How to improve climate change adaptation in rural areas of the Nordic Region

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Key recommendations

- Climate change adaptation should be addressed in a similar manner as mitigation, as a **cross-sectoral societal challenge** across all levels of governance. This requires involvement of all societal actors from both public and private sectors, civil society organisations and citizens, and **improved collaboration between local, regional, and national governance** levels.
- Solutions for climate adaptation need to be adapted to the local context and **integrate local knowledge and practices**. This requires that local authorities improve their communication with citizens and engage citizens in decision-making. For this to be possible more dialogue about the connection between climate change and the increase of local risks is needed.
- Climate adaptation strategies need to consider **societal groups that are particularly vulnerable** to the effects of climate change, such as indigenous and rural communities and socio-economically disadvantaged groups. This requires increased efforts to identify not only physical climate vulnerabilities, but also social and economic vulnerabilities.
- Laws and regulations must be developed further in order to **enable collective adaptation action** in local communities.

Introduction

At the time of writing, global warming already amounts to 1.1 degrees Celsius, displaying tangible effects around the world, of which the scenarios indicate that this will get much worse [1]. The Nordic Region is also affected by climate change with the Arctic being one of the fastest warming regions globally [2]. Climate change-related hazards – such as floods, droughts, wildfires, landslides and avalanches – have become more common in recent years and the risk of such hazards will significantly increase in the future. In addition to these more acute events, there are also gradual changes, such as the disappearance of permafrost and a changing flora and fauna, that need to be managed. However, the current speed of climate adaptation in the Nordic Region is too slow. There is therefore a great need for the Nordic countries to intensify their efforts to adapt to a changing climate [3, 4].

To achieve the vision that the Nordic Region will be the most sustainable and integrated region in the world by 2030, climate change adaptation should be at the centre of attention. While the main focus of current adaptation efforts is on urban areas, we argue that rural areas deserve more attention in the context of climate change adaptation. How successful rural areas manage to adapt will have large consequences for rural livelihood and economies. Central parts of rural economies, such as agriculture, forestry and tourism, rely on the weather and biodiversity and must improve their resilience to climate change-induced hazards.

Important infrastructure, such as roads, railways, and electricity lines pass through rural areas and should be adapted to withstand extreme weather events. Furthermore, rural areas are home to some of the most vulnerable groups to climate change, such as Sami reindeer herding communities and rural communities with nature-dependent livelihoods. Lastly, all citizens in the Nordic Region, including those living in rural areas, should be able to live with a minimum of risk from climate change-induced hazards. Increased climate adaptation efforts will thus reduce inequality between rural and urban areas and contribute to environmental, economic, and social sustainability of rural areas across the Nordic Region.

This policy brief is a result of a collaboration through the NordForsk-funded project CliCNord (Climate Change Resilience in Small Communities in the Nordic Countries). The recommendations presented here build on CliCNord project results and more generally on the state of research on climate adaptation in rural areas.

Climate change adaptation efforts are limited to specific societal sectors

While climate change mitigation and the reduction of greenhouse gas emissions is increasingly understood and dealt with as a cross-sectoral challenge, of which all societal actors (including citizens) engage with, climate adaptation is still a topic only dealt with by the few – mostly in the technical department of municipalities and in the scientific community. However, independent of our global success of reducing CO_2 emissions, climate change is already happening, and the Nordic countries must adapt. The climate adaptation challenges that the Nordic countries face demand the involvement of all sectors, in the same manner as our societies today engage with climate mitigation and the reduction of emissions.

Municipalities in the Nordic countries experience an increase of tasks related to the preparing for and handling of extreme weather events [5, 6]. For most climate change-related hazards, local governments have the responsibility for both assessing the risk and managing climate adaptation projects. The process of applying for planning and construction permission in rural municipalities in Norway, for example, has become more complex due to the increased focus on risks related to climate-induced hazards. The officials in charge who were previously able to process these applications alone, now often have to involve additional expertise to implement the risk assessments. These additional tasks stretch the human and economical resources, especially those of smaller municipalities in rural areas, which have fewer people to take care of the broad variation of tasks and who often lack the specialised competences needed to deal with climate change adaptation. Thus, climate adaptation needs more attention from regional and especially national authorities to support the adaptation efforts of municipalities. There is then also potential for increased learning and collaboration across municipalities, for example through sharing resources in intermunicipal cooperation. Additionally, there is a need for more actors to be involved on the local level too – such as citizens, businesses, and civil society organisations – as they have specialised knowledge that can support the management and decision making of the municipalities.

Policy recommendation 1: Address climate change adaptation as a cross-sectoral societal challenge on all levels of governance

Climate change adaptation must be treated as an important issue across all public and private sectors, as well as in civil society. Actors on both local, regional, and national levels must take responsibility for local climate change adaptation. For this to happen, climate adaptation must be treated with the same political attention as climate change mitigation.

Rural communities hold important knowledge about adapting to extreme weather

Adaptation to a changing climate occurs at the local level. Given that risks, needs, capacities, and possibilities vary between different physical places and different social communities, local knowledge about hazards and the specific places should form the basis for developing suitable adaptation strategies. Many rural communities have experienced events like storms and floods for generations and have thus developed strategies for handling them. These adaptation strategies are based on local knowledge and local practices which have often developed over generations and which enable said communities to deal independently with climate change-related hazards. For example, it is common that people in such communities are more aware of observing signs in the environment that indicate that a landslide or avalanche is about to happen, and will clean gullies or fill water streams with gravel in order to prevent an event such as a landslide [7, 8]. On top of this, the first response to such events in rural communities is often organised by citizens while they wait for professional emergency response to arrive from further afield. Without this local knowledge and such practices, many communities would experience more damage from extreme weather events. Thus, such knowledge and practices should be included in climate adaptation efforts in the future.

Policy recommendation 2: Integrate local knowledge and practices into climate adaptation

Future climate adaptation efforts would benefit from taking their starting point in local knowledge and practices. There is therefore a need to find ways to include this knowledge in all phases of climate adaptation, planning, implementation, operation, and maintenance, and in disaster management on local, regional, national, and Nordic levels.

Rural areas are among the most vulnerable to climate change and extreme events

To increase the Nordic countries' ability to implement climate adaptation, the social, political and geographical contexts need to be taken into consideration. Climate adaptation is never neutral – there will always be different goals, values and ambitions. The distribution of disadvantages and benefits may favour some groups and individuals more than others. Groups that are hardest hit by disasters are often synonymous with groups that are already economically, socially, and politically marginalised [9, 10].

People in rural areas are among the most vulnerable to climate change and extreme weather events. Rural areas are exposed to the changing climate in different ways than those in urban settlements due, for example, to nature-dependent livelihoods, large areas with small populations, high physical and social vulnerability, and lack of financial and human resources and expertise. Though rural communities are experienced in handling challenges locally, climate change also stretches their resources and consistently provides both greater and new challenges. Rural communities therefore need help from outside if they are going to be able to prepare for and respond to increased climate related risks on the same level as people in urban areas. Hence, rural areas are dependent on support from the wider society, both for the prevention of hazards and by way of support during acute events. This support could be in the form of training, funding for preventive measures or in some cases, help for relocation.

Policy recommendation 3: Consider societal groups that are particularly vulnerable in climate change adaptation efforts

There is a need to increase our understanding of how marginalised and vulnerable groups are affected by a changing climate, as well as how a fair distribution of responsibility for climate adaptation can be developed. Climate adaptation needs to be just and inclusive.

Laws and regulations create barriers for collective climate adaptation action

Today the regulations in force across the different Nordic countries constrain the opportunities for local communities to adapt to a changing climate. Even if the responsibility for adaptation varies between countries and hazards, the CliCNord project shows that there are similar problems throughout the Nordic Region. Adaptation to several of the climate related hazards is today the responsibility of individual home or landowners. For example, in Sweden, a large responsibility lies with the owner of the property or forest, and in Denmark protection against flooding from the sea is a private responsibility [11]. In recent years, research has argued that this division of responsibility, and especially the responsibility that lies with the property owners, is unreasonable given that individual property owners may be hit particularly hard and in most cases do not have the resources or ability to reduce the risk by themselves [3, 12, 13]. Furthermore, it might be difficult for property owners to act effectively, as measures often require coordination. Today, legislation is often designed to support individual actions and even creates barriers to more collective climate adaptation projects.

Policy recommendation 4: Enable collective adaptation action through the adjustment of existing laws and regulations.

There is a need to update the laws and regulations to ensure they support collective action in the best way possible, and that they do not create unnecessary barriers for people in rural areas to take action themselves to reduce their risk from climate related hazards.

Research needs

As input for the abovementioned policy recommendations, more inter- and transdisciplinary research on climate change adaptation is needed. Based on the current state of knowledge, we suggest the following, though not exclusive, list of research priorities, of which point to specific, much needed contributions of the social sciences:

- **Citizen engagement in climate adaptation** has mainly been argued for and studied from a top-down perspective. How citizens themselves understand their responsibility for and how they engage with adaptation needs to be investigated further.
- **Identification of vulnerability:** Research is needed to investigate who is vulnerable to climate change and which sectors, communities, and individuals will suffer the most and should thus be the focus of policies and measures.
- **Just climate adaptation:** Justice is a fast-growing field of research in the context of sustainability transitions and climate change mitigation. However, it has not been addressed widely in relation to climate change adaptation. Studies of distributional, recognition and procedural justice especially related to vulnerable groups in rural areas are needed.
- **Governance:** Small municipalities do not have enough resources for the climate adaptation tasks required. Research is needed to develop new governance models that focus on collaboration between local, regional, and national governance levels, but also on innovative ways of collaborating between local authorities, which can then aid in increasing capacity in rural areas.

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