered: "all the roads are closed. Do you have any other stupid questions?". People are so stressed out, so I reported myself to the police as a coworker for them, I could not just sit in the car" – Anders

Comparing to the disaster in Flåm, the emergency teams were already in field before where the disaster took place and that they were able to predict the outcomes. During the Flåm disaster, they work progressively with different teams. The situation would not turn out

so well if it was not for the good cooperation between the municipality and comparator: “I believe that we in NVE have a good cooperation and partnership with municipality and comparator (countryman)” – Anders

Karoline did also describe her experience with 30th of July disaster as shocking and unpredictable: there was a landslide that ran off only 200 meters above her household, and she observed it drift downwards the steep mountain hills towards her house. Additionally, the floods and landslide events isolated them within their own community, and they were not able to evacuate to another safer place due to the heavy precipitation. The precipitation was so extreme that the helicopters were not able to fly. Knowing this, made Karoline terrified.

- “It was pouring. It was an exception, this have never happened before, and besides, we were isolated. You rarely hear about that. That you are not able to go anywhere” – Karoline

During the disaster, Karoline helped people that were evacuated, both tourists and locals. She explains that even though she was terrified, she had to concentrate on her job, evacuating, helping, and preparing food and water for people that were involved: “it was terrifying, but I had to concentrate on my task” – Karoline

People from the other side of the fjord was also trapped and transported with boats in order to stay safe. She explains that they tried to escape away for Jølster, but the extreme precipitation made them stop earlier than planned. There seemed to be over 100 people in the evacuation house, and they all needed a place to stay overnight.

- “There were not only locals involved. Most of them were tourists from all over the world, and they could not get out of the village. I talked to more than 100 people who were in the evacuating house. They needed a place to stay overnight” – Karoline

She further explains that she felt just as terrified as those who were evacuated, but that she had to behave in a particular way because she wanted the people who were evacuated to feel safe. Also, in order for her to have a better focus on her tasks. She explains that it was almost like stepping into another role that unconditionally focuses on practical tasks, like divide beds between the evacuated, preparing food and water between the involved, but also be a caring and helpful person they could talk to.

- “There were many people who was afraid, and some in shock. It was obvious that they needed someone they could talk to about they just experienced, both locals who had to travel from their home and tourists. We all act different in situations like these. And it was hectic” – Karoline

Both Anders and Karoline experienced the 30th of July disaster though different emergency teams. However, it seems like Karoline was more emotionally touched throughout the 30th of July disaster. Anders explains that as he was more experienced, and involved in practical tasks, he cannot identify himself with other people’s frustrations and feelings of fear to the same degree - but that one can only imagine how terrifying it must have been for people involved, that are not used to experience disasters like he is. He explains his profession gives him more knowledge about how the disasters play, which gives him more confidence in situations like these.

Both Karoline and Anders express that they felt a lot of responsibility in the middle of a demanding situation, especially when people that surrounds them are anxious and stressed, then they really have to focus on their tasks:

- “I situations like these, I feel that I am taking distance from everything else and only doing what is highly necessary in order to handle the situation. You cannot connect and talk to other people in situation like these. The most important thing is to get a good overview over the situation. But it is hard when you don’t have any telephone connection” – Anders

Speaking of other experiences in Jølster, Nora seems to have harmonized impression to floods and landslides as she has experienced them before, even though they sometimes occur unexpectedly. She talks about a flash flood in a river that happened not too far from where she lived. She recalls how she was late for class because of this flood, but she cannot remember that it has felt frightening or had that it had any damaging effect: “It is just something you have to expect when you live in Jølster” – Nora.

However, her experience with a snow avalanche made her impressions change. Although she did not experience it directly, it made a great impression due to its impact on a man that were driving. The man came out safely out of the masses, but the consequences could have been much worse.

She further explains that the snow avalanche usually runs off in the wintertime on a road where she usually passes by when she is driving to work. She is aware of the powerful consequences of a disaster due to its previous events.

- “At the same road, there have been a lot of snow avalanches – only one or two weeks ago. It happens all the time. It is a narrow valley, and if an avalanche goes off, the mass will rapidly reach the roadway. So, in a way, you do not have anywhere you could escape to. I am going to drive the same road soon, but I think I want to do some more evaluations before I drive” - Nora

Another experience that made impression on Nora, was the 30th of July disaster. Nora was not in Jølster. She experienced the disaster indirectly; through other people’s stories and different newscasts. When she first heard about the disaster, she initially thought it a normal event; something the community would be in control of. Even though she seems to be very aware of Jølster’s powerful nature, she was very surprised that it actually would occur in her home village, without any predictions.

- “I didn’t think too much about it when it happened. The rain was so local, and I didn’t feel that it was something unusual” -Nora

The next morning, she was better informed about how much damage it caused, which made a great impact on her.

Ingrid and Kjirsten experienced the 30th of July directly, with damaging effect on their property yard. Ingrid’s story begins by explaining how the 30th of July started off as an pleasant evening. She was eating dinner together with her family, on an unusually hot summer day. It felt great, until it started to rain. It was pouring down, and at the same time, she got a text from her neighbors telling her that there had been a flash flood nearby.

- “The 30th July. It was on a hot day, and then it started to rain, heavily. At 15 CEST I think, we all ate dinner together in our home. Then I started to realize how heavily it was raining. Then, I got a text from my neighbors who told us that there had been a flash flood nearby. Then I thought, what is happening? I could not recall this ever happening before”. – Ingrid



Figure 12. Two months after the disaster the 30th of July

(photo: Bent Are Iversen, 2019) Source: <https://www.firda.no/slik-sag-huset-til-arlin-ut-etter-flaumen-no-foleer-vi-oss-veldig-trygge/s/5-15-1012778>

Ingrid stressed as she reached her phone when her mom called. Her mom wanted to check if they were ok. Her mom seemed to be just as nervous as Ingrid. Ingrid decided to check on her other neighbours, but when she was to call, she could not reach through as the telephone lines was shattered by the rain. This did not make the situation any better, and the rain did not seem to stop. Just a few seconds after that, a shocking sound, similar to an explosion, hits her background. A massive flash flood burst out from the surrounding hilltop and into her fields. It contained huge tree timbers that caused damages on her surrounding environment that would eventually destroy parts of her and her family's households. They had to move quickly into safety.

- “I wanted to text my neighbors, but then the network did not work. Suddenly, a strange sound came from behind. I turn around and look up on the mountain side, where big masses of flood and trees tumbles towards us and our house. I screamed to my partner that we have to move quickly” - Ingrid

They tried to escape but their car was stuck in the soil. Ingrid realized that she and her family needed help if they were to escape in time.

- “In the moment when they realized that they had to escape, their car was already stuck in the soil because of the flood”. – Ingrid

Luckily, some other people from the other side of Jølstravatnet observed the flashflood that ran into their home, drove over and rescued them. She explains how grateful she was; that they are willing to put themselves in danger in order to help others.

Unlike Ingrid who experienced the 30th of July disaster with her family, Kjirsten was alone and not able to contact her family due to the broken telephone lines. She experienced another flash flood that went off, ran off on one side of her house and downwards the roadway. It also found its way inside her family’s cowshed. She was worried that the disaster would harm her livestock which she was responsible for, that day.

- « I watched the river flowing inside the cowshed. Asking myself, am I going to evacuate the cows, or is that even possible? We have so many cows, and I was alone”.
– Kjirsten

Kjirsten tells that she has never experienced anything like this before, even though she had lived here almost her entire life. The only event Kjirsten could relate to, was the storm Dagmar in 2011. That was a storm, that lasted over several hours. The 30th of July disaster lasted over two hours but was more powerful and destructive.

- “Usually this river grows when the snow melts further up in the mountain, were it also turn out to be dark, but I have never seen it grow as much as it did that day. And so fast, only after 30 minutes”. – Kjirsten

Both Ingrid and Kjirsten, was mostly surprised about the heavy precipitation. It was something they would never expect. They both links the disaster to climate change due to the unexpected and unpredictable precipitation, and the dry and warm weather earlier the same day. Kjirsten expresses how surprising the event was, even though she checked the weather forecast before it all occurred:

- “It was very wild and local. I remember checking the weather forecast, but I did not think that it would be that rough. It is not the first time they forecasted heavy rain” –
Kjirsten



Figure 13. Car covered with surface deposit after the 30th of July disaster

(photo: Bent Are Iversen, 2019) Source: <https://www.firda.no/slik-sag-huset-til-arlin-ut-etter-flaumen-no-fole-vi-oss-veldig-trygge/s/5-15-1012778>

After Experience

This section portrays people's reactions after experience; their emotional reactions to the disaster in the aftermath/ what feelings they are left with. In common for all the respondents is that they all have experienced different events and disasters within Jølster. Whether the experience is direct or indirect, it seems to have impacted them emotionally.

It may be difficult to express and define emotional responses. It seems like the majority of the respondents are not used to talk about how they are emotionally impacted by these disasters. They rather describe the disasters effect on the community, like physical impacts on infrastructures, environment etc. Some of them claims that they underestimate the description of their feelings about their experience, or that they are 'lost for words':

- "I am not good at putting words on feelings, so that might be a bit underrated explanation" – Nora
- "Maybe I might express myself as a bit 'cold', but I have not reflected around this topic that much. Maybe I am displacing it" – Anders

Others seems to have a clearer and more thoughtful opinion regarding how they were emotionally impact by their experience with the disaster. Specifically, during the 30th of July; Ingrid and Kjirsten, who experienced damaging effect on their household, report their emotional impacts from the experience in a very similar way, like describing experience as frightening or traumatic. However, their reminding feeling from the disaster seems to fade away:

- “It scares me, thinking about how fast everything happened. We were only lucky that more people did not get hurt or died. It is traumatic feeling that remains after the experience. In the beginning, I had nightmares every night, without threatening feelings during the day” – Kjirsten
- “Sometimes I feel uncomfortable, especially in the beginning, but I feels much better now”. – Ingrid

Although negative feelings fade away, memories are coming back to their mind when they are in a specific area or through specific situations. Like the snow avalanche Nora experienced, presented in ‘Story of Experience’: she still fears to drive the same road, and every time she passes the area, she becomes extra aware: she tend to turn down the volume on her radio so she can pay extra attention to the mountain hills that surrounds the roadway.

Anders has a similar reaction to another roadway exposed to another snow avalanche. He explains that when he passes that area, it reminds him of a snow avalanche with potential damaging effect. It makes him frightened.

- “I am not usually afraid of driving anywhere, however there is one place that concerns me. It is inside Esebottn between the ferry and further inside the fjord line, that’s a place I don’t like to drive. I remember, in the wintertime, it ran off continuously”

Karoline does also link negative feelings from experience of disaster to a specific place, however she does not seem to fear hazards. She portrays the area were a man lost his life during the 30th July disaster. She feels sad every time she passes by, not because she is frightful of new events, but sad about the greatest loss of a man’s life.

- “Every time I pass the area where everything happened, with my bike, I feel sad. There was a man who died there. Every time, before I start biking, I think, ‘do I really

want to pass that area', and every time I bike that road, I'll be watching the water, unconsciously" - Karoline

Commonly for all the respondents is that they react negatively to the disasters they have experienced. Though, to different levels depended on how they experienced the disaster. This can possibly be linked to whether or not they experience triggers that brings back memories from experience, or situations in an everyday context that activates feelings that reminds them of an experience, like a flashback. Observing that in similarity, all of the respondents could justify that they do experience triggering effect, though to different degrees and though different situations.

Some triggers seem to be the same for all the respondents; negative feelings activated though heavy weather events, especially extreme precipitation, which was a stressing component for the landslides and flood event that occurred the 30th of July disaster. Almost all the respondents explain that heavy rain events make them feel uncomfortable.

- "If it is heavily raining, then I usually look up to the mountain side, and feel a bit uncomfortable, but not on a day like this" – Nora
- "When it rains. Once, it started to rain so much, while I was biking, that I felt I had to speeded up my tempo when I was passing that area of previous event. It is stuck in you" – Karoline
- "It is mostly the weather that triggers me. If it is days and nights with bad weather, I start to worry; increasing pulse, and flashbacks to previous experience. When they predict extreme weather events. More than 100 mm a day. Then I start to think It is going to happen again, asking myself whether I am prepared for a new event" – Kjirsten

Not only the weather triggers the respondents' negative feelings. So does strong river flows or seasonal changes. It reminds Karoline of the 30th of July:

- "Then I would think, if the river grows, there will be a new disaster. Then I usually feel unsafe, because I live here" – Karoline

Ingrid links negative feelings and memories to a specific situation that are not related to heavy rain events or river flows; once, she was triggered by a noise that reminded her of the massive flood event that ran off into her property the 30th of July.

- “Once, there was a truck that loaded off rocks. I remember the sound, and it brought me back to the experience. It is not in my control, just a reaction. The whole ground was shaking. At first you get scared, until you understand what is really happening” – Ingrid

Nowadays there are rarely situations in an everyday context that brings Ingrid back to the experience of the 30th July.

Anders from NVE, seems to react differently than the other respondents, and seem not to be worried about future events after his experience. Nora on the other hand, explains that she is more frightful for hazards, not due to her experiences, but because of climate change; she says that we need to understand that disasters may become more damaging and unpredictable in the future.

- “You need to be aware of the issue. Especially thinking about climate change. It may appear hazard events more often and in areas where it has never occurred before. Like this summer (30th of July)” - Nora

The other respondents seem to be more frightful for future hazards due to their experience.

- “The expert says that there is an insignificant chance for it to happen again, and the risk is not supposed to be higher than it already was the 30th of July. But they could not predict the 30th of July. They said the risk was low that day before it all happened, which I believe may occur again. But I understand that it was an extreme event because of the weather, and that’s what is most likely not going to happen again” – Kjirsten

Similar to Kjirsten, Ingrid explains that she can never be sure, and that she has mixed feelings about these measurements; she believes that the fears of it to happen again is an irrational mindset, and that the logic facts are in conflict to her feelings. It seems like she which she could trust the experts more than she does.

- “The logic facts and my feelings are contrasting from each other. That makes me not 100% sure. I know that there is a small chance of it to happen again, but the emotional impacts from the disaster are still in my mind. It is reactions that is not in my control”
– Ingrid

Ingrid does not live in her house anymore, due to her experience with the 30th July. She explains that she wishes she could feel safer in Jølster. She says that if she is to move back, she need someone to adapt to future hazard, and recover her private yard that was damaged by the disaster.

- “I need someone to secure that area to feel safe. But then I have to live her, because then I want to feel safe. But I don’t want the area to be damaged when I live here” –
Ingrid

Through the interviews the respondents seem to express that they have changed some of their behaviors. Particularly, individuals’ actions to reduce negative feelings driven by experience. In common for all, these actions seem to be activated though specific situations that reminds them of their experience, like when it rains.

- “I believe that I am more careful now than before. I am checking the weather forecast more often now than before. ‘The precautionary principle’” – Ingrid
- “I never drive when it rains too much. Before, I did not check the weather forecasts. Now I do. Especially if I am driving mountain roads». – Kjirsten

Nora explains how she avoids feelings that reminds her of the snow avalanche by prepare herself before being exposes to bad weather or are a place of previous event; checking the weather forecasts and turning down the volume on the radio whenever she drives the road of previous event.



Figure 14. Truck loading off rocks from the surface deposit after the 30th of July disaster (photo: Bent Are Iversen, 2019) Source: <https://www.firda.no/nyheiter/ras/jolster/nokre-grunneigarar-far-gratis-hjelp-andre-kan-fa-svindyr-eigenandel-etter-raset-i-jolster/s/5-15-881008>

Place Identity

This section portrays to what degree they identify themselves with a place (Dale & Berg, 2013): the level of emotional bond between peoples and place (level of place identity). The respondents seem to have different ways of expressing their level of place identity, and that descriptions are mainly based on the respondents' memories and experiences in Jølster.

All the respondents seem to have a strong connection to Jølster. Yet, for different reasons. Nora, Ingrid and Kjirsten grew up in Jølster and have strong relations to their family and family tradition from Jølster:

- “Very strong connection to this place. This place is where I am from. I guess I am a bit patriotic” – Kjirsten
- “This is ‘home’, it is special. I grew up here. My family and sister are also from here”.
– Nora

Not only family and family traditions are important for the respondents who grew up in Jølster. So, is Jølster's nature, esthetics and social life.

- "There is no other place prettier than Jølster (laughing). And there is a lot of nice people here too" – Kjirsten

Nature, family, and social relations are factors that plays an important role for all of them, and that it would be unacceptable to move away from this place; they are not willing to live in another type of environment. Nora believe nature is a 'key reason' for living here as it is easy to orientate and because she likes to spend time in Jølster's wild nature. She also believes that her attachment is linked to being comfortable in an environment she is familiar with. The city life would not be applicable: "extremely reluctant to move into a city, for example". – Nora

The surrounding nature or the people they meet does not only have a great value in itself but defines who they are. Through memories, experiences and, traditions that they have made thought generations.

Karoline and Anders did not grow up in Jølster, but they still define Jølster as their home, but express that they sometimes are longing for the environment they grew up in. Karoline says that her 'new' home has another type of nature than the one she came from. However, it seems like she loves spending time in Jølster's nature.

It seems experience has not changed what they feelings about Jølster, even after the 30th of July disaster. However, some of the respondents says that the disaster made them more frightful for new events. Ingrid believe that her place identity not have changed after her experience; there is a difference between emotional response from experience and emotional connections to a place.

- "I don't know, or not really (changed beliefs to place), because I still want to live here, and the chance of the same event will happen again is very small, I guess"

As written before, Ingrid moved to the other side of the Jølstravatnet after the 30th of July disaster, because she fears something similar could happen again. However, she wants to move back in her old house due to strong family traditions. She says that her family has lived there for generations, and that she wants her children to have a similar childhood; a large and safe place surrounded by beautiful nature. The other respondents seem to have similar beliefs to a place after experience.

- “No, absolutely no. However, I haven’t been reflecting too much about it” – Anders
- “I don’t think I feel that” – Kjirsten

Most of the respondents seems to be surprised about the 30th of July disaster and its critical outcomes, most of them knew a disaster such as this was a risk for the area. Nora explains that she was surprised it would occur her.

- “30th July was a disaster; it was a shocking experience. It all happened so fast. At the same time, if you think about it, we all knew that this was a problem. It has always been a problem. It was also a great reminder on that disasters may also occur you, not every other place in the world” – Nora
- “In the beginning I thought it was very hard. It has always felt so safe and lovely to live here, with a lot of good memories from my childhood, and then suddenly, a flood came out of nowhere. You would have never guessed or believe that” – Ingrid

Ingrid does also explain that she is very grateful to her neighbors. She believes that they had the same reactions as she, surprised about 30th of July disaster’s outcomes, fearing similar events in the future. They made her feel better, and she felt that she was not alone in a difficult situation.

- “The same is for them, they don’t want to move back, and they do not feel safe anymore. But it feels good to not be totally alone” – Ingrid

Box. 3. Nora reflections on Jølster and its environment.

“Jølster’s environment is shaped by steep mountain hills that surrounds a long and firm fjord, that is exposed to rivers and watercourses. Storms and snowmelts cause landslides, avalanches and floods – Jølster’s natural dynamics have always been like that. I know that looking at how they named different places in Jølster, a long time ago. There is a place that are named ‘Skrede’ (which means, ‘avalanche’ in English). Also, there is another old house was built with a specific structure that would prevent damages from floods and landslides, aimed to protects households from disasters. It can be seen as an old adaptation strategy”.

Nora explains that Jølster always have been vulnerable to natural hazards, and that the inhabitants have, through time learned how to adapt to this place in order to live safely. She is also explaining how her house is located in an old avalanche deposition. It looks something like a large landslide filled with big rocks. She knows it is an old deposit due to the trees and vegetation that covers the deposit; able to grow as a result of not being exposed to any disaster.

Attitudes on Adaptation and Recovery Strategies

In this section, I will present respondents attitudes about current adaptation and recovery strategies and presenting whether it changed after experience.

All the respondents seem to have opinions regarding current adaptation and recovery strategies. First of all, because they live in an area exposed for floods and landslides, where NVE regularly adapt for hazards or recover areas that are damaged from the previous events. They all seem to reflect the importance of these strategies and how important NVEs work are in order for them on order to be and feel safer from hazard, e. g Karoline puts a lot of trust in the NVE. She explains whenever NVE adapt to previous disasters, she feels safe, and that she believes they watch out for them.

- “I think that they keep an eye on us. They will contact us if something happens”. –
Karoline

However, the respondents do also criticize the adaptation strategies, that are action aim to keep them safe from disasters. Additionally, to critiques to current recovery strategies. Most

of the critiques is related to their experience and their involvement with the adaptation and recovery strategies. The respondents who are most involved in this research are those who have experienced disasters with damaging effect, especially on private ground. However, it is important to stress that none of the respondents' citizens NVE and the employees of NVE, but how decision-makers facilitate for NVE and develop strategies. This leads us to the 'cost benefit analysis', and how adaptation and recovering strategies are built on a hierarchical system, e. g. critiques to the authority's priorities, how much monetary value they put into adaptation and recovery strategies.

Kjirsten stresses how the current policy limits to improve adaptation that can be significant for hazards, and climate change driven hazards and disasters.

- "I guess that is already a debate. More support to NVE, more jobs and better adaptation strategies and facilities. There is an increasing need, especially thinking about climate change and future events" – Kjirsten

Ingrid criticizes the cost benefit analysis and that there is a lack of support to people who have experienced a damaging effect on their private ground, like she did the 30th of July disaster. She is afraid that she might have to pay most of the damage the disaster caused herself, without any monetary support, and that it is not NVE's job, but the policy; if the policy improves, it will be easier for people involved in disasters and the employees of NVE.

- "What can happen is that we don't get any monetary support, and we have to pay it ourselves. But I understand it is about the economy, and I believe that this is policy" – Ingrid

Anders, who works within NVE seems to agree with some of the critiques to the cost benefit analysis, but that they get a lot of requests from private persons that are involved in disasters, and that it is not NVE's task to take care of private persons' insurances. He stresses the issue as a challenge affecting his job; the issue is not only affecting employees in NVE, but also people involved in disasters. However, economic distributions mirror the quantity and quality of the work, and that the economic distributions, as it is today. These are too scarce compared to the quantity of projects in Norway. But it is important not to forget that the decision-makers mostly supply extra support in terms of need. At the same time NVE

precogitations depended on needs to prioritize as there are a lot of projects, where some seems to be delayed.

- “We can’t just conjure more money. But we can initiate project that helps people in difficult situation, and then get monetary support afterwards. Usually that works, the society are supportive in these situations. However, we are not uncritical in situations like these either, so there is a lot of expectations from us, and sometimes we need to delay ordinary projects” – Anders

Some of the respondents, like Kjirsten and Ingrid, does also give critiques to current adaptation policy as it goes through a hierarchal system, and that messages are hard to get through. Kjirsten says that she and other inhabitants of Jølster has a lot of knowledge concerning the place, and that adaptation and recovering strategies have not been satisfying. However, suggestions concerning how they could be done better are usually not getting through the authorities. She claims that there are many inhabitants that are suggesting changes that does not come through.

- “We have tried many times, and we know others that have done the same” – Kjirsten
- “They got their systems and strategies they have to follow, and its hierarchal system. I understand that they cannot take everyone feelings, values, opinions and experience into account, but I do feel that there is a difference between an area where it possible can possible occur a hazard and where it has already been a disaster” – Ingrid

Respondents explains that current policy effect what NVE has to prioritize, in regard to where they adapt, recover, where to map, and the time of each project. However, these tasks are challenging and that it would be impossible to cover every area in Jølster but suggest an improvement would had led to a safer community. Kjirsten and Nora explain that they don’t expect NVE to be able to predict every single natural hazard: “it is impossible to map every single area, and that tasks can be challenging” – Nora

Ingrid believes that the mapping system are one of the most important strategies to improve. After her experience, NVE found out that her household is within an area more exposed and vulnerable to hazards. This is not a surprise for Ingrid after her experience the 30th of July disaster. She also critiques the policy for not prioritize to protect every single household vulnerable area: due to the few households where she lives, the area was not

mapped. Additionally, because there only are damages on private ground, decision makers will not financially cover it.

- “They recently found out that our home is within a danger zone, but it still does not mean that you get a substation. There is still so much in our everyday we have to deal with. Jølster was supposed to be mapped. My home was not. Because it was within in an area with ‘only’ five households” – Ingrid

They also point out that individual measurements could possibly change from person to person, and that one person could evaluate and classify one area as safe, where another person evaluates and classify same areas as dangerous.

- “What’s interesting is that there does not exist any specific strategies, thinking about that one person would evaluate an area differently from another, which I find very strange” – Kjirsten
- “Should we open the road, close the road, is it safe enough? it is like if you put your finger in the air for measuring wind direction. It’s a qualified guessing and you will never be sure” – Nora

Ingrid does also believe that national policy is hypocritical in some cases; wanting the population to be spread throughout local Norwegian area, but at the same time, they are not secure every area with households for hazards. She believes that every single area with household should be mapped. She believes that the decision makers don’t support local areas good enough to fulfill their vision to make everyone safe, and that the cost benefit analysis limits NVEs vision to adapt and secure local areas. She also suggests that decision makers should apply more employees to NVE.

- “If we are supposed to have people living on the village, then we cannot always think cost- benefit. We should think that if we want more people living on the local villages, we also have to cover the costs that follows” – Ingrid

Ingrid raises other questions based on her experiences and gives critiques to how decision makers are separating private and public areas and rules concerning they meet people involved in traumatic situations and how to adapt in different areas. The day after her

experience, there were a lot of people in NVE inspecting her ground, checking if it was safe without asking for her permission.

- “If they want me to do much of the work (fix damaged areas on her private ground), why don’t they ask me before they inspect my private ground” – Ingrid

In other words, she was annoyed by suddenly finding people investigating in her property without asking, whereas the costs of almost all damage is on her. Like, if she is told that damage on her private ground are to be fixed through private substitutions, then decision makers should also treat it like private fund. But if they are to recover the areas, she should have had more substitutions and support from public interests.

Respondents opinions and attitudes to current strategies seems to be depended on the respondents’ experiences and degree of involvement, were Ingrid and Kjirsten seems to be more involved than the others due to the disasters damaging effect. However, Kjirsten did not experience any critical damage on her property, although the flood ran into her barn during the 30th of July disaster. However, the roadway close to her house was damaged, which were recovered through very short time after the disaster. Kjirsten seems to be very satisfied with that: stakeholders took care of all practical tasks, like insurance and restoration of landscape surrounding her household, and that is this because all damage was on public ground. She also adds on how short time it took until they finished. She is contrasting this to what she has heard about other households that still, one year after, working with restoring infrastructure and outside areas, which perfectly mirrors the description of Ingrid situation; still involved in adaptation processes, which are to be explained in the next paragraphs as a quotation.

- “I think I have already been on three different types of inspections, together with an appraiser, appraiser-sustention, nature-destructing-substitution, another nature-substitution etc, and then you need an entrepreneur to find out what thing possibly will cost. There are so many things you need to figure out and fix after a natural hazard, but if you experience it on the road, everything will get fixed for you”. – Ingrid

Nora explaining that it is not only the decision makers actions that effects current adaptation and recovering strategies, but the mentality of people that lives in (or plan to move into) local areas more exposed to hazards. She is focusing on issues linked to an areas physical risk and where we chose to live. She explains that people sometimes believe that

they can live wherever they want, without respecting the nature's risk. She believes we can save money on making better choices by respecting nature, without modifying it, only when it is highly needed to protect society.

This topic seems to give extra attention to the adaptation policy, believing that we should include and evaluate people's experiences and opinions, in order to do good for the environment: action aimed to protect nature, additionally reduce risk for hazards. Another way of saying, not choosing to live in area with beautiful nature with additional high risk of hazard, thinking it is possible to adapt to it. Rather choosing places that are less close to e. g. esthetical expectations, and not that risky, so that we both save money, nature and possible damage on society and infrastructure.

- "We think that we can adapt and secure ourselves against everything. We have the technologies to do that, also knowledge in regard to how we do it. However, maybe we could reflect more around that this includes risks; thinking, this area is beautiful. A nice spot, with a good view etc. but on the other hand, the place could be highly exposed to hazards." – Nora
- "Nowadays, we all need our own house, and traditionally we want to have an additionally cabin, and maybe another cabins another place. The more area we take, the higher chance is it to live within an area with high risk exposer" - Nora

Kjirsten shares similar thoughts as Nora, regarding where people are to settle down and the following risks, we don't pay enough attention to:

- "I think we have too much focus on settle down in areas that are beautiful but with too high risk for hazards" – Kjirsten

This perceptive is also concerned with critiques to the cost benefit analysis, in order to how we value nature out of monetary values. Nora believes the analysis and policies affects our attitudes, thinking that we can change nature like we want and that there is a monetary value that either limits action or gives desired standards.

- "Another consequence is that organs like NVE have to work harder and more to adapt in these areas, or something like that. That's just my thought" – Nora

Talking about humans' attitudes to nature are formed by certain policy like policy concerning adaptation, Nora arguing that people separate themselves from nature, not like we are a part of it anymore, which further leads to negative impact on nature:

- “This is just a hypothesis; we have distanced ourselves from nature. That we, as humans, kind of, raise ourselves above the nature. And that we forget that we are a part of it. And thereafter we have to find ourselves in a position where we can't just simply live wherever we want. So maybe, for example, an area where there is a high risk of avalanches. In this area, we already should take the conclusion that we can't live there, and maybe find another place” – Nora

Nora believes her thoughts on this topic is based on the fact that she lives in a rural area and due to her great attachment to Jølster; concerned in protecting the nature she grew up with and is surrounded with.

- “You become more aware of your home area's risk. You need to adapt to, to be able to live her. When you grow up in areas with a high exposure to risk of hazards, compared to other local areas of Norway, it also forms your attitudes and behavior” – Nora

All the respondents do also reflect the importance of the current adaptation and recovery strategies. Karoline explains that she does not know, in detail how they adapt or recover, but just the fact that they do, makes her feel safe and protected. This reflects the importance of adaptation in terms of feeling of safety in own home areas. Although it seems to be a variation between the respondents' opinions concerning how specific information should be in terms of how adaptation and recovery strategies are done.

Furthermore, some of the respondents raise attention to the importance of psychological support after being traumatized by an experience. Both Nora and Kjirsten give attention to their need for psychological support after their experience. Ingrid compares her situation to a car crash: when people are involved in an accident like a car crash, they are offered psychological support “maybe it is because it is a more common accident” – Ingrid. She believes that being experienced with a disaster is just as traumatizing as another car accident, and that experienced with disasters most likely would have had a positive effect by talking to someone professional, and not someone in their family relation, and someone not

involved in same disaster. This is what Kjirsten answer when I was asking if there should be organized more social support for people experienced with disasters:

- “Absolutely. I think we went through that process relatively ok, but I know that there are experienced people in this village that still won’t move back to their own home. There should be a social supportive organ for them because I think it would be absolutely necessarily”. – Kjirsten

Additionally, Ingrid suggest social support that concerns practical issues, like giving assistance to people that are experienced disasters, like insurance or giving information about how to restore damaged areas etc. Ingrid explains that it has been a difficult process, finding out who to contact in order to recover damaged areas, policies regarding the costs, and who is to pay what.

- “Will they help us clean and restore area? and do we get substitution for the destructed forest above our house? We are still waiting for our ‘nature-destructing-substitution’, and we still don’t know how much we will get” – Ingrid

One of the respondents from NVE suggest the opposite. He does not think that we should add an extra organization that supports people that are experienced:

- “Too many cooks spoil the broth. Currently we have ‘nature-damage-fund’, ‘insurance company’, ‘municipality’, that’s already enough people to deal with” – Anders

However, he does also understand Ingrid point of view; people who are experienced tend to ask NVE for help, when it is not their task, and that it would be much better if they were better informed.

- “People do not know who to contact either in situations like this. They want help and have expectations, where we already have a lot to do, although my job is very exciting” – Anders

Box. 4. Anders from NVE portrays why Jølster is more exposed to risk of floods and landslides, and the following importance of having adaptation and recovery strategies.

“There are differences between the east coast and west coast in Norway, thinking about the risk of floods: On the east part of Norway, flood events are normally slower in its movement than on the east parts of Norway because of the geography. Which means people are able to escape. Whereas on the west coast, floods became fast and big due to the steep mountains. In some cases, they may occur so fast that they are hard to escape to safety”.

“There are also more floods and landslides on the westside of Norway, due to steep hills that lays close to the fjord lines in Sogn and Fjordane, and Møre og Romsdalen. Also, Hardanger. The risk increases longer inside the land. So, along the coastline there is less precipitation than further inside the land, due to the effect when temperature cools down: Hot air absorbs more water than cold air. I am guessing that in on the west side of Førde and further in, is where it possibly rains most”.

“However, it is not only about the amount of precipitation, but also the soil. So that the soil in Romsdal for example, tolerates less humidity than the soil in Sogn og Fjordane and Møre og Romsdal, which leads to a higher risk of hazards”.

“Generally, the risk on Vestlandet is higher with more damaging consequences compared to the east coast of Norway. This fact explains the higher need of facilitation and employees in organizations like NVE on the west coast of Norway”.

“Through NVE we adapt before the hazard occur, like mapping areas of vulnerability and measuring risk. Though crisis we have to secure the flood event as it strikes. Also recovering damage after disasters. Additionally, develop an overview of when and how to act in crisis”

Climate Change Beliefs

This section portrays the respondent's beliefs in climate change, and if they believe that there is a link between disaster and climate change. Additionally, whether beliefs in climate change changed after experience.

In relation to this topic, I have asked if they feel or see any changes in the environment, and whether they think this has something to do with climate change. There are different opinions regards to this question: Ingrid believes it is hard to observe or feel any changes in environment (weather, processes, climate etc.) in her home area because of their climate has always felt unpredictable each season as long as she can remember. However, the disaster at 30th July have made her think about climate change due to its unexpected behaviors:

- "I think it is difficult to explain if there are some significant changes. It is because the winter season always have been unpredictable, and the autumn have always been wet. The world goes in cycles all the time, so I find it hard to answer. However, what we had this summer was special. It was so hot. Over 30 degrees Celsius, and so dry. And so much rain on such a short period of time. I cannot remember that I have ever experienced something like that before" – Ingrid

Other respondents, like Kjirsten and Nora, does seem to notice changes in climate and weather in Jølster, and blame it on climate change based on human activity.

- "Like this winter, less snow, and warmer temperatures. Almost no frost during the nighttime. I know that back in the days, when my grandfather was young, at that time there was always a lot of snow in Jølster. It was also sunny and nice days, but the summertime is not summer anymore. The weather is not very good, and it rains a lot. You can get some good days; however, we had a dry season last year. We have never had that before. This also affects the grass. I know because we had to put in water arrangements in Jølster!" – Kjirsten

Nora does also express how seasons were more constant before and that there is more precipitation now than before. She further explains her beliefs that, though a global perspective and gives reasons for why dangerous climate change impact local areas, and that she may observe these local changes.

- “How can you even believe that, knowing the consequences of CO₂, that you can emit too much CO₂, and think that it does not have any consequences? We also know that it is the humans that emits CO₂, so there is no doubt that climate change has anthropogenic drivers”. – Nora

Climate change seems to be a sensitive topic as it brings up negative feelings like anger and frustrations, during the interviews. Both Nora and Kjirsten seem to be convinced that human activity leads to climate changes issues and that there is a correlation between human activity, like GHG emission, increasing extreme weather events and disasters.

Nora further suggest that, as issues cornering climate change is complicated makes it harder for people to understand the importance to act pro environmentally. She then refers to a former prime minister Kåre Willock who argues that it is important to act even though you are skeptical to anthropogenic climate change. It is worth changing behaviors, as the consequences of climate change may be critical and damaging, like the 30th of July disaster was. Climate Change is an issue that are diffuse and complex, and people do not act as they do not understand how dangerous climate change issues are. The topic trigger Nora emotionally.

- "Speaking of climate change, it really provokes me. It really makes me angry and I cannot argue against it...and even if it was not a problem, do we afford it if it? Like Kåre Willock once said: you ensure your house, not because you think it will burn, but because there is a chance for it to happen” - Nora

All the respondents seem to believe that human activity effect the climate and that there will be an increasing risk of disaster. They also link the 30th of July disaster to climate change as the impacts devastating, and due to the heavy and unpredictable precipitation.

- “Yes, I believe so. When there is more precipitation, there will be more flood and landslide events, and I guess that is climate change...I believe it is human made, although sometimes I hope it is not” – Karoline

Further on, Karoline explains that she also is tired of climate change topic. She explains that she feels guilty for not doing good enough for the climate, but that she is not able to, due

to how the current climate change policy is shaped. She is not the only respondents who says this. Almost all the respondents spontaneously refer to their traditions of farming (independent of my questions) and the GHG emission due to their culture of farming.

- I disagree on reducing farming activities to reduce climate gas emission, and Jølster does not have a high rate of climate gas emission” – Kjirsten
- “I also think it is strange to think about that you cannot have livestock, which makes it more difficult to answer if climate change is impact by humans. However, we do pollute more than we did before...but I have not made a good enough understanding regarding climate change as a topic, so I am not sure” - Anders

Anders says that he understands other people’s worries concerning climate change, especially those who experienced 30th July with damaging effect. On the other hand, he reflects about that there is given too much attention to climate change within the community. He is worries about the increasing attention to climate change is based on incorrect knowledge, like, although there is an increasing risk of flash floods in Jølster due to more extreme precipitation based on climate change, all disasters do not always correlate with increasing temperatures based on anthropogenic climate change.

Karoline seems to have similar opinions, although she is more concerned about the climate change policy, and that the policy does not suit rural and local lifestyles.

- “There is also too much they tell us that we cannot do anymore. For example, that we have to stop farming livestock. I don’t event eat that much meat. But I cannot feel guilt for everything. Rather cut the flight than the cows. However, I don’t know too much about this” – Karoline

Karoline further explains that she feels that she is never able of ‘good enough’ for the environment; Jølster’s social structure and environment makes her dependent on her own car as there are public transport that would drive her to her work.

- “I need my car when I am going to work, there is not enough busses here, and I cannot bike on these roads with so much traffic. In the end I feel it becomes a bit too much talk about climate change in the news” – Karoline

On the other hand, Nora thinks that there should be given more attention to these topics through policies. Also, that there is a lack of attention to and climate change adaptation, as there will be more extreme weather events in future.

- “I think policy gives too little attention to climate change issues. There is a rising risk of hazards due to climate change. Also, that, hazard may appear in areas where it has never happened before due to rapid extreme weather events, like this summer, 30th July” – Nora

Discussion and conclusion

Below I will discuss how respondents experienced and emotionally reacted to the 30th of July disaster, and how reactions are linked to risk perception. Furthermore, I will be discussing whether the disaster impacted the respondents' level of place identity, and perception of risk of living in Jølster. Then, discuss attitudes to adaptation and recovery strategies, and climate change beliefs.

This chapter is divided into five sections: each section aims to answer its respective research question. Findings are discussed in light of relevant literature, as well as discovering new patterns and relationships. Limitations to the current study and its findings are presented, along with suggestions for future research. Lastly, presenting an overall conclusion.

How did the respondents experience the disaster, and what emotional response did the experience cause?

As described in 'Story of Experience', all the respondents have stories to share about their own experiences with disasters and events like floods, landslides or snow avalanches. However, respondents generally give more attention to the 30th of July disaster; there is a great variation in how they experienced the disaster. Nora experienced the disaster indirectly: she was not in Jølster during the disaster but was informed through news and family.

Karoline experienced the disasters through an emergency team, looking after those who were evacuated, and Anders through his job in NVE. Although Anders had just finished his work before the disaster occurred, due to his profession and the urgency of the situation he had to unexpectedly join in efforts to protect the community. The last two respondents, Ingrid and Kjirsten, experienced the disaster directly in their households. Specifically, the flood ran in to Kjirsten's barn with livestock, and Ingrid's home. Both had damaging effects. However, most of the damage Kjirsten experienced was on the surrounding public areas, while the flood largely damaged Ingrid's home and private grounds.

In addition to the physical impacts caused by the disaster, the respondents were emotionally affected by their experiences. Moreover, their emotional reactions seem to depend on whether and to what degree their homes and/or surroundings were physically impacted. Put differently, how respondents experienced the 30th of July disaster is linked to the level of emotional reactions.

Commonly for all the respondents is that their experience imprinted strong memories connected to the disaster. In comparison to those who experienced the disaster indirectly, those who experienced it directly seem to have stronger negative feelings associated with the disaster and that these feelings endure over time. Especially for those who experienced physical damage. This is clear when comparing Nora's experience with what Ingrid and Kjirsten experienced, as presented in 'Story of Experience' and 'After Experience'. Nora says she did not think too much about the disaster while it happened, because she was not there, and did not think it would cause so much damage. She initially thought it was a normal event. She further explains that she was surprised of the physical impacts. She expressed little emotional impact other than that she sympathizes for those who were more involved, traumatized and experienced damage. The other respondents seem to be more emotionally affected than Nora, especially those who experienced damaging effects. They report more negative feelings, that they are more easily triggered and are more fearful of hazards. The other respondents were more involved with the disaster and reacted differently than Nora did. Additionally, the other respondents' stories were richer and more detailed, most likely a consequence of experiencing the disaster directly.

Comparing Nora reactions to those who experienced 30th of July disaster direct without damaging effect and with damaging effect. Like, Ingrid who experience triggers that gives her flashbacks from the disaster, e. g feeling anxiety and terrified whenever it rains heavily as these dynamics reminds them of the disaster. Additionally, she does not live home as she fears hazards.

Anders perspective stands out from the others; does not feel emotionally affected by the 30th of July disaster except for that he, like Nora, sympathize a lot for those who were more involved. Maybe he is used to experience disaster directly more frequently as he seeks the events through his job?

In addition, it seems like negative feelings are linked to specific areas, and that the respondents are more emotionally impacted due to where the disaster occurred. This is seen in 'After Experience', e. g. Ingrid experienced the 30th of July disaster within their households, but right after her experience she moved away. Additionally, Nora does also fear to drive a specific road as she fears a new snow avalanche due to previous event. However, these are indications, and not clear results on whether it is possible to divide between individuals' reactions to experience and fear of hazard linked to a specific location.

These results become important in order to understand people's emotional reactions to experience with disasters. Anyhow, we cannot assume that these result counts for the whole

community in Jølster, or other areas in same situations. Additionally, there is not a clear answer to a relationship between experience and emotional reactions. Particularly, direct or damaging effect cause stronger emotional reactions, compared to indirect. These are among others, due to Anders reactions differs from the other respondents: experienced disaster directly without reporting any emotional reactions from his experience.

Yet, the result supports Brown (2017) and Wachinger et al., (2013) studies, claiming that people that are experienced with disaster may change individuals' cognitions, to different degrees depended on experience. Additionally, direct experiences report stronger emotional response than indirect experiences, especially for those who experienced damaging effect; damaging impacts effects individuals concerns regarding personal consequences, like worries or anxieties about personal wellbeing (Raaijmakers et al., 2008; Wachinger et al. 2013). Suggesting an interesting further research project is to look into other factors that may affect individual emotionally linked to disaster, or if peoples given role in a disaster impacts attitudes to previous experience with disaster, e. g people in NVE's experience compared to a private person's experience.

Does the respondents' emotional response, from the experience with the disaster indicate changes in individual risk perception?

As described in Theory section, 'Risk' is defined as the degree of exposure to natural hazards and the potential of such hazards to impact human values (Bye et al. 2013; Aven & Renn, 2009), and 'risk perception' is defined as an individuals' beliefs of risk: emotional and cognitive process affecting individual's and societies perceptions (Van Der Linden, 2014). In context of this section, results embrace the link between individual's risk perceptions, and emotional and cognitive processes driven experience; emotional response after the 30th of July disaster.

The results in the section above suggests that the respondents' level of emotional response is depended on the way they experienced the 30th of July disaster: direct experiences, especially for those who experienced damaging effects, reports higher levels of emotional response compared to indirect experience. Anyway, how come this result indicate changes in respondents' risk perception? The respondents do not tell directly in the interviews whether they believe they changed their risk perception after their experience or not. This section suggests that emotional response driven by disaster have an effect on individuals risk perception. This suggestion is based on relevant literature research.

According to Wachinger et al., (2013) and Van Der Linden (2014), experiencing disaster effect human cognitions and that changes are linked to in individuals risk perception. Also, that direct experiences lead to more intense and long-lasting negative feelings than indirect experiences, which leads to a change in risk perception: perception of increasing risk (Wachinger et al., 2013; Van Der Linden, 2014). Raaijmakers et al., (2008) does also support this suggestion: Strong emotional response from experience lead to a strong change in risk perception and that the extent of level of changes in risk perception depends harshness of the impacts of the disaster. These researches corresponded with this thesis respondents' reactions to the 30th of July disaster: As written in 'After Experience', Ingrid and Kjirsten have more negative feelings than the other respondents. Nora has little emotional impact other that she sympathizes for other directly involved. Additionally, results imply that those who experiences the 30th of July disaster direct are more fearful of hazards, like, Ingrid reactions to disaster was to move away from her household right after her experience.

Further, results indicate the respondents who acts in regard to reducing negative feelings or acts in order to increases control of potential hazards (mitigation strategies), changed perception of increasing risk. As written in 'After Experience', the respondents have changed behavior in specific context that reminds them of the 30th of July disaster; reduce negative feelings by e. g checking weather forecasts more regularly or checking river flows in order to gain more control. These reactions are linked to risk perception as reactions portrays increasing emotional response: Behavior confirms increasing emotional response, and increased emotional response is linked to perception of increased risk. Furthermore, the respondents' reactions to the 30th of July disaster mirrors the RPM presented in Theory section.

However, not all results indicate changes in risk perception. As written in 'Story of Experience', Anders did not react emotionally after being directly experienced with the disaster. However, he pays a lot attention to how he sympathizes for those who were involved. Likewise did Nora, who experienced the disaster indirectly. On the other hand, Wachinger et al., (2013) explains that sympathizing for the people suffering from disaster is a factor of changing people's risk perception. In other words, the results suggest that Anders and Nora seem to have an increased level of emotional response due to the disaster; sympathizing for others may me another way of expressing emotions driven by experience.

Furthermore, these results do not give a clear answer to whether or not the respondents changed their risk perceptions after experience, nor if there is a strong relationship between emotional response and changes in risk perception. As written in the introduction, risk

perception is a complex field of study where many different variables influence an individual's reactions to and judgement of disasters (Brown, 2017; Wachinger et al., 2013); results may only work as an indicator for possible changes in risk perception. Additionally, there are individual differences in reactions to disasters, where other respondents could possibly disprove presented results, like illustrated in RPM, individual differences and personalities.

The relationship between risk perception and emotional response to experience can however be important topic for future risk perception analyses; increased physical risk of natural hazards is a sufficient reason for giving more attention to topics like people's emotional reaction to disaster or changes in risk perceptions after experiencing disasters. These knowledges may be important in regard of understanding local communities needs after experiences with disasters, for an increased social well-being.

What is the respondents' level of place identity, and did the experience have a changing effect on level of place identity?

According to Dale & Berg (2013), people's connection to a place forms their identity, and to different degree. Results indicate that all the respondents have a high level of place identity. Commonly, they mention nature, family and friends, traditions, job and social life, as key factors for their strong connection to Jølster. These factors may be a part of what they identify themselves with.

Furthermore, results indicate that there are differences in the respondents' level of place identity, depended on whether they grew up in Jølster or not. The respondents who grew up in Jølster seems to have a higher relation to place than those who did not. This result is supported by Dale & Berg (2013) studies: 'the born and bred narrative', and the tendency of ambivalent relationship to place. As shown in 'Place Identity', the respondents who grew up in Jølster (Nora, Ingrid and Kjirsten) explains that they have deep roots with strong family traditions, which mirrors Dale & Berg (2013) 'born and bred' narrative. These respondents do also claim that they would never leave Jølster or live another place with a contrasting environment (e. g urban areas). Karoline and Anders moved in to Jølster and has a more ambivalent relationship to place compared to the other respondents. They both explains that they sometimes miss the environment in what they grew up in. Additionally, they explain that family and job is the main reason for why they moved into Jølster. On the other hand, they do claim that Jølster is their home now, and that they feel highly connected due to their family, and friends, and that their job in based in Jølster.

The result suggest that all the respondents have a strong relationship to Jølster as it is a rural area. They all seem to prefer the rural environment as they are more used to, compared to environment in urban areas. Dale & Berg (2013) supports this result by portraying the concept of ‘elective belonging’: respondents choose to live in an area that suits their identity.

Furthermore, the results imply that the experience with the 30th of July disaster did not change the respondents’ level of place identity. As shown in ‘Place Identity’, Ingrid declares directly through the interview that an experience is not able to change her identity to Jølster, and if so, to a very little degree. Ingrid does not live in her household anymore due to her experience. But she wants to move back so that her children may grow up in a house were family traditions are strong.

It is challenging to measure individual’s relation to place and whether it changed due to an experience through qualitative study; different experiences and factors that defines their place identity. These results do not count for the whole community in Jølster; however, it gives an insight on what the inhabitants of Jølster may identify themselves with, and how valuable and important a particular place is for the respondents. This may be an interesting topic for future research, e. g investigating the important of valuing inhabitants’ relationship to place in regard to modifying nature, e. g adaptation and recovery activities based on environments risk and social opinions and needs in order to sustain inhabitant’s well-being.

Did the experience lead to changes in individual’s perception of risks linked to living in the area?

As written above, ‘risk perception’ is defined as how emotional and cognitive process from experience, affects individual’s perception to risk. In context of this section, results embrace individual’s risk perceptions linked to a particular place: emotional and cognitive processes driven by individuals place identity, and whether these processes and/or experience affects individuals risk perception.

The results imply that there is a link between risk perception and high level of place identity: A decreasing effect on risk perception before experience disaster, and an increasing effect on risk perception after experience disaster. This result is based on comparing relevant literature research to this thesis empirical research.

According to Wachinger et al. 2010, risk factors forms parts of their identity, were individuals place identity becomes an optimistic bias before experience disaster. This has a decreasing effect on risk perception: People underestimate or don’t believe they are in risk of experiencing negative events when they are measuring risks within particular places

(Weinstein, 1989; Sharot, 2011). Meaning that the people with a strong relationship to a particular place downplays risk in same area; “strong nationalist feeling downplayed the perception of a constant risk” (Wachinger & Renn, 2010 p. 17).

As written in ‘Place Identity’, the results suggest that all the respondents have a high level of place identity. Especially for Nora, Ingrid and Kjirsten who grew up in Jølster. Suggesting, that the respondents’ level on place identity had a decreasing effect on risk perception before they experienced the disaster. These results are also seen as the respondents have been underestimating the power of the 30th of July disaster: they were highly surprised about its critical outcomes and it seems like they would never expect a disaster like the one on the 30th of July disaster to occur to them.

In other ways of saying, results suggest that the 30th of July disaster had an increasing effect on the respondents’ risk perception because their expectations of place changed after experience: Jølster seems to feel more unpredictable for hazards than before the experience. Additionally, as shown in ‘After Experience’, some of the respondents became more frightful for hazards after their experience with the 30th of July disaster. Especially those who had a direct and damaging effect, like Ingrid did. She portrays that the disaster went over their expectations in regards of from what they are used to expect from. Also, that she, nor her elder relatives, have never experienced a disaster like that before. Also, that it must be something unusual stressing the flash floods, like climate change, because the 30th July disaster was beyond their control. Sharot, (2011) and Weinstein (1989) supports the results, showing that people cannot predict the risk of hazards to the same extent as they did before an experience: overestimate a place risk after experience.

Perception of increased risk seems to be connected to specific locations within an area, like Vassenden in Jølster. In regard to that, the results suggest that specific locations of previous disaster seem to feel more unpredictable than it felt before the experience. As written in ‘After Experience’, results indicate that respondents react more emotionally in areas linked to a previous disaster: Karoline explains that she becomes sad whenever she passes the area of where a man lost his life in the 30th of July disaster; and both Nora and Anders become anxious whenever they pass an area of previous snow avalanche disaster. Supposedly, the respondents increased risk perception linked to specific locations in Jølster. These results are supported by Wachinger (2013) studies: risk perception is changed in relation to specific areas of disaster. Results are based on two different studies in France, showing that individuals’ risk perception increases in areas of where individuals did experience muddy flood; increased risk was geographically defined by the flood (Wachinger et al., 2013).

On the other hand, Nora explains that she knew Jølster was highly exposed to risk of disaster. As seen in ‘Story of Experience’, she was surprised by the 30th of July disaster, she seems to be more surprised that the disaster occurred within her lifetime; she knew it was an issue but was not prepared for experience it herself. Previous literature supports that this result is connected to risk perception as she has a ‘distancing attitude’. This way of thinking effect risk perception: According to Weinstein (1987), distancing attitudes has a decreasing effect on individuals risk perception.

Anyhow, as written in the Introduction, risk perception is a complex field of study, and that it is challenging to estimate whether the respondents changed their perception to risk through thesis results. However, these results provide a new insight into the relationship between experience and risk perception linked to living area, and how people may value a place differently after experience.

What are the respondents’ attitudes to adaptation and recovery strategies and climate change, and did they change after experiencing the 30th of July disaster?

Adaptation and Recovery Strategies:

The results suggest that attitudes concerning current adaptation and recovery strategies vary between the respondents. However, they commonly give critiques to the cost benefit analysis and the hierarchal system adaptation and recovery policy is based on. As shown in ‘Attitudes on Adaptation and Recovery Strategies’, Anders explains how economic distributions mirror the quantity and quality of the work, and that the economic distributions today are too scare compared to the quantity of projects in Norway. Additionally, some projects are being delayed. On the other hand, he explains that, the decition-makers mostly supply extra support in terms of need, and that he is very satisfied with the NVE and decition-makers cooperation.

Kjirsten stresses how strategies not have been satisfying, and that it is hard to give suggestions to improvement to the policies due to the hierarchal system. It seems like she believes that they underestimate, or do not take local knowledge in to account when improving or developing adaptation and/or recovery strategies.

Nora gives critiques to the cost benefit analysis; being skeptical to the cost benefit analysis as it gives monitory value that either limits action or gives desired standards.

Additionally, she believes that the current policy has a negative influence on people's attitude: people tend to believe they can live wherever we want without embracing an areas risk.

The result suggest that the respondents sees the great importance of current strategies. Like, Karoline: As shown in 'Attitudes on Adaptation and Recovery Strategies', she may relax and feel safe every time she seen a car from NVE passing her house.

Anyhow, these opinions do not seem to be driven by the 30th of July disaster, as every time they portray their opinions to adaptation and recovery strategies, they are exemplifying memories of other flood and landslide events, which not necessary has been damaging. These are rather opinion developed though other experience of living in Jølster. The results suggest that, as Jølster is more exposed to hazards, the inhabitants become more involved with strategies, and that they are used to observe services like NVE working in field aimed to secure the community.

On the other hand, Ingrid seems to have changed her opinions in regards of current adaptation and recovery strategies after her experience with the 30th of July disaster; it seems like she got a better insight in what the strategies includes. First of all, she believes in improving current policy for mapping systems: After her experience with the disaster, NVE found out that her household is within an area highly exposed to hazards. Her household was not mapped due to few households within a specific area. She is disappointed that they found out about this after the disaster, as it was traumatizing, and had damaging effect on her property.

Furthermore, she explains that the policy will not give her enough substations for the environmental damage caused by the disaster. Suggesting that there is a lack of support to people who have experienced damaging effect on private ground. She also believes that the policy that concerns adaptation and recovery strategies are in some cases hypocritical: Engaging people to move into local areas of Norway, without securing every household.

Further on, Ingrid explains the difficulties that follows damages on private areas, contra public areas. Results shows how Ingrid seems to be more involved than the others due to the disasters damaging effect. Kjirsten did not experience any critical damage on her property, although the flood ran into her barn during the 30th of July disaster. The roadway close to her house had damage, which were recovered though very short time after the disaster because it was within public areas. Kjirsten seems to be very satisfied whit the recovery.

Moreover, the result suggests that people who experienced damaging effect feels a need for psychological support: both Nora and Kjirsten stress their need or the importance after traumatizing experience. On the other hand, the respondents from NVE suggest the

opposite. He does not think that we should not develop extra organization as we already have too many organizations involved in situations like the 30th of July disaster.

These results provide a new insight regards to respondents' attitudes to the cost benefit analysis, and how they suggest improvement to the adaptation and recovery policy. These results could be interesting approaches to further research, e. g investigating peoples need of social and psychological support after experiencing disasters.

Climate Change:

The results suggest that that experiencing disasters rise attention to people's awareness or attention to climate change. As written in 'Climate Change Beliefs', it seems like the respondents reflect more about the climate change issues after their experience with the 30th of July disaster. Additionally, that experiencing disaster with damaging effect, indicate a change in climate change beliefs, like Ingrid, who has been reflecting more about anthropogenic climate change after her experience. Lujala et al. (2015 p. 490) supports Ingrid reaction, showing that "those who have experienced direct experience with natural hazards are more concerned about climate change issues". Additionally, does Spence et al. (2011), where study results show that people who have experience with flood events are more worried about climate change impacts and more willing to do good for climate.

On the other hand, the other respondents did not change their beliefs to climate change after the 30th of July disaster. As written in 'Climate Change Beliefs', the respondents believe that climate change issues are driven by human activity. Both Nora and Kjirsten seems to be convinced about these beliefs, and that they have seen changes in environment that they link to climate change issues. Not all the respondents have the same attitudes to climate change as Nora and Kjirsten has. Instead, Ingrid are more skeptical to visual changes in the environment due to climate change, and that the climate in Jølster has always felt rough and variable as long as she can remember. Moreover, the result suggests that most of the respondents link the 30th of July disaster to climate change due to the critical impacts, and due to the heavy and unpredictable precipitation that stressed the disaster.

Climate change seems however to be a sensitive topic for all the respondents, as it activates feelings like anger and frustrations during the interviews, and for different reasons. As written in 'Climate Change Beliefs', both Kjirsten and Nora seems so be extremely worried about our coming future. These frustrations lay in anthropogenic climate change issues and that there should be given me more attention to climate change in the current policies. However, other respondents seem to disagree with this opinion, explaining that

policies give too much attention to climate change. Karoline explains that she also is tired of listening to the climate change policies, and that she believes that climate change policies is not suitable to local rural areas like Jølster. As a consequence, she feels guilt; Karoline exemplifies how depended she is on her car, and that there are no cooperative transportations that is suited her job. Another example concerns Jølster's traditions of livestock farming. The results suggest that respondents feel blamed for being a part of this tradition, due to its GHG emission it causes. Most of the respondents does not believe that this tradition is a key reason for increased climate change issues, and that it is unfairer that people in rural areas are being blamed on. These results to portray another reason for why climate change is as a sensitive topic, especially concerning how all the respondents brought up this topic in depended on my questions.

These result does not count for the whole community, or other local and rural areas in Norway. However, the results provide an improved understanding on people of rural areas attitudes on current climate change policy, and how emotionally impacted the respondents are. Especially concerning their traditions of farming. This is also an interesting topic to look more into; e. g investigating local perception of current climate change policies, or how policies could be better improved to local and rural areas in order to fulfill inhabitants needs, and reduce national GHG emissions?

Overall Conclusion:

The results indicate that there is a variation in how the respondents experienced the 30th of July disaster and that these can be divided into two categories: four direct experiences and one indirect experience. Two of the respondents experienced damaging effects from two different flood during the 30th of July disaster. Commonly, all the respondents reported that they were surprised and shocked by the massive damage that the disaster caused, especially with regards to how abruptly the disaster occurred. The findings suggest that how the respondents experienced the disaster is related to their emotional reactions. Specifically, respondents who had direct experiences, especially those who experienced damaging effects, reported strong emotional impact.

The respondents' emotional response driven by the 30th of July disaster indicate changes in individual risk perception: strong response to experience leads to an increasing perception of risk. Additionally, sympathizing for people involved in disaster, can be seen as another emotional reaction driven by experience, and indicates an increased perception of risk. However, result is not reported directly from the respondents, rather supported by

relevant literature research: relationship between increased perception of risk and strong emotional reactions driven by experience. The results corresponded with the RPM, 'After experience'.

Furthermore, the results indicate that the respondents have a high level of place identity, especially the respondents who grew up in Jølster. Additionally, that level of place identity did not change after their experience with the 30th of July disaster. However, results indicate that the experience of the 30th of July disaster increased most of the respondents' perception of risks linked to living in the area: place feels more unpredictable and respondents are more frightful of hazards after experience linked to a particular place. Also, high level of place identity has a decreasing effect on risk perception before experiencing disaster: strong attachment to place becomes an optimistic bias to risk perception, where people tend to underestimate the risk to a particular area before experience. These results corresponded with the RPM, 'Before experience'.

Moreover, result indicates a greater variation in the respondents' opinions regarding current adaptation and recovery strategies. However, they commonly give critic to the cost benefit analysis. Also, results imply that respondents who experienced damaging effect are suggesting that decision makers should offer social and psychological support for people that have experienced disaster.

The results imply that all the respondents believe in anthropogenic climate change and that there is a link between increasing incidents of disaster and climate change. Climate change is however a sensitive topic for the respondents, and they are all critical to current climate change policy. To summarize: there is a lack of attention to climate change issues in policies and climate change policies do not suit Norwegian rural and local areas lifestyles. These opinions do not seem to be affected by the 30th of July disaster.

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Vil du bli intervjuet til en masteroppgave om skrederfaring, risikooppfatning og menneskers holdninger til klimaendringer?

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å finne ut hvilke faktorer som endrer holdninger knyttet til risikovurderinger etter skred- og/eller flomerfaring. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål

Prosjektets formål står i sammenheng med masteroppgaveskriving ved institutt for geografi ved NTNU Trondheim. Hovedmål til oppgaven er å forske på lokalbefolkningens holdninger til skred og flom etter egen erfaring. Foreløpig tittel er: *«Risk perceptions and role of experience; a qualitative study of people's thoughts on flashflood events in Jølster, Norway»*.

Oppgaven definerer «erfaring» som mennesker som er påvirket av flom og/eller skred i hjemområdet sitt. Det vil si at man må nødvendigvis ikke ha opplevd flom og/eller skred fysisk (personlig, hus, hjem osv..) men i hjemmeområde/hvor mennesket har tilhørighet (hjemme, sentrum, på vei til jobb, naturområder man ferdes i osv.)

Oppgaven vil også fokusere på lokalbefolkningens holdninger til sted og tilhørighet, tilpasning av naturkatastrofer og klimaendringer.

Ettersom erfaring med skred og/eller flom kan oppleves traumatisk og følelser kan potensielt være «fanget i kroppen», vil jeg informere deg om hvilke problemstillinger oppgaven min tar i bruk slik at du kan være forberedt på hvilke typer spørsmål som kan oppstå under intervjuet. I tillegg, om det er det noen spørsmål du ikke ønsker å svare går det helt fint, eventuelt om du kjenner at du mistrives under intervjuet avslutter vi når du måtte ønske det.

Masteroppgaven har en foreløpig hovedproblemstilling med følgende underproblemstillinger for å spisse oppgaven. Disse er (oversatt til norsk):

Hovedproblemstilling: «Hvilke faktorer endrer mennesker risikooppfatning av naturkatastrofer etter egen erfaring?»

Underproblemstillinger: «mennesker som har erfaring med flom og/eller skred, ...

- ... er de mer bekymret for fremtidige lignende hendelser enn det de var før erfaring?
- ... opplever de situasjoner i hverdagen som trigger følelser av tidligere erfaring med flom og eller skred? (eventuelt hvilke situasjoner trigger disse følelsene?)
- ... har de endret perspektiv på hjemme sitt/sin tilhørighet til sitt eget hjem?
- ... tror de at det er en sammenheng mellom forholdet mellom menneskepåvirket klimaendring og flom og/eller skredhendelse (naturkatastrofer).

Hvem er ansvarlig for forskningsprosjektet?

Mitt navn er Una Tveit Hauan og jeg er masterstudent ved det toårige programmet «Natural Resources Management». Dette forskningsprosjektet er en del av mitt 60 poengs (et-årlig) masteroppgaveskriving. Institutt for geografi ved NTNU Trondheim er hovedansvarlig for prosjektet. Veileder for prosjektet mitt er Haakon Lein.

Forskningen tar også del i et større prosjekt arrangert av institutt for psykologi ved NTNU. Prosjektet heter World of Wild Waters (WoWW), og deres mål er å utvikle er VR-spill om klimaendringer og naturkatastrofer. Spillet er opptatt av å gi informasjon knyttet til tema og endre folks holdninger til å bli mer miljøvennlige. Du kan finne mer informasjon på nettstedet deres, www.woww.no. Her finnes det også en liste over personer som jobber med prosjektet (team). Av dem så har jeg hovedsakelig kontakt med Amanda Lai.

Masteroppgavens del i dette forskningsprosjektet vil være å hente informasjon til spillet; intervju av lokalbefolkning angående skred og flom og holdninger til klimaendringer.

Hvorfor får du spørsmål om å delta?

Jeg spør deg ettersom du kommer fra eller bor i et lokalt område i Norge som har hatt erfaring med flom og skred. Område (Førde, Jølster omegn) er bestemt ut ifra geografi og hydrologi, og dens tidligere hendelse ved Jølster 30 juli 2019 ettersom følelser og beskrivelser ligger ferskere i minnet sammenlignet med andre hendelser i Norge, og av egne praktiske grunner som bo og studieplass.

Oppgaven er interessert i opp mot minst 3 timer med data. Det vil si 3-4 personer. Metoden jeg har brukt for å komme i kontakt med deg og andre aktuelle personer er gjennom nettavis (blant annet Firda ang skred og flom den 30 juli 2019), venner, eller at andre kontaktpersoner eller venner som har tipser meg om andre.

Hva innebærer det for deg å delta?

- *Forskningsprosjektet tar i bruk kvalitative dybdeintervjuer (to personer: intervjuer og intervjuobjekt)*
- *Hvis du velger å delta i prosjektet, innebærer det at du svarer på spørsmål jeg har utarbeidet til dette forskningsprosjektet.*
- *Det vil ta deg ca. 45 til 60 minutter.*
- *Dine svar fra spørreskjemaet blir registrert elektronisk ved lydopptak, der etter transkribert og slettet fra hvor lydopptakene blir lagret.*
- *Navn vil ikke bli tatt opp, men beskrevet i nummer på intervju i starten for ordensskyld, hvilket slettes i senere tid.*
- *Andre personopplysninger som alder, kjønn, jobb, livssyn osv., vil ikke være relevant for oppgaven min.*
- *Jeg kommer også til å intervju en «ekspertgruppe». Det vil si et ekstra dybdeintervju med NVE om mulig.*

Det er frivillig å delta

Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykke tilbake uten å oppgi noen grunn. Alle opplysninger om deg vil da bli anonymisert. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger

Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

- *Dem som har tilgang ved behandlingsansvarlig institusjon er meg (student) og veileder.*

- Tiltak jeg gjør for å sikre at ingen uvedkommende får tilgang til lydopptak og annen personinformasjon er (som nevnt i «hva innebærer det å delta for deg?»): navnet og kontaktopplysningene dine vil jeg erstatte med en kode som lagres på egen navneliste adskilt fra øvrige data, lagre datamaterialet på forskningsserver, innelåst/kryptert.
- Svar vil bli omformulert og anonymisert.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?

- Prosjektet skal etter planen avsluttes slutten av desember 2020.
- Alle opplysninger og lydopptak vil bli slettet fra sin lagringsplass.

Dine rettigheter

Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke personopplysninger som er registrert om deg,
- å få rettet personopplysninger om deg,
- få slettet personopplysninger om deg,
- få utlevert en kopi av dine personopplysninger (dataportabilitet), og
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?

Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra *Institutt for Geografi NTNU* har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer?

Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:

- Student og oppgaveskriver: Una Tveit Hauan, +47 48050778 på epost (unath@stud.ntnu.no)
- Veileder: Haakon Lein, 73591913 og 91897634, på epost (haakon.lein@ntnu.no)
- NSD – Norsk senter for forskningsdata AS, på epost (personverntjenester@nsd.no) eller telefon: 55 58 21 17.

Med vennlig hilsen

Una Tveit Hauan

(student)

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet «*Risk perceptions and role of experience; a qualitative study of people's thoughts on flashflood events in Jølster, Norway*», og har fått anledning til å stille spørsmål.

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet, ca. *desember 2020*.

(Signert av prosjektdeltaker, dato)

Appendix II: Notification form (translated version)

Do you want to participate for my master's thesis about experiences of natural hazards, risk perception and people's attitudes to climate change?

This is a question for you to participate in a research project where the purpose is to find out which factors change individuals risk perception after experience a natural hazard. Through this notification form, I will give information about the project's purposes and goal, and what it means for you to participate.

Investigation's purpose

The purpose of the project is in connection with master's thesis writing at the Department of Geography at NTNU Trondheim. The main goal of the thesis is to research the local population's stories on experience with natural hazards like landslides and floods. Preliminary title is: «Risk perceptions and role of experience; a qualitative study of people's thoughts on flash flood events in Jølster, Norway ».

The thesis defines "experience" as people who are affected by hazards, and that you do not necessarily need to have experiences that are direct, physically, personally, houses, homes, etc, but in the home area / where the person belongs (home, city centre, on the way to work, etc.). The thesis will also focus on the local population's place identity, and attitudes/beliefs on adaptation and recovering strategies and climate change.

As being experienced with hazards can feel traumatic where emotions may still be strong, I will through this notification form prepare you for some of the questions that may arise during the interview. Also, you are not required to answer questions you don't want to answer, and if you find out that you don't want to participate during the interview, or after, I will end the interview, and/or delete all the data.

The main research question is: "What factors change people's risk perception of natural disasters according to their own experience?"

Sub-issues: «people who have experience with floods and / or landslides, ...

- ... are they more worried about future similar incidents than they were before experience?

- ... do they experience situations in everyday life that trigger feelings of previous experience with floods and or landslides? (possibly which situations trigger these feelings?)
- ... have they changed their perspective on their home belonging to their own home?
- ... they believe that there is a connection between the relationship between human-influenced climate change and floods and / or landslides (natural disasters).

Who is responsible for the research project?

My name is Una Tveit Hauan and I am a master's student in the two-year program «Natural Resources Management». This research project is part of my 60-credit (one-year) master's thesis. The Department of Geography at NTNU Trondheim is primarily responsible for the project. Supervisor for my project is Haakon Lein.

The research also takes part in a larger project arranged by the Department of Psychology at NTNU. The project is called World of Wild Waters (WoWW), and their goal is to develop VR games about climate change and natural disasters. The game is concerned with providing information related to topics and changing people's attitudes to become more environmentally friendly. You can find more information on their website, www.woww.no. Here is also a list of people working on the project (team). Of them, I mainly have contact with Amanda Lai. My part of WoWW project, is to collect data for their project; information they can use in their VR game, which are mainly information of local people regarding landslides and floods and attitudes to climate change.

Why are you asked to participate?

I ask you as you are inhabitant from or live in a local area in Norway that has had experience with floods and landslides. Location (Førde, Jølster area) is based on geography and hydrology, and its previous event at Jølster 30th July 2019 as feelings and descriptions most likely are fresher in mind, compared to other hazards in Norway, and for own practical reasons, such as living and study place.

The thesis is interested in collecting up to at least 3 hours of data. That is at least 3-4 people. The method I have used to get in touch with you and other relevant people is through online newspapers (including Firda ang landslides and floods on July 30, 2019), friends, or people who know people (snowball sampling)

What does it mean for you to participate?

- The research project uses qualitative in-depth interviews (two people: interviewer and interviewee)
- If you choose to participate in the project, it means that you answer questions I have prepared for this research project.
- It will take you approx. 45 to 60 minutes.
- Your answers from the questionnaire are registered electronically by audio recordings, after which they are transcribed and then deleted for your security.
- Your answers from the questionnaire are registered electronically by audio recordings, after which they are transcribed and deleted from where the audio recordings are stored.
- Names will not be included but described in the interview. You will be numbered in my data at the beginning for the sake of order, which also will be deleted later.
- Other personal information such as age, gender, job, outlook on life, etc., will not be relevant to my thesis.
- I will also interview an «expert group». That is, an extra in-depth interview with NVE if possible, which will be mentioned.

It is voluntary to participate

It is voluntary to participate in the project. If you choose to participate, you can withdraw your consent at any time without giving any specific reason. All information about you will then be anonymized. It will not have any negative consequences for you if you do not want to participate or later choose to withdraw.

Your privacy - how we store and use your information?

- We will only use the information about you for the purposes we have described in this article. We treat the information confidentially and in accordance with the privacy regulations.
- Those who have access to the institution responsible for treatment are me (student) and supervisor.
- Measures I take to ensure that no unauthorized person has access to audio recordings and other personal information is (as mentioned in "what does it mean to participate for you?"): I will replace your name and contact information with a code stored on a

separate name list separately from other data, store the data material on research server, locked / encrypted.

- Answers will be reformulated and anonymized.

What happens to your information when we end the research project?

The project is scheduled to end at the end of December 2020. All information and audio recordings will be deleted from their storage location.

Your rights

As long as you can be identified in the data material, you have the right to:

- access to which personal information is registered about you,
- to have personal information about you corrected,
- have personal information about you deleted
- obtain a copy of your personal information (data portability), and
- to send a complaint to the Privacy Ombudsman or the Data Inspectorate about the processing of your personal data.

What entitles us to process personal information about you?

We process information about you based on your consent.

On behalf of the Department of Geography NTNU, NSD - Norwegian Centre for Research Data AS has assessed that the processing of personal data in this project is in accordance with the privacy regulations.

Where can I find out more?

If you have questions about the study, or want to exercise your rights, please contact:

- Student and thesis writer: Una Tveit Hauan, +47 48050778 by email (unath@stud.ntnu.no)
- Supervisor: Haakon Lein, 73591913 and 91897634, by email (haakon.lein@ntnu.no)
- NSD - Norwegian Centre for Research Data AS, by email (personverntjenester@nsd.no) or telephone: 55 58 21 17.

With best regards

Una Tveit Hauan

(student)

Declaration of consent

I have received and understood information about the project «Risk perceptions and role of experience; a qualitative study of people's thoughts on flash flood events in Jølster, Norway », and has had the opportunity to ask questions.

I agree that my information will be processed until the project is completed, approx. December 2020.

(Signed by project participant, date)

Intervjuguide

Introduksjon (kort)

- Starter intervju med å fortelle kort om meg selv, utdanningen min og masteroppgavens formål.
- Hvordan intervjuet vil foregå; informasjonsskriv og dybdeintervju
- Hva intervjuene har å si for min oppgave og samarbeidsprosjekt.
- Om det er noe du lurer på nå, eller underveis er det bare å si ifra.

Informant (kort)

- Hvem er du?
- Student, jobber, ikke jobber? med hva?
- Bor hvor, område?

Prioritering 1:

Plass og tilhørighet

- Er det noe med din hjemleplass som gjør den spesiell for deg? (altså, område du bor i og hvor du omgås, ikke spesifikt boligområde)
- Og i så fall hvorfor?
(hjelp: natur; hobbyer, erfaringer; grupper og tradisjoner)
- Kan du sette ord på følelser som vekkes hos deg når du er hjemme?
- Forklar?
- (hjelp: hverdagssituasjoner, noe du setter pris på som gjør deg glad, gir deg tilhørighet, eventuelt frykt – både positivt, moderat og negativt er interessant)
- Er det en spesiell grunn til at du bor her?
- (hjelp: jobb, familie og familiebedrift, tradisjon, tilfeldighet, venner, kjæreste?)
- Kan du forklare grad av tilhørighet til hjemleplassen din (Grad i dine ord)?
- Hvordan ville det vært for deg å flytte fra området? Forklar?

Skrederfaring

Min oppgave handler jo blant annet om skrederfaring, så da lurer jeg på om vi kan gå litt mer inn på dette temaet.

- Har du, eller kjenner du noen som har erfaring med jordskred og/eller flomskred her eller i nærområdet?
(Hjelp: Type skred, når og hvordan utartet det seg?)
- Hvem opplevde skredet?
(Nær relasjon, ikke nær, kun nyheter?)
- Opplevde du jordraset i Jølster den 30 Juli 2019? på hvilken måte evt. hvem?
- Hvilke følelser sitter du igjen med? (i hvilket skred?)
- Tenker du ofte på denne hendelsen?
- Har opplevelsen endret perspektiv på område du bor i?
- Har du opplevd å bli evakuert på grunn av skred?
- Forklar hvilke erfaringer du har med dette?
(tid, sted, og til hvilket skred. Følte du deg ivaretatt, hørt, redd/trygg, vanlig rutine?)
- Har hendelsen/e påvirket deg slik at det føles mer annerledes enn før å ferdes i område, sammenlignet med perioden før skred?
- Er det noen spesielle situasjoner som trigger følelse av erfaring med skred?
- Hjelp: følelser som frykt eller redsel i hverdagslige situasjoner evt. situasjoner som minner om skredhendelse?
- Forklar?
- Føler du deg trygg i området du bor i?
- Er du redd for at noe liknende skal skje igjen? Forklar?
- Eventuelt, er dette hendelser man må forutse når man bor her?
- Forklar? / Andre tanker eller inntrykk?

Prioritering 2:

Politisk:

I lokale områder med høyere risiko for skred enn andre deler av landet bli gjort tilpasninger for å beskytte område, natur og mennesker for å unngå eller redusere farligheten til potensielle fremtidige skred.

- Er dette et tema du hører mye om, eventuelt, tema som fanger din oppmerksomhet?
- Synes du det skapes for lite, for mye, passe mengde debatt rundt tema? Eller kanskje dette er noe du ikke har tenkt på? I så fall, hvorfor?
- Hvor viktig er det for deg at kommunen forbedrer tilpasning av skred og flom?
- Og hvorfor er dette viktig for deg?
- Har du meninger på hvordan rutiner av tilpasning eller evakuering kunne blitt gjort annerledes?
- I så fall, føler du deg hørt? Forklar.
- Er det mye prat om tema i din omgangskrets? Forklar

Klima og miljø

- Bemerkker du deg endringer i miljøet, været og/eller klimaet i område hvor du bor, eller har bodd før? Forklar.
- Og i sammenheng med hvor lenge du har bodd her?
- Tror du endringer i klima er menneskepåvirket?
- Tenker du at det er en sammenheng mellom skred og flom, og klimaendringer?
- Fortell hvorfor?

NVE og varsom.no forventer flere skred /økte risiko for skred ved områder hvor det er bebyggelse på grunn av menneskepåvirket klimaendringer.

- Hva tenker du om dette? Forklar?
- Er det andre saker/debatter i dagens samfunn som du synes er viktigere?
- Tror du kommunale tiltak som har mål om å redusere klimagasser er betydelig for at vi skal kunne redusere konsekvenser negative konsekvenser av klimaendringer, som værphenomen og skred?
- Samme spørsmål: bare din egen atferd istedenfor kommunale tiltak.
- Tenker du mer på temaer som klima og miljø evt. global oppvarming, mer nå enn før? I så fall, hvorfor? (eksterne faktorer eller egne opplevelser?)

Avslutning:

- Har du noen kommentarer? Noe du ikke fikk sakt, eller noen tanker som du tror kan være viktige, betydelige eller ikke betydelige for tema eller intervjuet?

- Til slutt, bare si ifra dersom det er andre ting du lurer på ang. intervju. Praktiske ting for eksempel.

Takk for meg!

Appendix IV: Interview guide (translated version)

Interview guide (translated version)

Introduction (short)

- Starts interview by telling briefly about myself, my education and the purpose of the master's thesis.
- How the interview will take place; information writing and in-depth interview
- What the interviews have to say for my assignment and collaborative project.
- Say: "If there is something you are wondering about now, or along the way, just ask".

Informant (short)

- Who are you?
- Student, working, not working? with what?
- Where, area?

Priority 1:

Place identity:

- Is there something about your home place that makes it special for you?
- And if so, why?
- (help: nature; hobbies, experiences; groups and traditions)
- Can you put into words the feelings that are aroused in you when you are at home?
- Explain?
- (help: everyday situations, something you appreciate that makes you happy, gives you belonging, possibly fear - both positive, moderate and negative are interesting)
- Is there a special reason why you live here?
- (help: job, family and family business, tradition, coincidence, friends, relationship?)
- Can you explain the degree of belonging to your place of residence (Degree in your words)?
- How would it be for you to move from the area? Explain?

Experience:

My thesis is about avalanche experience. So, then I wonder if we can go a little more into this topic.

- Do you have, or do you know anyone who has experience with landslides and / or floods here or in the immediate area?
- (Help: Type of landslide, when and how did it degenerate?)
- Who experienced the landslide?
- (Close relationship, not close, just news?)
- Did you experience the landslide in Jølster on 30th July 2019? in what way or who?
- What emotions are you left with? (in which landslide?)
- Do you often think about this often?
- Has the experience changed perspective on the area you live in?
- Have you experienced being evacuated due to landslides?
- Explain what experiences you have with this?
- (time, place, and to which landslide. Did you feel taken care of, heard, scared / safe, normal routine?)
- Has the hazard affected you so that it feels more different than before to travel in the area, compared to the period before the landslide?
- Are there any special situations that trigger a feeling of experience with landslides?
- Help: feelings, such as fear in everyday situations or situations that reminds you of a specific situation in hazard?
- Explain?
- Do you feel safe in the area you live in?
- Are you afraid that something similar will happen again? Explain?
- Possibly, are these events you have to expect when you live here?
- Explain? / Other thoughts or impressions?

Priority 2:

Political:

In local areas with a higher risk of landslides than other parts of the country, adaptation are made to protect the area, nature and people to avoid or reduce the danger of potential future landslides.

- Is this a topic you hear a lot about, possibly, topics that catch your attention?

- Do you think it creates too little, too much, of debate around the topic? Or maybe this is something you have made any thought on? If so, why?
- How important is it for you that the municipality improves the adaptation of landslides and floods?
- And why is this important to you?
- Do you have opinions on how routines of adaptation or evacuation could have been done differently?
- If so, do you feel heard? Explain.
- Is there a lot of talk about topics in your circle of friends? Explain

Climate and environment

- Do you notice changes in the environment, weather and / or climate in the area where you live, or have lived before? Explain.
- And in connection to the period of time you have lived here?
- Do you think climate change is human influenced?
- Do you think that there is a connection between landslides and floods, and climate change?
- If so, why?

NVE and varsom.no expect more hazards / increased risk in areas where there are households and other infrastructure, due to anthropogenic climate change.

- What do you think about this? Explain?
- Are there other issues / debates in today's society that you think are more important?
- Do you think municipal evaluations and their vision to reduce greenhouse gases are significant in order to reduce climate change impacts, like hazards?
- Same question: only your own behavior instead of municipal actions.
- Do you think more about topics such as climate and the environment or global warming, more now than before? If so, why? (external factors or own experiences?)

End:

- Do you have any comments? or any thoughts that you think may be important for my thesis, something you want to share?
- Say: “just let me know if there are other things you are wondering about regarding the interview (like, practical things)”.

Thank you!

Intervjuguide - NVE

Introduksjon

- Starter intervju med å fortelle kort om meg selv, utdanningen min og masteroppgavens formål.
- Hvordan intervjuet vil foregå; informasjonsskriv.
- Hva intervjuene har å si for min oppgave og samarbeidsprosjekt.
- Om det er noe du lurer på nå, eller underveis er det bare å si ifra.

- Har du lyst å fortelle litt om deg selv?
- Hvor lenge har du bodd her i området?
- Tilhørighet til plassen: Hva betyr hjemme ditt for deg?
- Hvorfor?
- Er naturen rundt deg en stor del av livet ditt, og grunnen til at du bor her?

Skrederfaring

Min oppgave handler jo blant annet om skred, og skrederfaring, så da lurer jeg på om vi kan prate litt mer om dette temaet ...

- Har du, eller kjenner du noen som har erfaring med jordskred, flomskred og/eller flom her eller i nærområdet?

[Dersom opplevd skred direkte eller indirekte]

- Hvem opplevde skred?
- Hvilken relasjon har du til den/dem som opplevde skred?
- Er det noen spesielle tanker du har lagt deg om hendelsen som du vil dele?
- Hvilke følelser sitter du igjen med?
- Tenker du på hendelsen ofte?
- Har opplevelsen endret ditt perspektiv på område du bor i?

[Dersom du ikke har opplevd skred eller har kjennskap til noen som har]

- Er dette et tema du tenker på?

- Må det oppleves eller at andre i nærheten oppleve dette før dette er noe man tenker over?

[for begge utfall]

- Føler du deg trygg i området du bor i?
- Redsel?
- Er dette en hendelse man må forutse for å bo i området?
- evt. Trygg? – skapt for mye debatt rundt tema?

Klima og miljø

Over til noe annet/ nytt tema. Diskutere litt mer rundt klima og miljø:

- Føler eller bemerker du deg endringer i miljøet, været og/eller klimaet i område hvor du bor, eller har bodd før.
- Sammenheng i forhold til hvor lenge du har bodd her: endringer i løpet av denne tid?
- Mer spesifikt, hvilke endringer har du bemerket deg, dersom du har?
- Eller er dette normale endringer/ikke endringer?
- Tror du endringer i klima er menneskepåvirket?
- Tenker du mer på temaer som klima og miljø evt. global oppvarming, mer nå enn før?
- Har du en mer spesifikk grunn til hvorfor du tenker mer på tema nå enn før? (motivert av personlige eller eksterne faktorer?)

Sammenheng mellom skredfare og klima

- Tenker du at det er en sammenheng mellom skred og flom, og klimaendringer?
- Fortell hvorfor?
- Har du eksempler på hendelser?

Klimatilpasning

- Hva tenker du når du hører ordet klimatilpasning?
- Er dette viktig for deg?
- Hvorfor? /hvorfor ikke?
- Dersom du er opptatt av klimatilpasninger, hva ville du påpekt som viktigst å eks. investere i?
- Er det andre saker/debatter du prioriterer høyere enn klimasaken?

- Hvilke og hvorfor?
- [Tilbake til fokus på klima og miljø, skred og flom]: dersom vi tilpasser flom og skred for å redusere sjansen for skade på befolkning og infrastruktur, ville du kalt dette «klimatilpassning»?
- Hvorfor/hvorfor ikke?
- Hvor viktig er det for deg at kommunen forbedrer tilpasning av skred og flom. Altså, forbygger før hendelsen skjer?
- Hvorfor er dette viktig for deg?
- Føler du kommunen støtter opp om lokal kunnskap og forslag til endring?
- Hvor viktig er det for deg at kommunen forbedrer tilpasning an reduksjon av klimagasser?
- Hvorfor er dette viktig for deg?
- Synes du det er vanskelig eller enkelt, noe imellom, å leve klimavennlig? Altså, at systemet i samfunnet er tilrettelagt godt nok?
- Hva vil det si for deg å leve klimavennlig? (høyst prioritert?)
- Noe mer du ønsker å ta opp rundt dette tema?

Egne handlinger

- Hva tenker du når du hører «klima eller klimatilpasninger»?
- (Evt. miljøvennlige holdninger. Holdninger fører til aktivitet, hvor aktivitet kan diskuteres: hvor miljøvennlig er egen aktivitet)
- Hva gjør du for et bedre klima og miljø?
- Hvorfor?
- Tenker du mye på ditt eget miljøavtrykk og hvordan du kan redusere det?
- Hvilke? (eksempel transport, mat og forbruk)
- Hvor viktig er det for deg å sette opp fokus klima og miljø krise i form av eksterne faktorer, som nyheter, skolesystem eller bland venner?
- Hvor ofte er dette et tema mellom deg og venner, bekjente, eller familie?
- Hva prater dere om da?
- Noen gjentakende temaer knyttet til klima og miljø krise?
- Har dine hverdagslige handlinger endret seg med tanke på klimaendringer?

- Føler du at din handling (om det er bedrift eller hverdagslige ting) har noe å si for klima endringer og dens konsekvenser?
- Føler du at det hjelper?
- Får du noe som helst bekreftelse på at handlingene dine for miljø og klima er bra eller dårlig?
- Skulle du ønske det var lettere å lære mer om klima og miljø knyttet opp mot klima konsekvenser? Og på lokalt nivå?
- Mer?

Avslutning:

- Noe mer du vil ta opp/diskutere?

Interview guide – NVE (translated version)

Introduction

Start interview by telling briefly about myself, my education and the purpose of the master's thesis.

How the interview will take place; information writing.

What the interviews have to say for my assignment and collaborative project.

“If there is something you are wondering about now, or along the way, just tell”

- Do you want to tell a little about yourself?
- How long have you lived here in the area?
- Belonging to the place: What does your home mean to you?
- Why?
- Is the nature around you a big part of your life, and the reason why you live here?

Experience

My assignment is about hazard experience, so then I wonder if we can talk a little more about this topic ...

- Do you have, or do you know anyone who has experience with landslides, landslides and / or floods here or in this area?

[If experienced landslides directly or indirectly]

- Who experienced landslides?
- What relationship do you have to the person / persons who experienced the landslide?
- Are there any special thoughts you have about the event that you want to share?
- What emotions are you left with?
- Do you think about the incident often?
- Has the experience changed your perspective on the area you live in?

[If you have not experienced landslides or have knowledge of someone who has]

- Is this a topic you are thinking about?
- Does it have to be experienced or that others nearby experience this before this is something you think about?

[for both outcomes]

- Do you feel safe in the area you live in?
- Fear?
- Is this an event you must anticipate to live in the area?
- possibly Safe? - created too much debate around topics?

Climate and environment

- Do you feel or notice changes in the environment, weather and / or climate in the area where you live, or have lived before?
- Relationship in relation to how long you have lived here: changes during this time?
- More specifically, what changes have you noticed, if you have?
- Or are these normal changes / not changes?

- Do you think climate change is human influenced?
- Do you think more about topics such as climate and the environment or global warming, more now than before?

[if so...]

- Do you have a specific reason for why you think more about topics now than before? (motivated by personal or external factors?)

Relationship between hazard and climate

- Do you think that there is a connection between landslides and floods, and climate change?
- Tell me why?
- Do you have examples of incidents?

Climate adaptation

- What do you think when you hear the word climate adaptation?
- Is this important to you?
- Why? /why not?
- If you are concerned about climate adaptation, what would you point out as most important?
- Are there other issues / debates that you prioritize higher than the climate issue?
- Which and why?

[Back to focus on climate and environment, landslides and floods]:

- if we adapt floods and landslides to reduce the chance of damage to population and infrastructure, would you call this «climate adaptation»?
- Why / why not?
- How important is it for you that the municipality improves the adaptation of landslides and floods? So, prevent before the incident happens?
- Why is this important to you?
- Do you feel the municipality supports local knowledge and proposals for change?
- How important is it for you that the municipality improves adaptation and reduction of greenhouse gases?
- Why is this important to you?
- Do you find it difficult or easy, sometimes in between, to live climate-friendly?
- What does it mean for you to live climate-friendly? (highest priority?)
- Anything else you want to address around this topic?

Individual actions

- What do you think when you hear «climate or climate adaptations»?
- (Possibly environmentally friendly attitudes. Attitudes lead to activity, where activity can be discussed: how environmentally friendly is own activity)
- What do you do for a better climate and environment?
- Why?
- Do you think a lot about your own environmental footprint and how you can reduce it?
- Which ones? (eg transport, food and consumption)
- How important is it for you to focus on the climate and environmental crisis in the form of external factors, such as news, school system or mix friends?
- How often is this a topic between you and friends, acquaintances, or family?
- What are you talking about then?
- Any recurring themes related to the climate and environmental crisis?
- Have your everyday actions changed with regard to climate change?
- Do you feel that your action (whether it is business or everyday things) has an effect on climate change and its consequences?
- Do you feel that it helps?

- Do you get any confirmation that your actions for the environment and climate are good or bad?
- Would you like it to be easier to learn more about climate and the environment linked to climate consequences? And at the local level?
- More?

End:

Anything else you want to bring

