Chapter 1
Co-production of Knowledge on Climate Change Adaptation in Reindeer Sámi Culture: Research Methodology and Ethics

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Abstract This paper presents part of the results of the "Feasibility study on co-production of knowledge between researchers and Indigenous communities for climate change adaptation" project. The research hypothesis was that academia and Sámi communities could find ways for culturally sustainable adaptation with the ethical and systematic co-production of knowledge. The research material comprises six workshops organized in the Finnish Sámi homeland with Sámi reindeer herders. Traditional knowledge and expertise of the Sámi people were considered equal alongside academic knowledge. The workshops conveyed distrust of researchers but considered future collaboration with the academia important. Participants identified critical prerequisites for research collaboration with the academia: the projects need to support the reindeer herding culture, and Sámi participation has to be included in the projects from the beginning. The chapter provides a procedure for the ethical co-production of knowledge in the reindeer Sámi context. Effects of climate change are widespread in Sámi reindeer herding culture. Workshops concluded that climate adaptation requires, among other things, action from the administration; collaboration with reindeer herders, authorities, and researchers; and the development of the status of reindeer herding.

Keywords Sámi reindeer herding · Co-production of knowledge · Climate change · Research ethics

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1.1 Introduction

The original aim of the project was to co-produce knowledge ethically on climate change adaptation in collaboration with the reindeer Sámi communities and academia by using the search conference method. This approach entails community members coming together to reflect in a structured way on problems affecting their community and seeking common ground on how to understand and address a problem (Schafft & Greenwood, 2003; Schusler & Decker, 2003). Co-production of knowledge can address the complex nature of contemporary sustainability challenges better than more traditional scientific approaches (Norström et al., 2020).

The plan was to organize an extensive research seminar by using search conference methodology and inviting members of academia and reindeer herders to the seminar to co-produce knowledge on climate change adaptation. The implementation had to be significantly modified from the original plan due to the COVID-19 pandemic and the resulting national and international restrictions and recommendations. Cross-border and internal travel was restricted, and meetings for over ten persons were forbidden. As a result, the involvement of external researchers was not possible.

The revised objectives of the project were (1) to identify the needs, topics, limits, and prerequisites of the Sámi reindeer herding communities for the co-production of knowledge with academia, (2) to identify the effects of climate change and climate change adaptation to reindeer Sámi culture, and (3) to explore how the Sámi have experienced the research collaboration and research ethics and (4) how research can be conducted ethically from a Sámi perspective.

1.2 Background

This paper presents the results of the feasibility study on the co-production of knowledge between researchers and Indigenous communities for climate change adaptation, a project implemented in the Finnish Sámi home region. Sámi are Indigenous people of Europe. In Finland, 10,795 persons were registered in the electoral register of the Sámi Parliament in 2019 (Sámediggi, 2019). There are 1220 reindeer owners and less than 300 full-time reindeer herders in the Sámi homeland. Most of the reindeer owners and full-time herders are Sámi (Näkkäläjärvi et al., 2020, 50–60).

The projected effects of climate change on the Sámi home region in Finland are significant. It is estimated that temperatures will continue to rise, precipitation will increase, the growing season will lengthen, and heat cycles will become more frequent. The duration of the snow cover will also shorten, and the amount of snow will decrease. Vegetation changes would also be significant as the boreal forest spreads farther north and to higher altitudes, replacing bare *fjeld* vegetation (Ruosteenoja et al., 2011; Ruosteenoja, 2016). Sámi reindeer herders have reported

that the ongoing effects of climate change are significant for their culture, environment, and livelihoods. The first Sámi observations of climate change have been dated to the 1960s. They have started adapting to climate change by changing, e.g., reindeer work models, introducing new technology, and starting supplementary feeding of reindeer (Näkkäläjärvi et al., 2020). The limited number of Sámi people, legislative challenges, emigration from the homeland, and low profitability of traditional livelihoods make Sámi culture vulnerable to social and environmental changes (Jaakkola et al., 2018). Indigenous reindeer herding is threatened by multiple drivers of environmental and social changes that affect the sustainability of grazing lands and the traditional use of environmental resources (Eira et al., 2018).

1.3 Methodology and Implementation

The methodology followed was the co-production of knowledge. Norström et al. define the co-production of knowledge as *iterative and collaborative processes involving diverse types of expertise, knowledge, and actors to produce context-specific knowledge and pathways toward a sustainable future* (2020). Our hypothesis is that academia and Sámi communities can find ways for culturally sustainable adaptation by using ethical and systematic co-production of knowledge. Research aimed at addressing sustainability challenges in the Anthropocene is most effective when co-produced by academics and non-academic stakeholders. A total of six workshops were organized covering all the reindeer herding cooperatives in the Sámi homeland (Fig. 1.1). The number of participants was limited to less than ten for each workshop. Only the lead researcher (who is an ethnic Sámi) and the photographer participated in the workshops. There were 32 participants, of which 5 were women (16%) and 27 were men (84%). The age range of the participants varied from 16 to 73 years old. The average age of the participants was 49.

Participants were selected systematically while taking into consideration COVID-19 restrictions and aiming at pluralistic co-production of knowledge (cf. Nielsen et al., 2017; Tengö et al., 2017). The following inclusion criteria were implemented: participants (1) have enculturated to reindeer Sámi culture, (2) have at least 10 years of experience from reindeer work (encompasses the experience a herder has had from childhood), (3) include reindeer herders who speak Sámi as their native language, (4) must include both sexes and different age groups, and (5) represent different *siidas* (reindeer herding communities). The criteria were first introduced in the SAAMI – Adaptation of the Sámi people to climate change project (Näkkäläjärvi et al., 2020), which proved successful. A systematic criterion ensured a diverse representation. All three Sámi linguistic and cultural groups in Finland were represented (North, Inari, and Skolt Sámi).

The languages of the workshops were North Sámi, Finnish, Skolt Sámi, and Inari Sámi, the language preferred by the participant. Workshops were videotaped for analysis. The length of the workshop varied from 2 to 4 h. The project was implemented with respect to the participants' intellectual property rights and ownership

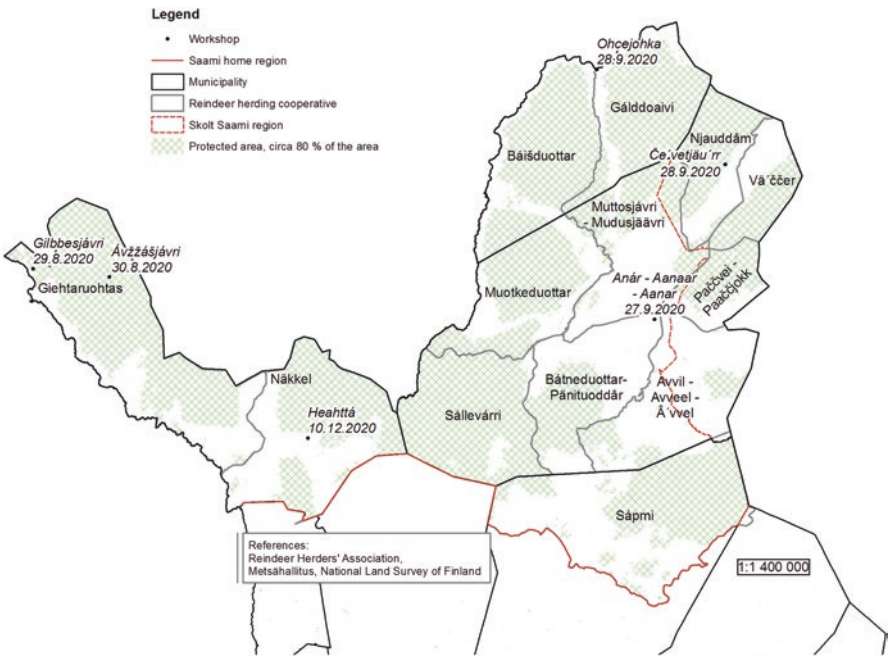

Fig. 1.1 Borders of Sámi home region, reindeer herding cooperatives, and organized workshops

of traditional knowledge. Participants were compensated economically for participation, and their travel expenses were reimbursed. The participants filled in a written consent form, available in North Sámi and Finnish. Participants could restrict or limit the use and reuse of video, photo, and other material in social media and outside the scope of this research project.

A set of topics was identified beforehand as a starting point for discussion. Participants could also freely introduce other topics and themes concerning climate change and the co-production of knowledge. The main topics for all the workshops were past, present, and future collaboration with academia and the effects of climate change and climate adaptation. Other topics that came into discussion were supplementary feeding of reindeer and its effects on the environment and reindeer culture (Heahttá workshop), competing land use (Anár workshop, Fig. 1.6), and legal obstacles for adaptation (all the workshops). Participants anonymously filled in a voluntary feedback questionnaire after the workshop, available in North Sámi and Finnish. The questionnaire included questions on workshop methods, usefulness, and collaboration with academia.

The Finnish Sámi Parliament has issued a procedure for acquiring free, prior, and informed consent for research projects dealing with Sámi cultural heritage and/or traditional knowledge (Sámediggi, 2016). This project applied for consent from Sámi Parliament and the Skolt Sámi Village Assembly. Both institutions consented to the project. The Sámi Parliament required research data to be handed over to the

Sámi Archives after the research project was completed as a condition for its consent. Some of the participants have in their consent form forbidden the transfer of research material to archives and external research projects. For this reason, the proposal of the Sámi Parliament couldn't be fulfilled. All informants were anonymized.

1.4 Results

1.4.1 Methodology

The workshop's themes were considered relevant and important for all the reindeer herding communities (32 answers, 1 missing). The participants' viewpoints are supported by research data, according to which climate change and adaptation are major everyday challenges for Sámi communities (Näkkäläjärvi et al., 2020; Eira et al., 2018; Jaakkola et al., 2018; Furberg et al., 2011).

> *Of course, the current situation in the world limits activities. A good workshop, despite it all.*
> Participant in the Gilbbesjávri workshop.

The participants were also asked whether the workshop method is a good practice for addressing these kinds of topics. Eighty-one percent of the participants considered the workshop a good practice, 11% preferred a more extensive workshop, and 5% preferred individual interviews. The workshop method has been widely used in studies on climate and environmental change (Lépy et al., 2018; Christie et al., 2018; Durkalec et al., 2015).

Fig. 1.2 Ávžžášjávri workshop participants. (Photo: Markku Kauranen)

1.4.2 Perception of Climate Change: Changes Are Constant

The effects and challenges of climate change were discussed extensively in the workshops. Climate change is commonplace for reindeer herders. Observed changes have accelerated in the twenty-first century (cf. Näkkäläjärvi et al., 2020). Changes in vegetation, seasonality, temperature, weather conditions, precipitation, and animal species behavior and an increase in extreme conditions have been observed. Winters are milder, and extreme weather events are more common. Altered conditions affect reindeer herding work and reindeer behavior. Wind velocity and frequency have accelerated. Wind affects the reindeer's movements and knocks down the reindeer fences (see Fig. 1.3). Fence work has increased everywhere. Winter conditions have become more extreme, and especially winter 2019–2020 was difficult. One participant (age 60–70) reported that winter conditions were the most difficult at the time of his life. There was already a deep snow cover (on average 0.5–1 m thick) in October. Long-lasting and thick snow cover prevents the reindeer from getting sufficient nutrition. Changes in the ice cover create challenges to reindeer herding and the safety of reindeer and reindeer herders. Waterways freeze later,

Fig. 1.3 Fallen reindeer fence between Norway and Finland in Rávdooaivi, Eanodat. The fence had fallen for several miles due to ice, snow, and strong wind combined. (Photo: Lemet Ánde Näkkäläjärvi, 2020)

and carrying capacity has weakened due to temperature fluctuations and heavy snow cover. For herders and reindeer, weak ice poses safety risks. Herders have reported falling through the ice in pasture work.

> *Climate change has been visible for many years. Pastures mold and freeze. Reindeer can't find nutrition.*
>
> Participant in the Če′vetjäu′rr workshop.

Forests have thickened and are growing faster, and pine seedlings have begun to grow above the tree line (see also Franke et al., 2015; Näkkäläjärvi et al., 2020). Reindeer herders try to mitigate the spread of invasive species by uprooting pine seedlings (Fig. 1.4).

The drying of the palsa mires has accelerated in the mountainous *fjeld* region (Fig. 1.5), and this was discussed in the Ávžžásjávri, Gilbbesjávri, and Ohcejohka workshops. All the palsa mires have disappeared in the twentieth century in south and central Finnish Sápmi. Their disappearance negatively affects the food intake of reindeer, as palsa mires are nutrient-rich areas. This directly affects Sámi nutrition since cloudberries have disappeared from areas where there used to be palsa mires. The disappearance of palsa mires changes the landscape, and, in some places, the change makes it difficult and dangerous to move around the terrain (Fig. 1.5).

Participants reported that reindeer work had increased considerably due to climate change, and the work has become physically and mentally heavier. Reindeer herding equipment, maintenance, supplementary feeding, and increased herding work bring more expenses. Subsidies for reindeer herding are still small, less than 14–18% of the reindeer herder's income. The subsidy is insufficient to cover the costs and losses in reindeer herding. Participants reported that in the 2000s, there had been mostly bad reindeer years (meaning conditions where many reindeer died

Fig. 1.4 Alien species in the fell region, Skadjaváreroavvi, Ohcejohka – pine seedlings and reindeer herder's way to protect biodiversity. (Photo: Urpo Vuolab, 2020)

Fig. 1.5 Dried and cracked former palsa mire in Áitejávri, Ohcejohka. (Photo: Urpo Vuolab, 2020)

Fig. 1.6 Participants of the Anár workshop. (Photo: Markku Kauranen)

during winter and few calves were born). In recent years, such as 2019–2021, few reindeer have been sold, as many reindeer died due to difficult winter and predatory conditions. Challenging winter conditions increase predation. Predators move easily in deep snow, and weak reindeer make easy prey.

> *Climate change is a great threat to Reindeer Sámi culture because it is the reason why young people are hesitant to start reindeer herding; they fear the effects and the future. If they don't start, our reindeer herding culture will disappear.*
>
> Participant in the Gilbbesjávri workshop.

The participants of the Heahttá workshop, compared to other workshops, pointed out that climate change was not currently considered a significant threat to their reindeer working model. The invasion of Finnish reindeer herding in the pasture areas of Sámi reindeer herders was considered a particularly significant challenge. The effects of climate change on nature, reindeer, and reindeer herding in the area were deemed significant, accelerating since the 1980s. Despite the significant impacts of climate change, the participants shared a common understanding that their traditional herding model can adapt to climate change. Sufficient pastures, traditional pasture rotation, and the end of invasions are prerequisites for this.

1.4.3 Limits and Possibilities for Adaptation

In addition to observing the effects of climate change, the workshops discussed what should be done to adapt to climate change. Reindeer herders have adapted to the changes in different ways regionally. Reindeer herders see changes daily while practicing reindeer herding, but the causal effects of climate change are not observed in the short term. Since this is a new situation, reindeer herders do not know whether their chosen adaptation method is correct. Every adaptation method also has cultural consequences. Reported adaptation means have been supplementary feeding of reindeer and technologies (such as drones and GPS collars for reindeer) have been introduced, the *siidas* have merged/divided, and the model of reindeer herding has been changed. Ávžžásjávri's workshop (Fig. 1.2) pointed out that supplementary feeding is almost the only way to adapt to climate change. Other workshops also highlighted the central role of supplemental feeding in adapting to climate change, except the Heahttá workshop. It did not consider supplementary feeding as appropriate means of adaptation.

> *Personally, I think that supplementary feeding does not fit our reindeer working model; it is completely different from what we have learned from previous generations. It would completely change our attitude towards reindeer, learned customs, traditions, work, and everything.*
>
> Participant in the Heahttá workshop.

Participants thought that the situation was unfair – they were not to blame for climate change, but they must bear the consequences. There was also distrust toward the authorities, and they experienced frustration toward the authorities. They felt

that the authorities were not taking climate change seriously and climate change could not be tackled by writing strategies. Rather, changes to legislation, administration, and herding subsidies are needed.

> *The authorities don't care how the Reindeer Sámi cope. Our view is nowhere to be seen and should be better presented.*
>
> Ávžžásjávri workshop participant

> *A lot of research data is available; we have also participated in several research projects. The effects of climate change have begun to show in our reindeer herding in the 1990s. Thirty years have passed, and the authorities have done absolutely nothing. Nothing has changed in legislation or administration.*
>
> Participant in the Heahttá workshop

> *I have thought a lot about this adaptation. After all, we humans may be able to adapt, but how can these animals of ours, this nature? Reindeer have difficulty adapting. As these extreme phenomena vary, droughts, persistent rains, and snow. What they all do to our animals. It would be important for people to be able to adapt, to facilitate the adaptation of reindeer.…To take care of reindeer welfare. When a man starts supporting a reindeer, things get bad. That's what this climate change is leading to.*
>
> Participant in the Anár workshop

> *It seems that this is the bureaucracy of Finland, that everything is investigated and investigated before decisions can be taken. After all, everyone saw that winter 2019–2020 was catastrophic for reindeer herding…Reindeer couldn't find nutrition. In Norway, the state used helicopters to send fodder and hays for the reindeer…But in Finland, nothing concrete, just researchers were hired to find out if it was a bad winter…Then it's going to be another year before we see if we can get some compensation…Then it might be too late…That response from the State has been slow.*
>
> Participant in the Če′vetjäu′rr workshop.

The participant refers to the study on the effects of difficult winter conditions on reindeer herding by the Natural Resources Institute Finland (Kumpula et al., 2020). As a result, a subsidy scheme was developed to cover the losses, but the scheme excluded three cooperatives from the Sámi homeland. The subsidy was allowed to be applied for in August 2021, and compensation was paid in December 2021. Reindeer herders from three reindeer herding cooperatives in Sápmi were forbidden to apply for support because the authorities felt that the number of reindeer in the reindeer herding cooperative was too high (Finnish Food Authority 2021a, b). Some Sámi herders have appealed the decision to the court. The participants pointed out that the State should be able to react quickly to extreme conditions, and emergency aid and support should be available in exceptional circumstances.

> *If and when reindeer herding becomes more difficult, it will be a major setback for the whole Skolt Sámi culture and language.*
>
> Participant of Če′vetjäu′rr workshop.

Participants felt that current legislation and governance hamper climate adaptation and do not allow cultural adaptation to climate change. The Reindeer Herding Act does not address Sámi reindeer herding, climate change, or the *siida* communal system, which was considered a major shortcoming.

The Sámi should be given the right to decide more broadly about their livelihood and culture. Participants argued that the Sámi are the best experts on their own culture, not the authorities in the Finnish capital region. Participants considered that reindeer herding maintains the Sámi language, culture, and vitality of the Sámi homeland. If reindeer herding disappears or its position worsens, it will harm the entire Sámi culture.

Adaptation requires action from the State; collaboration with reindeer herders, authorities, and researchers; and the development of a positive image and status of reindeer herding.

Herders are afraid of what the future changes will bring to the Sámi and Sámi culture. Questions were raised, such as will the traditional knowledge, the Sámi way of practicing reindeer herding, and the Sámi way of life be preserved in a changing climate? Herders hope these questions could be answered in collaboration with academia.

Climate change is a major challenge for Sámi reindeer herders, but reindeer herders have to compete for land use with other livelihoods such as tourism, infrastructure, mechanical gold placer mining, and logging (cf. Furberg et al., 2011; Jaakkola et al., 2018).

> *We would be able to cope with climate change and adapt if we were left alone to herd and reindeer can graze without interference. We are now more hampered by competing forms of land use, such as forestry, tourism, mechanical gold placer mining, and infrastructure projects of all kinds.*
>
> Participant in the Anár workshop.

All the participants of the Anár workshop shared this view. Anár and Vuohčču regions have significant land-use competition (see Anttonen et al., 2011; Kivinen & Kumpula, 2014).

1.4.4 Collaboration with Academia

All the participants have participated in research projects as informants, stakeholders (members of Sámi Parliament/Skolt Sámi Village Assembly), members of a steering group, workshop participants, or guides/drivers. The workshops discussed experiences of collaboration with academia on general terms.

> *Collaboration does not work with the researchers. They write what they want.…The reindeer Sámi have been involved in some research projects, but the role has been modest, I would say, as quota Sámi without any real significance.*
>
> Participant in Gilbbesjávri workshop.

The Gilbbesjávri workshop found that researchers do not understand Sámi reindeer herding in climate change research. It is argued that reindeer grazing threatens biodiversity (Kontula & Raunio, 2018), but it is also argued that reindeer grazing mitigates the negative effects of climate change (cf. Cohen et al., 2013; te Beest et al., 2016). The positive impact of reindeer grazing on mitigating the adverse effects of

climate change was expressed in all workshops. The Gilbbesjávri workshop provided a concrete example of a study in which the Sámi traditional knowledge was completely ignored. White-tailed eagle (*Haliaeetus albicilla*) population study started 20 years ago. Reindeer herders informed the scientists that the eagles were killing reindeer calves. The scientists did not believe the herders. Only now, 20 years later, have scientists confessed that the white-tailed eagle kills reindeer calves.

> *Reminds me of 30 years ago, when a study was published that you can see the condition of a reindeer in a reindeer's tibia. I remember my dad laughing in a fold and saying why they couldn't have asked the reindeer herders that too. We've always known where to see the condition of the reindeer. It's a good idea to investigate and investigate, but why not ask those who have lived through it first.*
>
> Participant in the Anár workshop.

The workshops conveyed a distrust of researchers and the feeling that the Sámi have been treated as resources, not as equals. The main drawback that emerged is that researchers do not know enough about Sámi culture and livelihood in advance and do not value the Sámi knowledge and skills at the same level as an academic science. Negative examples of non-cooperation were research projects on the state of reindeer grazing lands and research projects implemented by state research institutes. Research projects that do not take into consideration the importance of reindeer and reindeer herding for the Sámi and northern nature received a great deal of criticism in the workshops.

> *In my opinion, the Sámi have not held researchers in good regard, and usually it is because the researcher comes from outside, from the university or some research institute…A Sámi comes from his/her physical environment, in a way from a different world from the researcher…For more than generations, the Reindeer Sámi people have put their resources, their expertise into reindeer work. And knowledge has passed down from generation to generation, and of course, knowledge is created through experience. And yes, it is noticeable that scientists in some fields have directly stolen this information from the Reindeer Sámi and say that it is their new research and new knowledge of the matter, even though the Sámi have known it very long ago. The Sámi don't want to shout out their knowledge to all the world. That, too, is perhaps what we are used to; we do not make a big deal out of our livelihood expertise once we have seen how society and researchers have responded to this…Older generations say the researcher came over, asked a few questions, and went, and after that, there was no word. I personally expect that if the Sámi is interviewed and involved in the studies, then some benefit must come to Sámi.*
>
> Participant in the Anár workshop.

The participants were negative to the objectives of the previous studies to create a consistent picture of reindeer herding that it would be the same in both Finnish and Sámi reindeer herding. The participants pointed out that Sámi reindeer herding has several different working models within the reindeer herding cooperatives (Näkkäläjärvi et al., 2020). Regional differences and different working models should always be considered in studies to understand the local culture and adaptation to climate change.

> *Once, they wanted to study what reindeer eat and how it survives. One group eats lichen, the other group is given hay and some fodder, and someone is hit with sawdust in front.*

Let's wait month two and see. The reindeer ate lichen, hay, and fodder. Sawdust it did not eat and died. They're some crazy studies. And if you go to what the benefits of these studies are for us. Actually, there have been no studies on this side of the climate, or they are at the very beginning on that side. We don't really have any role in the investigation. And then we don't have access to the results on the results that would affect us. There is only one project (the SAAMI project) that has involved Sámi reindeer herders in climate change research. We should make the investigation better. Let's bring the Sámi traditional knowledge into research and see if we can find medicine for these difficulties or not.

Participant in the Anár workshop.

Some participants pointed out that they have experienced that their statements have been distorted in the final research papers or their message has been ignored. They argued that these research projects had only benefited the researchers themselves in their scientific careers. The informants felt they were just a resource and were not informed about the research results. This partly reflects that the Sámi have high expectations from research projects but are disappointed when expectations are not met. The criticism also indicates that communication between researchers and the target group must be improved, and interaction must continue after fieldwork.

Some pointed out that research is also evolving, and in recent years, there has been a positive development in climate change researchers' attitudes toward traditional Sámi knowledge and skills. Participants had positive experiences with research projects involving Sámi culture expertise.

Although experiences from previous collaborations with the research field have been mostly negative, the workshops considered collaboration with academia important for the future of their culture and livelihood.

Research can influence decision-makers and legislation. That is my motive for participating in research projects.

Participant in the Heahttá workshop

*It would be interesting to work with researchers, but they should take into account our views, and studies should be of benefit to us.*Participant in the Ávžžášjávri workshop.

Participants reported following research on reindeer herding. They see that researchers and reindeer herders can work together to find ways to adapt to climate change and meet the other modern challenges, such as competing land use, experienced by the Sámi people. The workshop revealed that reindeer herders want the research to be effective and concrete, trying to find solutions to the challenges faced by the Sámi together with the Sámi community (Table 1.1).

All topics that support the survival of the livelihood (reindeer herding).

Participant in the Ohcejohka workshop

On saving the mountain region for traditional nomadic reindeer herding. How supplementary feeding affects reindeer, Sámi reindeer herding and nature in the northern region.

Participant in the Heahttá workshop

Taking traditional knowledge into account in legislation.

Participant in the Ohcejohka workshop.

Table 1.1 Topics for future collaboration with the research community

	H	A	G	Á	Č	O	%
Effects of competing land use to reindeer herding	6	6	1	6	4	3	30%
Traditional knowledge and how it can be safeguarded	5	6	1	3	3	4	25%
Current and future effects of climate change in the Sápmi and for the reindeer herding	6	5	1	3	4	2	24%
Legislation concerning reindeer herding and subsidy system	5	5	0	3	2	3	20%
Missing			1				1%

H Heahttá, *A* Anár/Anaar/Aanar, *G* Gilbbesjávri, *Á* Ávžžášjávri, *Č* Če′vetjäu′rr, *O* Ohcejohka

Table 1.2 Possible methods for cooperation with the scientific community

	H	A	G	Á	Č	O	%
To be involved as an equal partner in planning and implementation of research projects	6	5	2	5	4	1	34%
Participate in workshops and seminars	6	5	1	2	4	4	32%
To be interviewed	3	4	1	2	11	0	31%
Missing	0	0	1	1	0	0	2%
I don't know yet	0	0	0	0	1	0	1%
No collaboration	0	0	0	0	0	0	0

H Heahttá, *A* Anár/Anaar/Aanar, *G* Gilbbesjávri, *Á* Ávžžášjávri, *Č* Če′vetjäu′rr, *O* Ohcejohka

> *It is important to involve Reindeer Sámi in research projects for the big picture. The rights of Indigenous people through reindeer herding must be presented to the public, and the image of reindeer herding should be turned useful for the Sámi – not the opposite – through research. Research results have to be returned to the community and given to political organizations to advance the common good.*
>
> Participant in the Ohcejohka workshop.

The workshops raised concerns about the poor public image of Sámi reindeer herding. Herders feel that in public, they are blamed for poor pasture conditions, for illegal killing of predators, and on making other livelihoods more difficult. It was considered that one of the reasons for the poor image is researchers. The research data, which the herders did not consider accurate, has been passed on to decision-makers and has therefore conveyed a poor view of reindeer herding. The poor public image of reindeer herding was considered detrimental to the adaptation of reindeer herding culture to climate change.

> *Sámi reindeer herding and traditional knowledge must be taken into account in all activities concerning our area and way of life.*
>
> Participant in the Ohcejohka workshop.

Most of the participants were interested in participating actively in research projects in the future on their own terms, also influencing the content and objectives of the research. No participant replied that he or she did not want to collaborate with the researchers (Table 1.2).

1.4.5 We Want to Be Treated as Equals

Although previous collaborations with the academia were considered largely negative among the participants, the workshops saw an opportunity for cooperation with the scientific community if herders were treated as equals and the researchers have expertise on Sámi culture, reindeer herding, and knowledge of Sámi language (Table 1.3).

The workshops sent a message about the demand for equality and genuine co-production of knowledge. Armitage et al. have suggested that knowledge co-production can serve as a trigger or mechanism for learning and adaptation (2011). Participants wanted to influence research by participating in the design and implementation of the whole research project. At no point did the participants demand a waiver of research independence. They felt that quality and ethical research that combines traditional knowledge and academic science could help them. Participants felt that co-production of knowledge refers to a procedure where *emic* (cultural) and *etic* (academic) knowledge are combined on a specific topic. Emic represents the way in which members of a culture perceive structure and value matters within their own sphere of life. The etic approach is the researcher's way of looking at things from the perspective of an outsider (Pike, 1967: 41–42.)

The workshop results indicate that Sámi people have become more aware of their own rights and the importance and benefits of traditional knowledge for research. At the same time, the Sámi have discovered new ways in which they can influence issues that are important to them, such as participating in research projects on their

Table 1.3 Identified prerequisites for research collaboration with academia

	H	A	G	Á	Č	O	%
Reindeer herders are treated as equals and traditional knowledge is regarded equal to scientific knowledge	6	6	1	4	3	3	18%
Reindeer herders have to be included in planning and implementation of the project	5	3	2	4	6	1	16%
The researchers have to have expertise on Sámi culture and reindeer herding	5	5	3	5	3	1	16%
Research project has to be carried out partly in Sámi language	5	5	1	2	1	2	13%
Consent form where the participant can restrict how the information can be used	5	5	1	2	3		13%
Research project has to have free, prior, and informed consent given by Sámi parliament and Skolt Sámi Village assembly	3	4	0	0	6	2	12%
Reindeer herders have to be compensated financially for their time	4	2			3	2	9%
Missing	0	0	2	1	0	1	3%

H Heahttá, *A* Anár/Anaar/Aanar, *G* Gilbbesjávri, *Á* Ávžžášjávri, *Č* Če′vetjäu′rr, *O* Ohcejohka

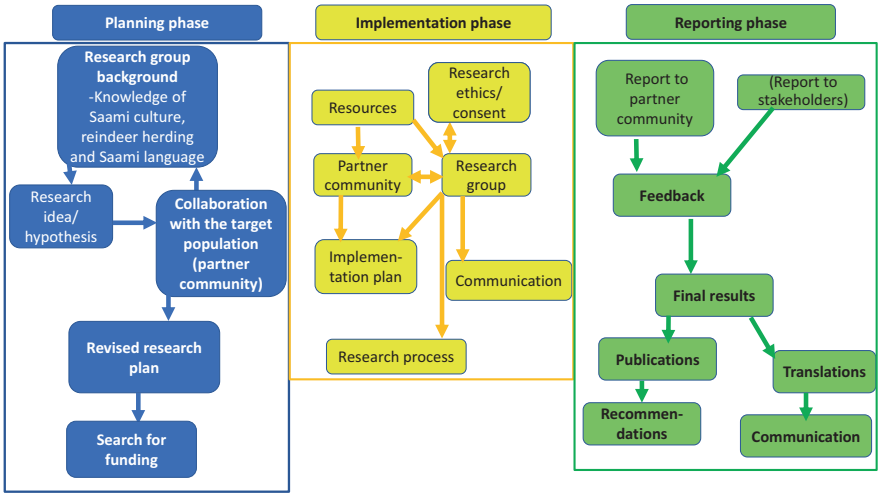

Fig. 1.7 Concept of co-production of knowledge adapted to the workshop results

terms. Figure 1.7 expresses the results of the workshops on the procedure of co-production of knowledge in studies concerning Sámi reindeer communities.

The message brought by informants is to deepen the intracultural approach in anthropology, in which the relationship of individuals and groups to their environment must be viewed from the perspective of the people who belong to it and have been enculturated to it (Sarmela, 1979:19). This suggests that genuinely intracultural research requires the involvement of the target population throughout the research project. This can improve the reliability, quality, and usability of research. In addition to the involvement of the target population, it is important to follow case-specific ethical guidelines.

Co-production of knowledge requires new skills and a new kind of thinking by academia. The research community must participate in the research design and in the definition of research questions, and researchers are required to have knowledge of Sámi culture. The Sámi do not want to teach researchers basic information about the Sámi culture but expect to reach a deeper level in collaboration with the researchers. The genuine co-production of knowledge also requires that the research community and researchers trust each other. The need for mutual trust was raised in several workshops. Research results should be available to the research community in a form that allows them to benefit from the information.

> *When considering implementation of the research projects on Sámi culture, the project has to take always into consideration that three Sámi languages are spoken in Finland.*
> Participant in the Če′vetjäu′rr workshop.

Ethical research requires additional resources, which must be considered when applying for funding. The Sámi want to use their own language, and this should be considered in project communication, materials, and publications.

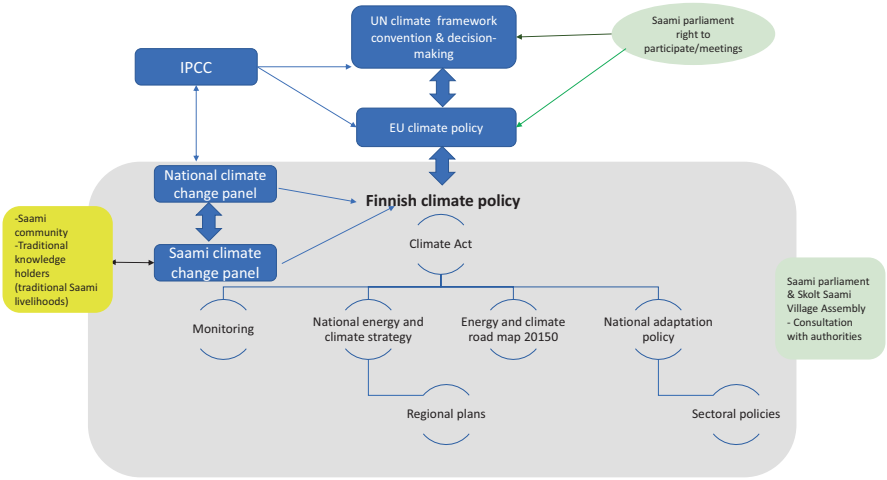

Fig. 1.8 Proposal to establish Sámi panel on climate change. (Näkkäläjärvi et al., 2020)

The SAAMI project proposed the establishment of the Sámi panel on climate change (Näkkäläjärvi et al., 2020, Fig. 1.8). This proposal was also discussed in the workshops and gained wide support. The climate panel would be represented by holders of Sámi traditional knowledge and representatives of the scientific community. The panel would co-produce knowledge and provide solutions for climate adaptation and mitigation. The proposal has received broad support from the Sámi society, the Sámi Parliament, and the Skolt Sámi Village Assembly. The workshops highlighted that the panel could be a means of bringing traditional knowledge and research data to decision-makers and enabling the development of legislation and administration. The Finnish Climate Change Act has established a Sámi Climate Council (Climate Act 423/2022). The State Council of Finland will appoint Sámi Climate Council in 24.8.2023. The State Council has appointed the Sámi Climate Council is for the time period of 1.9.2023–31.8.2027.

1.5 Discussion and Conclusion

Previous research and workshops show that the Sámi people follow the environmental conditions and changes in detail (Näkkäläjärvi et al., 2020; Jaakkola et al., 2018; Furberg et al., 2011). Not all the causal effects of climate change can be perceived and understood other than by living amid these changes. Academia and Sámi can learn from each other and produce information, measures, and solutions to mitigate the effects of climate change.

The workshop is an effective and fast way to reach participants. When comparing different methods, the workshop is a collaborative approach. At the same time, in-depth interviews (Näkkäläjärvi et al., 2020) can provide in-depth knowledge and broader interaction between the researcher and the interviewees. Indeed, some of the participants in the workshop hoped they would be interviewed again in-depth, as they wanted to report and explain the new observed effects of climate change in more detail. We conclude that a method combining workshops and interviews can effectively study the impact of climate change and adaptation measures.

We hypothesized that with the ethical and systematic co-production of knowledge, the academia and Sámi communities could find ways for culturally sustainable adaptation. Based on the results, our hypothesis received support from the Sámi community. Further studies are needed to include the views of a broad scientific community on the possibility of collaboration with the Sámi community and the co-production of knowledge.

Co-production of knowledge has been defined as one of the innovations needed to address climate change, but the best approach for co-production processes remains unclear (Harvey et al., 2019). Based on the workshop results, we see the process of co-production of knowledge as contextual, ethical, and adaptive (Figs. 1.7 and 1.8). Co-production of knowledge can be an effective and useful method of discussing climate challenges at a local level and improving legislation and administration on climate adaptation. The major challenge is the transformation of information into actions and decisions in the governance and activities of the State. The interaction of researchers and the Sámi community alone is not enough to solve the challenges experienced by the Sámi.

The need for ethical guidelines on Sámi research has been discussed within the framework of Sámi research (Drugge, 2016; Stordahl et al., 2015), and the Finnish Sámi Parliament has its own guidelines (Sámediggi, 2016). Ethical guideline for Sámi studies is currently being prepared in collaboration with universities (University of Lapland, 2021). The message of the workshops is that participants want to be involved in the process of defining case-specific ethical principles to be followed in the research. General ethical guidelines for science, such as the ethical guidelines for anthropology and the Sámi Parliament's guidelines, provide general framework conditions.

From the point of view of the social acceptability of the research, the workshops consider that the Sámi community has not been able to utilize previous research results, i.e., research has not had a social impact on the Sámi community. Sámi culture has not been considered in climate work, resulting in inadequate governance. Participation of holders of traditional knowledge in climate policy and scientific data production was considered vital, and an organ, like the Sámi climate council, was considered essential (Fig. 1.8). Muhonen et al. argued that science policy and academic practices should ensure and enable researchers to answer societally valuable questions in their research activities (2020). Our findings support this argument.

The workshops have shown that there is a need for the co-production of knowledge on the part of the Sámi community and that they are interested in the co-production of knowledge on themes that are important to the community in ethical cooperation with the scientific community. The traditional system of project planning, where researchers plan a project, apply for funding, and only collaborate with the target population in the implementation phase, is no longer sufficient when studying Sámi reindeer herding culture. The workshops have created a basis for ethical and equitable co-production of knowledge (Fig. 1.7) together with the scientific community and highlighted themes important for the Sámi community for further studies.

The workshops extensively discussed the participants' experiences on various research projects and expressed criticisms openly. The result of the study would certainly have been different if the original plan for joint workshops between researchers and herders had been implemented. The changed research setting enabled the participants to provide feedback and plan and develop research on the Sámi without external cultural guidance and from the perspective of Sámi reindeer culture.

Due to the COVID-19 pandemic, we only heard the reindeer Sámi community's views on the co-production of knowledge with the academia. Further research is needed to hear the scientific community's views on collaboration with the Sámi community, the co-production of knowledge, and the criticisms raised by the workshops.

Further discussion is needed on how inclusion and traditional Sámi knowledge can be considered throughout the research process and how, e.g., a peer review process can consider traditional knowledge and co-production of knowledge.

The results show how widespread and deep climate change is affecting Sámi culture and Sámi living environments. We can conclude that small research projects are not sufficiently effective, but there is a need for a comprehensive research program and monitoring to support adaptation to climate change. Although the results of this study concern the Sámi in Finland, they are also applicable in Indigenous research, especially among reindeer people and other Indigenous peoples of the Arctic.

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