



Withstanding winter vulnerabilities: A way of life in a northern seaside community

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ABSTRACT

This study responds to the dearth of qualitative research on long-term adaptation to winter climate-induced access and safety problems in rural areas in Western welfare societies. Based on qualitative interviews with 19 long-term residents in a thriving fishing village in northern Norway, the paper explores how they have adapted to and coped with roadside avalanches, blizzards, heavy snowfalls, and snowdrifts that have suddenly closed access highways and cut off other lifelines. The study shows that the inhabitants have internalised hazard adaptation and preparedness through safeguarding themselves, family members, their home and community during difficult times. Still, they admitted that local solidarity and coping capacity were changing with the arrival of newcomers who are less accustomed to and experienced with these hazards. Despite high personal and joint adaptation and coping capacities, the study also reveals denial of risk and the prevalence of worry, particularly among women. The inhabitants acknowledged mortality risk while driving on avalanche-exposed winter highways, yet assumed that they would not have a fatal accident.

1. Introduction

Rural inhabitants' vulnerabilities, personal reactions, adjustments, and coping strategies to extreme weather events and other winter climate-related hazards are still under-researched, particularly in prosperous, stable and modern Western communities (cf. [Brace and Geoghegan, 2010](#); [Cutter et al., 2003](#); [Kuhlicke et al., 2011](#); [Pelling, 2011](#)). With the possible exceptions of flooding and wildfires, research on outcomes of natural hazards has been conducted among mainly underprivileged rural people in less stable regions or countries ([Pilli-Sihvola et al., 2018](#)). There is thus a lack of studies in modern Western rural communities of the implications of winter climate-induced access interruptions and appurtenant safety problems ([Brace and Geoghegan, 2010](#); [Holand, 2015](#); [Larsen et al., 2011](#); [Straub et al., 2020](#)). Notably, there is a dearth of qualitative research on personal natural hazard experiences and reactions, given a prevalent techno-administrative approach in earlier analyses ([Bolin and Kurtz, 2018](#)). Unpacking inhabitants' viewpoints and experiences can deepen and contextualise their understandings of vulnerabilities and adjustment challenges that come with the elemental forces in rural communities in Western welfare states ([Jóhannesdóttir and Gísladóttir, 2010](#)).

In affluent Norway, numerous rural places have only one connection to the national highway network and are thus especially vulnerable to road outages ([Holand and Rød, 2013](#)). Moreover, in northern Norway's mountainous seaside areas, quite a few highway stretches along alpine mountains are sporadically exposed to roadside avalanches (e.g. [Statens vegvesen, 2019](#)) leading to both road-user perils and road closures. For instance, during the winter 2019–2020, five vital highways in this region had been closed 288 times ([Statens vegvesen, 2020](#)). Such outages will typically isolate from a few hundred to thousands of local inhabitants.

This qualitative study will illuminate the particularities of how inhabitants in a rural seaside community in northern Norway have anticipated, experienced, adapted to and recovered from winter hazards such as blizzards, heavy snowfalls, snowdrifts, and (imminent) roadside avalanches – with consequent loss of access to the outside. The article will impart insights into personal aspects of rural living amid winter climate-induced vulnerabilities, risks and worries.

2. Community adaptation

Communities differ in their ability to adapt to and cope with direct

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and knock-on effects of natural hazards (e.g. Adger, 2000; Brooks and Adger, 2004; Sander-Regier et al., 2009; Walker et al., 2019). Although the concept adaptation has often been associated with the quantifiable effects of natural hazards (Orlove, 2009), it also seems advantageous for qualitative research. Adaptation may include how people interpret and cope with vulnerabilities and risks (Agrawal and Perrin, 2009; Eiser et al., 2012; Stakhiv, 1993). Adaptation can also encompass the ways in which rural inhabitants perceive, act and react to recurrent but still sudden cut-offs from the physical networks that are critical to their health, safety, comfort and livelihood (Brooks, 2003; Cutter et al., 2003; Holand, 2015).

Coping capabilities in rural communities have also been shaped by their residents' assessments of and responses to government and public services advices and instructions (West and Orr, 2007), increasingly conveyed through social media, to improve local preparedness (Simon et al., 2015). On a societal level, vulnerabilities might be influenced by trust in, among others, health services and the road administration (cf. Christensen and Læg Reid, 2005). Moreover, medical and paramedical services may reduce vulnerability in communities that are occasionally isolated by natural hazards (Skinner et al., 2009). Individual vulnerability to winter weather-induced hazards has customarily been influenced by factors such as health, preparedness, and coping capacities (Brooks, 2003). For instance, rural inhabitants' ability to discern subtle weather changes may enable them to prepare and react to (imminent) adverse weather-induced events (Geirsdóttir et al., 2014). Thus, people have used past experiences to minimise undesirable outcomes, partly based on a rational risk-based logic for handling the future and explaining the past (Alaszewski and Burgess, 2007; Sjöberg, 1979). Taken together, social vulnerability to winter climate-induced hazards has depended on the residents in an area and on their resources (Adger, 2006; Holand et al., 2011).

Moreover, people's cognitive orientations – or mindset conditions – may affect their perceptions of risk, social vulnerability and their framing of events and decision-making (Taylor and Gollwitzer, 1995). People in an implemental mindset condition consider themselves less vulnerable than those in a deliberate mindset condition, as the former have plans to handle risks (see Fig. 1). 'Optimistically biased' people may likewise believe that they are immune to misfortune (Weinstein, 1984: 432). In contrast, people in a deliberate mindset condition, who have not yet decided upon a plan, will feel more vulnerable. They are less prone to the illusion of control and unrealistic optimism when it comes to assessing invulnerability to uncontrollable risks (Taylor and Gollwitzer, 1995).

Responses to natural hazards may include risk denial, passive risk acceptance, actions to reduce future losses, and livelihood adjustments or changes (Burton et al., 1993; Horlick-Jones and Jones, 1993). Denial of susceptibility to risk may entail failure to take precautions (Harvatt et al., 2011). Besides, rural residents who are susceptible to natural hazards have used stories about previous misfortunes as a normalising defensive mechanism (Jóhannesdóttir and Gísladóttir, 2010). The inhabitants then think that they will be safe, as their ancestors had been. As another psychological coping mechanism, some people have tended to forget previous extreme weather events (Vasseur et al., 2018).

Today's climate-related risks in several rural areas in northern Norway include driving on avalanche-exposed winter highways and electricity and telecommunication outages. On an individual level and in relation to roadside avalanches, this may include the probability of being caught in an avalanche while driving, and susceptibility to lifeline

interruptions or other winter climate-induced problems or perils (cf. Leiter, 2011). Natural hazards may activate and elicit fear, stress, panic, or a lack of stress and/or worry (e.g. Pelling, 2011; Vasseur et al., 2018). Ambiguous or uncertain circumstances that are perceived as threatening have tended to induce worry (Butler and Mathews, 1987). Worry may be understood as a cognitive activity in which people ponder over how to solve a mental problem with an uncertain or negative outcome in the future (Larsen et al., 2009). It is a mental state that is a mix of situational factors and personal expectations and experiences.

Worry is not identical to risk. 'Risk is the probability of certain adverse events times the magnitude of their consequences' – on an individual level it is a person's perception thereof (Larsen et al., 2009: 260). Hazard risk perceptions and accompanying emotional states have commonly been shaped by personal experiences (Slovic, 2000, as cited in Vasileiadou and Botzen, 2014; Wachinger et al., 2013). Additionally, risk perceptions might be influenced by factors such as a person's age and gender (Enarson, 1998; West and Orr, 2007). Perceptions of risk and worry may thus change during the life course, with young people being more risk-tolerant (France, 2000). With parenthood, worries about offspring may arise, particularly among mothers (Kurz, 2002; Wang et al., 2009). Moreover, a study in rural Canada has shown that in winter storms, women were more frightened and concerned with their family's safety and welfare (Vasseur et al., 2015). Men tended to assert that they were accustomed to storms and the temporary problems they might cause, and that there was no need to panic. Still, not only women but also some men expressed concern about the difficulties a winter tempest could pose for elderly people (Vasseur et al., 2015).

Residents' capacity to adapt to and cope with natural hazards may also depend on their personal and social capital (Brooks and Adger, 2004). Personal capital is a person's adaptive capacity, skills and information (Stokols et al., 2013). It can encompass efforts, motivations, commitments and competences that affect a person's ability to foresee, react, recover, and adjust from natural hazard events (Tapsell et al., 2010). The length of time living in a place, for instance, may improve a person's natural hazard preparedness (McGee and Russell, 2003), in that one continues to make appropriate adjustments to adverse conditions (Stokols et al., 2013).

Social capital has been said to signify resources, trust and networks that may aid people to behave effectively (e.g., Adger, 2000), affecting their readiness to engage in reciprocally advantageous collective action (Nakagawa and Shaw, 2004). Social capital, consisting of obligations and expectations, information sources and social norms (Coleman, 1988), has often been a critical component of adaptation capacity. Community involvement and social networks typically entail that people inform, help and support each other (Aldrich and Meyer, 2015; Jóhannesdóttir and Gísladóttir, 2010) and therefore contribute to collective identity and pride (Straub et al., 2020), buffering stressful incidents (Cohen and Wills, 1985). Social capital networks, thus, provide access to various resources in difficult situations, including information. Community bonding may increase the ability to cope with the effects of a natural hazard (e.g. King and MacGregor, 2000; Fresque-Baxter and Armitage, 2012; Straub et al., 2020). Since the 2010s, social media has contributed to strengthening social capital in the sense that people in crisis feel connected, useful, supported and encouraged by helping and being helped (Taylor et al., 2012).

Societal changes to rural villages, such as the arrival of many newcomers, may temporarily challenge community cohesion and adaptation capabilities to hazards (Geirsdóttir et al., 2014). Newcomers may possess less knowledge of the local weather, be less capable of adapting to it, have weaker social bonds, and less access to the local culture of risk sensitivity (Aznar-Crespo et al., 2020). In addition, several communities' self-reliance and personal natural hazard preparations are arguably being replaced by a propensity to demand or depend on public services and assistance (Horlick-Jones, 1995; Alexander, 2008).

Place attachment might also be noteworthy for the comprehension of natural hazard risks in rural areas; research has revealed both positive

	Implemental mindset condition	Deliberate mindset condition
Relation to planning	Have plans	Without plans
Risk perception	Optimistically biased	Vulnerable

Fig. 1. Peoples' cognitive perceptions of social vulnerability.

and negative relations between place attachment and natural environmental risk perception and risk coping (Bonaiuto et al., 2016). Simply speaking, place attachment has been outlined as the emotional and cognitive experiences that connect individuals to a place, commonly as part of their individual and collective identities (Lewicka, 2008; Low and Altman, 1992). In locales where residents often have been subjected to natural hazards, physical place has also been seen as vital (Lewicka, 2011).

Based on this theoretical background, the present study will explore how long-term residents in an affluent, industrious and rural seaside community prepare for, cope with, recover from and adapt to hazards induced by the winter climate. The paper will also investigate residents' social vulnerabilities, worries and risk perceptions concerning factors such as health, gender, mindset condition and emotional reactions, mortality judgements and trust in public services. Moreover, the article will examine facets of personal and social capital and place attachment.

3. Study area

The study locale is a flourishing fishing village in an area characterised by avalanche-prone access highways. The village itself, pseudonymously called Ocean Bay, is not exposed to avalanches. The community has a quite stable population, despite having received new seasonal and long-term inhabitants in the first 20 years of the twenty-first century. Livelihoods here depend on fishing, aqua farming, seafood processing and associated services, although here as elsewhere in Norway public sector employment is considerable. Additionally, the area has some tourism-related enterprises that cater to winter visitors.

Most seaside communities in northern Norway are involved in national and international supply chains and have developed towards 24/7 societies. In the study locale, winter catches of migrating cod are particularly lucrative and vital to local livelihoods. The seafood businesses consequently require unimpeded road access throughout the winter. Road outages not only prevent heavy-goods vehicles from transporting fresh produce to the markets, they commonly lead also to substantial economic losses for the fish-processing plants. Nevertheless, almost every winter brings sudden access highway closures in the area because of (imminent) avalanches, heavy snowfalls and/or gusts creating snowdrifts, partly resulting from sudden polar low pressure systems (also known as Arctic hurricanes). Many winters have also brought interruptions to electricity and telecommunication service.

Unpredictable winter weather thus often requires locals and visitors to have a plan B. People in such coastal parts of northern Norway have been portrayed as robust, reckless, humorous, sociable, direct, calm, and resilient (Eidheim, 1993; Slagsvold et al., 2006). Moreover, it has been discussed how faith and superstition have entangled in parts of the regional fisher culture, such as in conversations about the influence of magic (Borch, 2016).

4. Methods

This qualitative study was based on interviews conducted with 19 inhabitants who had lived for several years in this rural area. Sixteen informants were recruited with the help of two local contact persons; the remaining three were contacted on site. Recruitment of informants ended when new themes no longer came up in the interviews (cf. Guest et al., 2006), acknowledging the impossibility of getting 'the whole story down to every last little detail' (Wolcott, 1994: 19).

With the exception of one informant who was in the late teens, all were between 38 and 85 years of age at the time of data collection. Ten were females and nine males. Nine informants had grown up in the village and had lived there most of their lives. Eight persons had been born elsewhere in Norway but had lived in the community for 20–55 years, which was most of their adult life. One informant used to work in the study area but now lived nearby and one had recently relocated from a nearby place.

The interviews encompassed both one-on-one conversations and focus groups with two to four persons. The initial plan had been to conduct individual interviews only, but circumstances (e.g., both husband and wife being at home) resulted in five focus groups. Focus groups allow for discussions and negotiations among informants (Kitzinger and Farquhar, 1999). In contrast, one-on-one interviews tend to be more conducive to deeper explorations of respondents' experiences (Michell, 1999).

The questions were open, based on a list of topics or sensitising concepts (Charmaz, 2006) that could evoke positive and negative recollections of responses to winter-related problems and incidents. All interviews lasted about 1 h and were transcribed verbatim. The informants were given the opportunity to read and comment upon the transcript of their interview. In the analysis, the informants were anonymised.

An inductive and emic approach was chosen, centred on understanding the participants' viewpoints (Engel and Schutt, 2005). The data analyses were inspired by grounded theory's coding principles (Charmaz, 2006). First, open initial coding was performed to reveal analytic possibilities in the data. This was followed by focused coding, thereby selecting significant and frequent codes that were used to categorise the data relevant for understanding the research question. Additionally, data were recoded to expand the category properties. Five categories central to the understanding of how to sustain winter climate-induced challenges were developed: aging and health, emergency preparedness, risk and danger, attitudes, and solidarity. Table 1 gives an overview of the properties of these categories.

5. Living with blizzards and roadside avalanches

5.1. Risks and dangers on the road – ways of coping and adapting

The informants knew how to assess winter weather, especially when planning to go from or to the village. They mostly practiced safe driving and kept their cars stocked with warm clothing, food and drinks in case they were stranded and had to wait for a road to reopen. They checked the weather forecast and road reports before leaving for their destination. Often, snow-clearing crew members provided additional information. It was part of 'their lifestyle to be flexible about travelling' (Albert). Such attitudes reflected how they adapted to living in an area prone to blizzards and roadside avalanches.

One way that residents coped with weather-induced risks was to worry more about foreign lorry drivers' inability to manoeuvre safely on icy or snow-covered roads – often on substandard tyres – than about their own driving skills. They noted that inexperienced heavy-goods vehicle drivers made dangerous situations worse when going along narrow, partly steep and winding highway stretches. It was not unusual for these vehicles to block the highways. Sudden drops in temperature could change a stretch of road 'from good to slippery in 1 min' (Peter).

At the same time, the informants were aware of the risks posed by Arctic hurricanes, blizzards, and roadside avalanches, having braved them before. Lisa shared a story about driving with a friend, despite avalanche risk. Although she insisted that if it 'was dangerous, they would have closed the road already', she described the trip as 'rash'. Ten minutes after passing an exposed stretch of highway, an avalanche struck. Lisa insisted that taking some risks was part of life. 'If we want to go places during the winter, we just have to drive. Either we are stuck at home or we take some risks'. Albert, who drove his teenage son to football practice in a nearby place, claimed that he 'rationalised away the danger' of avalanches by reducing the risk to a mathematical probability, thereby not 'having the sense to be afraid'. His son had the same attitude.

Some interviewees recalled having been reckless winter drivers when they were younger. 'I was not afraid. I did not understand how dangerous it could be', said Ida. With age and experience, they learned to put safety first, even if this meant postponing a trip when rough

Table 1
List of properties of main categories.

Aging and health	Emergency preparedness	Risk and danger	Attitudes	Solidarity
Worried	Ambulance	Not able to get to hospital	That is life here	Help in need
Feel unsafe	Precautionary principle in closing road	Foreign lorry drivers	Need to accept weather to live here	Calm down worried neighbours
Scared	Defibrillator	Narrow, winding roads	Life is good here	Call and tell road is open
No need to worry	First responder group	Narrow tunnels	Used to it	Trust in snow-clearing staff
Get help most times	Rescue boat	Avalanches, polar lows, rock falls	Plan ahead	Help and check on the elderly
Afraid	Road barrier	Drive too fast	Drive carefully	More organised today
Anxious	Two roads	Limited visibility	Not think about potential danger	Facebook
More worry with age	Information on Facebook	Icy roads	Guardian angel	Less solidarity today
Stressed	Hoarding	Areas with no mobile coverage	Respect road barrier now	Positive attitude to voluntary communal work
Angry calls	Secure and clear outdoor areas	Difficult for old people to get medicine	No one has died yet	Care for neighbours
Hyped by media	Snowmobile/weasel	Mild spell	Take chances	Take in commuters
	Satellite phone	Heavy snowfalls	More careful with age	Take in people without wood-burning stove
	Courses in first aid and defibrillator	Damage to the transmission tower	Check weather report before driving	Unlocked doors
	Bombing away snow build-up	Ambulance outside village	Find solutions	Weather connects people
	Evacuation	Lack of local doctor/hospital	Stay at home	More international society today
	Wood-burning stove	Tourist drivers	Driving part of lifestyle	Family togetherness
	Secure boats	Rental cars	Get used to road conditions	Fishing village used to strangers
	Flashlight, batteries, candles	Patients dependent upon electricity	Teenagers used to not get home	
	Extra warm clothes in car	Fishing village safe haven	Nothing will happen to me	
	Hot drinks, food in car		Do, not think	
	Snow shovel in car		Flexible	
	Commuters to leave early		In your blood	
	Stand-by battery, mobile network		Live off and in harmony with weather	

Table 1 (continued)

Aging and health	Emergency preparedness	Risk and danger	Attitudes	Solidarity
				Forget harsh winter conditions
				Enjoy some rough weather
				Risk denial
				Respect forces of nature
				Cautious driving

weather was in the forecast. Mothers worried about their adult children driving on winter roads, just as their own mothers had worried about them years before. These women waited anxiously to receive word that a child had arrived safely at his or her destination. The adult children themselves were more nonchalant. ‘I don’t always want him to drive. However, he doesn’t understand. He is like me when I was 20 years old. He says to me, “mamma, relax, it’ll be fine”. I can’t say he’s not allowed’, said Ida.

Peter remembered that years earlier, several locals had driven when the road barrier was down, ‘thinking there will not be an avalanche while we are driving’. One car had been stuck in the snow and as soon as the driver and the passengers had gotten out, an avalanche buried it. Other residents knew people who had been stuck in their cars between two avalanches, and of people who had tried and failed to drive across minor avalanches. Lisa admitted that she had driven when the road barrier was down. Today, she sees the danger and insurance challenges of such actions. Back then, she says, ‘we just did it. We did not think at all. We were going to a party’. It was an exciting thing to do and they felt like ‘tough guys’.

The locals now had more respect for the road barriers, indicative of a change in attitude. They were more aware of danger posed by avalanches and respected decisions to close the highway. This was partly a consequence of maturity. The residents also had more respect for and understanding of why and when the snow-clearing crew advised a road to be closed.

Having been a snowplough driver for many years, Simon no longer panicked when caught in an avalanche. He said that he had become ‘hardened’. To continue in a job that entailed driving on a regular basis during the winter, he argued that one needed to persevere and be careful at the same time.

You are not frightened. Not when you are in the midst of it; you think about it in a completely different way. You are thinking ‘what am I doing now?’ ... I was stuck in a slab avalanche. I lost the chains on the snow truck wheels. I had opened the door just a crack to see a little. Worked for a while. However, then a new avalanche struck. You lose all your concentration; you do not know where you are. If you tip over, you have no sense of direction I did not use the safety belt in case I tipped over [with the vehicle falling downhill]. I had snow to my waist inside the truck. The right side door was smashed. The left door was half a metre open. I climbed out I got out of there as fast as I could.

Especially when large roadside avalanches were a possibility, Simon took reasonable precautions: leaving avalanche-prone areas, putting safety first and lower standards for advising the road administration to close a highway – and higher standards for reopening it.

These stories from the road reiterated the dangers of blizzards, Arctic hurricanes and avalanches; at the same time, as nobody had perished as a result – and sometimes because people had been rescued by other locals – they possessed a sense of invincibility. These survivors of close calls thought they had ‘a guardian angel’, it was seen as a ‘miracle’ and the rescuer had been on a ‘mission’. ‘It is almost as if God’s hand is

protecting us', said John. Older interviewees in particular mentioned a higher power.

However, those who had survived an avalanche or a hurricane knew how dangerous the forces of nature could be. They had been at the mercy of the situation, experiencing their vulnerability up against the elemental forces. They could not minimise the danger and had to face their powerlessness in the face of such forces. Albert described a close call during an Arctic hurricane:

One person had driven out ... to watch the sea as it broke over a jetty. After he got out of the car, he realised that debris was flying through the air. He had no control over it. If a piece had hit him, he would have been killed He was not hit. He rushed back home. He became a little quiet after that. He had something to ponder.

Yet, they asserted that weather was part of their collective identity. They stressed toughness as a way of coping. The inhabitants said they lived in harmony with nature and accepted everything that came with the winter climate; some were even proud of their ability to rise to its challenges. They insisted that the periodically harsh winter weather had made them tough. 'One is hardened from young age by weather and wind', commented Lilly. On calm days they forgot about the stormy ones.

Despite these narratives of invincibility and toughness, some informants described having been frightened and unable to cope with the risks and danger. 'I feel it when there is adverse weather', Ella admitted. 'I'm a little nervous that something can happen'. Ingrid, driving with her son during a sudden polar low, almost had a panic attack due to lack of visibility and fears of colliding with the snowplough. Simon reported a dramatic increase in worried and even angry callers asking about the road conditions when the weather turned bad. 'I tell them that we can get bad weather, but that there is no need to lie down or to muster all one's strength. We've had this weather before, so we will manage'.

5.2. Aging and health – trust in emergency preparedness and vulnerabilities

Besides risks and dangers while driving to and from the village in the winter, the inhabitants acknowledged that availability of emergency medical care was a critical factor, particularly for people who were older, chronically sick or pregnant. Yet, they believed that the rescue services (ambulance, rescue helicopter and fire brigade) would be able to assist anyone in need of urgent medical attention and that the snow-clearing crew had knowledge and skills necessary to advise highway closures before avalanches could strike. As Simon asserted, 'we suffer no hardship' compared to more urban places with a better emergency medicine infrastructure and other places in rural northern Norway with similar winter weather-induced challenges.

However, highway closures could keep ambulances off the road. Moreover, blizzards and gusts could make it unsafe for ambulance helicopters to fly. At such moments, residents felt unprotected. When Hannah's elderly mother had fallen in the bathroom, her mother had to be transported 60 km by ambulance before reaching a place where the rescue helicopter could be cleared to land. 'That was not okay', Hannah argued.

A prolonged power outage could also cause failures in mobile phone services and Norway's digital multiagency public safety network. At such times, the residents worried about their own health and that of others. It became obvious that living in this rural area could make it harder for them to receive emergency medical care. 'I think that many people have sleepless nights because of this', commented Rebekka.

5.3. Power failures – inconvenient but also time for family bonding

Most of the interviewees were pragmatic about weather-induced risks. They had chosen to live in the village and expected blizzards, avalanches, highway closures and power outages. They took sensible precautions such as securing their property and learning how to manage

without electricity. 'We just wait till the power is back; there are no problems', said Anna.

When the highway was closed, the villagers had all that they needed to live. A local grocery store kept people fed. If the electricity stayed on, 'we live quite normally', Ida claimed. Prolonged power outages could still be inconvenient. People who did not have a wood-burning stove would have to stay someplace else. Nonetheless, some informants mentioned the bright spots of these brief interruptions: chatting and playing games with family by candlelight, cosiness and relaxation. Christian liked it:

By power outage, it gets somewhat cosy. It is a bit like going back to basics. You cannot fiddle with your mobile or watch TV. Then it is board games or something like that Nobody needs to work. It is like a short break.

5.4. Unwanted media attention

The participants balanced living with the winter risks associated with Arctic hurricanes, blizzards and avalanches with pragmatism and ability to tolerate temporary isolation. The outside world, however, did not always allow for this. Several informants resented the national and regional media attention the village received when weather reports predicted extreme conditions. Although it was important for the locals to be informed, Peter noted that the media could 'blow things out of proportion'. This was needlessly alarming to the inhabitants and their relatives living elsewhere. They also thought that it could discourage people from moving into the village. Simon had been interviewed by news media numerous times:

The times I have been interviewed by ... [the public broadcaster] or other media, they are very concerned with living memory. It has never been so bad weather. I distract them and say, 'no, it is just good weather'. They never make me say anything else. They want to make headlines, but it brings nothing good. We must be realistic and say that now it is stormy. Done with it. We have had rough weather for centuries Now they have started with extreme weather warning. It has gone too far, people are frightened, for no reason. The weather is place bound but they forecast for all of northern Norway. That is how it will be. Then people call me. They are anxious. I am against this.

6. Preparedness and community solidarity

The residents had collective and individual responsibilities. Prolonged power outages could lead to telephone network failures and the municipality had thus provided satellite telephones. Ambulances stationed in the area also gave the inhabitants a sense of security. The snow-clearing crew posted information about highway conditions and closures on Facebook. Moreover, the locals tended to be eager to volunteer during weather crises. For instance, two informants were volunteers in the local first aid team. They knew how to handle medical emergencies and offered residents training in first aid and the use of a defibrillator. Ida said, 'If there is an avalanche [and no available ambulance], we are called out ... also when [elderly] people living alone get anxious during extreme weather'.

On an individual level, the informants talked about how the inhabitants helped each other during storms, electricity outages and closed access roads. As Jakob stated, 'we have to do this'. They checked on the safety and welfare of their family members. They kept an eye out for possible damage to neighbours' properties and kept in touch with older and/or disabled family members and neighbours. They invited stranded commuters and locals who did not have wood-burning stoves into their homes. They talked about how they had sent private boats to pick up children who could not get home because of road closures. This was possible when the sea was calm. 'One Christmas', Albert recalled, 'my elder son was coming home. He had to stay two nights in a nearby place; afterwards he was transported here by boat. ... More people were stranded, so some of our friends used Facebook to reach out to them'. To

a degree, social media had become a vehicle for disseminating gossip and news, requests for help, sharing frustration with the weather, and arranging for boat transport when roads were closed, becoming a complementary means of personal communication and solidarity.

At the same time, some informants noted that local solidarity had changed, with a more international village that became home to people without deep roots in the community, such as seasonal workers and refugees. Additionally, electronic communication platforms and emergency preparedness systems contributed to the changes. 'In the shop ... , there are numerous unfamiliar faces. We have many work migrants and refugees', Lisa commented. This means that 'the solidarity we used to have is about to weaken', added Simon.

Still, Albert argued that living with rough winter weather and its attendant risks strengthened community bonds. The residents were in it together against a common 'enemy'. He reflected that 'trouble shared was trouble halved'. Experiences and frustrations with roadside avalanches, closed highways and rough weather were recurring topics of many conversations. 'It was in their blood', said Peter. Despite some changes in the population, public preparedness and close community ties still made the inhabitants feel safe during adverse winter weather.

7. Discussion with conclusions

This study has demonstrated how the inhabitants of a Norwegian prosperous rural community adapted to the problems of winter climate and how the effects of winter storms and road closures affected their everyday lives. These residents proved to be quite adaptable and risk sensitive. At the same time, some residents still worried about the effects of winter hazards, while others minimised or denied them.

This high capacity for adaptation was evident in the ways in which these rural residents handled the risks of winter driving. It was part of their everyday strategy for handling the stress of impending roadside avalanches and sudden loss of electricity or communications (cf. Brooks, 2003; Cutter et al., 2003). They had also become accustomed to foreign lorries blocking the highways. Travel plans were postponed or cancelled if their own reading of weather signs, weather reports or snowplough crew information indicated bad weather and/or uncertain driving conditions. The latter two information types were conveyed mainly through the internet (cf. Simon et al., 2015). Temporary electricity failures did not disrupt their personal lives, and sudden power outages often offered opportunities for family bonding.

The informants were in what Taylor and Gollwitzer (1995: 214) have termed 'implemental mindset condition'; their plans, precautions and attentiveness to the forecast reduced their social vulnerability (cf. Geirsdóttir et al., 2014; Harvatt et al., 2011; Horlick-Jones and Jones, 1993; West and Orr, 2007). This mindset condition resulted from years of experience in protecting themselves, their families, their homes and their neighbours from adverse winter weather, access interruptions and electricity and telecommunication outages. They had, as claimed by McGee and Russell (2003), internalised hazard adaptation and preparedness (see also Stokols et al., 2013). Foreseeing, reacting to, recovering from and adjusting to natural hazard events often seemed to have become embodied personal capital (cf. Tapsell et al., 2010). Additionally, they trusted local and regional authorities and emergency systems (cf. Christensen and Læg Reid, 2005).

It is an ill wind that blows nobody any good. The ill winds of winter united this community and were part of their place attachment. During highway closures and other weather-induced incidents, the residents helped and supported each other through social media (cf. Taylor et al., 2012), telephone calls, and face-to-face interactions. They were acutely aware of the vulnerabilities of senior residents and those needing medical attention during road closures and power outages, aligning with Vasseur et al. (2015) findings. They also expressed a joint reaction to a partly unwanted and sensationalistic media attention that lifeline cut-offs could bring about. This corresponded to works by King and MacGregor (2000) and Fresque-Baxter and Armitage (2012); that social

capital, place attachment and a sense of belonging might amplify natural hazard adaptation capabilities. The findings indicate that social capital within a hazard-exposed rural community is vital not only for mutual support in times of need (Cohen and Wills, 1985) but is also imperative for human well-being (Adger, 2003).

However, there were hints that local solidarity was weakening, partly due to the village becoming more international with the arrival of short-term residents such as seasonal workers, refugees, and tourists. As some other studies also have shown, the presence of newcomers might reduce community cohesion and, thus, undermine preparedness for natural hazards (Geirsdóttir et al., 2014; McGee and Russell, 2003).

Despite the residents' high adaptive capacities, the findings suggested some forms of risk denial (cf. Burton et al., 1993) that might increase social vulnerability (Adger, 2000). For instance, many informants were more concerned with foreign lorry drivers' large and presumably substandard vehicles and their lack of familiarity with icy or snow-covered highways than they were with potential deadly effects of roadside avalanches. The residents had come to respect the highway barriers but were reluctant to admit that they could die in a weather-related accident. For some of them, risk denial took the form of calculated risk, aligning with Alaszewski and Burgess (2007) – that rational risk-based logic is central in modern societies' abilities to handle the future and explain the past. This implies that these informants considered risk to be a mental construct (Sjöberg, 1979), contrasting the physical aspects of natural hazards resulting in health-care challenges and other insecurities.

Risk denial also underpinned numerous stories about the inhabitants' exposure to sudden polar low-pressure systems and roadside avalanches and the idea that they were under the protection of a higher power. Such narratives and a sense of invincibility could be understood as a normalising defensive mechanism enabling residents to continue living their lives despite periodically adverse winter conditions (Jóhannesdóttir and Gísladóttir, 2010; Vasseur et al., 2018). Lack of stress due to being accustomed to and not physically harmed by unfavourable winter weather and road conditions suggested that such actions could be part of an 'adaptive psychosocial mechanism' (Vasseur et al., 2018: 43). Several informants were optimistically biased (Weinstein, 1984), prone to an illusion of control in assessing their vulnerability to uncontrollable risks (cf. Taylor and Gollwitzer, 1995).

Thus, their mortality risk assessments entailed minimising their own personal risks (cf. Leiter, 2011). Combined with the fact that there had been no loss of life, such attitudes and mechanisms made them feel nearly invincible against the forces of nature. Assumably this could be linked partially to superstitions found in fishing communities in northern Norway (Borch, 2016).

Still, some women reported feeling vulnerable, anxious and worried when they or their children drove in the winter. This aligns with research on gendered emotional responses to natural hazards. Women have been more likely than men to report being worried and afraid, particularly for their children (cf. Kurz, 2002; Vasseur et al., 2015; Wang et al., 2009). However, women also noted that most blizzards and roadside avalanches were forgotten once they were over, aligning with another psychological coping mechanism identified by Vasseur et al. (2018). As long-term inhabitants, they had adopted a collective presentation of self as unsentimental and sturdy people living in and with winter weather perils, similar to the Oklahoma spirit identified by Straub et al. (2020).

The informants in this seaside community had a strong sense of place, seemingly contributing to their hazard coping capacities and adaptation. Braving the elements and enduring periodically rough winter weather and sudden highway outages had become part of their lifestyles, expressed through the quotation 'if it is a problem, you cannot live here'. This indicated that the residents identified with local lore in northern Norway's rural littoral (cf. Eidheim, 1993) – that they could stand tall despite the unforgiving winter weather events.

Credit author statement

Bente Heimtun: Conceptualization, Methodology, Interviewing, Writing - original draft, Writing - review & editing. **Jens Kr Steen Jacobsen:** Conceptualization, Writing - original draft, Project administration, Supervision, Writing - review & editing, Funding acquisition.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jrurstud.2020.08.038>.

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