

# Climate Resilience of Arctic Tourism: A Finnish Perspective on the Post-Paris Agreement Era

Juho Kähkönen

*The Arctic is more globalised than ever and, in the Anthropocene, the Arctic region should be recognised as the laboratory of the future of industrial civilization (GlobalArctic, 2020). The actions taking place in the Global Arctic today may indicate how climate change impacts our future (see Finger & Heininen, 2019). Therefore, an analysis of the Arctic can provide a 'road map' for the post-Paris Agreement era (see Wu et al., 2018). In the Arctic, where the effects of climate change are the strongest, we see the importance of climate resilience, a concept highlighted in the Paris Climate Agreement. Arctic tourism in Finland is an illustrative example of climate resilience, as the industry has to respond to many different changes at the same time. Finland's government has set the goal of achieving carbon neutrality as the first industrialised society in the world by 2035. Global warming and the changing business environment is increasing the vulnerability of the tourism industry. Simultaneously, dramatic impacts following COVID-19 restrictions may halt the first-rate success of this locally essential livelihood. Unless we are able to effectively coordinate efforts to develop climate resiliency, the implementation of necessary measures will be delayed.*

## Introduction

In the Arctic region, tourism has a close relationship with the surrounding nature (Saarinen & Varnajot, 2019: 1) which is why climate change, with its diverse effects, is a key challenge for Arctic tourism (Kaján, 2014). Arctic tourism in Finland after the Paris Agreement is an illustrative topic for climate resilience research, as the Finnish government has outlined that by 2035 the country will be the first industrialized carbon-neutral society in the world (see Finnish Government, 2019). Globally, tourism grew strongly in the years leading up to the COVID-19 crisis and accounted for 5–8% of the greenhouse gas emissions in the world. This article engages with the following research question: what do the local perspectives of climate change on Arctic tourism tell us about their climate resilience in the post-Paris Agreement era? The material of the study consists of 20 semi-structured interviews conducted in Lapland, northern Finland, and the theoretical framework consists of the theory of climate resilience and theory-guided content analysis. The interviews for this study were conducted before the COVID-19 pandemic.

Regardless of the scenarios, the ongoing environmental changes are causing significant socio-ecological changes in the Arctic region (AMAP, 2017b: ix). However, the implementation of the Paris Agreement may reduce changes in the Arctic after 2050 (AMAP, 2019: 3). This study highlights four key findings on the climate resilience of Arctic tourism: 1) climate resilience is linked to the vitality of the region; 2) growing uncertainty challenges and renews climate resilience; 3) the capacity to bounce back acts as an indicator of climate resilience; and 4) in Finland, climate resilience in Arctic tourism is currently at a sufficient level, but there is a growing need to develop it. The study also highlights the need for more systematic coordination in carrying out the necessary actions to both mitigate the emissions and to adapt to climate change. This finding is in line with international comparisons, where the voluntary emission-control measures taken by the tourism industry have often proved ineffective (see e.g. Lenzen et al., 2018: 526–527; Scott et al., 2012: 11; WTTC, 2009). Balance is needed to fulfil local needs and global responsibilities.

The next section describes the relationship between climate change and Arctic tourism. This is followed by a section describing the theory of climate resilience. The methodology is then described before the local analysis figures. The end of the article summarises the study results before providing conclusions.

## **Climate change and Arctic tourism in Finland**

In Finland, Arctic tourism is an important and strongly growing industry (Rantala et al., 2019: 20–21). The national goal is to make Arctic tourism a ‘spearhead’ of national tourism marketing (Prime Minister’s Office, 2017: 1–2). In the municipality of Lapland, the tourism sector, which is heavily focused on the winter season, directly employs more than 10 percent of the local work force and attracts more than 3 million annual visitors (House of Lapland, 2019; Lapland Tourism Strategy, 2019: 12–14).

Arctic tourism is on the frontline facing multiple climate risks. After the dramatic results of the IPCC Special Report, Global Warming of 1.5 °C, and the Arctic Monitoring and Assessment Program, it is clear that with climate change there are no winners (see e.g. AMAP, 2017a; AMAP, 2017b; AMAP, 2019). Meanwhile, it is challenging to measure the capability to adapt, which is affected by the diversity of the Arctic tourism in Finland, its varying locations, and its cultural factors. For example, while a shortening winter increases vulnerability, it can simultaneously increase the experience of certainty of snow compared to competing travel destinations (Kaján, 2014: 6 & 48–50). According to Tervo-Kankare et al. (2018: 14 & 20), despite identified risks, Arctic tourism benefits from the environmental changes in the short run. Rantala et al. (2019: 54–57) are more cautious about possible benefits of climate change and outlines how the future of nature tourism, local infrastructure, invasive species, changes in customer behaviour, changing tourist profiles and the general increase in weather uncertainty are significant threats to livelihood.

With regards to global analysis, the tourism industry has so far been unable to take necessary action on its own initiative to mitigate or to adapt to climate change (Lenzen et al., 2018: 526–527; Scott et al., 2012: 11). This confirms the assessment that the role of public administration in ensuring local adaptability is significant. In Finland, the key problem for the tourism industry to adapt to climate change is the lack of adaptation strategies. Strategies that guide the development of industry, such as Finland’s Tourism Strategy 2019–2028 and the Lapland Tourism Strategy 2020–2023, comprehensively address economic growth and many dimensions of sustainability, but do

not provide tools for preparing for climate change. In the assessment of Finland's National Climate Change Adaptation Plan (2019), the tourism industry received the weakest results among other industries (Mäkinen et al., 2019: 30). There were, for example, the least measures taken in tourism, and none of the respondents had an adaptation strategy in place (Berninger et al., 2018: 14 & 24).

According to Lenzen et al. (2018: 526–527) and Scott et al. (2012: 11), the poor success of the tourism industry in voluntary emission control means that the public administration must ensure that emissions from tourism are reduced. Climate change mitigation is inevitably in the interest of the tourism industry (Scott et al., 2015: 18–19) and within the European Union tourism has long been under increasing pressure because of its greenhouse gas emissions (Gössling, 2009: 17). For example, carbon tax and emissions trading are seen as ways of limiting emissions from tourism (Lenzen et al., 2018: 526–527).

Lenzen et al. (2018: 522) estimate that global tourism generates 8 percent of all greenhouse gas emissions. According to the World Tourism Organization, the tourism industry currently produces about 5 percent of all energy-related CO<sub>2</sub> emissions and this is projected to continue growing steadily (World Tourism Organization and International Transport Forum, 2019: 11). For the time being, there are no reliable estimates of emissions from Arctic tourism in Finland. One indication is the fact that only one of Lapland's 21 municipalities has committed to the objective of carbon neutrality (Finnish Environment Institute, 2020). However, projects on low-carbon tourism have been launched and it is expected that more detailed information on emissions will be available in the future (see Regional Council of Lapland, 2020). In order to become a carbon-neutral country during the next 15 years, Finland will have a lot of work to do, but the trend is optimistic. National greenhouse gas emissions have fallen by 26 per cent since 1990. Prior to the pandemic, during the year 2019 alone emissions fell by 6 percent (Official Statistics of Finland, 2020: 5.) The Finnish Government stands firmly behind its aim to make Finland climate neutral by 2035, a view which the ongoing pandemic has only reinforced (United Nations, 2020).

## **Paris Agreement and climate resilience**

Tourism is one of the main contributors of anthropogenic climate change which is why there is a discrepancy when examining the various positive effects of local climate resilience on transformative changes (see e.g. Arctic Council, 2016, 110; Einarsson, 2009; Einarsson, 2011) and the effects on the global level. The situation can be described by the term “super wicked problem” associated with anthropogenic climate change, where those who solve problems also create them, where each attempt at a solution leads to a new problem, and in addition, solutions must be global (Sun & Yang, 2016: 2–3).

As a legally binding solution for mitigating climate change, the Paris Agreement set three key objectives: to curb rising average temperatures, strengthen adaptive capacity and climate resilience, and redirect financial flows towards low-carbon development (Paris Agreement, 2015). Irrespective of the actual emission scenario that will be realised, the strong changes in line with the current climate change trends will continue for at least the next 20 years (Finnish Meteorological Institute and Ministry of the Environment, 2018). As a result, in addition to mitigating climate change, societies will have to address the inevitable need to adapt to climate change. This requires climate resilience (Paris Agreement, 2015).

Resilience is a characteristic that describes the ability to act, recover, and thrive during and after various disturbances and shocks (ARAF, 2017: 2; Lentzos & Rose, 2009: 243). Transformative changes are central to climate resilience, because alongside a changing climate, climate change causes fundamental systemic changes in societies. These are often the result of not only disruptive events but also of preparedness for and response to them (IPCC, 2014: 1107). Inadequate consideration of transformative changes increases local vulnerabilities and risks (Bahadyr & Tanner, 2014: 9–12).

In Finland, climate change increases the average temperatures twice as fast as the world average. The warming is strongest in the northern parts of the country. (Ruosteenoja et al., 2016a: 3–15.) This is problematic for Arctic tourism, as the length of winter and certainty of snow are essential to income generation (Rantala et al., 2019; Hall, 2014). However, climate change poses challenges throughout the year, such as an increasing number of extreme weather events and increasing rainfall (Ruosteenoja et al., 2016b; Finnish Meteorological Institute and Finnish Environment Institute, 2018.)

Tourism is one of the industries that is most vulnerable to climate change, and the climate resilience of tourism is essentially determined by the surrounding society, state finances, political stability, and the economic environment. In practice, these affect the ability to make the necessary decisions, invest and further implement strategies for climate change adaptation and mitigation. (Dogru et al., 2019: 292–298.) This is also the case in Finland, where the capacity of Arctic tourism to adapt to climate change is strongly linked to the surrounding society (Kaján, 2014: 48–50). Since the Paris Agreement, the role and responsibilities of the corporate sector have been increasingly emphasized in climate policy (Chatham House, 2018: 6–8; Nasiritousi & Bäckstrand, 2018: 21–23), but the importance of public administration coordination is emphasized with regard to the diversity of the tourism industry.

Weaknesses in the study of climate resilience are often related to the lack of consideration of non-climate variables and societal dimensions (Adger, 2000; Adger, 2010). In tourism ecosystems, the fact that customers are the fastest adapters for climate change poses challenges to the others, dependent on these tourists (see e.g. Becken & Hay, 2012: 40–41). For this reason, tourism resilience emphasizes the agency of travel destinations and local communities in responding to climate change (Lew & Cheer, 2018: 3–12). The basis for tourism resilience is the well-being of the community, the infrastructure provided by the society, and the social, economic, and political capacity and resources (Dogru, 2019: 300; Gómez Martín, 2005: 574–576). In practice, the climate resilience of tourism requires climate change adaptation and mitigation measures that cut across societies.

This study follows the tradition of Arctic resilience, which has arisen from the need to respond to intense climate change in the Arctic (ARAF, 2017). Arctic resilience is built on the empowerment of individuals and networks, and public administration has a significant role to play in developing it (Arctic Council, 2016: 5–8). The theory is applied in practice, for example, in the analysis of climate resilience (Koivurova & Kähkönen, 2018: 5). The Arctic Resilience Report (2016) determines Arctic resilience as follows (Arctic Council, 2016: 8):

The capacity of people to learn, share and make use of their knowledge of social and ecological interactions and feedbacks, to deliberately and effectively engage in shaping adaptive or transformative social-ecological change.

In this study, Arctic resilience is complemented with Grove's (2018) theory of resilience applied to the anthropogenic world which expresses two things in particular: 1) an attempt to understand a changing world despite the limited amount of information available, and 2) a willingness to design existing structures so that they would be better suited to the new environment. The premise of the theory is to improve the existing situation rather than de-stabilize it, and thus the theory supports institutions in order to better respond to vulnerabilities caused by permanent change (Grove, 2018: 5 & 274–275). The usefulness of Grove's theory is emphasized as a result of the increased uncertainty and unpredictability of international politics (Lindroth & Sinevaara-Niskanen, 2019: 192).

## Methodology

In the study of climate resilience in tourism, it is important to involve local stakeholders (Dogru et al., 2019, 300). Methodological choices of this research are driven by this tradition to reveal local approaches to global phenomena. As an output of this, research reveals local perspectives to climate change and climate risks. Twenty anonymous semi-structured interviews were conducted for this study. The study looks at how climate resilience appears on the local level, hence all interviewees are local people from Finnish Lapland. Mainly they represent entrepreneurs, tourism specialists, workers, and politicians. The persons interviewed were selected using a purposive sampling method typical of a case study that allows for the study of a little-studied phenomenon (Robson, 1993: 141–142). As there are limited numbers of people familiar with the topic, several name lists were collected to fulfil a broad spectrum of stakeholders. The interviews were conducted in Finnish and the quotes used in this article are translated to English.

Content analysis makes it possible to carry out a systematic and objective analysis aimed at obtaining a generalizable and relatively concise description of the phenomenon studied. The approach chosen for this study is theory-guided approach to qualitative content analysis, where the starting point for the study is the data, but the empirical analysis of the materials will be further connected to theoretical concepts. This study commits to the interpretative tradition of content analysis, where the central idea is to describe the state of things on a general level (Tuomi & Sarajärvi, 2018: 113, 117–118 & 133).

## Climate resilience is linked to the vitality of the region

According to previous research, the climate resilience of travel destinations is highest in the travel destinations with the greatest social, economic, and political capacities, as well as the highest level of infrastructure provided by society (Dogru et al., 2019: 300). The well-being of the local community is also essential to the climate resilience of the tourism industry (Gómez Martín, 2005: 574–576). These points of view also emerge strongly from the material of this study. Stakeholder interviews highlight how the climate resilience of tourism is linked to the vitality of the region and to national decision-making. In practice, the estimated impacts of climate change are closely linked to everyday political issues and the vitality of the region creates the basis for its climate resilience. Thus, local action is based on local vitality.

This is highlighted in nearly all interviews, for instance, by references to national policies that define the infrastructure provided by the society in northern Finland, which to some extent is perceived as peripheral. For example, adaptation to climate change culminates in everyday issues of basic

infrastructure, such as public services that are perceived as limited, and they are not thought to take into account the specific features of the Arctic region, such as long distances. The fact that many decisions are made far away in the capital city is also felt as part of the problem.

The development of tourism in Lapland would have been even stronger if the decisions were not made in Helsinki. If Rovaniemi were making the decision, we would have had better results with all the indicators. [...] One rule for the whole country, that just does not work. I mean, if the basic conditions for living here are taken away, meaning police or hospitals, post offices and shops.

The dependence of tourism on public infrastructure concretizes the relationship with the decision-making in the capital, highlighting the limits of local agency. The general experience is that with the limited resources available, it is challenging to carry out new tasks. In practice climate adaptation and mitigation has to be linked to other ongoing development work.

When setting the goals for the government program, we pointed out that tourism is connected to so many things in a way. That it is such a diverse field.

According to Botterill et al. (2000: 9–10), important decision-making for the tourism industry often takes place in the “cores”, with the result that in the periphery, where many tourist areas are located, power is also perceived as weak in local issues. These power structures become concretely visible when comparing the infrastructures of the core and the periphery (ibid). In Lapland, this often materializes in the north-south dichotomy (Suopajarvi, 2001: 121–123). Koivumaa (2008), for his part, examines the structures that form peripherality in Lapland. His central observation is the actual capacity of Lapland to dismantle peripherality through the international system, of which the success of international tourism in Lapland is a key example.

Although Lapland and the region’s tourism industry are in fact subordinate to decision-making in the capital city, they have notable autonomous agency to develop the climate resilience of the industry. Indeed, the data shows general optimism regarding adaptation to and mitigation of climate change.

Without flights, there will be no such tourism business here that would make it possible for people to live in this province. That’s definitely a big question there. If we talk about climate policy, then similar things will probably happen all over Europe.

The main concerns are the potential impact of climate policy on mobility. Air transport is a particular worry, as there are not yet enough alternatives.

Our travel destinations should become carbon neutral pretty quickly, at the minimum. The ski resort Pyhä is at the moment carbon neutral [...] What is certain is that flying will become more expensive and day charters are probably something we will say goodbye to in the near future.

The industry exerts fate control over climate policies, as long as the perceived vital conditions are not compromised. Climate policy following the Paris Agreement also brings opportunities, because Arctic tourism in Finland is, in principle, well placed to implement the necessary changes. The high national standards and the stable operating environment are believed to be variables that have already made pioneering initiatives, such as a low-carbon ski resort, possible.

In summary, the climate resilience of tourism is strongly linked to the surrounding society. Currently, climate resilience is being actively developed, but slowly alongside other interests in the

region. As a result of limited resources, the active agency that is essential for climate resilience is limited by national decision-making, but at the same time, the industry has the will to increase its climate resilience. Pioneering companies with low carbon footprints are concrete examples of the capacity for independent action through the international system.

### **Growing uncertainty challenges and renews climate resilience**

The material highlights the growing uncertainty linked to weather and social change, which simultaneously challenges and renews climate resilience. The ways weather and climate affect tourism are a widely studied topic (see e.g., Smith, 1990: 176; Hall, 2014; Njoroge, 2015: 96; Fang et al., 2017) and local observations do not contradict the research.

It is the variations, that make it difficult. The fact that you cannot know it anymore. Before, the limit of winter was in mid-November. [...] Last summer, June, August and September were really good. We had a 10–15% increase in sales and visitor numbers, but July was a little behind the previous year. Inevitably [the weather] had effect. And I'm pretty sure that it was due to the crazy heat wave that was not good for us, as people probably sought relief by the rivers.

Weather uncertainty is observed in the data in many ways, but entrepreneurs in particular provide accurate estimates based on actual sales. Some of them have gathered reference material for decades. Weather uncertainty makes business planning difficult, as a result of which many have changed some of their practices. For example, safari routes have been redesigned so that program services can be implemented safely even in years when there is less snow or when bodies of water do not freeze as desired. This literally describes resilience as the willingness to redesign.

In addition to the weather, uncertainty is caused by a multitude of indirect effects that indicate a wider social shift. Often, these effects appear in surprising and unexpected ways, making them challenging from the point of view of climate resilience.

It is clear that these uncertain circumstances will be reflected in things like insurance, security issues, training needs and the need for audits. No matter what force majeure clauses there are, there may still be claims for compensation and repayment.

As a result of the uncertainty, the tourism industry has reviewed the potential benefits as well as the disadvantages of climate change. This is in line with earlier research (e.g. Tervo-Kankare, Kaján & Saarinen, 2017) but the less researched perspective is, that in some cases, this leads to zero-sum game thinking, where the benefit experienced by one is a loss to another, and vice versa. Such thinking is common, although in reality such situations are rare (Davidai & Ongis, 2019: 1–2). Such observations often lead to an erroneous assessment of the neutrality of perceived risks (Binmore, 2007: 216–217). In the data, this is reflected in the view that climate change is a locally manageable risk. Recent research, however, challenges this assessment (see AMAP, 2019; Rantala et al., 2019: 51–57) which is why this view should be problematized.

From the point of view of climate resilience, a zero-sum game is problematic because underestimating the risks will delay the launching of the necessary measures. A recurring observation in the data is that one's own risks related to climate change are tolerable, because the activities of others are more strongly affected by climate change. Often this conclusion is reached with careful consideration and preparation, which is reflected in the comprehensive reasoning.

In an activity like ours, based on making use of nature at all times and on this environment, then climate change is not so strongly reflected here because we can flexibly produce new programs and products. And we are prepared for changes.

Fate control is one of the most important starting points for climate resilience and it shows faith in the capacity to influence one's own future (see ASI, 2010: 127–146). Conversely, fate control may cause vulnerability to climate resilience if the risks are underestimated as a result. At its most concrete, the assessment of risks as 'manageable' is reflected in the fact that no significant action has been taken at the system level to develop climate resilience, even if the need has been identified. Even though some pioneers are already making headway, coordination and resources are still expected from the outside. This is an understandable approach, as public administration and strategic coordination usually play an important role in Arctic tourism. However, in terms of climate resilience, this is not the case, as can also be seen in the actions of those bodies who normally enforce coordination.

We hope that there will be clear guidelines and more direction for the work for environmental change and for responsible nature tourism in general from the public authorities. This way we could have the cards to take things forward, and adequate.

According to the materials, Arctic tourism benefits from a strict national climate policy and national carbon neutrality, which can be linked to the image of the tourism region. At the same time, this can be potentially damaging if the measures threaten the living conditions of the industry, such as air transport. On the other hand, no matter what happens on the local or on the national level, customer preferences will change.

Inevitably, they [customers] will make informed decisions on what they will consume. If there were some...exemptions to let people continue living as they have done before, that would not be a selling point in the future.

I believe that if consumer awareness continues to strengthen in this sector [climate change], as it so far seems to do, then the customers will start making tough choices. And this will certainly regulate the market and the competition to the extent that those who genuinely take responsibility will thrive.

Therefore, it would appear to be an advantage to climate resilience to have high national standards of responsibility. The vulnerability only emerges from the material if customer expectations are higher than the local standards. Instead, high standards of responsibility are an attraction.

In summary, the locals have perceived increased uncertainty, affecting both the weather and the business environment. Often the uncertainties are interlinked. The most exacting challenges for climate resilience are the rapidly emerging challenges, but the key is that the industry is able to operate even in exceptional circumstances and to renew its practices. So far, however, there is a vacuum in the coordination of climate resilience, and national solutions are expected in order to develop climate resilience. A key threat to climate resilience appears to be the lack of coordination for making the necessary preparations. The main identified risk caused by the uncertainty are lost sales, but uncertainties also have broader implications, as outlined in the next chapter.

## Worst case scenarios as climate change shock treatment

In data there are worst case scenarios related to climate change that, if materialised, would challenge climate resiliency. In practice, the worst case scenarios act as a “shock treatment” for societies in a way that causes different levels of society to respond to climate risks and can lead to rapid local reorganization (Urry, 2011: 162–165). This chapter examines the most concrete worst case scenario presented in interviews, in which the Finnish National Emergency Supply Agency simulates the resilience of a travel destination during fictitious winter weather conditions.

According to the simulation, an atypical weather condition can cause extensive local disturbance (National Emergency Supply Agency, 2018). The simulation simulates the weather, but it does not conflict with the estimated climate risks.

We have been thinking that for us, extreme weather events, storms, and freezing rains and the like are a big threat. Last winter, we had a virtual catastrophe exercise, with an icy rain that froze everything. And after that there was a massive frost, so people just got entrapped. That is, there was so much snow and water that the roads were blocked, and all connections and electricity were cut off, and we were practicing virtually what we should do.

The results of the simulation reveal vulnerabilities, in which public infrastructure such as transport routes, power lines and heat production in particular are disrupted. The National Climate Change Adaptation Plan (2019) identifies similar vulnerabilities, highlighting that most municipalities in Finland are not prepared for climate risks and that small municipalities in particular lack the necessary capacity (Mäkinen et al., 2019: 24 & 41).

It is noteworthy for the simulation setup that due to the strong growth of tourism, the capacity of the tourism industry is limited during its peak season. Many tourist destinations are also located tens of kilometres from regional centres, making it difficult to address vulnerabilities. The National Emergency Supply Agency’s report also highlights how, despite the strong growth in tourism, the number of employees in companies has not increased in the same proportion, which is reflected in security in conditions such as in the simulation (National Emergency Supply Agency, 2018: 11).

If you calculate the odds then at the peak time there will probably be 10–30 percent more people than beds, most likely... If the distribution of water, heat or electricity is then interrupted, then how is it intended to guarantee the well-being of the people? No way, that’s not possible.

The National Emergency Supply Agency recommends paying attention to the local level of preparedness and maintaining security in the priorities of tourism strategies also in the future. A key recommendation is to develop public-private partnerships to increase security. (National Emergency Supply Agency, 2018: 11.) The report considers infrastructural issues but does not take a position on the adequacy of public resources.

Increasing the capacity under exceptional circumstances may require a new way of thinking, where the tourist destinations are considered from the point of view of peak season needs. This will be accentuated if the national goal of doubling tourism revenues in a decade materializes (see Ministry of Economic Affairs and Employment of Finland 2019). Many tourist villages have already practically grown into small towns.

We should consider these as larger infrastructure entities. Therefore, they should perhaps be referred to as Arctic cities, as they require as large of infrastructure systems as any city of similar size.

The ongoing expansion of tourist seasons into year-round tourism can help to solve both infrastructural challenges and preparedness challenges. This observation is most concretely made by a seasonal worker, who says that the industry is already operating at its limits.

Perhaps year-round tourism would better allow for the construction of new facilities, which would help with these shortcomings. Because, just as I said earlier, this industry is working beyond its limits.

Year-round tourism would stabilize economic growth, diversify the infrastructure, and increase the number of permanent staff with a higher degree of preparedness. This also highlights how, as a result of limited local resources, actions to develop climate resilience need to be tied to and coordinated with other interests. Under the prevailing conditions, the success of year-round tourism would develop tourism resilience in a resource-efficient way (see Lew & Cheer, 2018: 3–12).

In summary, the simulated worst case scenario involves concrete risks that would go beyond local climate resilience. The National Emergency Supply Agency emphasizes the importance of local preparedness and reveals the limitations of the infrastructure (National Emergency Supply Agency, 2018: 11). In practice, the promotion of year-round tourism, which is already taking place, is a concrete way to respond to vulnerabilities posed by climate risks. At present, in the simulation, climate resilience has been found insufficient in certain cases, which shows that there is a need to effectively coordinate climate resilience development.

### **The industry expects effective coordination**

Globally, tourism as an industry is exceptionally dependent on the prevailing climate. However, tourism as an industry has more than average climate resilience, which is why it bounces back quickly after shocks. The starting point for climate resilience is determined by the surrounding society, such as state finances, political stability, social conditions, and the economic environment. In the richest countries like Finland, tourism is reasonably well protected from the most common vulnerabilities and, as a rule, has a lot of resilience. The poorest countries, on the other hand, often have the least resilience and tend to have the most vulnerabilities (Dogru et al., 2019: 292–298.)

In Finland, however, Arctic tourism is a kind of exception, as it is exceptionally vulnerable to climate change and also has vulnerabilities typical to peripheral regions. The most extreme example of vulnerability is the economically and image-wise significant Christmas tourism, which has been assessed as the most vulnerable tourist season in the world because a white Christmas cannot be postponed to another month (Tervo-Kankare et al., 2013: 20–22; Hall 2014). In Finnish Arctic tourism, the local ability to adapt to climate change is strongly linked to the surrounding society and economic development (Kaján, 2014: 48–50), which increases the climate resilience of the economy in a prosperous society. For this reason, the climate resilience of Finnish Arctic tourism is a national issue, in addition to the local dimension. One fact we must remember is that the Arctic is exceptionally global (Finger & Heininen, 2019).

The research question of the article is what does the local perspectives of climate change on Arctic tourism tell us about the climate resilience in the post-Paris Agreement era? The study has

highlighted three key dimensions: 1) climate resilience is tied to the vitality of the region, 2) growing uncertainty challenges and renews climate resilience, and 3) the capacity to bounce back serves as a measure of climate resilience. In these respects, the industry has shown two crucial characteristics of climate resilience in the anthropogenic era: 1) an attempt to understand a changing world despite the limited amount of information available, and 2) a willingness to design existing structures to better suit the new environment.

Resilience as a willingness to redesign is thus strong in climate adaptation, although the capacity of the industry to independently improve the situation is limited. This demonstrates the strong local will to adapt to lasting change and the willingness to curb climate change, which is imperative for climate resilience. Local commitment is essential because in the tourism sector, effective adaptation to climate change can only be concretely implemented at the local level, although the role of the national level is significant (Dogru et al., 2019: 294). Meanwhile, climate change mitigation has not yet progressed much.

Local tourism actors are motivated to develop climate resilience and they expect adequate coordination from the public administration. It is noteworthy that locals often consider their resources to be insufficient to carry out the necessary actions, which underlines the importance of the public sector. A key finding is that so far, the development of climate resilience is not systematically coordinated, making it difficult to build local capacity based on local expertise. This further undermines the development of climate resilience against transformative changes.

Local expectations and hopes for effective coordination are justified, as the industry received the weakest results among the sectors examined in the assessment of the National Climate Change Adaptation Plan (Mäkinen et al., 2019: 30). The need for coordination is clear, but its implementation is not straightforward. In practice, in the tourism sector, climate change adaptation and mitigation strategies are poorly generalizable, which is why in most cases they must be identified and implemented, one destination at a time. (Dogru et al., 2019: 294; Kaján, 2014.)

This study has shown that Arctic tourism is undergoing a transformation as a result of climate change in the post-Paris Agreement era. This is likely to increase the need for adaptation to and mitigation of climate change at the local level. Adaptation is needed because both the climate and the surrounding society are undergoing a transition. Mitigation, in turn, is important in addition to the global climate resilience and the responsibilities arising from the Paris Agreement, also because of the credibility that is essential for the tourism industry. Without mitigation, the inevitably necessary decoupling between economic development and the environmental impacts will not take place (see Heikkilä & Lettenmeier, 2014: 7–9). In this way, the set-up challenges the future development of the industry. The material indicates that the growing need for both adaptation and mitigation may emerge faster than expected, which may pose challenges to the future climate resilience of tourism.

In response to the research question, this study shows that the effects of climate change on Arctic tourism indicate that in the post-Paris Agreement era, the climate resilience of Arctic tourism in Finland is sufficient for the time being, but its key vulnerability is the lack of efficient coordination to develop climate resilience. As a result, tackling the challenges has been delayed, and the lack of coordination and resources limits the local capacity to develop livelihoods sustainably for transformative changes. Effective coordination would also contribute to the national goal of carbon neutrality, which is why the current situation calls into question the role of public

administration in the post-Paris Agreement era. Arctic tourism itself may not ever become climate neutral per se, but it may set the new standards for sustainable tourism. This could lead to a path of stronger credibility of tourism in the post-Paris Agreement era. However, the main reason for fostering the necessary action is game-theoretical: if climate change mitigation fails, everyone loses.

## Conclusions

In practice, the climate resilience of tourism requires climate change adaptation and mitigation measures that cut across societies. The study highlights four essential dimensions of climate resilience in tourism in the post-Paris Agreement era: 1) climate resilience is linked to the vitality of the region; 2) growing uncertainty challenges and renews climate resilience; 3) the capacity to bounce back acts as a measure of climate resilience; and 4) in Finland, climate resilience in Arctic tourism is currently at a sufficient level, but there is a growing need for efficient coordination. For the time being, the lack of coordination and resources contribute to delaying the implementation of the necessary measures to develop climate resilience. This finding is in line with international comparisons, where voluntary system-level measures by the tourism industry to adapt to and mitigate climate change have often proved ineffective.

From the point of view of international policies, it is noteworthy that the contribution of a fast-growing tourism industry is essential for the implementation of the Paris Agreement and global climate sensitivity. In the period before the COVID-19 crisis, tourism already accounted for 5–8 percent of all greenhouse gas emissions, and Finland's increasing Arctic tourism, which is growing especially among international tourists, has repeatedly broken growth records. If there are no permanent restrictions to international mobility following the pandemic, then Finnish Arctic tourism will have to face the inevitable need to adjust its activities to adapt to a rapidly changing climate and a carbon-neutral society simultaneously. In order to be a sustainable industry in the post-Paris Agreement era, Arctic tourism must be able to solve the challenges related to climate change mitigation and adaptation. At the time of writing, Finland has 15 years to accomplish this.

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