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Lead Author(s): Seija Tuulentie, Taru Rikkonen, Esa Inkilä, Pasi Rikkonen, Rannveig Ólafsdóttir, Anna Guðrún Edvardsdóttir, Ragnheiður Bogadóttir, Elisa Vang, Gun Lidestav, Per Sandström, Stefan Sandström, Kristine Lyngge-Pedersen, Roy Robertsen, Audun Iversen, Sten Siikavuopio, Leena Suopajärvi

Review(s): 1°/date

2°/date

Reviewer(s): Jukka Teräs, Pasi Rautio

[name(s)]

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Executive summary

This report assesses the future action needed up to 2035, based on scenarios from different Arctic hubs, which are central locations for traditional and emerging industries. The purpose of these recommended actions is to facilitate better decision-making and strategic planning, and to encourage proactive responses to potential opportunities and threats. This report is part of the WP5 work of the ArcticHubs project, which integrates socio-economic and environmental data with insights from various stakeholders, including decision-makers and indigenous peoples, to create desirable future pathways for the studied regions.

Local empowerment and balancing industrial growth with environmental sustainability were found to be key issues across the Arctic region. Effective participation and early involvement of local communities in planning processes is essential for sustainable development and attracting new residents. Particular attention needs to be paid to indigenous peoples' participation and dialogue. It is also important to maximise local benefits from extractive industries.

Concrete policy recommendations for tourism industry include exploring and possibly implementing tourism fees or other similar benefits of tourism to local communities and developing long-term tourism strategies. The focus of tourism should be on quality rather than quantity. Housing issues should also be addressed for both tourism workers and permanent residents. Aquaculture needs diversified methods and stronger environmental regulation for sustainable production. In fisheries, invasive species should be managed and exploited. Forestry also needs new, softer methods and in relation to that the project has tested an unmanned, lean forestry machine (cf. Rautio et al., 2023). There is a need to balance the protection of old-growth forests with the growing demand for wood-based materials, and to develop local plans for forest use. Dialogue with local communities is particularly important for mining companies, which often come from outside the region. Social sustainability issues should be addressed in addition to environmental impact assessment and monitoring.

In general, land use needs better zoning and climate-resilient strategies. Promoting local production and improving the marketing of local products would be good for overall social development. Investment in energy efficiency and renewable energy is needed, but any spatial needs for energy production should be decided with local people. At present, addressing geopolitical uncertainties, improving infrastructure and increasing food security have become more important. For areas such as the Westfjords in Iceland and Suðuroy in the Faroe Islands, improving road conditions and accessibility is a top priority to support economic activity and quality of life.

National governments are key players in regulation. Municipalities also have a very important role to play, as they are expected to facilitate discussions and negotiations between different parties and





stakeholders, and in general to bring different actors together. Municipalities also play an important role in land-use planning, which is crucial in times of climate change and green transition.

These policy recommendations are based on the future scenario work, workshops and Future Forums organised by ArcticHubs project in six locations that serve as hubs for important Arctic livelihoods or indigenous culture. The locations are Inari (Finland), Malå (Sweden), Nuuk (Greenland), Suðuroy (Faroe Islands), Varanger (Norway) and Westfjords (Iceland). In addition, broader scenario work has been carried out on forestry in Sweden and Finland and youth insights from across the Arctic.





1 Introduction

The narrative of the Arctic as a remote frontier and economic hinterland is being challenged by increased attention to the rich natural resources of the Arctic region to meet the challenges of the green transition, especially in the European context (Nygaard et al., 2024). Interest in the Arctic is growing among various actors, both globally and nationally. In particular, the interest of state actors in the physical space and natural assets of the European Arctic will increase (Suopajärvi et al., 2024). It is important to take into account new opportunities and changes in the operational environment. This report is the final and most important, but also the most difficult, stage of the scenario work, as it aims to consider the scenarios in terms of the information that would influence decisions in real life. It is often noted that analysing and tracking individual scenarios is not necessarily useful, as it is unlikely that any scenario would be fully realised as such. It is therefore more important to be able to identify the key issues that need to be monitored, draw general conclusions and put actions into practice. (Lätti et al., 2022.)

This report assesses the future actions needed up to 2035, based on the scenario work carried out in different Arctic areas that serve as important hubs for key industries, both traditional and those that represent new needs. The value of future studies lies less in the accuracy of the predictions than in their usefulness for planning and opening the minds of actors. Scenarios are action-oriented and can encourage individuals to be proactive in determining their own images of the future. People can also start to protect what is most valuable for the survival of their community (Natcher et al, 2007). It is important that the future scenarios produced are used by decision-makers and industrial actors. The aim is not to know or predict the future, but to help make better decisions today, using methods that force us to anticipate opportunities and threats and consider how to deal with them.

The focus of WP5 of the ArcticHubs project has been to map out future pathways up to the year 2035 for the studied regions by complementing existing socio-economic and environmental data, including that produced in the ArcticHubs working packages (WPs) 1-4, with the knowledge and views of decision-makers, authorities, economic actors and local residents, including indigenous peoples. The work has been carried out in close cooperation with stakeholders at different levels in each Hub, with a focus on reconciling different activities to develop desirable future pathways.





In the first stage (Tuulentie et al., 2023), progress was made towards these objectives by conducting Delphi surveys based on the issues identified in WPs 1-4 and by developing scenarios in future workshops. The second step was to evaluate the results of the scenarios developed (Tuulentie et al., 2024). On this basis, policy recommendations were developed and compiled and further elaborated in future forums in some hub regions.

The purpose of the policy recommendations is to move towards concrete measures and actions on how to adapt to and manage future changes in each region. These recommendations are presented in this report and summarised in the Policy Brief (2024).





1. Background: from scenarios to action

Most future studies are based on great simplifications. Typically, they start by defining a particular field, sector, region or issue of interest, and by setting a time horizon relevant for decision-making (Arbo et al., 2013). The use of foresight methods increases anticipatory awareness, which in turn increases foresight to be prepared and act faster or earlier, making the organisation or individual more effective in dealing with change. The ability to anticipate provides time to better understand threats and opportunities, develop more creative strategies, create new opportunities, and create and share a vision for organisational change (Arbo et al., 2013; Glenn & Gordon, 2009). Thus, scenarios should be used to support decision-making in the present by building capacity to better anticipate an unpredictable future (Spijkers et al., 2021). Recognising how and by whom the narratives are created and how resources are defined is part of understanding both the temporal and spatial geographies of the Arctic (Avango, 2013).

Similar to other futures studies, in the ArcticHubs -project scenarios are not an end in themselves, but a management tool to improve the quality of decision-making (Wilson, 2000). However, moving from scenarios to action seems to be more difficult than developing them. As Wilson (2000) notes, more scenario projects fail because they have no impact on strategy and management decisions than because they are unimaginative or poorly constructed. To avoid this, decision-makers have been involved in the ArcticHubs scenario processes. The scenarios produced in the first stage (D23) were evaluated by experts (D24) and then brought back to the wider local communities and Arctic experts to discuss how to proceed to action (this report). Stages one and two identified desired and undesired futures, and this third stage discussed the actions needed.

Important global drivers for Arctic futures are, among others, demographic changes, increasing foreign ownership and investments, importance of indigenous peoples' rights and local communities' acceptance, and challenges of climate change (Nygaard et al, 2024). Common trends seen in nearly all Arctic regions in the future are aging populations, increased population concentration into larger urban settlements, and the depopulation of smaller settlements (Heleniak, 2021). Although climate change can be seen as the biggest threat, these demographic issues are important and tangible for the residents and these as well as industry and land and sea use related aspects are intertwined in the discussions. The emphasis on economic development is recognized by Arbo et al (2012) as well as the major topic in the future-oriented Arctic literature.

Although the link between scenarios and action has been discussed more in relation to the business world, and in the case of ArcticHubs the scenarios deal more with the future of society as a whole, the business literature provides interesting insights into the issue. As an example, Meristö et al (2012) state that the essential success factor in a good foresight activity is the commitment of top





management and other decision-makers. As Wilson (2000) says, scenario planning is not merely a new planning tool, but rather a new way of thinking. In the evaluation stage of the ArcticHubs' future work concrete steps and responsible parties were already identified by experts. In this stage, the locals discussed the actions needed and this included in many cases the decision-makers who are responsible for implementing the scenarios.



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2. Data and methods: Future Forums and workshops

In the different hub regions, the processes for considering future policy actions have been conducted slightly different ways. What has been done in all regions is the examination of future threats and opportunities and then scenarios have been formulated in workshops. The basic scheme of the process is illustrated in Figure 1. This scheme has been applied in slightly different ways in different regions due to local circumstances. This report is based on step five. The results of steps 1-3 are described in deliverable 5.1 [23] (Tuulentie et al., 2023) and the results of step 4 in deliverable 5.2 (Tuulentie et al., 2024).

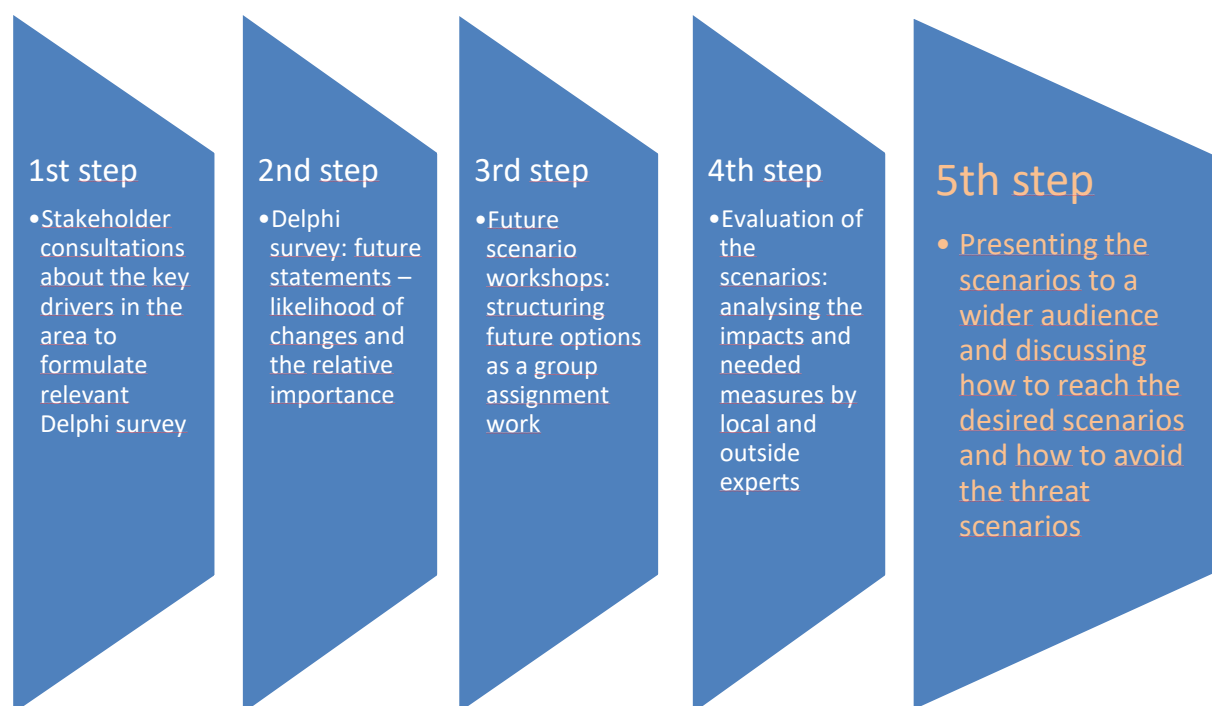


Figure 1. Basic scheme of the future work process in the ArcticHubs project. This report deals with step 5.

This work continued in different ways in the Hubs through the organisation of Future Forums (FF) or other events with local and regional stakeholders and other key actors. The Work Package 5 plan describes the Future Forum as a continuation of the evaluation of the scenarios produced in order to formulate and develop policy recommendations. Three full Future Forums were organised: one in Malå, Sweden, one in Inari, Finland and a cross-border workshop with the neighbouring municipalities of Varanger and Inari. Participants for the workshops were recruited through personal invitations to a wide range of local actors, from representatives of indigenous peoples to municipal actors, business





representatives and nature conservationists. In the Inari-Varanger workshop, the focus was on business developers from both municipalities and regions, as the aim was also to improve cooperation between neighbouring areas.

In Suðuroy, Faroe Islands, the Future Forum was fully planned, but widespread strikes prevented it from taking place. The Faroese FF will be organised later in the autumn. In Nuuk, Greenland, future policy actions were already formulated in the workshops, so there was no need to invite the same stakeholders to a Future Forum (FF). As Nuuk and even whole Greenland has a small population and therefore few potential respondents to the increasing research activities, it is important that researchers adapt the research activities so that they are relevant and meaningful and take into account the conditions of the respondents involved. In the Westfjords, Iceland, it turned out that it was impossible to organise a FF due to a lack of resources. However, the survey and various workshops with different stakeholders (including workers of foreign origin) provided a good basis for developing the policy recommendations. Therefore, where FF did not take place, the information is based on the previous future workshops and interviews. In addition to the regional FFs, the common actions for the whole Arctic were elaborated in the Arctic Youth Workshop, in an Arctic future session held in Helsinki in connection with the Sustainability Science Days (SSD) conference (June 2024) and some already in Deliverable 5.2 [D24] (Tuulentie et al., 2024). Wider Arctic insights were also collected in relation to the WP5 webinar through Mentimeter and in a session 'Voices for the Future' at the Arctic Circle Forum Berlin on May 2024.

In Sustainability Science Day session and in the Inari and Varanger-Inari forums, the working method used was the World Café, also known as the Learning Café (Nunez et al., 2020). The World Café is a tool that is widely used as a participatory method for gathering qualitative data. As a conversational process, it facilitates dialogue and mutual learning within large and heterogeneous groups, but also produces valuable data for researchers (Löhr et al., 2020). The basic idea of a World Café is that the process begins with the first of three or more twenty-minute rounds of conversation for small groups of people seated around a table. At the end of the twenty minutes, each member of the group moves to another new table. The 'table host' welcomes the next group and gives a brief update on what happened in the previous round. In this way, all participants are able to engage with all the topics and not just their own area of expertise.

In Malå, the process consisted of several interlinked activities, from the presentation of the serious game produced in the ArcticHubs -project (Online Interactive Game, 2024) to a final workshop to find out which issues were consensual and which were conflictual. In these cases the audience had the opportunity to ask questions.





All FFs also included presentations and discussions with national Arctic experts to inspire participants. In Inari and Helsinki SSD conference, specialists from the Finnish Ministry of the Environment presented their views on the future of the Arctic, and in Malå there was an online meeting with five candidates in the upcoming EU elections.

An important aspect of the evaluation was information on whether the results of the scenario work are being used in future planning activities by municipalities, industries or regions. The processes in the different hub regions are described in the following sub-chapters.





2.1. Rationale behind the selection of hubs

Six of the 15 ArcticHubs project sites have been selected for this future work process (Figure 2.). They represent both coastal and inland contexts and all have more than one industrial hub. They cover well tourism (5), aquaculture (4) and indigenous cultures (4) hubs, two of them also have mining and one is a forestry hub. In addition, forest-related future work was carried out together with Swedish and Finnish forestry hubs, and special attention was given to the youth perspective in a youth workshop and in the youth session of the Arctic Circle Berlin Forum.

While ArcticHubs deliverable 3.4 [14] (Elomina et al., 2014) conducted a Q-study to investigate socio-cultural issues in other hubs than this future work (Kittilä in Finland, Egersund in Norway, Leoben in Austria and Val Germanasca in Italy), it is possible to compare the results with those of the future work.

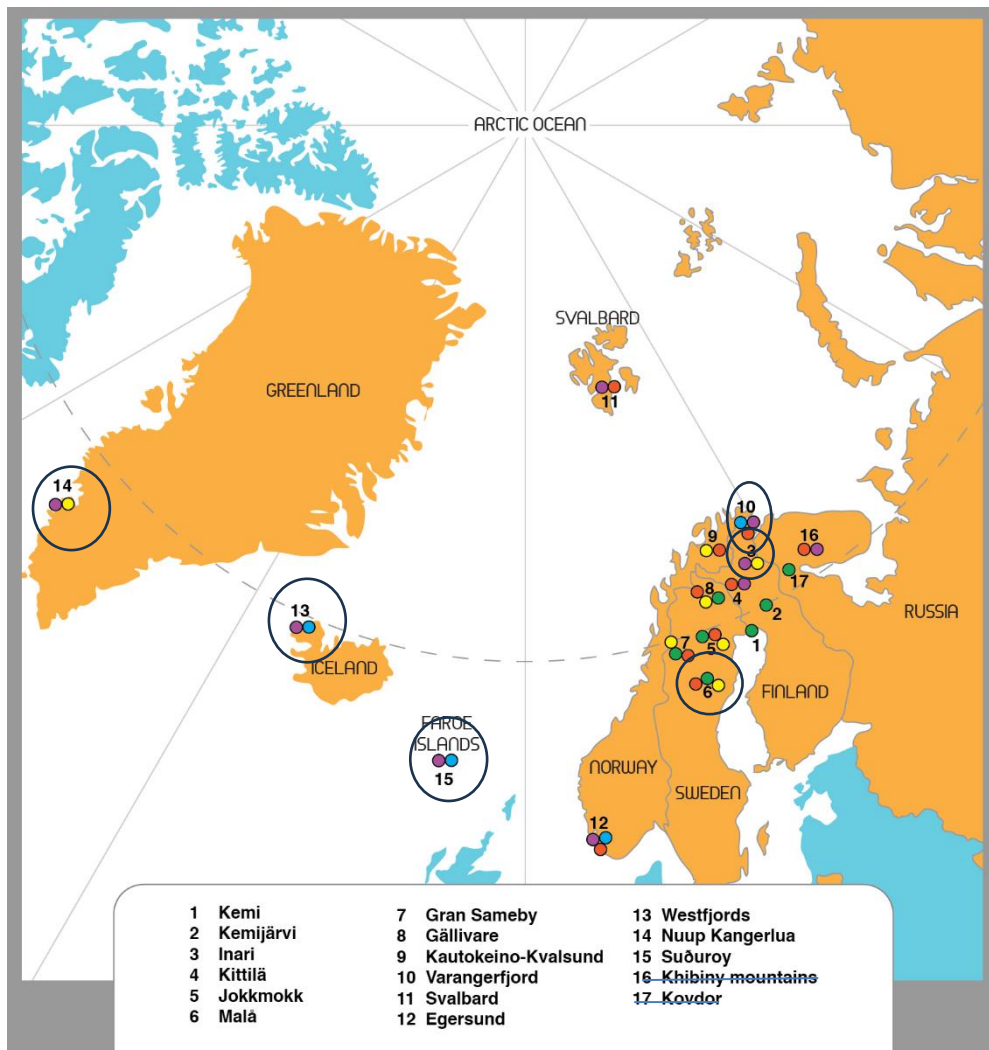


Figure 2. A map of selected hub locations: 3. Inari, 6. Malå, 10. Varangerfjord, 13. Westfjords, 14 . Nuuk and 15. Suðuroy





2.2. Inari, Finland

The work on the future policy actions of the Inari hub region started already in D5.1, where the future workshops were held in 2023, where the different scenarios were built, and in D5.2, where the scenarios were evaluated by external experts. The workshops already discussed concrete actions: what should be done to achieve the desired futures and avoid the undesired ones. In June 2024, this work was continued in the Inari Future Forum with both indigenous Sámi and non-Sámi locals representing, for example, the tourism industry, the municipality, nature conservation and the Sámi Museum. A total of 15 stakeholders participated in the forum.

The aim of this FF was to move from scenarios to action by defining concrete actions and actors to work on the key issues. The World Café was used as a method for which the organisers had chosen three themes that had emerged as the most important in the previous workshops: 1) Tourism, 2) Forests and Energy, and 3) Reindeer Herding, Fishing, Hunting and Gathering. The themes also represented the Inari hub industries of tourism and indigenous culture. Inari was not defined as a forestry hub (i.e. centre for forestry activities) in the ArcticHubs project, but the forestry issues of the Kemi forestry hub affect the whole of Lapland, including Inari. In addition, forests and forestry have also been an important topic in connection with energy issues at a time when Russian timber imports have come to an end due to international trading restrictions following Russian aggression in Ukraine.

For these themes, key issues were taken up from the previous work. At the beginning of the work, the participants had the opportunity to comment on the selected topics and to add if they considered another topic to be important. These themes and questions were discussed with the group with the help of a facilitator and all groups participated in all three theme tables. The next groups were then able to add to and comment on the answers, so that each group discussed each theme. The discussion focused on what needs to be done to achieve or avoid the issues raised in the scenarios, and by whom.

After the World café the results were presented and discussed together. There were 15 participants and six facilitators. On top of this, a public event for the locals in Inari was held to share the results of the ArcticHubs project.

2.3. Malå Sweden

In Malå, the work on the future policy actions was also started based on the work from the previous deliverables. For example, the policy actions were already discussed in one of the workshops held in Malå in 2023 (see Deliverable 5.1). At this stage, the more concrete actions for the future of the region were discussed at the Malå Future Forum in June 2024, which brought together different actors from different sectors and levels. This Future Forum included a wide range of interlinked activities aimed at consolidating and developing the work done so far.





The first activity was called "Building bridges" (6 participants) and consisted of a development of the serious game implemented in WP6 with local stakeholders. The second activity was called "Concluding Workshop" (7 participants) and it was a workshop to define the prioritised key actions based on the previous work. This was the main workshop for this deliverable. The third activity was called "Digital Conversation" (30 in the audience) and included a discussion with the EU Parliamentary election candidates on ArcticHubs issues. The fourth activity was called "Municipality Board Information and Dialogue" (12 participants) and it consisted of a dialogue on future cooperation between research, practice and politics regarding the results of the future scenario process in Malå. Since Malå is especially a forestry hub, the fifth activity was called "Lean Forestry" (24 participants) and included a half day in the field with local stakeholders to discuss the urgent technical, organisational and business adaptations with a focus on land preparation, and also to show the practical sides of these issues, for example the development of the unmanned forestry machine. The sixth activity was called "Competence development module" (20 participants) and focused on "Lean Forestry" methods in green transition during a forest evening for forest and nature lovers. The final activity was called "Game development of 'Building bridges'" (2 school classes) and was a workshop for students at Nila School to create a 3D character for the game developed in WP6.

2.4. Suðuroy, Faroe Islands

In Suðuroy, Faroe Islands, the final Future Forum, which was the final element of the participatory research process, was planned and scheduled to take place on 6 June 2024. Because of a national workers strike (beginning 13 May and ending 9 June), which entailed among other things the closing down of all public schools and day-care institution as well as public transport, and shortages of gas and food supply, the final future forum workshop that was had to be cancelled. The research team members were not able to travel to Suðuroy, the planned venue (the Public upper-secondary school in Suðuroy) was closed down, and local stakeholders and participants were not able to participate because of the effects from strike. Therefore, the Future Forum had to be postponed. However, the whole ArcticHubs research process has been designed as a iterative process of data collection and analysis, and the generation of new data through presentation and discussion of the findings, with the aim of co-producing knowledge and possible and desirable future scenarios. Therefore, the work on the Future Policy Actions in Suðuroy is based on the earlier ArcticHubs' work. A Future Forum will be held in autumn 2024 to report the results to the local community and to continue the discussions with stakeholders.

2.5. Nuuk, Greenland

Similar to Suðuroy, a wider Future Forum did not take place in Nuuk. In Nuuk, the future scenarios and future policy actions were prepared in two physical workshops held in 2023. The participants





represented different areas and levels of society and their insights, experiences and needs helped to create a diverse and nuanced dialogue, where new understandings were formed, new relationships were created, and new ideas were formed. Future policy actions were also formulated for the realisation of wish scenarios and suggestions on how threat scenarios can be prevented. The scenarios and future policy actions were put together in a trilingual report (Deliverables 5.1 and 5.2). The report was published and sent to all participants, interest groups, the municipality and the Self-Government. In addition, a press release was prepared, which led to a series of radio interviews, and thus the diverse voices were passed on from the physical future workshop to the public. In the case of Nuuk, it is particularly positive that, in line with the work of the Nuuk hubs on future scenarios and future policies, the relevant key actors have initiated action on some of the recommendations and have been inspired to organise participatory events to get input from the local population on the municipality's new future strategy.

2.6. Varanger, Norway

The Varanger Future policy actions are based on the work done in D5.1, in particular an early-stage Future Forum seminar in Kirkenes in June 2023. This work was then further developed in the joint workshop with Inari municipality in Ivalo in 2024.

A joint Future Forum of the Varanger (4 participants) and Inari (5 participants) areas took place in June 2024. The main aim of this FF was to address issues relevant to both regions, as they are neighbouring municipalities with many common problems - not least the situation with the closed border to Russia. There is now more interest in cooperation than there was before the war in Ukraine. The aim of the workshop was to define concrete actions and actors to work on the issues raised in the scenarios. The Inari-Varanger Future Forum brought together a total of 30 participants, stakeholders from both the Inari and Varanger regions, as well as Finnish and Norwegian partners in the ArcticHubs project.

The joint workshop followed the World Café method, but the topics were different from the Inari workshop. The themes discussed were based on previous work in the ArcticHubs project and were land and sea use, security, and tourism and fisheries. Under these themes there were several concrete topics. After working with the World Café method, the results were discussed together.

2.7. Westfjords, Iceland

The work on Future Policy Actions in the Westfjords Hub also started with the foundation laid by deliverable 5.1 [23] (Tuulentie et al., 2024). Including a PPGIS survey that was followed up by three on-site workshops aimed at broadening the survey's outreach to the various resident segments within the Westfjords study area (e.g., young residents, older residents, residents of foreign origin).





The goal was to gain a more comprehensive understanding of residents' attitudes to underpin the base for the future workshop, that was held in Patreksfjörður in November 2023.

The future workshops focused on discussing the planned future topics (threats and opportunities) and the formulated statements. A total of 13 residents participated, including 3 representatives of the public sector (among them the mayor of Vesturbyggð municipality), 3 private sector representatives (from aquaculture and tourism), 2 senior citizen representatives, and 5 representatives from residents of foreign origin (comprising employees in aquaculture, fish processing factory, and in kindergarten). The workshops commenced with participants engaging in individual tasks, involving the identification of opportunities and threats, and the evaluation of statements. This was followed by group activities where participants shared their individual insights from the initial phase. Each group then collectively determined the three most significant future opportunities and threats for the regional development of the area, ultimately ranking them in order of importance. These results were further elaborated by the research group in order to formulate a set of future policy actions.

2.8. Common Arctic Future work

The future policy actions for the Arctic in general were discussed in several events. The Inari Youth Workshop (August 2023; see more in D5.1 and D5.2) and the 'Youth in the Arctic' session at the Arctic Circle Forum Berlin in May 2024, organised together with the ACAF project (Arctic Network for Climate Adaptation and Food Security, funded by the Ministry for Foreign Affairs of Finland), contributed to the discussion on the future from a youth perspective. The workshop 'Resilient Futures of Arctic Livelihoods' was organised at the Sustainability Science Days conference in Helsinki in June 2024 together with another H2020 project, CHARTER. ArcticHubs' WP5 also organised a webinar entitled 'Arctic Futures 2035 - Opportunities - Threats - Actions' in May 2024.

The Helsinki workshop and the youth workshop used the World Café method. In the youth futures workshop, with 14 participants from across the Arctic, we discussed how to achieve or avoid the scenarios formulated earlier in the workshop. At the Helsinki conference, the ArcticHubs session was titled Resilient Futures of Arctic Livelihoods (see Appendix 1) and there were 12 participants, mainly researchers and PhD students from different parts of the world. Three pre-selected themes and issues, based on the project's scenario work, were chosen to be discussed in the workshop. The themes were 1) tourism, 2) forestry, 3) reindeer husbandry and, for the online participants, more general themes relevant to the 4) Arctic as a whole. The main aim was to discuss what needs to be done to address or avoid the issues and by whom. In the WP5 webinar the different scenarios, threats and opportunities for the different nodes of the project were presented and based on this a Mentimeter questionnaire was created for the online participants. In the Mentimeter, participants





had to rank different opportunities and threats as the most important or significant for the Arctic, and they could also identify the most important policy actions that need to be taken now for the future of the Arctic until 2035. A total of 17 experts and researchers took part in the Mentimeter voting.

The session 'Voices for the Future' at the Arctic Circle Forum Berlin was a panel discussion together with the Belgian EGMONT institute and APECS (the German National Committee of the Association of Polar Early Career Scientists) (see session description in: [Arctic Circle Berlin: Voices for the Future - ACAF](#)).

Chapters 3 and 4 below present the results based on all the material collected. Chapter 3 summarises the policy recommendations and chapter 4 sets out the roles of each actor in achieving a desirable future for the Arctic.





3. Policy recommendations by the Future Forums and workshops

The Future Workshops and Forums produced many recommendations for different actors to achieve the desired future of the Arctic. While the recommendations often have local emphases, many of the aspirations are fundamentally common to the region. Here, the recommendations are divided into those that are relevant to several Arctic regions more broadly, albeit with a local focus, and those that are specifically addressed to the development of a particular industry. The broader issues are referred to here as recommendations for the future of the Arctic as a whole (3.1), and the industry-specific issues are referred to below each industry (3.2). Each recommendation is followed in parentheses by a reference to the workshop(s) where the issue was specifically raised. The designation CommonA refers to those events that have involved actors from several regions (i.e. Common Arctic Future work as presented above), either Arctic or non-Arctic. Otherwise, references are according to hub locations.

3.1. Recommendations for the future of the Arctic as a whole

3.1.1. Geopolitics, security and Arctic cooperation

- **Promote open communication and cooperation among Arctic countries** to address common challenges. Work together to resolve conflicts and promote peaceful relations. (CommonA)
- **Prioritise Nordic and EU cooperation** as rebuilding trust with Russia will take time. The question of maintaining friendly relations with Russia divided the participants in the Future Forum. Some said that relations should be maintained during the Ukrainian war, but others felt that this was not possible. The frozen situation and difficulties in people-to-people collaboration with Russia. Also, one of the biggest companies in Kirkenes, Norway is not allowed to repair and service Russian fishing trawlers which has affected jobs and economy in Kirkenes. (Inari-Varanger)
- **Raise awareness of Arctic issues outside the Arctic.** It is important to raise awareness about the Arctic, for example in Central Europe, in order to foster a greater sense of global connectedness in the face of global challenges such as climate change. However, while we should not fall into the trap of Arctic exceptionalism and see the Arctic as inherently separate from the rest of the world, the special characteristics of the Arctic must be kept in mind when discussing it. (CommonA)
- **Be prepared.** Prioritise actions to address challenges at local, national and EU levels, focusing on crisis preparedness and community resilience. Increase diversity and spaces for innovative encounters. (Malå)
- **Improve infrastructure from a security perspective.** The road network in northern Scandinavia needs to be improved. The possibility of developing the port of Kirkenes was also seen as important by both Norwegian and Finnish actors. In order to improve self-sufficiency, it is necessary to develop IT connections and communication infrastructure in general.
- **Emphasise the need for effective regulatory and governance strategies** to address key issues such as nature conservation, accessibility, migration and taxes to support tourism.





Regulate the green transition in a more holistic and equitable manner. Respect the Arctic Council's agreement that the Arctic is a sustainable, non-war zone where decisions are made in close cooperation with indigenous communities. Agreed climate change policies must be implemented (CommonA)

3.1.2. Climate resilience and green transition

- **Develop strategies to increase climate resilience and adaptation in communities**, taking into account the potential impacts of climate change on traditional livelihoods, economic drivers that may be at risk and the overall well-being of the community. (Nuuk, Westfjords)
- **Invest in renewable energy** to ensure self-sufficiency and minimise the carbon footprint. (Faroe Islands)
- **Promote and develop new forms of energy production:** solar power, offshore wind farms and small modular nuclear power plants have been promoted. A financial return to the local community from wind power would help its local acceptance. This will require legislative changes. Government support for local energy companies would be important. More research is needed on the effects of energy production and other land use changes, especially wind power, on reindeer husbandry and other local livelihoods. (Inari-Varanger)

3.1.3. Empowering and benefiting local communities

- **Adopt the working model of "dialogue - consensus - interaction - cooperation"** at all levels and between practice and research. (Malå)
- **Manage the land and sea use needs together with local communities, especially indigenous peoples.** Since aquaculture and fishing operate in the same fjords, joint solutions require long-term exchanges and the use of different platforms or approaches. Early dialogue and participation are needed. Compensation may be necessary to protect local and indigenous culture. (Varanger)
- **Promote community-led development projects** that emphasise the participation of local people in decision-making and ensure that the benefits of industries such as aquaculture and tourism contribute directly to the well-being of local people. Strengthen a strong cultural identity to attract tourists and new residents. (Westfjords)
- **Promote transparency and inclusiveness in decision-making processes** related to industrial development, ensuring that local communities have a voice in shaping the future of their region and that benefits are shared equitably. Involve local people in policy formulation. (Westfjords; CommonA)
- **Use innovative participatory methods**, such as citizen panels, participatory workshops and opinion surveys to improve public involvement and engagement in land-use planning and decision-making processes. (CommonA)
- **Invest in education and research.** Focus on education at all levels related to sustainability, climate change and local cultures. Increase funding for scientific research and technology (especially using collaborative methods) related to sustainable development and recycling.





Support initiatives to promote education and use of indigenous knowledge and languages in indigenous areas. (CommonA)

- **Industries should benefit local economy.** Tourism, mining and energy production would be more acceptable if the revenue remained more local. Importance of securing that the local society gets a major part of the values should be explored. (commonA, Inari)

3.1.4. Indigenous cultures

- **Prioritise the participation of indigenous people and the use of indigenous knowledge** in Greenland in order to ensure that development is rooted. Development should also support the preservation of indigenous languages, cultures and livelihoods and promote the continuity of traditional, indigenous and local knowledge in order to value and strengthen cultural heritage, sustainable tourism and community well-being. Both the revival of elements of Inuit culture and the development of modern Greenlandic culture will develop a strong culture and a population with a proud identity. (Nuuk)
- **Protect elements of Inuit and Sami culture through dialogue on indigenous peoples' rights and culture.** There is a need for public dialogue on how the UN and ILO declarations on the rights of indigenous peoples should be understood and respected when decisions are made about new uses of land, fjord areas and natural resources. There is also a need for public dialogue in Greenland because there are different views on development: some are more positive and open to rapid development of the tourism industry using international concepts, while others want slow, locally based and culturally sensitive tourism to protect existing ways of life and revive some cultural values and traditions. (Nuuk, Inari)
- **Support initiatives that preserve and promote the unique cultural identity** of the local people, including the revival of traditional crafts, cultural events and the promotion of indigenous languages to strengthen community cohesion and pride. (Inari)

3.1.5. Sense of place and local identities

- **Promote the place as an attractive community.** Develop urban and rural areas to support remote working, small businesses and food self-sufficiency. Provide more resources for functional advice that meets the needs of the community's reindeer herders and foresters. (Malå)
- **Develop the image of the area.** Attract young people by offering a unique combination of urban life and outdoor activities, while strengthening cultural identity and pride by promoting local arts and heritage. Encourage remote working to attract global talent while supporting local jobs. (Varanger)
- **Recognise Arctic diversity and the sense of place.** For young people growing up in a remote Arctic place is different from living in the urban Arctic. Also, the difference between living in the Arctic and in the capitals of Arctic countries is the same as the difference between the Arctic and, for example, Central Europe. (CommonA)





- **Promote local identities to raise awareness** of traditions to support local pride and consumer habits. (CommonA)

3.1.6. Demographics and youth engagement

- **Pursue an active economic policy to attract educated, young and female people.** A developed housing policy and health services are also needed. Aquaculture offers year-round employment for more educated, female and young workers, but needs to be balanced with more traditional industries. (Varanger)
- **Improve current forms of cooperation and create models for attracting residents.** For example, clarify the immigration and work permit process to attract new residents and stakeholders. Create more opportunities for remote work to attract and retain residents in Arctic communities. (CommonA; Inari)
- **Engage youth in digital literacy** through workshops that integrate local cultural and environmental themes into game development. Use student-created characters and concepts to promote community representation and pride. (Malå)
- **Involve young people in decision-making processes** and policy development to ensure that their perspectives and concerns are taken into account in shaping the future of Arctic regions. The multiple challenges associated with major global changes - climatic, environmental, political and social - call for fresh perspectives and innovative thinking. Given the space and time, young people can provide that freshness. (CommonA)

3.1.7. Local products

- **Encourage local production for local consumption** and promote entrepreneurship education in primary schools. (Malå)
- **Promote and market local food and other local products.** Develop local markets or fairs where small businesses and local producers can sell their products. Self-sufficiency is also linked to energy production, which should be small-scale and local. (Inari; CommonA)
- **Improve the image and added value of local products.** Focus on promoting local ingredients such as reindeer meat, fish, berries and mushrooms. Increased awareness and branding of local products is needed. (Inari)
- **Consider food security as an important part of security.** Interest in local food should be increased. Other communities should learn from isolated communities that have always had support. (Inari-Varanger)

3.1.8. Infrastructure, transport and accessibility

- **Prioritise connectivity in infrastructure improvements**, such as an undersea tunnel project, to improve accessibility, promote economic development and support the region's tourism and aquaculture sectors. (Faroe Islands)
- **Invest in infrastructure development**, particularly in improving the region's roads. This is essential to strengthen social links and cooperation between local town and to improve





connections with the capital area. Improved accessibility will support economic activities and strengthen social interaction within the region. (Westfjords)

- **Prioritise investment in road infrastructure** and improve accessibility in remote Arctic areas, such as the Westfjords in Iceland and Suðuroy in the Faroe Islands, to support economic growth and connectivity. Invest in forest roads and infrastructure while maintaining high technical efficiency. (CommonA)

3.1.9. The use of participatory mapping and zoning in planning

- **Implement Participation Geographic Information System (PPGIS) for better mapping and planning.** Focus surveys on specific local land use issues and integrate them into community policies or conflict resolution processes to increase relevance and participation. Aim to locate and restrict tourism activities to specific areas to ensure nature and culture friendly tourism and to preserve traditional local activities. Use PPGIS also to assess the natural values of forests. (CommonA; Malå)
- **Create zones for different activities.** There should be zones that are kept free of tourist activities and zones for multiple activities with good coexistence between different resource users. In Greenland, there is a need for a nationwide effort to identify and map the different zones, and the Self-Government has included a paragraph on zoning in its draft of a new "Tourism Act". However, zoning will also require the incorporation of many other existing laws and acceded conventions. (Nuuk)

3.2. Industry specific recommendations

3.2.1. Tourism

- **Examine the taxes on tourists.** More benefits from tourism should be directed for local communities, but in practice the issue is complicated. Taxes or fees need broad cooperation of all stakeholders. Municipalities should lobby national decision-makers. There is an urgent need to benchmark and study how tourist taxes work in other places and how they could be applied in Finnish Lapland. In Greenland, the Self-Government is already working with various options for tax levies, ranging from cruise ship and passenger tax, hotel accommodation tax, CO2 tax, etc. Taxes and their level of revenue will fall far short of the needs for capacity building and maintenance costs. (Inari, Nuuk)
- **Develop long-term planning of tourism with focus on sustainable practices and community well-being.** Tourism is seen as an important opportunity with the greatest potential to contribute to future development. To realise the potential of tourism and minimise the risks, long-term planning is required. This includes mapping tourism destinations and managing visitor flows and making sure that local communities benefit through job creation, improved public services and enhanced quality of life. (Faroe Islands, Westfjords)





- **Coordinate tourism activities with local development goals and responsible land use.** Knowledge-based planning includes capacity analysis, drafting of regulations and implementation of monitoring mechanisms to ensure the preservation of a clean and diverse natural environment. (commonA)
- **Establish working groups across relevant sectors, interest groups and tourism stakeholders to coordinate and regulate** cruise tourism and other tourism activities. Joint coordination and regulation is desirable to ensure good coexistence and nature- and culture-friendly tourism. (Nuuk)
- **Control and monitor tourism activities.** Given Greenland's large geographical size and small supervisory authority, it is difficult to monitor the geographically dispersed tourist activities.. The government must include strict safety requirements in the draft Tourism Act, even though critics say this will scare away investors. (Nuuk)
- **Create a system of seed capital for permanent residents.** A good financial framework is needed to ensure local ownership and culturally authentic tourism development. Foreign investors are welcome, but the draft of the new Tourism Act stipulates that 2/3 of the owners of tourism companies must live and pay taxes in Greenland. (Nuuk)
- **Develop year-round tourism and remote working opportunities to solve the housing shortage.** If summer tourism develops, families can settle and buy houses. Developing conditions for remote working would also help. In addition to the entrepreneurs' own actions, the municipality is a key actor. Tourists and non-locals in some cases have privileged access to housing, such as Airbnb and holiday/second homes, over local residents. (Inari, Faroe Islands)
- **Create a cooperation platform for labour markets.** Tourism seasons in Finland (winter) and Norway (summer) are different - a cooperation platform for labour markets is needed to bring fluidity and mutual benefits across the region. (Inari-Varanger)
- **Promote quality over quantity in tourism.** There are concerns about overtourism, overcrowding and degradation of nature. It is necessary to emphasise the development of quality tourism over quantity in order to not to overload local infrastructure. If Suðuroy nature is successfully branded, it could potentially attract mass tourism to the island, which would be detrimental to local nature and local people's access to nature and services. (Faroe Islands; Inari)
- **Develop more sustainable transport and accessibility.** A platform for buses, for example, to sell extra capacity could be one solution. At present in Scandinavia buses often return empty after taking tourists somewhere. (Inari; Varanger)

3.2.2. Aquaculture

- **Strengthen aquaculture practices to reduce environmental impacts** and ensure the health of fjord ecosystems. Diversify by exploring alternative aquaculture methods, such as offshore and multi-trophic systems, to reduce the environmental footprint and increase sustainability. (Faroe Islands)





- **Improve industry structure and local involvement.** Focus on spin-off industries from fish farming (e.g. suppliers, innovative sustainable solutions in aquaculture production). Threat of centralisation of ownership should be avoided (not all licences owned by one company). Increased local influence and participation in the production and value chain needed. (Faroe Islands)
- **Improve industry's social sustainability by giving local residents more say in aquaculture decisions.** The aquaculture companies should actively engage in the communities' social development and make sure that profits remain within the local communities. Promote local job opportunities related to aquaculture processing in the area. (Westfjords)
- **Improve coexistence of fishing, aquaculture and tourism.** In Varanger, a decision needs to be taken on whether more aquaculture is wanted. Seafood will remain important, there should be room for both aquaculture and fisheries. Traditional industries should be the focus, but there should be openness to innovation and new. (Varanger)
- **Encourage economic diversification** by exploring alternative sustainable sectors beyond aquaculture and tourism, such as renewable energy and creative industries, to enhance economic flexibility and reduce dependence on a single sector. (Faroe Islands)

3.2.3. Reindeer herding, fishing, hunting and gathering

- **Improve winter pastures for reindeer husbandry.** This includes measures such as expanding and preventing excessive fragmentation, implementing sustainable grazing cycles and sharing location-based information. Consideration will also be given to the possibility of reducing reindeer numbers. (Inari)
- **Develop sustainable fishing practices.** Fishing should be integrated to tourism and fishing should be marketed as summer tourism – “live like a local” – and interaction between professional fishermen and tourists promoted. Also, training could be given in fish preparation. In general, local fish should be promoted and marketing strategies improved. New infrastructure is needed. (Inari)
- **Take advantage of invasive species coming along with climate change.** The prominent fisheries sector has faced the introduction of non-indigenous species. In Norway, the king crab problem has been reversed but the increase of pink salmon is not yet brought under control. The increase in pink salmon in Norway and Finland cannot be influenced because Russia favours it. The solution is to turn it into a usable resource but the use of this resource needs much more attention - changes in regulation, processing and marketing. (Varanger-Inari)
- **Develop fishing tourism.** An opportunity offered by pink salmon requires new attitudes. The difficulty for professional fishermen to engage in fishing tourism because of the need for certification. Regulatory changes needed. Cod, halibut and, in inland waters, pike should be promoted for tourism. (Inari-Varanger)





3.2.4. Mining

- **Leave part of the profits to the local community.** Social sustainability issues (such as the use of local labour) should be addressed in addition to environmental impact assessment and monitoring. (Varanger)
- **Establish monitoring mechanisms and control measures** to address concerns related to foreign investment and lack of local integration in the region to ensure sustainable development and community well-being. Mining requires government regulation, as well as third-party evaluators and consultants with local knowledge. (Varanger)

3.2.5. Forestry

- **Negotiate the protection of old-growth forests.** A development plan for forest use is needed. Municipality and forest owners/managers are central actors, but a broader cooperation platform is also needed. Buying forests to offset carbon emissions is one possibility. The EU, the Finnish government and NGOs as lobbyists have a responsibility for the future of forests. (Inari)
- **Promote lean forestry techniques that minimise soil impact and support reindeer husbandry by reducing land-use conflicts.** It is important to "do it right the first time". Develop autonomous forestry machines with AI capabilities to improve soil preparation accuracy and reduce environmental impacts.
- **Showcase best practice.** Showcase successful examples from different industries and smart technologies that balance resource use and environmental protection.





4. Responsible actors

All the ArcticHubs' future workshops, and especially the future forums, have discussed the question of who is responsible for making the desired future of the Arctic a reality. The focus was on different actors for different questions and the results were as follows.

The European Union was seen as the most important actor, especially in forestry matters. This was reflected in both the Inari and Malå Forums. In Malå, it was pointed out to the European Parliament candidates that the EU does not understand the realities of northern Sweden. The candidates acknowledged that this is certainly true. In Inari, the issue of the protection of old-growth forests was one where the EU's role was seen as important. The EU's responsibility in financing the development of renewable energy sources was also seen as key. Climate policy is also such a broad issue that the EU and other supranational actors are at the heart of it. **The Arctic Council** was mentioned only once, by a webinar participant who said that the Arctic Council's agreement that the Arctic is a sustainable, non-war zone where decisions are made in close cooperation with indigenous communities should be respected.

National governments as legislators were perceived as the most important actors in many areas. E.g. the governmental regulation policy (quotas and access) is very important for the fishing activity. What was raised in particular in the discussions was the tourist tax, which was supported in many regions and regarded as a state-level issue. In Inari, it was stressed that all taxes collected go to the state. If a 'tourist tax' were to be implemented, it would have to be a charge other than a tax. In any case, such a solution would require a decision at national level. The role of the municipalities in this was seen as lobbying the state. In Greenland, the Greenlandic Government has already drafted a proposal for a Tourism Act to ensure that the tourism industry is locally anchored and that different activities are zoned to ensure good coexistence and minimise undesirable conflicts between different users of nature and natural resources.

Other regulatory issues where the state was seen as a key player were mentioned, particularly in relation to mining in the Varanger region and local energy production. In the area of security and crisis preparedness, the state was also seen as a key actor.

On forestry issues, the Finnish Metsähallitus, which is the state-owned state forest manager, plays a key role, as the forests in the northern region are mainly state-owned. Similarly, in Sweden, the state was seen as a key actor in forest issues. The possible but unlikely establishment of Lake Inari National Park was also seen as being in the hands of the Ministry of the Environment.

The development of road networks and other infrastructure is also the responsibility of the state and a great deal of emphasis has been placed on this issue, particularly in Iceland. In the Faroe Islands,





stricter regulation of fish farming was called for to make production more sustainable and safeguard fjord ecosystems.

Regional and cross-border actors were particularly mentioned in the context of Norwegian-Finnish border issues. The issue of invasive fish species, pink salmon, in Norwegian and Finnish waterways was seen as an issue requiring strong cross-border cooperation. In Finland, however, regional councils were also seen as important actors in regional land use planning. In Varanger, the information collected in ArcticHubs project has also been used to contribute towards the important coastal plan developed by the four municipalities surrounding Varangerfjord. In the Faroese island of Suðuroy, collaboration across municipal boundaries was seen as a requirement for long-term tourism planning strategies.

Municipalities are key players in many measures, especially in coordinating land use, making planning truly participatory and empowering and engaging all members of local communities. One of the most widespread aspirations for the future across the Arctic region was to better involve local communities in development projects. The municipality was seen as an actor that could create arenas for innovative and initiative encounters. However, municipalities were not expected to act alone, but to coordinate and to make things possible in cooperation with other actors. Additionally, the benefits of sharing experiences and results from other municipalities or regions was highly valued, and something that delivered through a number of the ArcticHubs webinars, workshops and training sessions.

In Inari, for example, the municipality was seen as an important player in almost all areas of the desired future. Especially managing tourism and enabling the better marketing of local products municipality should coordinate the planning and cooperation of entrepreneurs. In Nuuk, it was noted that citizen involvement requires resources, but that it is necessary if the municipality wants to ensure that development initiatives are locally adapted and rooted. The benefits of utilising cross-sectoral input and co-creative methods as applied by the ArcticHubs researchers, were strongly acknowledged in this context.

Municipal actors have been closely involved in future work in most regions and there are therefore already signs that the results are taken into account. In Malå, Sweden, for example, forestry operators and the municipality agreed to continue the cooperation initiated at the Future Forum. Also, the Malå municipal board expressed that the ArcticHubs' work has been appreciated and called for continued cooperation in the form of new projects where the municipality is involved. Increased citizen involvement in the development of Nuuk was mentioned in relation to several desired scenarios, and the municipality was so inspired by the ArcticHubs process that it has started a series of citizen meetings to gather input for the new Nuuk future strategy. Also in Inari, the municipality





has been extremely interested in the ArcticHubs process and results, and the municipal actors have said that this has been eye opening process.

Global industry actors coming to the Arctic should take care of social acceptance. It is a question of contributing to local communities also in other ways than job creation and taking care of environmental sustainability. Formal (law-based) and informal (open house visits, public meetings etc) engagement of local communities is crucial for achieving Social Licence to Operate (SLO). Formal dialogues may not always resolve issues effectively. Transparent processes and good communication between industries and communities is needed. In the Faroe Islands, for example, the centralisation of fisheries and fish farming has left local people feeling powerless, and they see tourism as a more promising alternative for the future, as an industry that allows for more local initiative and control. In Westfjords in Iceland, it was emphasised that benefits of industries such as aquaculture and tourism should contribute directly to the well-being of local people. The dilemma in Greenland is that there is a lack of local capital and, thus, foreign investors are invited to participate in capacity building. However, e.g. the Tourism Act draft suggests that that 2/3 of the owners of tourism companies must be resident in Greenland to keep the tourism in the hands of the locals. Tourism based on Greenlandic culture is expected to be preferred by both local and foreign tourism operators and future tourists, to ensure an authentic and rooted tourism industry that is enjoyed by both visitors and permanent residents. In cruise tourism, the companies seem to have minimal communication among destinations and economic concerns overshadow collaborative planning (Ólafsdóttir et al, 2024).

Local companies also have their responsibilities. In tourism in particular, companies should take responsibility for social and environmental sustainability. Creating year-round jobs and solving housing problems were also seen as the responsibility of tourism companies. Transportation solutions could also be based on local companies' activity. In Greenland it was suggested e.g. that tourism operators can arrange nature restoration projects with tourists to ensure that Nuuk's future is shaped with a tourist industry that promotes healthy environments and creates a strong local culture.

Especially in tourism local businesses are often small, so it is important that they work together to minimise the potential negative impacts of tourism. Businesses are also expected to be innovative and benefit local communities at large.

Local residents were seen as being responsible in particular for consumer behaviour, the production of local natural products and the creation and maintenance of a strong local identity. Residents could contribute to profiling the places as attractive places and present the original characteristics of the areas.





The role of **indigenous peoples** could be related to educating tourists about indigenous cultures, improving the preservation of indigenous languages and cultures, and promoting the continuity of traditional knowledge. In reindeer husbandry, the improvement of pastures is also partly in the hands of indigenous peoples.

Researchers should understand the circumstances of indigenous peoples in a world of increasing research activity and aim for mutually meaningful research collaboration with them. Also inclusion of different kinds of knowledges was seen important. However, it is important to understand that local traditional knowledge is not a static entity but changes over time.





5. Conclusions

The future of the Arctic to 2035 will be shaped by several actions that require better management and development. Although the Arctic region is not homogeneous and different parts of it have different needs, there is a common denominator. **Climate change**, with all the actions that need to be taken, and **geopolitics** form the backdrop to most of the recommendations, although these issues were not often directly mentioned. However, the mentimeter survey in the Arctic Futures webinar showed that these issues are at the heart of everything (Figure 3). But then again, the most important issues raised by the stakeholders in the workshops and future forums were the **involvement of local people** and **local benefits** from all activities in the Arctic. Therefore, the key features of the Arctic Dream future are the **empowerment of local people** and **well-managed development in and between the industries** that are important throughout the Arctic.

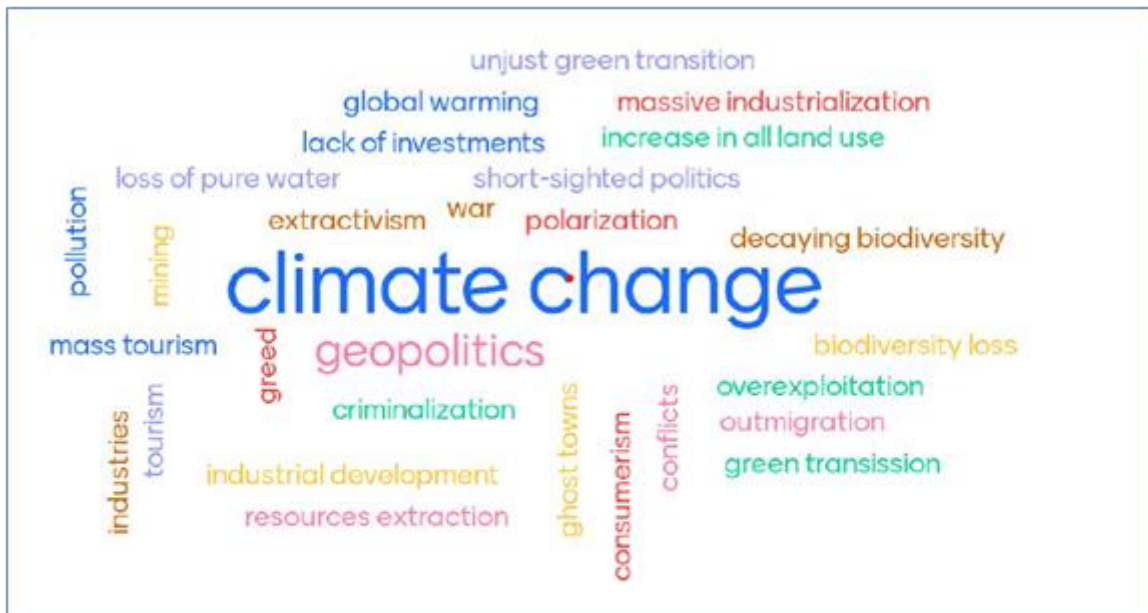


Figure 3. One question for the WP5 webinar audience was: In one word what do you consider the biggest threat to the Arctic? This word cloud consists of 37 answers.

As far as industries are concerned, **mining is viewed with scepticism** and will require different approaches from both the mining industry and national regulators to make it locally acceptable. **Environmental issues and reconciliation** with the traditional fishing industry are the main challenges for the future of **fish farming**. The concentration of the sector also makes local acceptance more difficult, as local people feel they have no say in what goes on. In **forestry**, broad **local cooperation forums** are obviously needed. Tourism and tourism growth were discussed in almost all ArcticHubs project areas. While there are differences between **cruise tourism and inland tourism** in particular,





regulation and rules are needed. Respecting local culture, avoiding problems of overtourism and **collecting tourist fees** to offset disadvantages were seen as important in most cases.

Transport and accessibility are key issues in areas such as the Westfjords in Iceland and Suðuroy in the Faroe Islands. However, much could be done to improve mobility in all areas and make it more sustainable.

In terms of actors, much hope is placed on external actors such as the **EU and national governments**. But much can also be improved at the local level. **Greater local involvement**, especially in the early stages of the various development and planning processes, and the development of cooperation forums and dialogue arenas would go a long way. There is also work to be done in developing methods of participation - the **Public Participation GIS** developed in the ArcticHubs project is a good way of doing this.

When listing the actors separately it is important to note that also a wide cooperation between different actors is a wish. As it was put in Varanger, decision-makers like politicians at national, regional and local level must have the ability to plan and decide for the future to the best for the society. Cooperation between business actors, public organizations and local people is necessary to attract new inhabitants.





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