

Faculty of Humanities, Social Sciences and Education

Bivdit Luosa – To Ask for Salmon

*Saami Traditional Knowledge on Salmon and the River Deatnu:
In Research and Decision-making*

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Master Thesis in Indigenous Studies

Submitted in May 2018



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Spring 2018

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To áhčči

For teaching me to fish salmon

Acknowledgements

It is mid-May and I am finishing the last piece of salmon I have left from last summer. In the words of the old folk, *guolli galgá bistit suddásis suddásii*, “You should have enough salmon from when the river freezes, until it melts again.” If you still have salmon you caught last summer, when the new fishing season starts, it is considered that you will get *guoržžu*, bad luck. That is because you have fished excessively and did not share enough. *Bivdit luosa* means ‘to fish salmon’, but it also means ‘to ask for salmon’ – and one should not ask for more than is needed. So first of all, as I have been nourished by salmon while writing this thesis, I will express my gratitude to the salmon.

The way I caught my salmon last summer is considered illegal by the state of Finland. According to the new regulations of 2017, students cannot take part in the practice of traditional Saami fishing methods in the Deatnu River. Those *luossabivdit*, salmon fishers, who live permanently in the river valley, were left with a fraction of what they were fishing before. By protecting salmon, the states say they are protecting the Saami culture.

I want to thank my father for teaching me how to fish salmon. While doing that, I learned so much more than just how to fish. I inherited a drive of striving for *birgejupmi*, which can be briefly described as a survival capacity, a way of maintaining oneself in a certain area with its respective resources.

I want to thank my supervisor, Steinar Pedersen, for his valuable support, advice and inspiration. Not only did we have an academic relationship, we share a connection of one salmon fisher to another as well.

I will also thank Else Grete Broderstad for thinking together with me, helping me to structure my thoughts and for giving her advice at any time I asked.

Big thanks as well to Tero Mustonen, for the good advice and difficult questions, as well as for reminding me that thesis is not a manifesto.

Finally, I want to thank the whole Ellos Deatnu movement. Deatnu is *Deatnu* because of the Saami, and we have the responsibility for making sure those who come after us will have a *birgejupmi* in Deatnu – so that Deatnu will live on.

Abstract

Summers in the Deatnu valley revolve around salmon. For the indigenous Saami people, wild Atlantic salmon is a fundamental aspect of culture and self-sufficiency. In the traditional Saami culture, salmon cannot be ‘taken’, it must be ‘asked for’. Today, in order to maintain these relations to salmon, the Saami must *ask for* the permission from the state authorities of Norway and Finland, who despite of strong Saami opposition, impose harsh restrictions on traditional Saami fishing especially.

This thesis is about Saami traditional knowledge (TK) on the salmon, as a part of the ecosystem, and the role of this knowledge in research and management. Saami knowledge consisting of centuries of observations highlights various changes in the environment to explain fluctuations in salmon stocks. The fish biologists informing state authorities consider TK as merely a source of data, not as a knowledge system, breaking it down to examine each concern individually – and concluding that none of the factors TK holders raise are causing a decline in salmon stocks, leaving overexploitation as the only remarkable factor. As the states consider the Saami right to self-determination fulfilled with a hearing or a consultation process, the result is that traditional Saami fishing is strongly limited – thus threatening the continuation of traditional knowledge.

List of Abbreviations

AFC: Agricultural and Forestry Committee of Finland

CBD: Convention on Biological Diversity

EA: Ecosystem Approach

ILO 169: Indigenous and Tribal Peoples Convention 169 of the International Labour Organisation

NASCO: North Atlantic Salmon Conservation Organisation

TK: Traditional Knowledge (*árbediehtu* in North Saami cf. *árbemáhttu*, traditional skills)

TRG: Tana Research Group

UNDRIP: United Nations Declaration on the Rights of Indigenous Peoples

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1. Introduction

1.1. Topic

One reason why the Saami historically developed into a distinct people and culture was their knowledge on how to live in challenging sub-arctic conditions, and how to adapt to changing circumstances by using whatever resources were available. Although a lot has changed for the Saami, one fundamental issue that has remained the same is that an intact natural resource base is a prerequisite for traditional Saami ways of life - *árbeviroláš ealáhusat*. *Árbediehtu*, traditional knowledge, is the foundation for traditional Saami ways of living as a part of Arctic nature. *Árbemáhttu* are the skills of utilising *árbediehtu*, and it is only maintained in practice. Therefore, the use of *árbediehtu* in the form of specific practices and resource management systems is the basis for its preservation (Riseth, 2011, p. 146). This thesis is about *árbediehtu* related to salmon, and how that knowledge should be part of research and decision-making. The fishing regulations of 2017 for the river Deatnu will be examined as a case study on how the Nordic states of Finland and Norway deal with indigenous peoples' rights and knowledge on a national level, while governing traditional Saami salmon fishing in Deatnu,¹ in the north of Sápmi – the land of indigenous Saami people.

Deatnu (*Tana* in Norwegian, *Teno* in Finnish) is a river with one of the biggest Atlantic salmon populations in the Atlantic Ocean basin, and it is genetically the most diverse Atlantic salmon river in the world, with around 30 different salmon strains (Erkinaro, et al., 2015). Indigenous Saami people have inhabited the area for millennia and today are still a majority in the Deatnu valley. Salmon is a core element of the Saami culture in the Deatnu valley, and salmon is such a central part in people's lives that in the summer it is more common to ask "Have you caught any fish?" than it is to ask "How are you doing?" Deatnu is a very popular destination for fishing tourists, which is a central part of the economy of the region. If you ask how the salmon stocks in Deatnu are doing, some may say they are doing just fine while others refer to the situation as a crisis. If the salmon stocks are not doing well, what is the reason and who is to blame? Tourists? Traditional net fishers? Predators? The narrow-sightedness of governance authorities and fish biologists? Various interest groups, differing views on

¹ Deatnu is the name of the great river, but also name of the municipality on the Norwegian side of the river Deatnu. In this thesis I refer to the river as Deatnu and the Deatnu region as the areas surrounding the river on both sides of the state border. When referring specifically to the municipality on the Norwegian side I use the term 'Deatnu municipality'.

the status of salmon populations, as well as political power struggles have resulted in a heated situation over the management and distribution of fishing rights.

Fishing in Deatnu is regulated by a bilateral agreement between the states of Finland and Norway. In the summer of 2017 new fishing regulations were imposed on Deatnu, despite strong Saami opposition (Public letter, 12.8.2016; Public letter, 16.2.2017; Saami Parliament of Finland, 2016a; Saami Parliament of Finland, 2016b). New regulations most strongly limit the traditional net-fishing² of the Saami, while lighter limitations were set for tourist fishing. In addition, a new group of fishing-rights holders – non-local cabin owners – was created. New restrictions were made because fish biologists point out a need to limit fishing pressure in order to strengthen the salmon populations, especially in some of the upper tributaries (Falkegård, et al., 2016, p. 79). The way these restrictions were created remains highly controversial (Saami Parliament of Finland, 2016a; Saami Parliament of Finland, 2016b; Ihmisoikeusliitto, 2017; Chancellor of Justice, 2016) Moreover, based on the estimates of stock status in the major tributaries of Máskejohka, Veahčajohka and Ohcejohka, the stocks were doing well with the previous level of fishing pressure (Erkinaro, et al., 2018, p. 3). Still, traditional fishing was strongly restricted in these tributaries as well.

Despite the new regulations, many local Saami on the Finnish side of the river kept fishing in their traditional ways, which became illegal for them based on the new regulations. Five of them publicly reported this “illegal” fishing to the police, wanting to engage in a legal battle against the state (YLE, 10.8.2017). The main reasons why Saami oppose the new regulations is that traditional Saami fishing rights are limited most strongly. Some Saami are completely denied the right to practice traditional fishing methods. As well, the Saami were excluded from effective participation in the negotiations, which resulted in a neglect of traditional knowledge in the agreement (see parts 5.3 and 5.5).

The governance of states is historically a relatively new phenomenon in Deatnu; in the 1600’s Saami had exclusive right to salmon fishing in Deatnu, and the upper parts of Deatnu were under Saami authority until the 1800’s (Helander-Renvall, 2013, p. 135). After centuries of Saami fishing and management, Deatnu has some of the most abundant and diverse Atlantic salmon populations in the world. It has been during the state regulation that the current worries on the status of some salmon populations in Deatnu have been raised (Erkinaro, et al., 2012, p. 11). Due to discontent towards the way the states manage fishing, some Saami in Deatnu valley consider they not only have the right,

² Today three types of traditional net fishing are practiced: weir (Sám: *Buodđu*), gillnet (Sám: *Njánggofierbmi*) and drift net (Sám: *Golgadat*). When referring to ‘traditional fishing’ I mean especially net-fishing, though also luring is traditional.

but also the responsibility to govern and care for the river (Declaration by a community meeting, 25.6.2017).

The way Finland governs its salmon rivers cannot be praised, since more than 90% of salmon rivers in Finland have been destroyed since 1900 (WWF Suomi, 2017). Today there are wild salmon populations only in four rivers in Finland, two of these are Simo and Tornio rivers, which flow to the Baltic sea, and the maximum allowable concentration of toxins set by EU are exceeded in the salmon caught there (Vuorinen, et al., 2017). These facts raise serious concerns about the way Finland governs its salmon rivers. The only two salmon rivers in Finland with salmon suitable for daily human consumption are the two border rivers in Sápmi: Deatnu and Njauddâm (Fin. *Näätämö*, Nor. *Neiden*). Both of these areas are predominantly Saami areas. Though the states of Finland and Norway have practiced their legislative powers in these rivers for the past century, it has been mainly the Saami who have been fishing and caring for these rivers on both sides of the border.

In this thesis, I consider the knowledge and reasons behind the current way of managing fishing in Deatnu. Another central topic examined are key issues raised by traditional knowledge holders on issues impacting salmon. According to prevailing obligations, the traditional knowledge of Saami rights-holders should be included in research and decision-making. In order to consider to what extent that is done, I examine the annual reports of the Tana research group³ on salmon stocks and analyse how they counter issues raised by traditional knowledge holders about the river and its salmon populations. Issues of traditional knowledge will be addressed by looking into how human activities⁴ in the Deatnu region have been managed in the past, among other, how fishing has been conducted and how predator populations⁵ have been restricted. In times of rapid environmental change there are many unanswered questions for both traditional knowledge holders as well as to natural science researchers (Falkegård, et al., 2016, p. 91). I see a need for better understanding and stronger cooperation of different knowledge systems in order to take steps towards a better management of human activities in Deatnu.

³ Though I am using the Saami name Deatnu throughout this thesis, I will use the Norwegian word for Deatnu, *Tana*, in the context of the research group, as well as with the fishing agreement, to highlight the different approach and meanings that Deatnu has to them in comparison to that of the Saami. Compare to Joks & Law (2016a) on the words *luossa* (North Saami word for salmon) and *laks* (Norwegian for 'salmon'). Working Group on Salmon Monitoring and Research in the Tana River System, "the Tana research group", was appointed in 2010 by the Ministry of Agriculture and Forestry in Finland and the Ministry of Climate and Environment in Norway. It is the main body for providing scientific information for the management authorities on the salmon stocks in Deatnu. See part 3.1.

⁴ I am not only talking about management of salmon fishing since salmon is a part of the ecosystem and we must look at the ecosystem as a whole. Based on traditional Saami approach (Saami Conference, 2017), nature cannot be managed, but we can manage human activities impacting the ecosystem (see part 4.3.1).

⁵ By predator populations I refer to the various species that feed on salmon, including juveniles or roe.

1.2. Research question

The context of this thesis is the process that led to the 2017 fishing agreement in Deatnu, and the core theme is the status of traditional knowledge in research as a basis for decision-making. By considering the views of Saami knowledge holders on Deatnu, salmon and research, and comparing these views to those of the Tana research group, I will be able to achieve a view of the position of traditional knowledge among Saami rights-holders, as well as in the Tana research group. That leads me to propose the following research questions:

- To what degree is traditional knowledge taken into account in the research that lays the ground for the fishing management decisions in the river Deatnu?

This question will be assessed by looking into discourses on Atlantic salmon stocks and management in official documents and among Saami knowledge holders, in the context of the 2017 fishing agreement for Deatnu.

As pointed out by Fenge and Funston (2009) for traditional knowledge to be brought to bear in relation to Arctic governance systems, the participation of indigenous peoples in the processes of decision-making will be a necessary and crucially important factor. As the fulfilment of the Saami right to decision-making over traditional resources should ensure the inclusion of traditional knowledge, Saami participation in the political process of making the fishing regulations will be evaluated as well. Thus, in addition, I ask:

- How was the right to effective Saami participation handled in the processes that led to the adoption of the fishing agreement of 2017 for Deatnu?

1.3. Methods and methodology

Since I am writing about my traditional practice of salmon fishing, this is an empirical thesis with autoethnographic reflections. I am writing about traditional knowledge of my community, therefore I will be reflecting on knowledge I have gained through living and fishing in the Deatnu valley. Still, I draw on several theoretical reflections, included in this subchapter. My point of departure is the Indigenous paradigm as described by Rauna Kuokkanen (2000, p. 415), who argues that there is a need for an Indigenous research paradigm since: “there is a need for Indigenous peoples to become

independent from Western intellectual structures since a significant part of colonialism is being dependent on modes, structures, epistemologies, and approaches of the West.” Kuokkanen writes that Indigenous paradigm has a clear social and political agenda which aims at the overall decolonisation of Indigenous societies. Part of Indigenous paradigm is to be critical towards biased privileging of Western systems of knowledge, and Cartesian dualism⁶ which still informs current patterns of thinking and research practises. This critique should derive from and be based on indigenous cultural practices (ibid.).

In this thesis, I analytically make use of the concept of *discourses*, and analyse discourses that continue to marginalise the application of traditional knowledge (TK) and Saami right to self-determination (see part 2.2), as well as those discourses supporting Saami rights and knowledge. By doing so I also aim to contribute to the debate on decolonising Saami society. In line with an Indigenous paradigm, I am also critical of the privilege of a Western system of knowledge⁷ in contrast to the traditional knowledge related to Deatnu and salmon. By applying Saami concepts in my analyses, I base my research on Saami cultural understandings. One key concept is *bivdit*, which links practice to the worldview (see part 4.3.2). *Árbediehtu* and *árbemáhttu* are two of those concepts, traditional knowledge and traditional skills. They link multigenerational observations to practice and link the two main themes of this thesis together: knowledge on the ecosystem and the right to maintain that knowledge while utilising components of that ecosystem.

An indigenous epistemology, as depicted by Shawn Wilson (2008) is formed by relationships. A *thing* that exists is not as important as are the relationships it has with other *things*. Therefore, meanings are created through relationships. This approach will be relevant when considering what *salmon* is to various actors (see part 4.3.4). According to Wilson the goal of research, which is based on an indigenous research paradigm, is to strengthen the relationships we are researching, in order to serve the needs of the communities we are researching. With my research I aim to strengthen my relationship with Deatnu and the various types of knowledge on Deatnu and its salmon, as well as to contribute to strengthening the relationship between these different ways of knowing. In accordance with indigenous research methodology, I am doing research out of the need of the community to strengthen the position of traditional knowledge in management. This thesis will as well contribute to the discussion on the Saami right to self-determination, in relation to management of traditional natural resources.

⁶ Binaries such as mind/body, human/nature (Kuokkanen, 2009, p. 155).

⁷ In this case the research of the fish biologists of the Tana research group.

This thesis is a qualitative case study on Deatnu, the management of salmon fishing and knowledges of relevance for the management. The design of a case study allows for in-depth analyses of various discourses in their contexts. I will be applying elements of *discourse analysis* in reviewing official documents and discussions on TK, and thus be reflecting on the significance of traditional knowledge. By *discourse* I mean a group of statements which provide a language for talking about a particular kind of knowledge about a topic. The focus in this thesis will be on the content and context of various arguments, not specifically on language. In this context a discourse is similar to *an ideology*, a set of statements or beliefs which produce knowledge that serves the interests of a particular group. Discourses are inextricably linked with production of knowledge, and are either ways of referring to or producing knowledge about particular phenomena. According to Foucault, knowledge is also produced by competing discourses, which are linked to contestation of power, as it is the more powerful discourse that will be considered as “truth” (Hall, 2006, p. 167). Discourses are socially influential and can either help to sustain the social status quo or contribute to transforming it. Discourse is a social practise, which implies a two-way relationship between a particular *discursive event* and the *situations, institutions and social structures* framing it (Fairclough & Wodak, 1997, p. 258). Two-way relationship means that the discursive event is shaped by situations, institutions and social structures, but it also shapes them. I will apply a *critical* approach as described by Wodak and Meyer (2009, p. 6), which implies that social theory should in an interdisciplinary way be oriented towards critiquing and changing society. From the point of departure of socially constructed reality, following a critical approach means also recognising and making visible the interconnectedness of things. A part of this is linking social and political engagement to research by recognising that the researcher comes from a specific social context.

The main *discursive event* in this thesis is *how salmon stocks in Deatnu should be secured*. The discourses examined will fall under two main topics that are interlinked: knowledge and the right to effective participation in decision-making on natural resources. The emphasis is put on examining Saami traditional knowledge in Deatnu and how are the concerns of TK holders considered by the Tana research group. The discursive event on how salmon should be secured is shaped by and shapes the social structures, situations and institutions. In this case, the *social structure* is the system of traditional Saami fishery in Deatnu region. The *situations* are furthermore understood as the role of the international and national legal and political context on this specific case of the 2017 fishing agreement for Deatnu. The specific *institutions* topical here are both research, political and legislative institutions. The main institutions are the Tana research group, and to a lesser extent, the states of Norway and Finland. In order to examine the status of traditional knowledge in research as a basis

for decision-making, understood as to what degree traditional knowledge is taken into account and the question of effective participation, I first, discuss the situations framing Tana agreement of 2017. Secondly, I discuss the understanding of TK of the Tana research group. Third, I discuss the *Árbediehtu* of Deatnu, and finally, how Saami right to decision-making is understood and implemented. The discourses analysed will be on traditional knowledge, sciences and policy, each of which are composed of the following main actors:

- A. Discourses of Saami traditional fishers and supportive institutions⁸
- B. Discourses of the Tana Research Group (TRG)
- C. Discourses of the state actors

The relationships of these three discourses can be viewed in the following way: discourses A and B are in dialogue on ecological knowledge. C discourses draw their ecological arguments from the B discourses. A and C are in dialogue on the right to decision-making, and A discourses draw arguments from international law, while C interprets rights from the dominant position of a sovereign state.

I look into the issues seeming to be cause confrontations and differing truth statements between the traditional knowledge holders and biologists of the Tana research group. I consider what is depicted as knowledge by different actors, and how that knowledge is constructed and used to argue for specific management actions. I look at the processes of knowledge production and decision-making in considering how traditional knowledge and the right of Saami to participate in decision-making are recognised *formally* and how that is reflected in the *content*. The Tana 2017 fishing agreement will be the case study on how these formal recognitions are materialised in the negotiation process,⁹ the product, as well as in the research of the TRG, which is used to argument for the new restrictions. I examine what are the arguments from those part of a state governance structure, who argue for restricting Saami rights to fishing and decision-making. By using these methods, I reveal mistreatments in the procedures and gaps between formal recognition and actual content. Contestation of power is at the heart of these discourses: who has the power to define knowledge and who decides how that knowledge is used to argue for specific kinds of management actions.

⁸ Institutions that supported Saami traditional fishing rights and inclusion of TK into management in the Tana agreement debate: the local fishery cooperatives (though being a part of the state structure), the Saami parliaments of Norway and Finland, and local organisations which will be named when they are being referred to.

⁹ By negotiation process I refer to the whole process of making the Tana agreement. Though the procedure on Norwegian side in relation to Saami rights-holders is *consultation*, it was done as a part of the overall negotiation of the Tana agreement. See parts 2.2.2 and 5.3.

1.4. Relevance

Fishing in Deatnu has always been a central element in the lives of the Saami in the Deatnu watershed. It was estimated that in the early 1800's just one sixth of people living in Ohcejohka municipality¹⁰ would survive without salmon, and half of the population lived on salmon fishing throughout the year (Helander, 1985). Today salmon fishing in Deatnu is still central for the subsistence, culture, and economy of the region. Saami opposition to state governance of salmon fishing also has a long history and has produced similar rhetoric for decades. In 1975 Saami salmon fishers from both sides of Deatnu gathered and decided that they would not accept the state-imposed fishing agreement for Deatnu. Aslak Järvensivu, who was the secretary of the meeting, explained the rationale: “the state does not own the river and the agreement is done without hearing those who own the waters.” (Helsingin Sanomat, 2.9.1975) In 2017 Saami fishers gathered in Ohcejohka stating that Deatnu watershed belongs to Saami, who have the right and the responsibility to care for and govern it, and the states have no rightful claims to Deatnu and their authority is rejected (Yle Sápmi, 26.6.2017). In May 2018 this statement has 200 signatures¹¹. Still today fishing in Deatnu is governed by the states of Finland and Norway, and there is no effective Saami participation in the governance and management.

As discussed in this thesis, Saami priorities and knowledge are currently overlooked in management, Saami fishing rights are taken away or strongly restricted, while non-local fishers are gaining stronger ground. Saami cultural practices depend upon specific elements of biodiversity for their existence and expression, and though the interlinkage between biological and cultural diversity is widely recognised (IUCN, 2018; SCBD, 2018; Pretty, et al., 2009), the cultural impacts of the current management actions in Deatnu are not evaluated. As discussed in chapter 4, Saami fishers have extensive knowledge on the salmon and the ecosystem, and though the research informing decision-makers is supposed to include traditional knowledge (Falkegård, et al., 2016, p. 60), it fails to do so in a sufficient way (Ween, 2012; Pedersen, 2011; Joks & Law, 2016a; Solbakk, 2016). There is mistrust from Saami fishermen towards the research of fish biologists (Ween, 2012), and many issues raised by traditional knowledge holders are dismissed by the Tana research group (Falkegård, et al., 2016, p. 145).

¹⁰ The municipality that includes the Deatnu region on the Finnish side.

¹¹ Source: Personal communication with Aura Mari Pieski on 28.4.2018, who has the declaration with 200 handwritten signatures.

Saami have very different views on what factors impact salmon populations in comparison to the views of the TRG. The TRG raises overfishing as the main, if not the only, cause for decline of some salmon stocks (Falkegård, et al., 2016, p. 79). Those who argue that Saami are not overfishing the river, point out issues such as strong decline in the use of traditional fishing methods and a big increase in the number of tourists (see part 4.4). In chapter 4 various concerns raised by traditional knowledge holders as issues that impact the ecosystem and salmon are discussed. These issues include changes in ocean conditions, weather, food sources for the salmon, natural phenomena such as water levels, erosion, and the increase of solids in water due to farming and building of infrastructure. People are as well concerned about the strong increase in the populations of salmon's predators, which formerly used to be restricted by hunting and fishing, which today is forbidden due to protection of salmon's predator species (See sections 4.5 and 4.2).

Research can be used as an effective tool for colonialism (Smith, 2012; Kuokkanen, 2009; Coates, 2004). In the case of the new fishing regulations for Deatnu, references to the research of the Tana research group are used to advocate for strongly limiting traditional Saami fishing rights, even though no argument is provided on why traditional Saami net fishing should be especially limited¹² (Ministry of Agriculture and Forestry of Finland, 2016). The number of traditional salmon fishers in Deatnu has declined strongly in the past decades (Solbakk, 2016), and as fishing is the only way to preserve the knowledge related to salmon and the river, strong restrictions on traditional fishing threaten the continuation of traditional knowledge (Ween & Colombi, 2013). As the very foundations of the Saami culture in Deatnu as well as the food sovereignty¹³ of the region are at risk, it is crucial to look at ways in which govern human actions in Deatnu region in a way that safeguards the Saami ways of life, secures the salmon stocks, respects Saami right to self-determination, and values the great body of knowledge that Saami have developed through centuries of living with Deatnu and its salmon.

¹² As an exception are limitations to drift net fishing, which happens early in the fishing season, and are explained to be needed to ensure more fish gets to the higher tributaries that have poor stock status (Parliament of Finland, 2016, p. 3.2).

¹³ "Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems" (Nyeleni, 2007).

1.5. Positioning and reflexivity

I am coming from a specific social context and I belong to certain discourses I am writing about. I have been a fisherman in Deatnu for all my life. I am a Saami actively involved in politics¹⁴ and activism, especially around issues related to Deatnu. In my view, the new regulations are a grave violation of Saami right to self-determination and food sovereignty, and they threaten the continuation of Saami culture and traditional knowledge in Deatnu. I will continue working politically, as an activist, and also as a researcher addressing these regulations. Social research at community level is often referred to as community action research or emancipatory research, which are approaches that assume that people know and can reflect their own lives. These approaches enable indigenous researchers to work within their own communities (Smith, 2012, p. 135). I have a strong stance towards the current state-steered governance of fishing in Deatnu, not as a result of my research, but as a politician, activist, and a person directly impacted by the fishing regulations in Deatnu. Since my studies require me to live outside my community, I am considered a non-local in Deatnu and based on the new fishing regulations, I am now a criminal in my home, by Finnish law, while engaging in my traditional practice of fishing salmon with my father. In addition to the undermining of the Saami right to self-determination, I am concerned about the lack of a holistic approach to natural resource management in Deatnu.

The traditional knowledge I discuss in this thesis is mainly from traditional fishers from the Deatnu mainstream. The total area of Deatnu where salmon is distributed is in total over 1 250 km, while the Deatnu mainstream is 210 km long (Erkinaro, et al., 2012, p. 13). Due to the vastness of the area and large number of different salmon stocks, there are differing situations with the various salmon stocks, therefore various views on the situation of salmon in Deatnu in general. Since I am writing about knowledge of the fishers in Deatnu mainstream, it must be noted that salmon that are swimming up to the higher tributaries must pass through whole 210 km of Deatnu before reaching their native tributary. Since fishers in the Deatnu mainstream are fishing multiple genetically different salmon

¹⁴ I am a member of the Saami Parliament for Finland and a Vice President of the Saami Council. Saami Council is an umbrella organisation of Saami non-governmental organisations, with members from each of the four states in Sápmi: Russia, Finland, Sweden and Norway. Saami Council is one of the indigenous peoples' Permanent Participant organisations in the Arctic Council. I have been working for the Saami Council occasionally for several years, mostly participating in the Convention on Biological Diversity meetings. I am a member of the fishery co-operative board (Fin. *hoitokunta*) of Njuorggán water village and a member of the steering committee of Snowchange co-operative, a non-profit and independent cooperative that works with issues such as traditional knowledge, ecological restoration and human rights.

populations,¹⁵ a decline in some populations higher up might not have a strong impact on the fishery in the mainstream.

There are several different situations in the vast watershed, and since some salmon stocks are doing worse than others, there are also views within Saami that support strong overall limitations to salmon fishing (Avvir, 16.8.2016; Yle Sápmi, 30.6.2017). While I am emphasizing the strong Saami resistance against the new fishing regulations, I do not mean to silence those Saami who are supportive of the new regulations. It must be mentioned however, that often also those voices that support the new regulations are not satisfied with the uneven restrictions to traditional methods in comparison to tourist fishing – the support seems to be in general in limiting fishing so that there would be more fish in the higher parts of the watershed (Avvir, 16.8.2016). On the rights discourse the situation is simpler, since it is clear that there is no consent from the Saami for the new regulations, since all Saami representatives in the negotiations were against the proposal, as well as the Saami parliaments, among other instances (see part 5.3).

I have been actively involved in the protest movement Ellos Deatnu, which strives for Saami self-determination and opposes the new fishing regulations for Deatnu, arguing that since they are not accepted by the Saami rights holders, they are illegal by Saami customary law and international law. In June 2017 Ellos Deatnu established a moratorium on the island of Čearretsuolu in the Deatnu River, near the village of Ohcejohka. By this moratorium Ellos Deatnu defies the jurisdiction of the states of Finland and Norway on this island and the waters surrounding it, claiming that the right to govern these areas and their use belongs to Saami who have used these areas since time immemorial, and the states of Norway and Finland have failed to provide any explanation on how they have gained the right to govern these areas (Ellos Deatnu, 2017). This movement can be seen as a reaction to a states' governance system that fails to recognise Saami rights to control their livelihoods and resources.

I consider that my close relationship to the issues I am writing about allows me to give valuable insights to the situation in Deatnu from the specific perspective of a traditional fisherman as well as an indigenous rights defender. Deatnu, salmon and our co-existence are of utmost importance to me, and as I see it, to the whole community in Deatnu. Both traditional knowledge and fish biology have their strengths and weaknesses, and as the best foundation for management I see a model combining these two by leaning on their strengths. I consider the fundamental problem with Deatnu to be the

¹⁵ See part 4.3.3 for Saami ways of recognizing genetically different salmon populations by appearance.

denial of the Saami right to self-determination. This thesis can be seen as looking for the next steps: if Saami voice were stronger in the research and decision-making, what might be done differently in securing the future of salmon as well as the relationship that Saami have with it?

1.6. Previous research and data

On the rights discourses I examine statements and letters from collectives that are supportive of Saami rights and have taken positions against the 2017 Tana agreement. These discourses will be examined in contrast to the arguments of the state authorities, presented in committee documents and other official communications on the 2017 Tana agreement. Focus will be on the statements of the committees of the Finnish Parliament.

The main focus regarding scientific knowledge is to evaluate the annual reports of the Tana research group, especially in relation to issues raised by TK holders. I use the reports from the years 2012 to 2018. These documents are the main source of information on the approach of the researchers of this group towards traditional knowledge and the role of TK in their research on Deatnu. I refer to other biological studies as well to show how some concerns raised by traditional knowledge holders are addressed.

There are various studies and articles on Traditional Knowledge in Deatnu. One is Solveig Joks's doctoral dissertation from 2015, *Laksen trenger ro - Tilnærming til tradisjonelle kunnskaper gjennom praksiser, begreper og fortellinger fra Sirbmá-området*.¹⁶ Joks gives plenty of examples on traditional knowledge from Sirbmá area in Deatnu and a general view on what challenges exist in Deatnu on including Traditional Knowledge in research on and management. Joks, together with John Law, has published two articles in English about Deatnu and, as they call it, Local Ecological Knowledge (Joks & Law, 2016a; Joks & Law, 2016b). These articles discuss and summarise some of the main points raised by Joks in her dissertation. While Joks's and Law's texts are of a more general nature, discussing the metaphysical differences of knowledge systems as well, I take these considerations to a more practical level and discuss what specific issues are raised by traditional knowledge holders and how are those issues considered and countered by the TRG.

¹⁶ My translation: "Salmon needs peace - Approaches to traditional knowledge through practices, concepts and narratives from the Sirbmá area."

Steinar Pedersen writes in his report *Tradisjonell kunnskap og laks – Noen momenter* about kinds of obligations Norway has for including traditional knowledge into management. Moreover, he discusses traditional knowledge in Deatnu, especially in relation to salmon's predators. He also views changes that have happened in time in fishing of salmon in the sea, with the tourist fishing, as well as historical changes in salmon catches (Pedersen, 2011). Gro Ween has written two articles in English about Deatnu and traditional knowledge. Ween's (2012) article *Resisting the Imminent Death of Wild Salmon: Local Knowledge of Tana Fishermen in Arctic Norway* is an especially valuable resource for my thesis since it discusses many of the key concerns of salmon fishers, as well as attitudes of salmon fishers in Deatnu towards fish biologists and environmental institutions. Additionally, I refer to issues raised at a community meeting in Fanasgieddi.¹⁷

In this thesis I will be referring to things I learned from *áhčči*, my father, with whom I have been fishing salmon in Deatnu since I was old enough to go on a boat, which by Deatnu standards seems to be at the age of four years. Since my father is my main link to TK in Deatnu I must introduce him as "a source of data": My father, Skuvlaalmá Áslat Niillas, or by his "passport name" Nils Antti Holmberg, was born in 1933 in Buolbmátjávri, near Njuorggán, on the Finnish side of Sápmi very close to the border with Norway. When *áhčči* was seven years old, their family moved to Gassaeana (winter place) and Seavžjávri (summer place), closer to Aanaar. The family evacuated in the later stages of the Second World War to Ylivieska for a year or so. *Áhčči* started *reangut*, to help out reindeer herders with their herds at the age of 17. He did this before motorised vehicles were commonly used, so he was walking and skiing, spending many months in *duoddar*, the tundra. He returned to Deatnu valley in 1955 and has lived there ever since. During his time in Deatnu valley he first worked with other people's reindeer, until he earned enough reindeer to have a herd of his own. For some 15 years, besides herding reindeer and fishing, he was also working with a fur farm, which must have been the closest thing he has had to a permanent job. In the summer time salmon fishing has been his main occupation. *Áhčči* has fished with tourists as a fishing guide, and started fishing with nets in Deatnu in the 1960's. He has made his living by mixing various activities; fishing, herding, picking cloudberries, hunting and working occasionally as a carpenter. After retiring from

¹⁷ The Saami council organised a community meeting in Fanasgieddi, Sápmi, Norway on 5th of April 2018 as a preparatory meeting for a project by the Arctic council working group on Conservation of Arctic Flora and Fauna (CAFF). The project "Salmon peoples of Arctic rivers" aims to gather traditional knowledge related to salmon into a format that would serve local needs. The aim of the meeting was to hear the main issues that Saami fishers in Deatnu raise and what they see would be important to include in such a project. I am a member of the steering committee for this project on behalf of the Saami council and I was taking notes in the meeting, which I will refer to in this paper. Participants of the meeting were made known of my position as a researcher who is writing his thesis on traditional knowledge in Deatnu, and participants gave their permission to refer to the discussions of this meeting in my thesis. There were about 20 people present, most of them traditional Saami salmon fishers. A clear majority were men, a few youth, and the average person was a male in his 60's, while the oldest person was in his 90's.

reindeer herding, he started *duddjot*, to make traditional Saami handicrafts during the winter times, and has made especially *guvssiid*, wooden bowls and *niibbiid*, knives. He is my main link to traditional knowledge in Deatnu and he has taught me to fish salmon, among many other things. We have fished with *buoddu*, a weir, since I was about 12 years old.

1.7. A guide through the thesis

In the second chapter I situate the discourses by looking into aspects of international law, as well as current national interpretations of Saami rights in relation to requirements for including Saami and their knowledge into decision-making and research. Chapters 3 and 4 deal with the knowledge discourses, and chapter 5 highlights the policy discourse. Chapter 3 is about the research methods and data of the Tana group. Spawning target as a key management goal will be discussed in light of issues raised by TK-holders. A cultural collision of catch reporting and Saami perspectives will be considered, and its impact on the data of the research group. This is followed by a discussion of the group's approach to traditional knowledge. Chapter 4 focuses on Saami traditional knowledge in Deatnu. A brief description of the historical context is given, following a general consideration of aspects of Saami knowledge in Deatnu, then moving on to considerations of specific issues raised by TK-holders on factors impacting salmon, and what the Tana research group writes about those issues. Chapter 5 is about the Tana 2017 fishing agreement. It is a case study on how the states of Finland and Norway deal with indigenous peoples' rights and knowledge on a national level, in relation to governance of salmon fishing. The negotiation process and the product are discussed in light of the formal recognitions on Saami rights and traditional knowledge, which were discussed in chapter 2. Finally, some arguments of the state actors will be compared with arguments of the Saami rights holders, regarding salmon, fishing and self-determination.

2. Situating the discourses: Inclusion of Saami and their knowledge into decision-making and research

2.1. Introduction

This chapter is about situating the discourses in the international and national legal and political contexts. As the lack of effective participation of Saami knowledge holders in decision-making and research is a key issue in this thesis, I begin by examining what is meant by indigenous peoples' right to self-determination, especially in relation to decision-making over traditional natural resources. I briefly look into the current understandings of international law on indigenous peoples' right to self-determination and how that applies to the current situation of the Saami Parliaments of Finland and Norway, as well as to the fishing rights in Deatnu. Then, I will consider what kinds of requirements and acknowledgements there are on international and national levels on traditional knowledge, specifically on the inclusion of traditional knowledge into decision-making and research.

2.2. Saami people's right to self-determination

2.2.1. International law

Mattias Åhren (2016) writes that the understanding of two key concepts in international law, 'peoples' and 'equality', have changed in the last several decades in a way that can be described as nothing less than a paradigm shift. These changes have had fundamental implications to the understanding of indigenous peoples' rights. Peoples' right to self-determination is a foundational principle of international law. While in the 1980's the word 'peoples' was understood as referring to the aggregate populations of states, today 'peoples' in international law is used to refer to a group of people with shared cultural and/or ethnic background. With this developed understanding on the word 'peoples', indigenous peoples are as well recognised as peoples in international law, and as all peoples are equal, indigenous peoples have the right to self-determination. As Åhren (2016, p. 225) points out, the right to self-determination in relation to indigenous peoples is not to be confused with the right to consultation, since consultation includes only a right to *a process* – a right to be involved in decision-making. The right to self-determination means that indigenous peoples must be able to

genuinely influence the outcome of decision-making processes of relevance to them. The Human Rights Committee¹⁸ has affirmed that in certain cases indigenous peoples' right to self-determination and culture means that consent must be obtained, which also means the right to say no (Heinämäki, et al., 2017, p. 76). As Åhren (2016, p. 225) writes: "under the right to self-determination, there must – by definition – be examples when the will of the state has to yield to that of the indigenous people in cases of conflict." Defining under what conditions the will of an indigenous people should prevail to that of a state is beyond the scope of this thesis, but as suggested by Åhren (ibid.), the relative importance of the issue should be a critical factor. As the use of traditional natural resources is the basis for indigenous peoples' traditional livelihoods – which are core elements of their cultures – it can be argued that the scope of the right to self-determination in relation to traditional livelihoods and resources should be far-reaching.

The right to equality is another central principle in the contemporary human rights system, and it includes that everyone has the equal right to enjoy their culture,¹⁹ meaning that nobody can be discriminated against because of their cultural background. Earlier equality was understood as the right of each individual to have identical treatment. However, as an example, it would be discriminatory towards members of minorities to teach everybody only the majority language and culture in schools, and so the understanding of the right to equality has developed into being seen as the right of individuals to be treated in accordance with their cultural background. The right to equality is also interlinked to the right to property: everyone should have equal position when developing a right to own property. As a basic premise on the right to property, it would appear reasonable that human beings hold certain rights over territories and resources, which they have by some measure of legitimacy reduced to their own control (Åhren, 2016). The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) is the most comprehensive high-level international document on indigenous peoples' rights, and though it is not itself legally binding, it does largely reflect principles of binding international law. UNDRIP article 26.2 states that "Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use..." This will be further discussed in part 2.2.2 in relation to Deatnu and salmon fishing.

¹⁸ The body of independent experts that monitors implementation of the International Covenant on Civil and Political Rights, which is a legally binding document to both Norway and Finland.

¹⁹ International Covenant on Civil and Political Rights Article 27: In those States in which ethnic, religious or linguistic minorities exist, persons belonging to such minorities shall not be denied the right, in community with the other members of their group, to enjoy their own culture, to profess and practice their own religion, or to use their own language.

2.2.2. Implementation on national levels

The constitution of Finland in § 17.2 recognises Saami as an indigenous people (Parliament of Finland, 1999), while the constitution of Norway in § 108 refers to Saami as a *folkegruppe*, an ethnic group (Lovdata, 2016). While the constitution of Norway does not recognise Saami as a people, other legislation such as the Nature Diversity Act (Nor. *Naturmangfoldloven*) does refer to indigenous people (Nor. *urfolk*), and it is clear that these are references to Saami people. Saami are therefore recognised as *a people* in both Norway and Finland, which should be reflected in all levels of legislation.

In Finland the § 9 of the act on Saami Parliament requires that “The authorities negotiate with the Saami Parliament on any major and significant procedures, which might directly²⁰ and on a specific way impact the status of the Saami as an indigenous people in the Saami homelands”²¹ Furthermore: “In order to meet the obligation to negotiate, the authorities have to give the Saami parliament the opportunity to be heard and to negotiate on the matter. If this opportunity is left unused, it does not prevent authorities from proceeding with the matter.”²² As the Constitutional Committee has stated, this provides only a *procedural* protection, meaning that the Saami Parliament has the right to be heard in issues of direct relevance to them (Heinämäki, et al., 2017, p. 29). However, as discussed in the section above, the right to self-determination is more than just a *procedural* right, which requires the authorities to provide an opportunity to be heard and to negotiate but, leaves the decision-making solely to the state.

As a way to fulfil the Norwegian ratification of the International Labour Organisation’s (ILO) convention number 169 on Indigenous and Tribal Peoples, the government of Norway and the Saami Parliament signed a consultation agreement in 2005. State authorities are obliged to consult with Saami on legislative or administrative measures that may affect them directly. According to the ILO 169 article 6.2 consultations “shall be undertaken, in good faith and in a form appropriate to the circumstances, with the objective of achieving agreement or consent to the proposed measures.” It

²⁰ The Finnish word used here is *välittömästi*, which could also be translated ‘immediately’.

²¹ My translation. The original in Finnish: ”Viranomaiset neuvottelevat saamelaiskäräjien kanssa kaikista laajakantoisista ja merkittävistä toimenpiteistä, jotka voivat välittömästi ja erityisellä tavalla vaikuttaa saamelaisten asemaan alkuperäiskansana ja jotka koskevat saamelaisten kotiseutalueella.”

²² The so-called Saami homelands include the three northernmost municipalities and Lappi reindeer herding district from *Soadegilli* municipality. My translation. The original in Finnish: “Neuvotteluelvoitteen täyttämiseksi asianomaisen viranomaisen on varattava saamelaiskäräjille tilaisuus tulla kuulluksi ja neuvotella asiasta. Tilaisuuden käyttämättä jättäminen ei estä viranomaista jatkamasta asian käsittelyä.”

can therefore be considered that this is a stronger requirement than that of the Finnish Act on Saami Parliament, which requires an opportunity to be heard. However, this requirement is also a *procedural* requirement, and leaves decision-making power to the state. Yet, as underlined by Broderstad et al. (2015), the obligations of the authorities to consult are tied to both process and substance. Premises of real participation in decision-making, partnership perspective, and “good faith” can potentially counteract a pure procedural comprehension of consultations.

Article 14 of the ILO convention 169 reads: “The rights of ownership and possession of the peoples concerned over the lands which they traditionally occupy shall be recognised.” In Finnmark, the northernmost county of Norway, this resulted in the adoption of the Finnmark Act, which transferred what use to be state-owned land to the possession of Finnmark Property (FeFo, Sámi. *Finnmárkkuopmodat*, Nor. *Finnmarkseiendommen*). The Finnmark Act states that fishing in Deatnu will be determined by a specific act, which should facilitate a local, rights-based management of fish resources.²³ This led to the establishing of the local fishing administration, Deanučázádaga Guolástushálddahus²⁴ (DG, Nor. *Tanavassdragets Fiskeforvaltning*). As it is the states of Finland and Norway who govern the fishing in Deatnu with the precise regulations, the main tasks left for the local fishing administration DG are selling fishing licenses and overseeing that the regulations are being abided by, leaving little room for management decisions.

2.3. Salmon fishing rights in Deatnu

A more comprehensive historical background on fishing and rights in Deatnu is presented in section 3.2, while this section deals with the current status of fishing rights and the last steps leading to it. Currently on the Norwegian side of Deatnu the right to fish with nets belongs to people who live not more than two kilometres away from Deatnu River, on or near property where they harvest at least 2000 kilos of hay annually.²⁵ They are called the “salmon letter holders”. On the Norwegian side of the river, people who live in Deatnu or Kárášjohka municipalities can purchase a seasonal ticket at a

²³ In Norwegian: Forskriften skal legge til rette for en lokal, rettighetsbasert forvaltning av fiskeressursene...

²⁴ Tana River Fish Management is organized with a group of nine members, where the local Salmon letter holders (net-fishing rights holders, see below) appoint five. The official Tana and Karasjok municipalities each appoint two representatives that are not in possession of Salmon letters. Those in possession of Salmon letters have a majority in the local administrative agency (Deanučázádaga Guolástushálddahus, 2017).

²⁵ When the first Tana act was adopted in 1888, the main reason of this requirement was to ensure that only people living permanently along Deatnu could fish with nets, and safeguard their rights against newcomers moving to the district (Pedersen, 1986, pp. 142-145).

low price for rod fishing, as do those living next to salmon rivers of the Deatnu watershed in Guovdageaidnu municipality (Lovdata, 2014). Special immemorial fishing rights of the Saami are recognised for Deatnu (The Finnmark act § 28), however the ownership of the waters on the Norwegian side are not clarified. Interestingly in the government's proposal for the Tana agreement, the Finnish government states that Norway owns the waters of Deatnu on the Norwegian side (Parliament of Finland, 2016). When the officials of the Norwegian ministry were asked if they have forwarded such claim to the Finnish government, the response was that they have not (Personal communication, 5.5.2018). On the Finnish side of the river the right to net fishing is attached to ownership of property. Those who own properties in the Deatnu watershed with fishing rights attached to them and live permanently in the valleys of the watershed, are entitled to fish with nets.²⁶ On the Finnish side people who live permanently in the valleys of the Deatnu watershed can purchase seasonal tickets for fishing with rods (Parliament of Finland, 2016). The new Tana agreement established a new group of fishing rights holders for the cabin owners, which will be discussed in part 5.6.

When the current situation on fishing rights in Deatnu is compared to international law, some contradictions arise since the right to traditional fishing is tied to ownership of property. Bearing in mind the developed understanding of equality discussed above, referring to the UNDRIP article 26.2, indigenous peoples have the right to own and control the territories and resources that they possess by reason of traditional ownership or use. As the UNDRIP does to an extent reflect binding international law, this article indicates that the right to salmon fishing belongs collectively to the Saami community, which has traditionally fished salmon. This is not the case at the moment in Deatnu, where some rights are dispersed as individual rights, while collective rights remain unresolved, as will be further discussed below. Fishing rights of the Saami who do not own properties remain unresolved on the Finnish side (Heinämäki, et al., 2017, p. 65), and the situation is similar on the Norwegian side, where only "salmon letter holders" are allowed to fish salmon with nets.

When private properties were established on the Finnish side of Sápmi during the Great Partition²⁷ (Sám. *stuorrajuohku*, Fin. *isojako*, Swe. *storskiftet*), those *dálut* (Fin. *Tila*) or 'estates' that were established for reindeer herders or for those whose income was tied to 'natural economies' such as hunting and gathering, could obtain fishing rights by buying water areas from the state. *Dálut* were

²⁶ In the areas of some fishery cooperatives this depends as well on the proportion of the fishing right, in Finnish *manttaaliluku*. A certain *manttaaliluku* entitles to fish with one net or a weir.

²⁷ Land reform that started when Finland was a part of Sweden. In Ohcejohka municipality this process was done between 1932 and 1962 (Helander, 1985, p. 16).

established for people whose main income came from fishing. A fundamental principle in the establishment of a *dállu* was that since fishing is the main income of a *dállu*, fishing right has to be sufficient to secure that each *dállu* was viable; in other words so that it would have enough fishing rights to provide sufficient income (Tenojoen kalastustoimikunta, 1985, pp. 17-18). This is a crucial issue when considering any limitations to the fishing rights of the *dálut*, as that means limiting their ability to provide sufficient income.²⁸

Čáhcejuohku (Fin. *Vesipiirirajankäynti*) was a continuation of the Great partition, which was a process to resolve and distribute the fishing rights to properties in Finland. In the three northernmost municipalities the preparations and the process itself took place between 1975 and 1982. A heated debate during this process was whether the historical Saami rights should be kept as collective rights or made private property. At the time Oula Näkkäljärvi was an expert of the rights unit of the Saami Parliament²⁹ of Finland, and he argued against individualisation of fishing rights, because it is against Saami conceptions of justice that individuals could make decisions over land or water. Traditionally *Siida*³⁰ owned and governed their areas collectively, and decisions were made between families. Furthermore, he argued that privatising waters would prevent historical Saami rights from being solved and would in fact mean confirming that the state has the right to rule in these areas. The so-called *Kekkos Máhte* committee which was working with *čáhcejuohku* in the northernmost municipalities (in which Ohcejohka was included), and they admitted that they could not take Saami rights aspects into consideration, because it was a too complex an issue. Näkkäljärvi further stated:

The Great Partition is unfinished for Saami. Saami *Siida*'s should have been included and should have gotten their lands separated. ... Therefore, on my opinion it is strange that this kind of committee has started to suggest that these waters will be divided, though they don't even know who owns these lands³¹ (Yle Ealli Arkiiva, 2017).

Those who were supportive of individualisation of fishing rights had the belief that once the waters would be made private property, people could then make decisions over their property and would have a say on how fishing was to be done in their own waters (Yle Ealli Arkiiva, 2017). However,

²⁸ While *dálut* have been divided in distribution of inheritance and due to property sales, the fishing rights have in many cases been multiplied, which does further complicate the situation (Länsman, 2012).

²⁹ Not same as the current *Sámediggi*, which in English is also called a Saami parliament and was established with the act of Saami Parliament in 1996. The Saami Parliament in the 1970's was called *Sámi parlameanta* in North Saami and was the predecessor of the current Saami Parliament.

³⁰ A traditional Saami governance structure, a village, see part 4.2.

³¹ My translation, the original in North Saami: "Stuorrajuohku lea báhcán gaskan sámiid guovdu. Sámi siiddat livčče galgan leat oasálašžan ja dat livčče galgan oážžut sirrejuvvot daid eatnamiid. /.../ Dan dihtii mu mielas orru imaš ahte dákkár doaibmagoddi lea álgán evttohit ahte dáid čáziid juohkit, go gearddi eai dieđe dange geat oamastit dáid eatnamiid."

this did not end up being the case. After the *čáhcejuohku* – bearing in mind that the collective rights of *Siida* were not resolved – roughly two thirds of the waters ended up under private ownership and a third was considered as belonging to the state of Finland (Tenojoen kalastustoimikunta, 1985, p. 4). The estates with rights to fishing constituted the fishery co-operatives,³² which own the private waters. Due to Deatnu being a border river, the states of Finland and Norway considered there was a need to agree on the management of fishing bilaterally. This resulted in the bilateral agreement, which was used to govern fishing in Deatnu prior to *čáhcejuohku*, when the private waters had not been established, and the practice continued even after the rights to waters were considered resolved. However, as it was pointed out already in 1985, in the appendix of the report of the Finnish fishing rights committee for Deatnu (Fin. *Tenojoen kalastustoimikunta*), the bilateral agreement does go unnecessarily far with its authority, since it limits the decision-making power of the owners of the waters (Helander, 1985). Still today the fishing also in the private waters of the fishery cooperatives is governed by the bilateral agreement between the states, where rights holders do not have a decisive power.

2.4. Including traditional knowledge into decision-making and management

2.4.1. What is traditional knowledge

Much of the traditional knowledge related to Deatnu and fishing, which I am looking into in this thesis, could be called Indigenous Knowledge or Traditional Ecological Knowledge, although some researchers prefer to use Local Knowledge or Local Ecological Knowledge (LEK, Joks & Law, 2016a) or Fisher Knowledge (Maurstad, 2002). However, local knowledge and fisher knowledge can be the knowledge of any community, while traditional knowledge is used to refer especially to the knowledge of indigenous peoples. The United Nations Declaration on the Rights of Indigenous Peoples uses both indigenous knowledge and traditional knowledge (United Nations, 2008). The language on the Convention on Biological Diversity (CBD) Article 8(j) is “knowledge, innovations and practices of indigenous and local communities” (CBD, 1993). ‘Traditional and local knowledge’ are often used together in the decisions of the CBD, and the indigenous peoples’ organisations

³² Sám. Guolástangoddi and later osolašgoddi. Fin. kalastuskunta and later osakaskunta.

working with the CBD mainly use ‘traditional knowledge’ (CBD, 2017; International Indigenous Forum on Biodiversity, 2017). Indigenous peoples’ Permanent Participants in the Arctic Council³³ have created the *Ottawa Traditional Knowledge Principles* as a guiding document in the work of the Arctic Council in relation to traditional knowledge. I use the definition of traditional knowledge as stated in this document:

Traditional Knowledge is a systematic way of thinking and knowing that is elaborated and applied to phenomena across biological, physical, cultural and linguistic systems. Traditional Knowledge is owned by the holders of that knowledge, often collectively, and is uniquely expressed and transmitted through indigenous languages. It is a body of knowledge generated through cultural practices, lived experiences including extensive and multigenerational observations, lessons and skills. It has been developed and verified over millennia and is still developing in a living process, including knowledge acquired today and in the future, and it is passed on from generation to generation (Permanent Participants, 2017).

Therefore, by traditional knowledge I refer to holistic knowledge systems held by indigenous peoples or communities. Traditional knowledge is the intellectual property of indigenous peoples, and due to their right to self-determination indigenous peoples have the right to own and control such knowledge, including how it is used in management and research. Saami traditional knowledge is discussed in part 4.3.

Both Western science³⁴ and traditional knowledge are the results of the same general intellectual process of creating order out of disorder (Berkes, 2008 [1999], p. 10). Traditional knowledge and Western science have many similar properties, though they are products of two different cultural traditions and both of them function within a wider cultural and social context (Kuokkanen, 2009, p. 53). As Aikenhead and Michell (2011, p. 106) write about similarities of indigenous and western ways of knowing “they share intellectual processes such as observing, questioning, interpreting, looking for patterns, inferring, classifying, predicting, verifying, problem solving, adapting, monitoring and so on.” On the verification of knowledge, Fikret Berkes (2008 [1999], p. 4) writes: “Traditions are the products of generations of intellectual reflection tested in the rigorous laboratory of survival. That they have endured is proof to their power.”

³³ The Arctic Council is an intergovernmental body consisting of eight Arctic states (including Norway and Finland) and six indigenous peoples’ Permanent Participant organisations, and it is committed to maintaining peace, stability and constructive cooperation in the Arctic.

³⁴ In this context the research of the fish biologists of the Tana group, discussed in part 3.2.

2.4.2. International conventions and declarations on traditional knowledge

The value of traditional knowledge is recognised in various international conventions and declarations, which bring obligations and guidelines to states on how traditional knowledge should be taken into account. Declarations give political commitments and are aspirational soft-law documents, while conventions are legally binding. While the commitments towards traditional knowledge from these instruments are often less precise, they show that traditional knowledge is highly valued internationally. Thus, they provide a basis for arguing for the inclusion of traditional knowledge in research and management, as well as protecting TK as cultural heritage.³⁵ However, there remains a clear gap between these internationally recognised principles and their implementation on national level.

The Convention on Biological Diversity³⁶ (CBD) Article 10(c) recognises the importance of traditional cultural practices for the sustainable use of biological resources and the Article 8(j) encourages parties to maintain and promote wider application of traditional knowledge relevant for the conservation and sustainable use of biological diversity. Norway has a national biodiversity act³⁷ for reaching the goals of the CBD. In the Plan of action on Article 10(c) indigenous peoples' traditional management systems are recognised as contributing to the sustainable use of biological diversity, and their involvement in the management of their traditional areas should be secured (CBD, 2014). Moreover, this plan states: "Traditional knowledge should be valued, respected and considered as useful and necessary for biodiversity conservation and sustainable use as other forms of

³⁵ UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (UNESCO, 2003) defines cultural heritage as something that "is transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity" Compare to definition of TK in section 2.4.1.

³⁶ A holistic United Nations convention, created to conserve biological diversity, to advance sustainable use of components of biological diversity and to share fairly and equitably the benefits arising from the utilisation of genetic resources (CBD, 1993). Both Norway and Finland are signatories, and while Finland has adopted it as part of their legislation, Norway has a specific Nature diversity act which is discussed below.

³⁷ Nature Diversity Act states in section 8: "the authorities shall attach importance to knowledge that is based on many generations of experience acquired through the use of and interaction with the natural environment, *including traditional Sami use*, and that can promote the conservation and sustainable use of biological, geological and landscape diversity." (my italics). Chapter VII on access to genetic resources and traditional knowledge attached to genetic resources in § 57 states that the exploitation of genetic resources should be as beneficial as possible to the environment and to people while "attaching importance to appropriate measures for sharing the benefits arising out of the utilisation of genetic material and *in such a way as to safeguard the interests of indigenous peoples and local communities*" (my italics).

knowledge.” The Article 7 of the Nagoya Protocol³⁸ is of special importance when considering the inclusion of TK into management. It reads:

In accordance with domestic law, each Party shall take measures, as appropriate, with the aim of ensuring that traditional knowledge associated with genetic resources that is held by indigenous and local communities is accessed with the prior and informed consent or approval and involvement of these indigenous and local communities, and that mutually agreed terms have been established.

ILO convention 169 does not mention traditional knowledge but there are several articles addressing traditional livelihoods of indigenous peoples and participation of indigenous peoples in management. These are also relevant for inclusion of TK in decision-making. Article 8.1. states “In applying national laws and regulations to the peoples concerned, due regard shall be had to their customs or customary laws.” Article 7.1 states “The peoples concerned shall have the right to decide their own priorities for the process of development as it affects their lives, beliefs, institutions and spiritual well-being and the lands they occupy or otherwise use, and to exercise control, to the extent possible, over their own economic, social and cultural development.” Article 23 states that whenever appropriate, fishing should also be recognised as an important factor in maintaining indigenous cultures, their economic self-reliance and development, and that these activities should be strengthened and promoted, with the participation of these people.

Other declarations which recognise TK include the **UNDRIP** (see part 2.2.1), which in the preamble states: “respect for indigenous knowledge, cultures and traditional practices contributes to sustainable and equitable development and proper management of the environment”. Article 31 states that indigenous peoples have the right to maintain, control, protect and develop their traditional knowledge and manifestations of their technologies and genetic resources and that states shall take effective measures to protect the exercise of these rights. The **Arctic Council**³⁹ Fairbanks Ministerial Declaration recognises in the Article 31 the importance of incorporating traditional knowledge into informed decision-making in the Arctic, together with scientific assessments and projections (Arctic Council, 2017). **The European Parliament** (2017) recognises in its Arctic Policy that “science-informed decision-making, including local and indigenous knowledge, is key to safeguarding fragile

³⁸ A supplementary agreement to the Convention on Biological Diversity, which provides a transparent legal framework for the effective implementation of the objective of fair and equitable sharing of benefits arising out of the utilization of genetic resources. Norway ratified the Nagoya protocol in 2013 and Finland in 2016 (CBD, 2018).

³⁹ The Arctic Council is an intergovernmental body consisting of eight Arctic states (including Norway and Finland) and six indigenous peoples’ Permanent Participant organisations, and it is committed to maintaining peace, stability and constructive cooperation in the Arctic.

ecosystems of the Arctic” and “Emphasises the importance of including traditional and local knowledge in decision making in the Arctic”.

2.4.3. The Tana fishing agreement on traditional knowledge

The new bilateral Tana fishing agreement between the states of Norway and Finland is the main document in defining how fishing the river should be managed (see chapter 5). The intention of the agreement (Article 1.1) is to improve ecologically, economically and socially sustainable use of the fish stocks of Deatnu watershed. This should be done based on the best available knowledge, including traditional knowledge. This is the only mention of TK in the agreement. As pointed out by Heinämäki et al (2017, p. 76), this recognition of traditional knowledge is significant for Saami rights, and it must be interpreted together with the CBD. This brings the requirement to take TK into account in governance, conservation measures, and fishing restrictions, and that cultural impact assessments should be carried out on the impacts of these measures. Article 1.2 states that in conservation measures special attention should be given to fishing methods that are based on local cultural traditions.

The main document guiding the management of fishing in Deatnu will be the management plan (*Sám. dikšunplána*, *Fin. hoitosuunnitelma*, *Nor. forvaltningsplan*). The participation of fishing rights holders is required in the development of the management plan. The establishment of a monitoring and research group is required to evaluate possible needs of additional restrictions, and fishing rights holders must be included in the evaluation of such needs. However, the mention of ‘rights holders’ does not necessarily mean that traditional knowledge holders will take part in this work. As described in part 2.3, fishing rights are attached to properties and can be bought by anybody, regardless of the person’s knowledge of the river.⁴⁰ Therefore, the agreement is very vague on how TK is to be included.

⁴⁰ As it is currently, a clear majority of fishing rights is owned by the Saami (Tenojoen kalastustoimikunta, 1985; Burgess, 1996; Länsman, 2012).

2.4.4. The Ecosystem Approach to management

The Ecosystem Approach⁴¹ (EA) is a strategy for integrated management of land, water and living resources, which recognises that humans, with their cultural diversity, are an integral component of many ecosystems (SCBD, 2004). The Ecosystem Approach is the primary framework for action under the Convention on Biological Diversity (SCBD, 2004), and the Food and Agriculture Organisation recognises Ecosystem Approach to Fisheries as an important guiding principle for management of small-scale fisheries (FAO, 2015). As defined by the CBD, one key principle of EA is decentralisation of management to the lowest appropriate level, thus enhancing the role of local and traditional knowledge (SCBD, 2004, p. 10). This means involving all stakeholders and balancing local interests with the wider public interest. Based on EA attention should be given to the environmental conditions limiting natural productivity, ecosystem structure, functioning and diversity (CBD COP 5, 2000). EA does not preclude other management and conservation approaches but does require adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete understanding of their functioning (SCBD, 2004). As part of adaptive management, measures may need to be taken even when some cause-and-effect relationships are not yet fully established scientifically (CBD COP 5, 2000).

2.5. Summary

This chapter has been about situating the political discourse on the right to decision-making and the discourse on traditional knowledge in relation to national and international recognition and obligations. The Saami have the right to effective participation in decision-making over natural resources they have traditionally used, and participation of TK-holders in decision-making is required for the effective inclusion of traditional knowledge. By the standards of international law, indigenous peoples' have the right to effective participation over matters of importance to them, to an extent that on some occasions the will of indigenous people must prevail over that of the state. However, from the states' perspective, the Saami right to self-determination is considered to be fulfilled on national levels in Finland and Norway by the Saami parliaments, which, only have the right to a *procedure* in relation to decision-making, while holding no decisive power. Fishing rights in Deatnu are attached to private ownership of land and are dependent on where a person lives. The status of the water-areas

⁴¹ EA is the primary framework for action under the CBD (SCBD, 2004) and is recognised by the Food and Agriculture Organisation as an important guiding principle for management of small-scale fisheries (FAO, 2015).

that are not under private ownership is unclear on both sides of the state border, as the collective rights of Saami *Siida*'s to waters in Deatnu remain unresolved. While this is the case, the two states practice full authority over the governance of fishing in Deatnu.

Traditional knowledge is recognised as a key component for safeguarding fragile ecosystems of the Arctic. Crucial to the successful inclusion of traditional knowledge is effective participation of such knowledge holders in decision-making and research. Traditional knowledge is the intellectual property of indigenous peoples, and they have the right to maintain it and decide how it is used. The Tana agreement recognises TK, and this recognition must be interpreted in the light of international agreements, especially the CBD. This recognition also includes the requirement to take TK into account in governance, conservation measures and fishing restrictions, and that cultural impact assessment should be carried out on the impacts of such measures.

3. The Tana research group and reports on salmon stocks

3.1. Introduction

This chapter deals with the scientific discourse of knowledge production of the “Working group on salmon monitoring and research in the Tana river system”⁴² (referred to as the Tana research group, Tana group or TRG). I look into the TRG evaluation of the salmon stocks and how management goals are set. Two key concepts are discussed: Spawning target as a management goal and catch statistics as an important source of data. A collision between Saami culture and catch reporting will be discussed, and what implications that might have on the data analysed in research by this group. The approach of the TRG towards traditional knowledge is considered by looking into discussion on TK in the annual reports. This chapter lays the groundwork for further considerations in chapter 4, which discusses how the TRG considers issues that traditional knowledge holders raise as factors impacting salmon populations. The aim of both chapter 3 and 4 is to bring the two knowledge discourses into dialogue. This chapter discusses the science discourse and reflects it in the light of the TK discourse.

3.2. Approaches, methods and data

The TRG produces reports for the state authorities on the status of salmon populations in Deatnu watershed and gives scientific advice to the management authorities. According to their mandate, the TRG is to evaluate the management of salmon stocks in light of relevant NASCO⁴³ guidelines, which, among other aims, requires the sustainment of salmon stocks above their conservation limits (see part 3.4) and creating conservation plans for those stocks that do not reach their conservation limit. The research of the group leans on quantitative methods, which demand considerable data which is or can be transferred into numeric form. This data is then used in calculations to evaluate the situation of salmon stocks. Evaluations must be done even if some data is not available or is inaccurate. Data that the Tana research group uses comes from catch statistics, scale samples, electrofishing and fish counting with cameras, or in some cases with sonar, and by diving. Genetic stock identification is

⁴² The four-member group of fish biologists was formally appointed in 2010 by the Ministry of Agriculture and Forestry in Finland and the Ministry of Environment in Norway (Erkinaro, et al., 2012).

⁴³ North Atlantic Salmon Conservation Organisation, discussed in part 3.3

used to estimate proportions, times, and where and with what methods each salmon populations are being exploited (Parliament of Finland, 2016, part 2.5.6). Some data from salmon tagging is also available for the research group (Falkegård, et al., 2016, p. 89). The TRG uses traditional knowledge as one source of data, which will be discussed in part 3.6. The research done by the Tana research group is single-species oriented research, which means focusing on one species in the ecosystem, as opposed to the more holistic Ecosystem Approach (see part 2.4.4).

3.3. The role of NASCO

The North Atlantic Salmon Conservation Organisation (NASCO) is an intergovernmental organisation aiming to conserve, restore, enhance, and rationally manage Atlantic salmon through international cooperation. NASCO has six members, including Norway and the European Union (NASCO, 2018). Since the TRG must evaluate the management of stocks in light of relevant NASCO guidelines, NASCO has a strong influence on the approach of the research done in Deatnu. One key document of NASCO is the Precautionary Approach agreement, requiring all salmon stocks in the NASCO area to be maintained above their conservation limit, which is defined as the spawning stock level producing maximum sustainable yield (NASCO, 1998).

NASCO considers that by expanding its work to habitat protection and restoration, by-catch, aquaculture, socio-economic factors and other areas, they are adopting and applying an Ecosystem Approach (EA, see part 2.4.4) in its work (NASCO, 2012). However, elements of the Ecosystem Approach, such as local decision-making and the inclusion of traditional knowledge into research and management, are not present in the NASCO guidelines. As NASCO considers itself to be applying the Ecosystem Approach to its work, it could be assumed that principles of EA would be visible in their guidelines. If that were the case, as national level decision-making is supposed to abide by NASCO guidelines and approaches, the Ecosystem Approach should be visible in the Tana agreement and regulations, as well as in the work of the TRG.

3.4. Spawning target (Conservation limit) – The maximum production potential of a river

3.4.1. The Tana Research Group

Spawning target, which is also called the conservation limit, defines the maximum production potential of recruits of a river or a river section. The way the Tana research group estimates the status of the salmon populations is to define a spawning target for a river section which has a specific salmon population, and then estimates if that target is reached. The TRG writes about spawning target as follows:

The spawning target is founded on the premise that the number of recruits in a fish stock in some way is depending on the number of spawners and that each river has a maximum potential production of recruits. The number of spawners necessary to produce this maximum number of recruits is the spawning target of a river (Falkegård, et al., 2016, p. 62).

To calculate if the spawning target is reached, information is needed on how much salmon smolts a tributary or a river-section can produce, in other words, the maximum production potential of a river. The number of spawning redds⁴⁴ and areas suitable for salmon parr⁴⁵ to live in are issues impacting the production potential of a river. To know if a spawning goal has been reached, how much eggs were laid needs to be estimated. This is calculated by estimating if the required female salmon biomass survived until spawning. This approach has high demands on data. It is not possible to know if a spawning target was reached if it is not known how much salmon *survived* and spawned successfully. Getting data on this is challenging. Catch statistics (see part 3.5) only give estimates on how well the fishers were doing, and don't tell how much salmon were left in the river. By combining genetic stock identification data from the Deatnu mainstem and fish counting data, the TRG has set up a model to estimate the proportion of catches. Some tributaries have cameras to count fish and in some occasions fish are counted by divers or by sonar. However, it is not possible to count fish in bigger streams, and therefore the number of spawning females is not known, for example in the Deatnu mainstream (Erkinaro, et al., 2018, p. 24; Erkinaro, et al., 2014).

Spawning targets are needed for estimating maximum sustainable yield, meaning the amount of fish that can be caught without limiting the salmon production of a river. Sustainable exploitation level means only harvesting the surplus of the stock, so that enough female salmon survive to reproduce

⁴⁴ Places suitable for fish to make “nests” to lay eggs into.

⁴⁵ Young salmon that lives in a river.

and reach the spawning target (Falkegård, et al., 2016, pp. 81-82). Due to annual fluctuations, the maximum sustainable yield is not a fixed quantity. In estimating the maximum sustainable yield, the TRG has to deal with much *uncertainty* regarding how environmental factors impact salmon survival during the various stages of their life cycles. This uncertainty on the impacts of environmental conditions is further increased by climate change. Largely due to an extensive mixed-stock fishery both in the Deatnu main stem and along the coast, the TRG writes that “there is substantial uncertainty about the relationships between management actions, exploitation efficiencies and the resulting spawning stock sizes.” (Falkegård, et al., 2016, p. 91) The impacts of all these factors combined must be evaluated on each of the nearly 30 genetically distinct salmon stocks in the watershed. It is then estimated how many fish can be caught and still have enough salmon in the river to reach the spawning target. The TRG points out that local fishers argue there is more salmon in the river than what the scientists are able to observe – a matter which the TRG seems to agree on: “The status evaluation can never be better than the data that are put into the evaluation, and we lack physical fish counting for most areas in Tana. In the absence of such data, we have to make a *conservative evaluation* and this might easily be unrealistically negative.” (Falkegård, et al., 2016, p. 146, my italics)

3.4.2. In the light of Saami knowledge

As be discussed in chapter 4, Saami knowledge holders have observed changes impacting the salmon production potential of rivers in the Deatnu watershed. Observations on the reduction of spawning redds and areas suitable for juvenile salmon to live, are issues emphasised by some TK-holders (see part 4.7), but TRG does not consider these to have a remarkable impact on salmon production. The increased number of predators is a common concern raised by Saami knowledge holders as an issue affecting the production potential of rivers (see part 4.5), but this is not taken into account in estimating the production potentials. Despite dealing with many uncertainties caused by annual variation, environmental factors and in the absence of accurate data, the TRG tries to calculate how many fish can be caught so that enough salmon are still left in the river to spawn, in order to reach the spawning target. A Saami response to all this uncertainty and complexity might be *Gal Deatnu luosas fuolaha*, “Deatnu will take care of salmon”, or in other words: *Luondu dat lea mii stivre*, “It is nature that is in charge” (see part 4.6.1). These references from TK point out how much environmental conditions impact both the salmon survival as well as fishing conditions. Clearly, this approach cannot be adopted by scientists of the TRG whose task is to precisely calculate estimates in the midst

of uncertainties. Part 4.6 will further discuss if reaching spawning targets on an annual basis seems like a plausible goal for management, considering the large natural variation of salmon stocks.

3.5. Catch Statistics and Reporting

One argument used as proof of the declining salmon populations in Deatnu is that the long-time average catches have fallen (The Parliament of Finland, 2016, sections 2.5.1-2.5.2; Erkinaro, et al., 2012, p. 18). Catch statistics are a way of estimating how much fish has been caught, and they used to be a central way of studying the levels of salmon stocks. However, due to the subjective nature of this information, it is not considered to be a trustworthy way of gaining knowledge on the stocks. Though catch reporting is required by law,⁴⁶ many fishermen do not report their catch numbers (Ween, 2012, p. 166; Falkegård, 2014, p. 22-23). Even if the amount of fish caught would be known, that would mainly indicate how well the fishers are doing, and does not tell how many fish are left in the river to spawn. Environmental factors such as water-levels and temperature have an impact on fishing conditions and therefore also on how many fish are caught. As discussed in part 3.4, for the evaluation of spawning stocks, it is more important to know how many fish are left in the river to spawn. In any case, catch statistics remain a key source of information for the TRG (Erkinaro, et al., 2012, p. 93).

In traditional Saami culture it is inappropriate to brag about ones' catches, which might cause you to lose your fishing spot or luck. You do not want to make your neighbours jealous by letting them know what you have caught. Considering the mistrust of Saami towards the fish biologists and natural resource managers (Ween, 2012), a Saami fisher might not want to let the fish biologists to know how many fish were caught, to avoid harder restrictions on fishing. This might be amplified after new regulations make it possible to limit fishing immediately, if it the salmon catch is estimated to be too high.⁴⁷ By reporting your catch, you would also be showing your level of income from salmon fishing. There are also deeper spiritual reasons against telling how much you have caught, as will be discussed in section 4.3.2 on *bivdit*. I have heard of an incident that happened a long time ago, when a man in Deatnu valley was seen gutting his good salmon catch behind a shed and after being seen he threw away the catch since he considered it to be contaminated. Though my father has provided

⁴⁶ On the Finnish side only after the new agreement was adopted in 2017

⁴⁷ Articles 34 and 35 in the new regulation make it possible to impose further restrictions in the middle of the fishing season, if it is estimated that some stocks are being exploited too much. For this, catch reports need to be delivered on a weekly basis.

the researchers with scale samples and catch information for a decade or so, I have learned not to show your catch to others or let them know if you have had a good catch. Though showing your catch to your neighbour and reporting it to the authorities are not the same, both are a matter of letting others know what you have caught, and hiding that information may be considered protecting your source of income and fishing luck.

On the consequence of hiding your catches Morten Falkegård, one of the researchers of the Tana group writes: “Insufficient catch reporting can cause the administration to assume that the number of spawning fish is smaller than it really is. If administration assumes that spawning stock is smaller than the aimed spawning stock, it means that administration must work towards limiting fishing.”⁴⁸ (Falkegård, 2014, p. 23) The consequence of this cultural collision is obvious and must be recognised. Despite the TRG being aware of the subjective nature of the catch statistics, in the 2018 report the group writes: “The current stock status assessment makes no attempt to estimate any proportion of unreported catches in the different areas and the catch statistics of both countries are treated as an accurate representation of the actual catch in various parts of Tana.” (Erkinaro, et al., 2018) Due to the complexity of estimating how much catch is left unreported, and though the TRG knows catch statistics to be inaccurate, they are treated as accurate data.

When looking at catch statistics it must be remembered that there has been a decline of more than 70% in the use of traditional fishing methods since 1970’s (Solbakk, 2016, p. 20). However, the fact that there are less net-fishers is not being reflected in the catch statistics, and for example the estimated proportion of weir catch was the same in 1984 and 2010; 20% of the total catch estimate (Erkinaro, et al., 2012, pp. 58-59). Estimating issues impacting fishers reporting would require qualitative sociological studies, which clearly fall outside the scope of research done by the TRG and are therefore not evaluated in the reports. The following considerations would be relevant for estimating why the estimated catches caught by weir have not fallen, despite the strong decline in the number of weirs: when the oldest fishers have stopped fishing, a generation shift happened. Do each of the fishers of the ‘next generation’ of weir fishers catch more than those of the previous generation, or are they just more likely to report more catches? Perhaps the new generation is more distanced from the old reciprocal ways of thinking about nature (see part 4.3.2), and more trusting of scientists and authorities. How have the ways of estimating unreported catch changed and what impacts might this have on statistics? Perhaps everyone is less likely to report their catches, in fear of tougher

⁴⁸ My translation, in North Saami: “Váillálaš sálašdieđiheapmi sáhtá dagahit ahte hálddašeaddjit navdet ahte godđoguliid lohku lea uhcit go dat duođaid lea. Jus hálddašeaddjit de navdet ahte godđomáddodat lea uhcit go godđomáddodatmihttu, de dat mielddisbukta ahte hálddašeaddjit fertejit bargat dan badjelii ahte bivdu geahpeduvvo.”

restrictions to the group of fishers that they belong to. Perhaps when someone gets a good catch they only report part of it, while bad catches are fully reported. Perhaps catch statistics are an indicator of trust towards the scientists and management authorities. This is not to say that nobody would report their catches honestly, and that there would be no correlation between the amount of salmon caught and the number of catches reported. However, these considerations are relevant when looking purely at the numbers of reported catches. I refer to catch statistics in this thesis as *catch estimates*.

A Saami woman from Deatnu valley summarised the impact of catch statistics in a discussion on Facebook in a way that sheds some light on the way some Saami see the impact of catch reporting:

When a lot of salmon is caught, the fish biologists react: “They are catching too much salmon, we must limit fishing.”

When a small number of salmon is caught, the fish biologists react: “They are catching too little salmon, we must limit fishing.”

3.6. Linking the knowledge discourses: the approach of TRG and traditional knowledge

According to its mandate, the Tana research group must “integrate local and traditional knowledge of the stocks in their evaluations”, as well as “collect information from local communities and organizations” (Erkinaro, et al., 2015, p. 8). The reports do not discuss in what way the group accesses TK, therefore it is not clear if the TRG is abiding by the principle of the Nagoya Protocol Article 7 (see part 2.4.2), which requires that TK associated with genetic resources to be “accessed with the prior and informed consent or approval and involvement of these indigenous and local communities, and that mutually agreed terms have been established.” Examples of how the TRG uses traditional knowledge – or as the group calls it, local knowledge – is information on habitat quality, salmon distribution, extent and distribution of salmon spawning activity (for estimating production potentials) and information on fishing experiences in different areas (Falkegård, et al., 2016, p. 144).

The Tana research group writes “The Group recognizes the *potential* positive contribution from local/traditional (ecological) knowledge, and will strive to incorporate relevant knowledge of this kind in its work.” (Erkinaro, et al., 2016, p. 5, my italics) Based on this proclamation, the Tana research group does not seem to be sure if traditional knowledge is useful to their work, but, as their mandate requires, they are looking into ways of including traditional knowledge into their research.

The reports from 2012 (Erkinaro, et al.) and 2016 (Falkegård, et al.) do, to an extent, address some of the main issues raised by TK holders, as discussed in chapter 4. However, in the words of the 2016 report (p. 145): “All of these have been heard and evaluated, and for various reasons deemed irrelevant for the conclusions presented in this report.”

As the scientific advisory body for governance authorities, the TRG has practically a monopoly in producing ecological knowledge impacting decision-making over fishing in Deatnu (see chapter 5). Due to its position, the TRG is the filter through which issues raised by traditional knowledge holders can reach to inform decision-making. The TRG refers to scientific knowledge production as being largely objective, as opposed to subjective traditional knowledge (Erkinaro, et al., 2012, pp. 29-30). However, even the fish biologists of the TRG come from a certain social context, which does have an impact on their research. The language that the TRG uses reveals a binary between nature and culture, as is seen in division between ‘exploitation’ and ‘predation’ (Erkinaro, et al., 2012; Joks & Law, 2016a; discussed further in part 4.5.2). This has an impact on their argumentation; when predation is called ‘natural mortality’, human exploitation then becomes unnatural. Cultural preconceptions, worldviews, values and epistemologies have an impact on research: on what kind of hypothesis are set,⁴⁹ how research is planned,⁵⁰ how information is gathered, organised and interpreted,⁵¹ as well as how are the research results presented (Kuokkanen, 2009, p. 208). In the face of unfathomable complexity of an ecosystem, decisions have to be made on how to deal cautiously with uncertainty and the kinds of risks which can be taken. These decisions are not made in a vacuum but are impacted by their social context.

In the 2016 report, the Tana research group explains their views on the possible relationship between traditional knowledge research and natural sciences. This description is crucial for considering why the scientific discourse and TK discourse do not properly correlate. The TRG is aware of the accusations of not including traditional knowledge in their reports, to which they answer:

Arguments about researchers not using local/traditional knowledge is also fundamentally flawed. A core issue in this argument stem from a misunderstanding about the possible relationship between natural science and local/traditional knowledge research. Natural sciences are concerned with finding objective truths, while the research of local/traditional knowledge is relativistic and descriptive about people and their knowledge-belief system. Parts of this *belief system* pertain to the fishermen and how they exercise their

⁴⁹ For example, are the effects of predation to salmon in Deatnu studied, or the impacts of tourist fishing to a specific salmon stock.

⁵⁰ For example, how do you include TK-holders.

⁵¹ For example, how is information gathered and interpreted on the impacts of environmental factors (see part 4.7).

fishery, other parts pertain to the salmon. It is the latter that is relevant for the science-based status evaluation. The use of the latter poses a challenge that cannot be solved by segregating the domain of natural science and the domain of local/traditional knowledge. Rather, *the only possible solution* is that we as biologists need to find proper input levels for alternative sources of *data*, of which local/traditional knowledge is one (Falkegård, et al., 2016, p. 144, my italics).

I agree that it would be unfounded to claim that the Tana research group does not use traditional knowledge at all in their research, however, their approach towards traditional knowledge does raise some serious concerns. The assumed hierarchy of knowledge systems is evident in this quote: whereas natural sciences are described as being concerned with finding *objective truths*, traditional knowledge is called a *belief-system*. By not recognising traditional knowledge as something that has, to an extent, been verified by generations of experience, they seem to be misunderstanding the possible relationship between natural science and traditional knowledge research. I agree that the challenge of including traditional knowledge in the research on salmon in Deatnu cannot be solved by segregating natural science and TK research. However, the Tana research group seems to be doing this exact thing. Trying to remain on a higher level of knowledge, the group claims that *the only possible solution* is that they as biologists need to find proper input levels for various sources of *data*, of which TK is one. First of all, TK is much more than just data, and secondly, this is far from being the only possible solution. However, approaches such as co-construction of knowledge⁵² (Apgar, et al., 2016) are not considered as options for including TK into research. Currently TK is considered by the TRG as merely a potential source of data. The approach of the group seems to be that only knowledge, or information, that can be transformed into numeric form can be incorporated in their research (Joks & Law, 2016b, p. 3). If the researchers of the Tana group are able to translate TK into a language that they can use in their quantitative research models, they might consider it useful. However if they fail to do so, TK is deemed irrelevant.

Recall from section 2.4.2 the level of international recognition on TK: “Traditional knowledge should be valued, respected and considered as useful and necessary for biodiversity conservation and sustainable use as other forms of knowledge.” (CBD, 2014) It is apparent that the Tana research group does not consider traditional knowledge as an equally valuable system of knowledge as their own scientific approaches. Then again, it must be acknowledged that traditional knowledge, *árbediehtu*, is transferred within its own social context and while practising traditional skills, *árbemáhttu*. The researchers of the TRG have not been educated in *árbediehtu* through the practice of *árbemáhttu*, and

⁵² Co-construction of knowledge brings together researcher-derived understanding, with local, practitioner or non-researcher understanding.

are not familiar with its ways of knowing. Therefore, TK as a knowledge system is outweighed by the ways of knowing and verifying that the TRG is educated in, which is science.

3.7. Conclusions

The Tana research group works with extremely complex issues, where unpredictable environmental conditions impact salmon in various areas and during different stages of its life-cycle. The impacts of certain management actions to specific salmon populations, especially in the case of extensive mixed-stock fisheries, are complicated to estimate. In this complexity, it is indeed a great challenge trying to estimate the mathematical probability if the exploitation level of a certain salmon population is on a sustainable level. This is, however, the frame within which the TRG works. Decisions have to be made on how to deal with uncertainty, and what kinds of risks can be undertaken. In the words of the group: in the absence of accurate data they have to make conservative evaluations, which might easily be unrealistically negative (Falkegård, et al., 2016, p. 146). The next chapter discusses a different approach in *árbediehtu* on dealing with uncertainty.

As will be discussed in the chapter 4, it seems that some arguments raised by traditional knowledge holders are dismissed by the TRG because it is hard to validate this information with methods that the TRG is familiar with. The TRG is the filter that picks pieces of traditional knowledge that they deem to be relevant, and which is in the format that fits their methods. By dealing with TK just as a source of data, the TRG is undermining TK as a knowledge system. Similar lack of trust towards the research of fish biologists can be seen from the local Saami, who consider the approach of the fish biologists to salmon to be very narrow, and not adequately taking into account the complexity of nature and interconnectedness of things, or salmon's behaviour as a factor (Ween, 2012). These issues are further discussed in chapter 4.

4. Saami knowledge on salmon and Deatnu

4.1. Introduction

This chapter is about the discourse of traditional Saami knowledge about Deatnu. To put the discourse into its current context, a brief overview of the history of management and use of natural resources in Deatnu is given, including changes that have occurred. Certain foundational aspects and principles of *árbediehtu*, traditional knowledge, are discussed as well. While Ween (2012) and Joks (2015) together with Law (Joks & Law, 2016a; 2016b) have discussed Saami ways of knowing about salmon and Deatnu, this chapter examines in sections 4.4-4.8 *specific issues* raised by TK holders related to the river Deatnu and salmon, and how these issues are considered by the TRG. This discussion is followed by an analysis on differences emerging between the two knowledge discourses.

4.2. Fishing and hunting historically in Deatnu and changes that have occurred

Salmon fishing has been going on in Deatnu since the first people arrived after the ice age. Saami culture has existed for about 2000 to 3000 years, and the Saami are the oldest living ethnic group in the area. Salmon fishing has always been and remains a fundamental part of Saami culture and economy in Deatnu valley (Pedersen, 2009). *Siida* or the Saami village was the governing structure of the Saami, which governed the Saami areas before colonisation. Salmon fishing was governed and managed by *Siida* and disputes on fishing places were resolved either within a *Siida* or between neighbouring *Siidas* (Aikio, 1992, pp. 104-113; Solbakk, 2003). First mentions in the literature on salmon fishing in Deatnu valley can be found at the end of the 1500's, which refers to salmon as an important merchandise. At times salmon was used for paying taxes to the states. In 1600's, local Saami had an exclusive right to salmon fishing in Deatnu, and in the upper parts of Deatnu up until 1800's fishing in Deatnu was under Saami authority (Helander-Renvall, 2013, p. 135).

The first state authority regulations on Deatnu were set in 1872 and 1873, which prohibited various fishing methods (Helander, 1985, p. 6). *Duhásteapmi*, was forbidden, a fishing method using a spear and a light. The use of *rastábuođđu* was also forbidden, which was a weir that was built across the river and was a collective fishing method done with as many as 40 families from both sides of the

river. *Goldin* was forbidden, which was another very efficient collective fishing method, including the use of a weir across the river together with driftnets and seines. In some occasions up to 800 salmon were caught by *goldin* (Saessalo, 1982, p. 97). Usually one member from each household of the region took part in these collective efforts. *Goldin* is described as a way of taking the amount of salmon at one time, that in order to catch the same amount by other fishing methods would have required one to work for the whole summer (Tenon ylpiä kala - Deanu ceavlas guolli, 1984). The *rastábuoddu* in Vuovdaguoika gathered people all the way from Kárášjohka some 30 km upstream. Catches were distributed equally or based on how many nets each participant provided (Helander-Renvall, 2013). Though this might seem like a fierce way of exploiting salmon stocks, besides being efficient, it was also a way of ensuring that everyone got their share of the catch. In this way everyone who took part in the catch saw how much salmon was taken, so that the level of exploitation was known to people. At least once people from lower parts of the stream continued fishing with these efficient methods after people from upper parts of the stream had left, which caused a dispute, which was locally solved (Pieski, 2013). There are mentions of *goldin* being practised still in July 1945, despite the prohibition (Helander-Renvall, 2013, p. 136). It was not done with very much secrecy, signalling that customary laws were stronger than state laws.

The structure of the society has also changed with the dismantling of the *Siida* structure and arrival of more centralised governance system and outside authority (Aikio, 1992). Farming came to Deatnu valley in the 1700's and brought a great change. After the border between Finland and Norway was closed in 1852, reindeer herding became more difficult, which increased sedentary ways of life (Aikio, 2005, p. 31). The economy of the communities changed, as Veli-Pekka Lehtola (2012, p. 406) states, the values of subsistence economy were replaced with the values of monetary economy, and as a result the old multi-economic model⁵³ was not efficient enough. Christianisation also impacted, and to an extent changed, the worldviews of Saami. In the Christian world view human is above nature and should dominate it, and nature is here to fulfil the needs of people. In the traditional Saami worldview humans are a part of nature, not above any other forms of life (Helander, 2000). Making a living and being in a balanced relationship with the surroundings was key. Life of Saami in Deatnu valley has also changed drastically in the past century, so much that an experienced knowledge holder Aslak Ola Aikio (born in 1931) described the region as having experienced many 'revolutions' (Mustonen, 2012, p. 33). The building of roads was one great change, which meant that Deatnu was

⁵³ Fin. *monitalous*. An economic model with various seasonal, sources of income, such as fishing, hunting reindeer herding and gathering.

no longer the main means of transport. A road was built to Ohcejohka in 1957, which was the beginning of a large number of tourist fishers to start coming to Deatnu (see section 4.4).

Fishing has changed considerably in Deatnu, a major change being the arrival of outboard motors for boats. Previously people used to *goarkjut*, to travel by pushing the boat upstream with *čuoibmi*, a wooden stick. After the outboard motors it became much faster to go from one place to another. This changed *golgadeapmi*, drift net fishing, since it was possible to do it again and again at a much faster pace. My father has told how people used to *golgadit*, to drift net in Bildan⁵⁴, and how they first *goarkjut*, push the boat upstream for a few kilometres with wooden sticks – which took a good while – and after that they used to *oruhit Deanu*, to wait and let the river stay for a while without any interference for an hour, to let the salmon to swim up. This custom was maintained even after the outboard motors.⁵⁵ When this *oruhit Deanu* is compared to the height of the drift netting season, when the water level was just right in Boratbokca, the difference is huge. There used to be a continuous pace of boats flowing down with drift nets.⁵⁶ Though this is a big change in *golgadeapmi*, it should be kept in mind that there have been very efficient fishing methods practiced in Deatnu for a long time, such as *rastábuođđu* and *goldin* discussed above. Nets have changed a lot as well; while my grandfather used to make his own nets from scratch, today we buy nets without the cords and add the cords.⁵⁷ The nets are also stronger and thinner than before, which means that catching fish with new equipment is more efficient than previously.⁵⁸ Fishing with traditional methods takes a lot of effort and especially since *návetluossa*, Norwegian farmed salmon flooded the markets, the income from selling wild salmon has fallen immensely (Ween & Colombi, 2013, p. 487).

Predation is one issue discussed in detail in part 4.5, as it is one of the main concerns raised by traditional knowledge holders in Deatnu as a reason for decreasing salmon populations. Local Saami say that predator populations have increased since hunting and fishing them is no longer allowed (Ween, 2012; Joks & Law, 2016a; Pedersen, 2011). Changed lifestyles have also had an impact, as many of salmon's predators used to be an important part of the previous multi-economy, but are not as significant in the monetary economy today. The goosander is named as one key predator of salmon (Ween, 2012; Pedersen, 2011). Goosander used to be hunted with various methods, with nets (Itkonen, 1948, p. 55), floating traps, booby traps and by shooting (Itkonen, 1948, p. 9). The eggs of

⁵⁴ A narrow section of Deatnu just above Vuollegeavh̄gis.

⁵⁵ I make no claims on whether this custom is still being abided by or not.

⁵⁶ Drift netting on the Finnish side of Boratbokca was forbidden in 2012 (Yle Lappi, 2012).

⁵⁷ For example, drift nets need to be specific kind; the lower cord needs to be longer than the upper cord, and these are not available ready-made.

⁵⁸ See part 4.7.1 on how today warmer and more murky waters, on the other hand, make net-fishing more difficult.

goosander used to be picked and eaten, as well as eggs of other waterfowl (Itkonen, 1948, p. 67). Though Saami spring hunting of waterfowl is well-known tradition in Guovdageaidnu, it used to be a common practice in other parts of Sápmi as well (Pedersen, 2011, p. 23). Lately up to 30 000 goosanders have been reported towards autumn season in the Deatnu fjord alone (Falkegård, 2014, p. 55). Otter is also named as one ruthless predator of salmon (Ween, 2012, p. 160), and Saami in Deatnu valley say otter populations both in the fjord and river have increased strongly (Pedersen, 2011, p. 25). The traditional Saami male winter hat from Deatnu region has a lining from otter fur, which indicates otter used to be a common animal to hunt. However, otter used to be rare and therefore precious (Saressalo, 1982, p. 118), and its fur was used for trading (Itkonen, 1948, p. 7). Otter has been protected in Norway since 1982 (Pedersen, 2011, p. 25). Another mammal that eats salmon is seal, which used to be hunted by Saami in the fjords (Itkonen, 1948, p. 54) and since seal hunting is strongly regulated (Pedersen, 2011, p. 15), seals are now partially blamed by local fishermen in Deatnu for the reduction of salmon in Deatnu (Ween, 2012, pp. 158-159). People say that seal “eats the best fish first”, referring to its preference to salmon (Tenon ylpiä kala - Deanu ceavlas guolli, 1984). Various fish species that feed on salmon, its roe or juveniles used to be fished, fish such as burbot,⁵⁹ pike,⁶⁰ sea trout,⁶¹ (Pedersen, 2011) grayling⁶² (Saressalo, 1982, p. 106), and common whitefish⁶³ (Tenojoen kalastustoimikunta, 1985, p. 26), but due to fishing restrictions, as well as changed lifestyles, these fish are not fished today as much as before.

4.3. *Árbediehtu* – Saami traditional knowledge in Deatnu

Those who have learned from books have studied issues in school for a short time. Their knowledge is incomplete. Us, people of the river have at least a thousand years of experience. We know the river and the ways of the salmon (Helsingin Sanomat, 1991, p. C9).⁶⁴

- Erkke Ánde, Antti Katekeetta, a salmon fisher in Deatnu

⁵⁹ Sámi. *njáhká*, Fin. *máde*

⁶⁰ Sámi. *hávgá*, Fin. *hauki*

⁶¹ Sámi. *guvža* ja *gudjor*, Fin. *meritaimen*

⁶² Sámi. *soavvil/hárri*, Fin. *harjus/harri*

⁶³ Sámi. *čuovža*, Fin. *siika*

⁶⁴ My translation. The original in Finnish: “Kirjaoppineet ovat opetelleen asioita lyhyen koulun ajan. Heidän tietonsa on keskeneräistä. Meillä joen ihmisillä on ainakin tuhatvuotinen kokemus. Me tunnemme joen ja lohen tavat.”

4.3.1. Utilisation of *árbediehtu* in accordance with inherited customs

Traditional knowledge in North Saami is called *árbediehtu* and is intrinsically linked with *árbevirolaš máhttu*,⁶⁵ (in short *árbemáhttu*), which can be translated ‘traditional skills’. *Árbemáhttu* has more of a practical content: you need to have the knowledge and also the ability to utilise it in practice. One might have the knowledge (*diehtu*) on how to do something, but only after doing it, can one claim to have the skills (*máhttu*) on how to utilise that knowledge (Guttorm, 2011, p. 63). Due to the empirical foundations of traditional knowledge, the practice of *árbemáhttu* (traditional skills) is a way of sustaining and developing *árbediehtu* (traditional knowledge) – meaning they are intrinsically linked. Traditional knowledge of the Saami salmon fishers in Deatnu is based on long-term observations of nature, largely gained when practicing *árbemáhttu* as a part of traditional livelihoods, *árbevirolaš ealáhusat*. As the continuation of *árbediehtu* and *árbemáhttu* depends on people’s ability to maintain them in practice, harsh restrictions on traditional fishing methods threaten the very foundations of *árbediehtu* and *árbemáhttu* (see chapter 5, especially 5.9).

Foundational aspects of *árbediehtu* are the recognition that resources are limited, and that one must not take more than is needed. Sustainability is an intrinsic part of traditional practises, since they would not have become traditional unless it was possible to practise them over the long-term (see part 2.4.1). This can be described as a requirement of living in harmony as a part of nature. Human’s role in nature in the traditional Saami world view is reciprocal: when you get something, you must also give something back. This was done in the form of stewardship practices such as *dikšut jávrriid*,⁶⁶ as well as by offerings to *sieidi*⁶⁷ (Turi, 2010, p. 117). The *Siida*-system and dividing areas between families also served to strengthen the responsibility over certain areas. It was necessary for families to ensure that there would be enough game and fish for the following years, as the impact for taking too much would be a lack of food.

⁶⁵ *Árbe-* means something inherited, *-virolaš* comes from the word *vierru*, which means ‘a custom’ or ‘a habit’, and *árbevirolaš* means ‘traditional’, though literally ‘in accordance with inherited customs’. *Diehtu* means ‘knowledge’ and *máhttu* means ‘skill’. Thus *árbevirolaš máhttu/diehtu* would literally mean ‘a skill/knowledge that is in accordance with inherited customs’.

⁶⁶ A way of taking care of lakes: if there is too much fish in a lake, the lake has *heittot ealát*, bad living conditions for the fish. Therefore, by fishing the lake people improved the living conditions of the fish, while as well getting fish for yourself (Guovdageainnu Meahcceguovddáš, 2018).

⁶⁷ A sacrificial place.

4.3.2. *Bivdit* – to ask for a catch

Bivdit is the North Saami word meaning both hunting and fishing. *Bivdit* also means ‘to ask for something’, which reflects the Saami worldview: by hunting or fishing a Saami does not go and ‘take’ something from nature, but asks for something, and gets it if it is given. Nature has to be willing to share with you; the salmon has to be willing to get caught. This view was also experienced by Solveig Joks (2015, p. 139) during fieldwork around Sirbmá in Deatnu, while she was fishing with a Saami fisherman. After having caught nothing they went to the shore for a break. During the break they saw someone on another boat catching a salmon. To this Joks reacted by saying that if they had been on the river now they could have caught that salmon, to which the fisherman replied “that fish was not meant for us”⁶⁸ I have experienced the same thing numerous times when fishing with my father when he has said about other people’s fishing: “for sure they will not catch our salmon”.⁶⁹ Only you can catch the salmon that was meant to be yours. This also reflects the high level of respect towards salmon: it has its autonomy and it is smart. When trying to get a salmon to swim into your net, the issue is about persuading and outsmarting the salmon.

This aspect of *bivdit* – the willingness of nature – is relevant in relation to catch reporting, as discussed in section 3.5. Audhild Schanche (2004, p. 3) discusses bragging about your catch in the context of nature’s willingness to give:

Bragging about a salmon catch would put you above it as something you had conquered due to your own cleverness. If part of the reason behind the catch had to do with the salmon’s willingness to be caught or the wilderness’s willingness to share something with you, then expressing it as a private success would threaten the contractual nature of the catch. The result might well be that the next time you fished at the same spot you would catch nothing.

This points to the view that humans must be humble in front of the power of nature: we are at nature’s mercy, we do not master it (Saami Conference, 2017). A central aspect of the traditional Saami approach to nature is that we do not govern nature, but we manage our actions impacting nature. In the traditional Saami livelihoods⁷⁰ this view is manifested so that Saami did not modify the surroundings to fit their needs, but changed their own actions to fit the surroundings. This was done by combining various subsistence methods and migrating seasonally to areas that would provide the

⁶⁸ Could be also translated “That salmon was not *fated* for us.” In North Saami: ”Diet guolli ii lean munnuide oidnojuvvon.”

⁶⁹ In North Saami: ”Eai dat goit munno luosa gotte.”

⁷⁰ Various components of the mixed-economy: Hunting, fishing, gathering, herding, *duddjon* (handicrafts making).

best means for *birgejupmi*⁷¹ in each season. In order to do this, an in-depth knowledge of the surroundings was needed, which is reflected in the wide vocabulary that exists in North Saami language to describe weather, surroundings, river, salmon, snow, as well as in place names.

4.3.3. North Saami vocabulary on the river and salmon

The vocabulary related to the river and salmon shows the depth of knowledge that Saami have of their surroundings. To give some examples of Saami knowledge on Deatnu, there are various names for different sections of the river based on the strength of the current: *geavh̄h̄is* is the strongest rapid, which is typically not travelled by boats. There are two *geavh̄h̄is* in Deatnu, which are so defining that the area between them is called *geavh̄h̄idgaska*, 'the area between two *geavh̄h̄is*'. *Guoika* is a rapid, but not as strong as *geavh̄h̄is*. *Njavvi* is a place with somewhat strong current – not as strong as in a *guoika*, but stronger than *savu*, which is a part of a river with a slow current. *Goatnil* is a place with slow or no current due to a protective cape or a rock. There is also a specific word for a short slow-current area between two rapids: *dappal*, and a slow-current area between two strong rapids: *jalvi*. There are various words pertaining the bottom of the river, like *earti*, where water gets deeper, *leadđu*, an area with a flat bottom, and *gohpi*, a dip. These words are related to finding out what is a good *čákŋansadji*, a place where salmon will swim to a net. Words *dulvat* and *coahkut* define the work of a *buodđobivdi*, a person who fishes with a weir. *Dulvat* means that water level is getting higher and *coahkut* means that it is getting lower. A change of few centimetres in the water level can mean that you have to make changes to the weir. The water level defines when an area is *bivdočázis*, when the water level is correct for a specific fishing spot so that salmon can be caught in it.

Words that pertain to salmon describe the size,⁷² gender,⁷³ place of origin, stage of life or migration, quality *cuohppa*; "the meat" of the fish, as well as the behaviour of the fish. *Oalgejohdiddi* refers to a small salmon which belongs to a tributary. This is seen from the shape of the fish, for example, salmon in some tributaries are more slender than those belonging to the Deatnu mainstream – *Deanu*

⁷¹ "Birgejupmi is to be understood as livelihood, survival capacity, and the way people (individuals and communities) maintain themselves in a certain area with its respective resources, which exist or can be found in the natural and social environment. It requires know-how skills, resourcefulness, reflexivity and professional and social competence. It ties together people/communities, landscape and natural environment, the ecosystem, healthy social and spiritual development, and identity." (Porsanger & Guttorm, 2011, p. 21)

⁷² Names of salmon depending on the size, as I have learned them: *diddi* (a salmon up to 3 kg), *luosjuolgi* (a salmon from 3 kg to 6 kg), *luossa* (salmon bigger than 6 kg).

⁷³ *Duovvi*, a female salmon, *goadjin*, a male salmon, though especially used for big males.

diddi.⁷⁴ Some are even able to recognise to which tributary an *oalgejohdiddi* caught from Deatnu belongs to. *Goargŋu luossa* or *šelges luossa* refers to a salmon that is ascending up the river on the way to spawn. *Šelges* means ‘bright’ and refers to the bright silver colour of a salmon that is coming from the ocean. *Bisánan guolli*⁷⁵ means a fish that has stopped its migration, “claimed its territory” it could be said, meaning that it has found a place where it has settled. When a *bisánan guolli* has been in the river long enough, it becomes *čáhppes guolli*, ‘a black fish’, since the colour turns dark. The word *fierbmeguolli* literally means a ‘net fish’ and *vuoggaguolli* a ‘lure fish’, and these words refer the behaviour of the salmon. On some periods there can be very few *vuoggaguolli*: fish that catch the lure. This does not mean that there is not much fish in the river. While there is little *vuoggaguolli*, it could be that net fishers are still catching a lot of salmon: *fierbmeguolli*. *Čuonžá* is a type of salmon that is very fat and it will not spawn during that year when it comes to Deatnu. *Šoaran* is the type of salmon returning to the river after being in the ocean just briefly. *Šoaran* will not spawn and are not as fat as a normal salmon that is coming to the river to spawn. *Vuorru* is a salmon which has spawned, spent the winter in the river and is very thin. *Vuorru* are heading back to the ocean when *goargŋu luossa* start coming from the ocean to the river.

4.3.4. *Luossanállli* – Salmon and its different meanings

Salmon means different things depending on who speaks of it. Salmon is *luossa* in North Saami. When Saami speak of *luossanállli*, ‘the salmon stock’ (see part 5.9), they generally speak of the salmon of their respective fishery. For someone who fishes in the Deatnu main stream, their *luossanállli*, is those salmon stocks that swim past that part of the river. In the language of the Tana research group, a traditional weir fisher, *buođđobivdi*, in Deatnu mainstream is practising mixed-stock fishing. There are various salmon populations swimming up the river, and for a *buođđobivdi* in Deatnu mainstream it might not make much difference what is the specific genetic structure of a salmon they catch. The 30 genetically distinct salmon populations, which the Tana research group writes about, do not exist to them in practice.⁷⁶ This also means that a decline of a specific salmon stock belonging to an upper tributary might not impact the catches of a fisher in the lower parts of Deatnu. This partially explains why there are various truths about the situation of *the salmon* in the

⁷⁴ A salmon under three kilos which belongs to a Deatnu mainstream population.

⁷⁵ *Guolli* means ‘fish’ but is often used to refer especially to salmon.

⁷⁶ Although, as discussed in part 4.3.3, traditional knowledge holders can recognise different salmon populations.

Deatnu watershed, since there are various situations, and *the salmon* means different things for people in different areas. *The salmon* of the Tana research group is those close to 30 genetically distinct salmon populations. Therefore, when the Tana research group speaks of salmon, they are speaking of different salmon than traditional fishers in Deatnu.⁷⁷

4.4. Tourist fishing

4.4.1. Critical Saami views

The building of the road to Ohcejohka in 1957 signalled the beginning of a flood of fishing tourists to the area, meaning the river had to feed more mouths than before. This flood of tourists had a strong impact on Saami salmon fishing from the very beginning. In 1959, just two years after the road was built, the Lapp council⁷⁸ suggested with a letter to the Ministry of Agriculture in Finland and Norway that tourist salmon fishing should be restricted from the middle of July till the end of August (Nordic Lapp Council, 1969, p. 122). Tourism has increased immensely since that time, and tourists have purchased approximately a million daily fishing licences to Deatnu, and caught over million kilos of salmon (Deanučázádaga guolástushálddahuš, 2018; Burgess, 1996; Vitenskapelig Råd for Lakseforvaltning, 2009). While in 1953 there were 593 day cards sold to fishing tourists on the Finnish side, 2 196 daily licenses were sold in 1963 (Burgess, 1996, p. 45), and in 2013 the number was 33 148 (Länsman, et al., 2014). Between 1972 and 2008 based on the catch estimates (see part 3.5), tourists caught by average 25% of the total catch in Deatnu (Vitenskapelig Råd for Lakseforvaltning, 2009, p. 35), and from 2005 onwards the proportion is estimated to have been 30-40% of the total catch (Deanučázádaga guolástushálddahuš, 2018, p. 5).

A rather common North Saami word used to describe the amount of Finnish fishing tourists in Deatnu is *čáhppadin* – the river is ‘black’ with tourists (Joks, 2015, p. 127). The name of Joks’s (2015) dissertation is *Laksen trenger ro*, which means ‘salmon needs peace’, and the name refers to one issue raised by traditional knowledge holders, that the salmon do not get any peace due to the high number of tourists. Local fishers state that especially during spawning time, salmon need calm waters, and locals generally do not fish salmon after they turn dark – as they do when approaching spawning

⁷⁷ This subchapter was to point out that the salmon for the Saami and the salmon for the TRG are *concretely* different. For more on the differences in the ways of knowing and the different meanings which salmon has to Saami fishers in comparison to fish biologists, see Joks, 2015; Joks & Law, 2016a & 2016b; Ween, 2012.

⁷⁸ The Saami council was previously called the Nordic Lapp council.

time. However, tourists might be happy with any kind of fish they catch, even a dark salmon (Joks & Law, 2016b, p. 3). It is noteworthy that even if traditional net fishing seems to get much of the blame for being accountable of causing reduction in the salmon populations, based on the data of the TRG when comparing the estimated proportions of catches in 1984 and 2010, the only fishing group whose proportion has remarkably increased is tourist fishers.

4.4.2. Tana research group's reports

The Tana research group obtains estimates on the amount of salmon tourists catch (see part 3.5). They also have estimates on the amount of male and female salmon caught during which weeks of the summer (Falkegård, et al., 2016, p. 95). The TRG considers tourists as one factor contributing to the overall fishing pressure that has led to the overexploitation of certain stocks, but tourists are not singled out as being responsible for declining stocks (Erkinaro, et al., 2012, p. 37). It is not clear from the reports if the TRG suggests specific kinds of restrictions to each fishing method and group. The group provides models on the estimated distribution of catches by fishing methods and groups, if the proposed regulations are enforced. The report does not clarify how they have come to such results. Nevertheless, based on the catch estimates of 2017, tourists fishing pressure was not remarkably limited by the new regulations (see part 5.7).

4.5. Predation

4.5.1. What kind of predation happens to salmon of Deatnu

The fishermen argue that the environmental authorities should look beyond relations between man and fish. A multitude of nuanced relations are evoked, tracing the existence of multiple, complex interspecies relations (Ween, 2012, p. 160)

As already stated, one issue repeatedly raised by traditional knowledge holders is the increase in the number of predators that feed on salmon, because people are not allowed to limit predator populations as they used to do (Ween, 2012; Pedersen, 2011; Solbakk, 2016; Joks & Law, 2016b; Falkegård, et al., 2016). As discussed in section 4.2, Saami have previously hunted and trapped many salmon-eating animals such as seals, otter, and various species of waterfowl, and gathered their eggs at spring time as well. The types of fish that eat salmon or its eggs, and which have been fished previously

more than they are nowadays include grayling, burbot, pike, and especially sea trout (Pedersen, 2017). Unnecessary and harmful restrictions to fishing of other fish species were pointed out already in the 1985 committee report (Tenojoen kalastustoimikunta, 1985, p. 26), however the new Tana agreement (17 §) allows net fishing of other fish species than salmon to happen only from May 20th to June 10th in Deatnu.⁷⁹

The salmon of Deatnu face various types of predation throughout its lifecycle, from spawning until becoming an adult and returning to spawn in the river. Predation happens in spawning redds, brooks where juveniles live, tributaries, the Deatnu mainstream, the estuary, the Deatnu fjord and in the ocean. A number of eggs are eaten by various fish, birds and invertebrates. During the juvenile stage, which lasts a few years, salmon parr face various predators such as piscivorous fish such as pike, burbot and trout, as well as birds like goosander and cormorants. During the smolt stage, when salmon is ready to head to the ocean, salmon face largely the same predators as during the juvenile stage. From the place where a salmon parr grew up, on its way to the ocean, a smolt might have to swim through various lakes with high densities of pike, and to the fjord with high numbers of goosanders (see also 4.8.1). In the fjord, cod and pollock are major predators for smolts. It is probable that in the sea grown salmon are eaten by marine fish as well as mammals, such as seal and whales. Seals also hunt salmon in the fjord and the estuary when salmon return to Deatnu to spawn (Erkinaro, et al., 2012, pp. 32-33). Traditional knowledge holders have reported that due to erosion the estuary has gotten shallower, making it easier for seal to catch salmon (see 4.7.1). In the river, otter are described as an especially ruthless predator of salmon, as well as mink, which is an invasive species. Introduced predators often have more of an impact than naturally occurring predators – which is noted by the TRG as well (Erkinaro, et al., 2012, p. 32). However, mink predation is not discussed further in the reports.

4.5.2. Responses of the Tana research group

While the Saami consider the protection of salmon's predators to be an intervention to what used to be the "natural balance" in Deatnu (Ween, 2012, pp. 160-161), the TRG considers unrestricted predator populations to be a natural part of the ecosystem. The TRG refers to local worries about predation being "expressed in emotional accusations" when salmon stocks are declining (Erkinaro,

⁷⁹ In the tributaries of Anárjohka and Skiehččanjohka it is allowed from 20th of May until 20th of August. (17 § of the fishing agreement)

et al., 2012, p. 31). This seems to be a reference to this aspect of traditional knowledge being based on emotions. The group further explains the reason for these emotions, as it is easy to blame predators, because many predators are “large and easily spotted animals”. Therefore, the TRG considers it is understandable that people would think and feel the way they do. The group continues to write about predation:

There is very little biological basis for arguing that naturally occurring predators are a threat to salmon, and predation must rather be viewed as an integral and natural part of the ecosystems that salmon live in and it is rarely possible to measure any negative impacts from predation (Erkinaro, et al., 2012, p. 5).

The quote above points out an epistemological difference between the researchers of the Tana group and that of the Saami. By referring to predators as natural and integral part of the ecosystem, they are indirectly saying that humans are not an integral and natural part of the ecosystem (see also part 3.6). In the traditional Saami worldview, humans are part of nature, and as Saami have lived in the Deatnu region for millennia and fished salmon, this ecosystem *without* humans would be unnatural. This said, it is clear that people have had negative impacts to Deatnu as well (see section 4.7), and that changes in lifestyles and values have also impacted the relationship the Saami have today with the ecosystem (see parts 4.2 and 4.9). However, Saami have been part of the web of interspecies relations and have historically supervised and managed the predator populations. There still is knowledge on how this was done, and these practices can be revitalised.

The quote above points out how knowledge that cannot be measured, i.e. is not transferrable or available in the form of numbers, is poorly incorporated into the research of the TRG. The group writes that it is rarely possible to *measure* any negative impacts from predation, as if to indicate that if a thing cannot be measured, it does not exist or have an impact. The exploitation of salmon in different stages of its life cycle by various predators is a very complex issue, and though it is difficult to measure and calculate the impacts of predation, it does not make the issue insignificant. At the very least, the number of predators should be seen as a factor that impacts the maximum production potential of a river (see part 3.4). As will be discussed below, there are many studies on the impacts of predation to salmon. It is true that it is very difficult to draw any certain conclusions, for example, on what is the impact of salmon juvenile predation to the amount of returning salmon. However, it cannot be denied that studies point towards predation being one of the main causes of salmon mortality, and thus more predators means more salmon lost to predation.

Regarding the salmon eggs lost to predation, the TRG writes that two core issues should be kept in mind in evaluating egg predation. First, that eggs falling outside spawning redds will die even without egg predation (Erkinaro, et al., 2012, p. 32). The amount of spawning redds impacts how many eggs will fall outside, and this is a factor which is considered when calculating the spawning target. The second argument is that there are density dependent stages in the life cycle of salmon after the egg stage, which will largely compensate for eggs lost to predation (Erkinaro, et al., 2012, p. 33). This argument, however, would seem to be relevant only in cases when the spawning target (see part 3.4) is exceeded, because in the evaluation of the maximum production potential of a river, these density dependant stages are to be taken into account.

Though predation is not listed as a serious threat to salmon, the TRG does not deny that it makes an impact. In fact, in the 2012 report the group refers to a study by Mather (1998), which concludes that predation is one of the most important sources of mortality throughout the salmon life cycle. On the other hand, the group writes “it has not been found that *a predator, by itself*, has been *the sole cause* of stock decline” (Erkinaro, et al., 2012, p. 31, my italics) First of all, besides two studies done in the Deatnu fjord (see part 4.8.1), there have been no studies on the developments of predator populations and their impact on salmon populations of Deatnu (Pedersen, 2017). Secondly, the argument of the traditional knowledge holders is not that *a predator* would have this impact. What is argued is that the cumulative impact of the increase in the numbers of various predator species is the cause for an unsustainably high predation rate (Ween, 2012; Pedersen, 2011).

The TRG writes that often a high predator density will result in an initial high predation rate and a rapid decline in prey density (Erkinaro, et al., 2012, p. 32). This seems to support the argument of the traditional knowledge holders: because there are lot of predators, there is less salmon. Moreover, the TRG writes: “many predators will respond to a lowered prey density by either moving to new feeding areas or changing prey species, thus lowering the predation rate on the initial prey.” (ibid.) This indicates that even if the number of salmon prey has decreased, the number of predators might not, since they have other sources of food. Furthermore, the TRG writes that the highest proportions removed by predators will be observed when salmon stocks are depleted (Falkegård, et al., 2016, p. 79). This being said, it seems odd that on the current threat analysis, predation is set on moderate-low axis, as the TRG estimates some stocks to be depleted to a point of having no exploitable surplus. On the future threats analysis, the group sets predation as a low level threat, since they believe that their strong push for tougher fishing regulations will increase the number of returning salmon and make predation even less significant (Falkegård, et al., 2016, p. 79).

4.5.3. Studies on the impacts of salmon predation

An analysis of 45 peer-reviewed field studies which explicitly tested the importance of direct effects of predation on anadromous salmonid prey shows that 80% of these studies concluded that predation was important (Mather, 1998). Only 12 of these studies estimate the percentage of prey population consumed by predation, with the estimates ranging from 0,7 to 100%, with a mean of 28%. It must be noted that these studies did not try to estimate the total number of prey lost to predators but estimated only the impacts of specific fish or bird predation. This paper clearly concludes that predators can seriously affect potential salmon prey. If, on average, these studies on either fish or bird predation suggest that 28% of total salmon prey was lost to predation, one can only try to imagine the possible combined effects of multiple predators on various stages of salmon's life cycle.

A four-year study on the effects of goosander (Lat. *Mergus Merganser*, Sámi. *Gussagoalsi*) predation to Atlantic salmon and of predator control was done in parts of Restigouche River, in Listuguj Mi'gmaq territory in Québec, Canada from 1982 to 1985 (Anderson, 1986). In this project, researchers found that about 70% of the diet of goosanders in Restigouche consisted of juvenile salmon. Researchers then calculated how much a goosander would on average consume in one day. The project looked into using predator control as a way of increasing the smolt production in the river and therefore also increasing the number of returning adult salmon. During the research period the number of goosanders was strongly limited by hunting. Based on their calculations of how many salmon juveniles each goosander would have eaten daily and how many were conserved by hunting them, a total of almost 170 000 smolts were estimated to be saved in the study period. After considering the survival rate of smolts in the ocean, it was estimated that the number returning adults increased by 8 400. However, in the absence of accurate performance indicators, the project could not unequivocally conclude that decreasing the number of goosanders actually increased salmon production. Electro-seining results however indicated a modest growth in salmon juvenile densities in the rivers with goosander control, and the data also suggests an expected increase in the number of returning adults.

4.5.4. Final considerations

Predators of salmon are a part of the ecosystem in Deatnu. The Saami have historically restricted predator populations in various ways, thus increasing the salmon production of rivers. The current restrictions on hunting and fishing predators of salmon are breaking what used to be the natural state in Deatnu region. Against this historical background, the argument of the TRG about predators being – at their current levels – a natural part of the ecosystem, is historically false. The emphasis of the TRG is on reaching spawning targets, while the living conditions of salmon at its various stages of life do not get as much weight. While the TRG does not consider predation to have a significant impact, overfishing is highlighted as the main factor impacting salmon, and restricting human consumption the only viable mean of protecting salmon.

Though the TRG recognises the impacts of predation, predation is not taken into consideration when estimating the maximum salmon production potential of a river. If we take a number from the above-mentioned study by Mather (1998) and consider that hypothetically 28% of the salmon eggs and juveniles combined would be lost to one type of predation, this should be seen as factor impacting the salmon population, similarly to if the spawning goal is not reached. Nevertheless, if a spawning goal was reached only by 72% the salmon stock would be considered threatened, and fishing would be restricted. Therefore, I argue that the number of predators impacts the maximum production potential of a river, and should be considered in the evaluation of the salmon production of a river, as well as in conservation measures.

4.6. *Jahki ii leat jagi viellja* - Annual variation and natural phenomena

4.6.1. A Saami view: Nature defines how salmon is doing

A Saami proverb says *jahki ii leat jagi viellja*, which translates to: “one year is not a brother of another year”. This proverb on annual variation was raised in a community meeting (2018) by an elder fisherman who said he had been fishing salmon in Deatnu for 80 years. He talked about what he had heard from his late relative about “dark years”: the father of the family had caught just one six-kilo salmon during the whole summer in Deatnu. In this era there were many very bad salmon years and people had to fish lakes. The salmon fishers in the fjord caught very few salmon and there were also

very few cod in the fjord. Those were times when getting or making nets was a huge undertaking and people did not have a lot of nets, so the lack of salmon was not due to overfishing. This man continued to emphasise the power of nature and how much weather and natural phenomena affect salmon. He talked about what people in those days considered possible reasons for the bad salmon years, such as when there was high flood after spawning, which would wipe away a lot of the roe. He told about an ice run happening in November and how that would wipe out all the roe from the redds. Another natural event he mentioned was when Deatnu would freeze all the way to the bottom in some shallow parts, and the water would start flowing on top of the ice, and how this might cause the roe and parr that were underneath to die. Moreover, he emphasised that counting salmon parr or estimating how much roe has been laid one year does not tell much about the salmon population, since natural events can change the salmon situation completely to the next year. The main argument was that compared to the power of nature and its impact on the salmon populations, the impact of human fishing is small. Therefore, limiting fishing due to bad salmon years seems like unreasonably punishing people because of bad natural conditions.

References to the power of nature were heard during the flood summer of 2017: *gal Deatnu luosa suodjala*, “Deatnu is protecting salmon”, people said. When the water is high salmon are less likely to swim into nets on the lower parts of Deatnu and instead make it to the upstream spawning areas. This was interpreted as nature’s way of protecting its species. As discussed in section 4.2, during bad salmon years people fished lakes, since it was not worth fishing salmon due to the high amount of work and little gain. That too was a “natural” way of limiting fishing pressure on years when there are not many salmon.

4.6.2. Tana research group’s view

The Tana research group argues that pointing to natural variation is a fundamentally flawed [sic] argument, which is caused by “a misunderstanding about the status evaluation and its implication for fisheries regulations” (Erkinaro, et al., 2012, p. 36). They explain further: “The future aim of the fishery regulation is to keep spawning stocks above targets both in good and bad years.”⁸⁰ (p. 37) A matter that seems to be outside discussion is, if reaching the spawning targets on an annual basis is a realistic goal due to natural variation. That is, however, the root of the argument: that on bad years

⁸⁰ On best years the estimated number of salmon caught exceeds 60 000 fish and in the worst years the estimate is 15 000 fish (Falkegård, et al., 2016, p. 69).

there are simply not enough salmon. It is understandable why this matter is not even mentioned, because it would seriously question the current approach to management.

Another argument the TRG gives is that if salmon stocks are fluctuating due to natural variation, similar patterns should be seen in other rivers in Finnmark, which is not the case (Erkinaro, et al., 2012, p. 36). However, one argument of the TK-holders is that causes for natural variation can be very local. The TRG finds the argument of natural variation, by itself, “deeply troubling in the sense that it absolves everyone of any responsibility when it comes to stock development.” (Falkegård, et al., 2016, p. 146) If the current fluctuation of salmon stocks are caused *only* by natural variation, there would be no long-term declining trend in the stocks, as the monitoring of large salmon in the watershed indicate. As discussed in this chapter, natural variation is far from being the only issue raised by TK-holders on issues impacting salmon. A key issue in the impacts of natural variation is not if it is *the only* cause for a stock decline, but whether it happens to an extent that reaching spawning goals annually is impossible. If that is the case, this is not a matter of *absolving everyone from any responsibility*, rather it is a matter of recognising that humans cannot dominate nature (see part 4.3.2).

4.7. Climate change, pollution, erosion & solids in the water

4.7.1. Saami knowledge and observations

One change during the 15 years I’ve been fishing with my father in Deatnu with a weir, is that nets become dirty faster now than they did in the early 2000’s. This means that as the threads of the nets become thicker and more visible, it is easier for the fish to spot them and they will avoid swimming into it. Thus, fishing with nets in murkier water is not as effective and the nets must be cleaned very often. This issue was raised also in the community meeting (2018) in Fanasgieddi: nets get dirty faster in warm water and when the water is murky. Agriculture is the biggest polluter of the water and due to pollution, the water in Deatnu should not be drunk (Salin, et al., 2004, p. 292). Previously wastewater has also been a cause of pollution to the river (Saressalo, 1982, p. 109). Impact of eutrophication⁸¹ has been observed in the increase of willows in the riverbanks (Salin, et al., 2004, p. 292).

⁸¹ When a body of water becomes overly enriched with minerals and nutrients that induce excessive growth of plants and algae.

Murky water absorbs more heat than clear water, raising the temperature of rivers. Climate change is an issue impacting the water temperature as well as the amount of solids in the water due to melting of palsas,⁸² as reported by the locals (Community meeting, 2018). When rainfall has increased (AMAP, 2017, p. 12), more solids are washed into the water. The increased amount of solids in water covers areas of gravel and small rocks under soil, which are spawning areas and areas for salmon parr to live in, thus decreasing the production potential of rivers. Intensified erosion increases the amount of solids in the water as well as building the of roads and houses, making fields, forestry and mining. A man in the Fanasgieddi meeting described how as a child they used to play by catching parr in a small river, but after a field was made there were no more parr to be found.

Observations of heavy erosion were reported by local Saami in the Community meeting (2018). Deatnu was said to be much wider in Fanasgieddi now than it was half a century ago. In the lower parts of Deatnu it was said that the river banks had moved as much as 500 meters due to sand banks falling, and many weir places have been ruined when sand has buried fishing spots. Another effect of erosion that was mentioned was that since Deatnu has gotten shallower at the lowermost parts and where the river meets the fjord, it is easier for seals to hunt salmon. Similar falling of sand banks was reported from Anárjohka, one of the uppermost big tributaries of the Deatnu watershed. In an interview in 1980 Hans Vuolab said that falling of banks had increased in the Dálvadas⁸³ area, and that this caused sand to be mixed in the water, preventing salmon from coming to the upper parts of Deatnu (Helsingin Sanomat, 1980). In the same interview it was mentioned that in the end of 1970's *Vesihallitus*, the "Water Authority" of Finland at the time reinforced the banks by bringing rocks, but that has since stopped. I have myself heard people from higher parts of Deatnu tell about the great lengths of what used to be *gárggobotni*, river bottom with rocks and gravel, is now under sand due to erosion.

A fair number of local Saami observations on the impacts of climate change have been documented on the Finnish side of Deatnu watershed (Salin, et al., 2004). Observations include changes in snow conditions, winds, length of winter, weather, ice breakup, ground not freezing properly in the fall, and changes in rainfall patterns. A diminished number of species was observed, such as the fresh water flounder (Sám. *finddar*), small birds (Sám. *cizázat*) and insects, as well as the arrival of mink as a new species. In relation to rainfall, it was stated that if there is little rain during June and the water levels are low, salmon will not swim to the higher parts of the watershed (ibid. p. 300). The

⁸² Low frost heaves with permanently frozen ice lenses.

⁸³ Some 30km upstream from Badjeavnjis, in upper parts of Deatnu.

same issue was noted in the community meeting (2018); how salmon will “turn around” at Dálvadasguoika if there is too little water. However, the past few years that has definitely not been the case. The summer of 2016 had especially high water levels, but the summer of 2017 had such high water levels throughout the summer that we were not able to set up our weir properly during the whole summer due to the floods. My father said he has never seen anything like this in his almost 70 years of fishing in Deatnu. Another impact of warmer winters has been observed in the change of ice breakup in Deatnu, which is “quiet and smooth” compared to what it used to be (Salin, et al., 2004, p. 293), in the words of my father: “The ice just melts there”.⁸⁴ An impact of the lack of proper ice break is that the ice will no longer properly clean the riverbanks and bottoms (Community meeting, 2018). However, the weather patterns have changed, and in the spring of 2018 the weather became warm very fast, resulting in a proper ice run.

4.7.2. Views of the Tana research group

The Tana research group writes that erosion causes clogging of spawning redds and that “Agricultural activity can increase the nutrient salt load of the river system and contribute to erosion.” (Falkegård, et al., 2016, p. 76) Though there is widespread agriculture in the watershed, the group estimates that its effect is likely small. On climate change the group writes that it “potentially affects salmon stocks on a multitude of levels, from changes in discharge, water temperature and water chemistry within rivers to large-scale changes in oceanic ecosystems” (Falkegård, et al., 2016, p. 77). The group estimates the impact of climate change on salmon populations to be currently low and moderate in the future, but “might be moved upwards on the risk axis as correlations between climate and salmon growth and survival become better understood.” (ibid.)

4.8. Ocean conditions

4.8.1. Food of salmon and salmon’s predators

One more concern raised by traditional knowledge holders is a decline of sand eel stocks, which are food for salmon as well as food for many of salmon’s predators (Ween, 2012). According to Bellona⁸⁵

⁸⁴ Sámegillii: Jieŋat dušše suddet dasa.

⁸⁵ An independent non-profit organization that aims to meet and fight the climate challenges, through identifying and implementing sustainable environmental solutions.

(2017), the sand eel populations have decreased greatly in Norway. The same is the case with capelin, another fish salmon feeds on. The Ocean Research Institute of Norway recommended a quota of 0 kilos of capelin for Barents Sea in 2016 and 2017 due to the weak status of the populations (Havforskningsinstituttet, 2017). Capelin catches have fluctuated from the worst catches of around 2 000 tons caught in 2006 to more than 270 000 tons caught in 2010, and sand eel from less than 6 000 tons caught in 2006 to more than 100 000 tons caught in 2011 (Statistics of Norway, 2018). Such changes in the abundance of key species that salmon feed on are very significant for the evaluation of salmon's living conditions.

Two studies have looked into the effects of predation of salmon in Deatnu fjord, one on effects of goosander and another on marine fish predation (Svenning, et al., 2005a; Svenning, et al., 2005b). Both of these studies concluded that salmon was not a remarkable part of the prey, probably because of the large abundance of sand eel constituting the main part of the diets of these predators. The importance of the sand eel was highly emphasised in the study on marine fish predation in Deatnu fjord: "Sandeel may thus be a key factor for the status of the Tana river as one of the world best Atlantic salmon rivers, by reducing the high smolt and post-smolt mortality as observed in several other estuaries and fjords." (Svenning, et al., 2005b, p. 466) Marine mortality of salmon, which is not due to human fishing, is the highest during the first few months at sea and predation is estimated to be the major mortality factor (Hansen & Quinn, 1998, p. 104). Moreover, predation of smolts and post-smolts may be most severe in estuaries and fjords, after the smolts have just left freshwater (Hansen & Quinn, 1998, p. 109). As discussed above, when the amount of certain type of prey collapses, predators are likely to move to another prey species or to another area. The situation in Deatnu fjord might have changed significantly since the studies on predation in the fjord were done. A decrease in the number of sand eel in the Deatnu fjord would mean that goosanders as well as piscivorous⁸⁶ fish will have to feed on something else.

The TRG discusses ocean conditions under overexploitation when considering the impact that ocean survival has to the possible exploitation levels: "With sea survival at a medium level (5 %), a total exploitation of over 50 % can be sustained even if smolt production is somewhat reduced (>75 %). At higher sea survival (>10 %), a total exploitation of up to 80-90 % can be sustained." (Falkegård, et al., 2016, p. 91) As the quote indicates, ocean survival has an immense impact on what is the sustainable exploitation level of salmon. However, the TRG does not discuss ocean conditions

⁸⁶ Fish that feed on other fish.

extensively. In the 2016 report the group writes “There is little doubt that environmental conditions in the ocean have contributed to reduced survival and decreased number of grilse⁸⁷ in Norway in the last decades. However, it is difficult to evaluate this factor as a human-caused threat factor.” (Falkegård, et al., 2016, p. 79) However, overfishing of sand eel and capelin are clearly human-caused factors. The only thing written about sand eel is discussed under predation: “Depleting the number of sandeel in the Tana estuary might increase seal and goosanders predation on salmon and trout.” (Erkinaro, et al., 2015, p. 33) To consider that the ocean is where salmon become fully grown, the food of salmon in the ocean would seem to be a key factor for the health of salmon populations. Though sand eel and capelin are not the only sources of food for salmon, it seems odd that this aspect gets very little attention in the evaluation of salmon’s living conditions and in the threat-factors analysis.

4.8.2. *Návethuossa*⁸⁸ - Salmon farming

Traditional knowledge holders in the Deatnu region state there is little help in regulating fishing in the river, if experts do not pay attention to what happens in the sea. Fishermen are convinced that quantity of fish farms on the coast of the Norwegian side of Sápmi and the size and quantity of industrial fishing is strongly impacting salmon populations in Deatnu (Ween, 2012, p. 164). These two are interlinked, since the food of wild salmon is being fished as food for farmed salmon. Other impacts of salmon farming on wild salmon include genetic introgression,⁸⁹ mortality due to salmon lice infections, viral disease outbreaks, organic load and eutrophication (Taranger, et al., 2015). Deatnu fjord was ratified as a national salmon fjord in Norway in 2003, and afterwards all aquaculture in the fjord was closed (Falkegård, et al., 2016, p. 78). This means that the immediate impacts of salmon farming do not affect Deatnu salmon in the Deatnu fjord, but it does not mean salmon farms do not have an impact on the Deatnu salmon in other areas on the coast. On a nationwide evaluation of threats to wild salmon in Norway, escaped farmed salmon are estimated as the biggest threat and salmon lice⁹⁰ the second biggest threat. Escaped farmed salmon cause genetic changes to wild salmon populations when they mix-breed, and studies indicate that mixed-salmon with escapee genetics have a higher mortality rate than wild salmon (Taranger, 2015, p. 1000). The number of escaped farmed

⁸⁷ Salmon

⁸⁸ A Saami word used for farmed salmon, literally meaning “barn salmon”, which gives an idea of the Saami approach towards salmon being grown in captivity.

⁸⁹ Genetic change in wild salmon due to escaped farmed salmon breeding with wild salmon.

⁹⁰ Also linked to the salmon farming industry

salmon is estimated to have been small in the recent years. However, test fishing in the lower section of Deatnu in 1990 and 1991 during fall, after most salmon have ascended the river, revealed proportions of escaped salmon to be more than 40% (Erkinaro, et al., 2009, p. 133). Therefore, the genetics of farmed salmon escapees have mixed with Deatnu salmon and impacted the genome, which might cause a higher mortality rate.

The Tana research group estimates the impacts of escaped farmed salmon to wild salmon of Deatnu to be small, but potentially growing in the future (Falkegård, et al., 2016, p. 78). The TRG estimates that the increased number of salmon lice due to aquaculture is causing an increased sea mortality and therefore decreasing the number of returning salmon to Deatnu (Falkegård, et al., 2016, p. 77).

4.9. Discussion and conclusions

Saami have a longer history of observing Deatnu than fish biologists. While this chapter is by no means a comprehensive study of traditional knowledge about Deatnu and salmon, through the examination of various specific issues raised by traditional knowledge holders, a manifold web of cause-effect relationships is revealed. Many of these observations pertain to changes occurring in the Deatnu watershed or in the ocean, and how those changes are considered to impact the salmon. Saami and their knowledge are a part of the ecosystem in Deatnu; they cannot be separated since neither would be the same without the other. Traditional practices would not have become traditional unless they were sustainable, therefore the recognition of the limitedness of natural resources is a foundational principle of *árbediehtu* (TK). The aim is not to romanticise the contemporary Saami communities of the Deatnu valley, as the relationship people have today with the ecosystem is clearly far from what it used to be. Traditions, however, do not exist in a vacuum. Traditions adapt to changing conditions and advance through technological achievements – which does not mean that the underlying principles have to change. Saami still have knowledge on how to live in a reciprocal, balanced connection with other parts of the ecosystem, and this knowledge should be harnessed and revitalised.

Traditional management practices can be seen, for example, in the way the efficient collective fishing methods were practiced rarely enough not to endanger the salmon, and how catches were distributed. During bad salmon years fishing pressure was limited, since it was not worth the effort to set nets and build weirs, and people went instead went to fish the lakes or the sea (see part 4.6). During

golgadeapmi (drift netting) in Bildan, *oruhit Deanu* was a period without fishing, a way of letting the river be without any interference, to let the salmon swim up stream (see part 4.2). This was a custom not set by fishing regulations, but the fishers themselves. The management of predator populations was a way of improving salmon's living conditions and the current restrictions on hunting and fishing of the salmon's predators are seen as an interference to what used to be a natural balance in Deatnu.

When comparing the two knowledge discourses on factors impacting salmon, one difference which emerges is where the emphasis lies in the life cycle of a salmon. Traditional knowledge holders highlight many changes in the environment, impacting the salmon's living or spawning conditions. These changes impact salmon during various stages of its life cycle and have decreased the salmon production. The emphasis of the TRG is heavily on spawning. The immense impact of ocean conditions is mentioned almost in passing. Most of the concerns raised by TK holders are addressed one by one, and the conclusion is that not a single one of those factors is considered to significantly impact the salmon production of rivers. That being the case, human exploitation is raised as the main threat to salmon.

If you are breaking things down into their smallest pieces, you are destroying all of the relationships around it. So an Indigenous style of analysis has to look at all those relationships as a whole instead of breaking it down, because it just won't work (Wilson, 2008, p. 119).

This quote resonates with the comparison of the TK and science discourses. The TK holders combine various factors into a web of relationships, and though it might be hard to estimate and *measure* the impact of each of those factors, it is considered that *in combination* they have caused a decline in some salmon stocks. On the other hand, the TRG considers various factors separately and tries to estimate *how much* each of them might impact the salmon, while perhaps not giving due consideration the possible cumulative impacts of these factors.

Saami knowledge discourse is closer to the Ecosystem Approach (see part 2.4.4), while the TRG's has a single-species approach. While both approaches have their strengths and weaknesses, the single-species approach has been criticised for being overtly reductionist and for overlooking inter-species relationships (Lindenmayer, et al., 2007). This is a similar critique to questions traditional knowledge holders in Deatnu raise towards the research of the fish biologists (Ween, 2012). The Ecosystem Approach requires adaptive management, meaning that measures may need to be taken even when some cause-and-effect relationships are not yet fully established scientifically. It can be hard to scientifically prove and measure how much, for example, an increased number of predators impacts the number of returning salmon. As an adaptive management measure, the Ecosystem Approach

seems to accommodate predator control programs, such as the one done in Restigouche river, discussed in part 4.5.3.

Overexploitation is an issue where the two discourses partially convene. Tourist fishing is highlighted by the TK holders as adding too much fishing pressure. While the use of traditional methods has strongly declined since the 1980's, the estimated proportion of catches by tourists has simultaneously increased. The TRG considers tourist fishing as one factor contributing to overall fishing pressure, which has led to overexploitation. The TRG considers the impacts of tourist fishing in numbers, largely leaning on the catch estimates (see part 3.5). The TK holders state that *luossa dárbbáša ráfi*, “salmon needs peace”, and that tourist fishing disturbs that peace (Joks, 2015). A continuous flow of tourist fishers is a different kind of *disturbance* or fishing pressure than what local lurers cause; while a local fisher might fish every now and then, a tourist who purchased a daily license is likely to want to fish as many hours of that license as possible. Perhaps because the impacts of different *types* of fishing pressure have not been studied much, and as it is difficult to *quantify* it, the TRG does not discuss this issue.

One difference between these two knowledge discourses is their approach to dealing with *uncertainty* (see parts 3.4 & 4.6). The TRG must take into account a substantial uncertainty in their evaluations. One issue contributing to this uncertainty is large annual variation in salmon stocks. Based on the catch estimates – which also add to the uncertainty (see part 3.5) – during the best years over 60 000 salmon are caught in the Deatnu watershed, and in the worst years around 15 000 (Falkegård, et al., 2016, p. 69). As discussed in part 4.6, the accounts of extremely bad salmon years in the past raise questions as to if the current management goal of reaching spawning targets annually is realistic (see part 3.4). The TK holders stated that during dry summers salmon would not swim so high up the watershed – how can the spawning targets be reached then? Despite such a large variation, the TRG estimates *how much salmon can be caught annually*, and still reach the spawning target. Due to this great uncertainty and deriving from the precautionary approach (see part 3.3), the TRG makes *conservative evaluations* which might be *unrealistically negative*. This might result in unnecessarily strict limitations to fishing. The Saami have very different approaches to uncertainty. As discussed in part 4.3.2, the recognition that humans cannot master nature is a part of *árbediehtu*. This requires admitting that there are certain things we humans cannot control or know. In the words of a man who had fished Deatnu for 80 years, *luondu dat lea mii stivre*, “it is nature that steers” (Community meeting, 2018, see part 3.4.2). This is not about absolving people from the responsibility of managing their actions, this is about humility in front of the power of nature.

Salmon is obviously the key concept in both of the knowledge discourses. When the Saami speak of *luossanállli*, ‘the salmon stock’ (see parts 4.3.4 and 5.9), they are generally speaking of the fish of their fishery – which might be a mixed-stock fishery. There are many situations in the vast watershed, and some stocks are doing better than others. The TRG must work for securing all those close to 30 different salmon stocks. That means that their *salmon* is threatened if the status of even one of those stocks is estimated to be weak. Some of those stocks are someone else’s whole fishery, so their value is evident. However, as the fishery of a weir fisher, *buodđobivdi*, in Deatnu mainstream might be doing just fine, the knowledge of the TRG on the worrying situation of *the salmon* is not true for them – as they are in fact speaking of different things. Based on the TRG *fragments* of the mixed-stock fishery are weak, not the whole fishery. As discussed in chapter 5, for securing *the salmon* of the TRG as well as *the salmon* of a fisher in an upper tributary, *buodđobivdi* in the Deatnu mainstream has to sacrifice a large part of their fishery – which in fact is not threatened.

While this chapter has dealt with traditional knowledge of the Saami salmon fishers, the next chapter describes the latest developments in Deatnu. As the new fishing regulations strongly limit the practicing of *árbemáhttu*, traditional skills, they question the very preconditions of the continuation of *árbediehtu*, the knowledge discussed in this chapter.

5. The Tana agreement of 2017

5.1. Introduction

This chapter discusses the policy discourse on the right to decision-making. As the main discursive event of this thesis is the securing of salmon stocks in Deatnu, this chapter is a case study on the role of Saami rights and knowledge in the governance and management of fishing in Deatnu. This chapter reflects on the right to decision-making, and requirements on including TK in management, which were discussed in chapter 2. This chapter also reflects on the knowledge discourses of chapters 3 and 4, as basis for management decisions. First, the main changes of the new agreement are briefly examined, followed by an examination of the negotiation and consultation processes, and some impacts of the new agreement. As the goal of the new agreement was to limit fishing pressure strongly, a particularly notable issue is how on the Finnish side of the river, a new fishing rights holders group was established for cabin owners, thus adding additional fishing pressure. Finally, some conflicting arguments between the actors of the Finnish state and the Saami will be discussed.

5.2. Changes of the new agreement

FISHING METHOD OR GROUP	Old regulations	New regulations
LOCAL ROD-FISHERS	20 th May – 31 st of August	1 st of June – 20 th of August
TOURISTS (ROD-FISHERS)	1 st of June – 20 th of August	10 th of June – 10 th of August
DRIFT NET	20 th of May – 15 th of June, 3 days / week (total 12 days)	1 st of June – 15 th of June, 2 days / week (total 4 days)
WEIR	20 th of May – 31 st of August, 3 days / week (d/w)	1 st of June – 15 th of June, 2 d/w 16 th of June – 31 st of July, 3 d/w
GILLNET	20 th of May – 31 st of August, 3 days / week	1 st of June – 15 th of July, 2 d/w 16 th of July – 31 st of July, 3 d/w

The table above shows the old regulations and the new regulations, and the changes in fishing time that took place for various fishing groups and equipment. In addition to time restrictions, the amount of equipment (nets or weirs) was limited from previously being two for each fishing rights owner, to one for each estate, which by itself means a limitation of 50%.⁹¹ If one uses a driftnet, one cannot simultaneously use a gillnet or a weir, though with the old regulations one was allowed to drift net and use two other equipment⁹² simultaneously. The Saami Parliament estimates a total limitation of 70-80% for traditional Saami net-fishing methods, while tourist fishing was not limited nearly as strongly⁹³ (Saami Parliament of Finland, 2016a). In fact, in 2017 the estimated tourists' catch stayed nearly the same as it was with the old regulations (see part 5.7). Nor was the fishing of local rod-fishers limited nearly as harshly. Therefore, the strongest limitations by far were set for traditional net fishing, even though they are the rights holders and on the Finnish side also the owners of most of the waters (see part 2.3).

5.3. The negotiation and consultation process

5.3.1. Negotiating teams

The bilateral Tana agreement (Fin. *sopimus*, Nor. *avtale*) and the fishing regulations (Fin. *kalastussääntö*, Nor. *fiskeregler*) govern fishing in Deatnu. The agreement is of a more general nature and sets the overall ground for regulating fishing in Deatnu, while the fishing regulations are more detailed, restricting fishing time and equipment. The responsible governance body in Finland is the Ministry of Agriculture and Forestry and in Norway the Ministry of Climate and Environment. These ministries prepared the agreement, which was accepted by both state parliaments. In preparing the agreement and the regulations, both ministries nominated negotiating groups. When the agreement was renewed in 2017 the negotiating group on the Finnish side consisted of four representatives from the state bodies and four Saami representatives.⁹⁴ On the Norwegian side, the Act on Tana states in

⁹¹ On the Finnish side there are differences between the fishery cooperatives on the amount of nets for each rights holder, depending on the proportion of fishing rights attached to their properties (see part 2.3). If a person owns more than one estate with large enough proportions of fishing rights to allow net-fishing, they are still able to fish with more than one equipment.

⁹² Either one gillnet and one weir, or two gillnets or two weirs.

⁹³ In addition to limitations in number of fishing days, some changes in the fishing hours and an annual and a weekly quota for daily licenses.

⁹⁴ Chair and vice-chair were from the Ministry of Agriculture and Forestry, members from Ministry of external affairs, Lappi Center for Economic Development, Transport and Environment (Fin. ELY-keskus), Saami parliament of Finland,

Article 6 that the negotiations must be conducted in consultation with Deanučázádaga Guolástushálddahus (the local fishery administration, see part 2.2.2) and the Saami Parliament of Norway (Lovdata, 2014).⁹⁵

5.3.2. Finnish side

According to Esko Aikio, a Saami representative from the Finnish negotiating team, the Saami representatives were invited to the meetings of the negotiating group, but in some meetings they were not allowed to participate in the negotiations. Instead they waited in the hallway while the state representatives were negotiating (Ihmisoikeusliitto, 2017). When the negotiating group decided whether the new regulations should be accepted or not, all the Saami representatives on the Finnish negotiating team voted against the agreement. But with the double vote of the chair, who was appointed by the Finnish Ministry, the agreement was passed (YLE Sápmi, 2016). As discussed in the section 2.2.2, on a national level in Finland, indigenous peoples' right to self-determination is considered to be purely a *procedural* right, a right to be in the room and have your views be heard. However, referring to the description of Aikio (Ihmisoikeusliitto, 2017), in this case the Saami were not even in the room in some meetings, but waited in the hallways when the state representatives negotiated.

The Act on Saami Parliament (see part 2.2.2) in Finland requires that issues of special importance to Saami must be negotiated with the Saami parliament. However, regarding the Tana agreement these negotiations with the Saami Parliament were organised only after the agreement was already made. In the aftermath of the negotiations, the Saami Parliament of Finland sent a complaint on the procedure to the Chancellor of Justice. The Deputy Chancellor of Justice responded that indeed the Act on the Saami Parliament and its negotiation requirements (9 §, see 2.2.2) were not followed, and therefore pointed out misdemeanours in the negotiation process (Chancellor of Justice, 2016). The Deputy Chancellor noted that the possibility to have an impact on the negotiations was not actualised, since the negotiations on the agreement were already closed when the Saami Parliament was called for negotiations. However, the statement of the Chancellor was released only after the Parliament of Finland had already voted to accept the Tana agreement, so the statement could not have had an

Saami tourism and entrepreneurs organisation, and two members from the fishery cooperatives (Parliament of Finland, 2016). As discussed in part 2.3 the fishing rights holders are not necessarily Saami, but in this case they were.

⁹⁵ Tanaloven § 6: "Utarbeidelsen av forskrifter og forhandlinger med Finland om fisket i lakseførende deler av Tanavassdraget skal skje i samråd med Tanavassdragets fiskeforvaltning og Sametinget."

impact on the decision of the Finnish Parliament. It can be questioned, if the Parliament would have voted the way they did, if it would have been known that the law was broken in the negotiation process. It is also clear that the Parliament did not have sufficient information on the process, thus the grounds for decision making was weak.

5.3.3. Norwegian side

On the Norwegian side of the river the local fishing administration, Deanučázádaga Guolástushálddahuš (DG), with their two Saami representatives and one representative of the Saami Parliament of Norway were part of the consultations until the process of preparing the new agreement was officially put on hold. Without involving or even informing DG on the final meeting, the negotiations were concluded. This cannot be considered as fulfilling the requirements of the ILO 169, to consult “in good faith and in a form appropriate to the circumstances, with the objective of achieving agreement or consent to the proposed measures” (Article 6.2). This resulted in a complaint by the DG to the Standing Committee on Scrutiny and Constitutional Affairs of Norway, in which DG refers to the Act on Deatnu (Nor. *Tanaloven*), which requires to prepare the fishing agreement and regulations in cooperation with DG and the Saami parliament of Norway (Deanučázádaga guolástushálddahuš, 17.1.2017). In May 2018 the committee has still not made a decision on the matter, while the complaint has been standing for more than a year.

5.3.4. Negotiations in the light of procedural requirements

After the negotiations of the Tana agreement were concluded, two members of the United Nations Permanent Forum on Indigenous Issues (Loode & Sambo Dorough, 2016) questioned the Finnish Ministry of Agriculture and Forestry on how they consider to have abided by the principle of free, prior and informed consent (FPIC) in the negotiations of the Tana agreement. The Government of Finland responded: “The FPIC principle, recognised as a right of indigenous peoples, does not mean that indigenous peoples have the right of veto concerning decisions to be made but that they are entitled to make demands concerning the procedures.” (Government of Finland, 2017, p. 2) This shows the interpretation of the state of Finland on indigenous peoples’ right to self-determination: it is considered purely a procedural matter – the right to make demands (see part 2.2.2).

Local Saami rights-holders take part in the negotiations and consultations⁹⁶ to a certain degree. However, as shown above, the Saami influence is very limited, and the government representatives decide without involvement of core Saami participants. The substance of the process does not comply with premises of how consultations should be carried out. The consent of the Saami is not required for the agreement, nor is there weight on traditional knowledge in decision-making. In Finland, the requirement to involve the Saami Parliament is purely procedural, and to fulfil it the state authority has to hear the views of the Saami Parliament (see part 2.2.2). As pointed out by the Saami Parliament and the Deputy Chancellor of Justice, this procedural requirement was not fulfilled. The ILO convention 169 obliges Norway to consult in good faith with the objective of achieving agreement. Since neither the DG nor the representative of the Saami Parliament were part of the final phase of the negotiations, the requirement for consultation cannot be regarded as fulfilled.

5.4. Saami fishing rights in the agreement

There is no mention of Saami fishing rights in the agreement. The importance of salmon fishing to Saami culture is recognised in the preface of agreement, and in many occasions in official documents dealing with the Tana agreement (MmVM, 2017; Parliament of Finland, 2016; PeLV, 2017).⁹⁷ The Constitutional Committee of Finland raised concerns about the new agreement regarding the right of the Saami to practice their culture. The Committee highlighted that denying the non-local Saami from participating in traditional fishing practices was of special concern (see part 5.6). After voting on their decision the committee recommended the Parliament to accept the new regulations, despite the flaws, but required that the government continues negotiations on securing traditional Saami fishing practises (PeLV, 2017).⁹⁸

An International Comparative Research on Saami rights in Finland (Heinämäki, et al., 2017), ordered by the Prime Minister's Office of Finland, recognises traditional Saami livelihoods, including fishing, as prerequisite for the survival of the culture. The study addresses the Tana agreement and points out

⁹⁶ The act of Saami Parliament of Finland uses the word *neuvottelu*, which translates as negotiation. Procedurally it is a matter of a hearing process, as discussed in section 2.2.2. Based on ILO 169 Norway has the obligation to consult the Saami in matters of relevance to them.

⁹⁷ MmVM: *Maa- ja Metsätalousvaliokunta*, The Agriculture and Forestry Committee. PeLV: *Perustuslakivaliokunta*, The Constitutional Committee.

⁹⁸ A dissenting opinion was left to the decision of the committee, highlighting that especially harsh restrictions on Saami traditional fishing methods endanger the continuation of Saami culture, and that there would have been other options for limiting fishing pressure, which were not duly considered (PeLV, 2017).

that restrictions for protecting salmon populations should be conducted evenly, not specifically to a certain fishing group or method, while giving special protection to traditional fishing methods. Moreover, the study states that Saami who do not live in the river valleys of Deatnu watershed should be able to take part in traditional fishing methods (Heinämäki, et al., 2017, p. 76). While there is no mention of Saami fishing rights in the agreement, in Article 1.2 the agreement states that in protecting, caring and using fish stocks, special emphasis should be given to fishing that is based on local cultural traditions. Though not specific, this would seem to provide some formal protection for traditional fishing methods. However, while the traditional net-fishing is most strongly limited, this formal recognition does not seem to be reflected in the content.

In the background memo of the Tana agreement the Finnish Ministry of Agriculture and Forestry explains that Saami culture has been taken into account since they are still allowing [sic] traditional Saami fishing methods. Moreover, the memo justifies the new regulations with research pointing out that overfishing has caused a decline in the salmon stocks, and states that the need to limit fishing “concerns especially traditional fishing with the effective weir and net equipment”⁹⁹ (Ministry of Agriculture and Forestry of Finland, 2016, p. 3). No explanation is given by the Ministry on why traditional fishing methods must be especially limited. Referring to the catch estimates (see part 3.5), since the 1980’s on average more fish have been caught with rod than with traditional net-fishing methods (Erkinaro, et al., 2015, p. 20). Since 2005, the tourists’ catch is estimated to have been between 30-40% of the total catches in Deatnu (Falkegård, et al., 2016, p. 95), while the estimated weir catches are 20% (Erkinaro, et al., 2012, p. 59). Looking at the estimated catch proportions on the Finnish side of the river, in 2010 tourists’ catch was 49%, while weir catches were 7% (Erkinaro, et al., 2012, p. 59).

5.5. Saami influence on management

The Tana research group together with the national authorities are supposed to evaluate the effects of the fishing agreement and regulations on annual basis. Fishing rights owners will be included in this work, but will have no decision-making power. The need for further limitations on fishing in special circumstances (Article 16) will be determined by the government authorities, and local rights holders will be heard to the extent that the urgency of the situation so permits. The parties must compose a

⁹⁹My translation, the original: “Tämä koskee etenkin perinnepyyntiä tehokkailla pato- ja verkkopyydyksillä”

management plan (*Sám. dikšunplána*, *Fin. hoitosuunnitelma*, *Nor. forvaltningsplan*), which should describe the situation of the salmon stocks and include conservation plans for those salmon strains that are estimated to not reach their spawning targets. Again, local fishing rights holders will be included in this work, but do not have any decision-making power (Parliament of Finland, 2016). There is only one mention of traditional knowledge in the Tana agreement (Article 1.1). It seems that the inclusion of traditional knowledge is considered fulfilled by including local rights holders. However, the fishing rights in both Finland and Norway are based on ownership of land and anybody can buy fishing rights to Deatnu, regardless if they have long-term knowledge on the river or not (see part 2.3). Therefore, the inclusion of ‘local rights holders’ does not guarantee the inclusion of traditional knowledge. Hence, the Tana agreement does not define how, in accordance to the Article 1, traditional knowledge should be included in the evaluations relevant for management decisions.

As shown here, the way the Saami rights holders are included in crucial decision-making processes is clearly incomplete in terms of fulfilling norms of consultations and negotiations. To an extent Saami participate in the governance process, and local rights holders are included in defining the needs for management decisions, but the decisive power always lies with the state authorities. The agreement does not address in detail the issue of including traditional knowledge in evaluation of management actions. The Tana research group has a strong influence, though the final decisions are done by the state authorities. No cultural impact assessments are conducted, nor at any stage in the governance or management process is Saami consent required.

5.6. Cabin owners’ rights vs. rights of non-local Saami

One priority set by the representatives of the state of Finland was strengthening the position of non-local fishing rights holders (Parliament of Finland, 2016, p. 3.1). The only group that gained more fishing rights with the new agreement was the cabin owners on the Finnish side. In this context cabin owners are people who have bought land in Deatnu valley with fishing rights attached to the properties and built cabins. With the new agreement they are entitled to buy cheap daily luring licences, and the number of licenses they can buy depends on the proportion of fishing rights attached to their properties.¹⁰⁰ These daily licenses entitle them to fish at any time of the day, like locals.

¹⁰⁰ As defined in § 12 of the Tana enactment law (Parliament of Finland, 24.3.2017), and by regulations set by the Ministry of Agriculture and Forestry. See also part 2.3.

In the previous agreement, there was a specific fishing rights holders group for people who did not live permanently in the Ohcejohka municipality but had inherited properties with fishing rights from people who had been living permanently there. These people were predominantly Saami¹⁰¹ and could practice traditional net-fishing methods. This arrangement can be interpreted as a way of trying to secure the continuation of traditional fishing culture in the phase of strong migration to south (Länsman, 2012). In the new agreement, this group merged together with the group of “cabin owners”, and non-local Saami who inherited their fishing rights are no longer able to practice the traditional net fishing methods. As the Saami Parliament of Finland points out, denying non-local Saami the right to fish with traditional methods is denying them the right to practice their culture (Saami Parliament of Finland, 2016a). Though losing their right to fish with nets, non-local Saami are entitled, together with the “cabin owners,” to buy cheaper luring licenses. A restricted number of cheap daily luring licences is hardly comparable to the right to fish with nets for the whole season. Thus, the position of non-local Saami who had inherited fishing rights, was in fact weakened significantly with the new agreement. Therefore, the government’s goal of strengthening the position of non-local fishing rights holders had the exact opposite effect to non-local Saami with inherited fishing rights, while only strengthening the position of those who had purchased their properties and had been considered tourists until the fishing season of 2016.

Prior to the new agreement, non-local fishing rights owners were unable to use their fishing rights unless they had inherited that right. The fishing rights of the cabin owners in Deatnu valley have been handled through each step of the national legal system and then in the European Court of Human Rights (ECHR) as a case *Taivalaho v. Finland* (European Court of Human Rights, 2006). All these courts concluded that rights were not violated by restricting non-locals from using their fishing rights belonging to their properties. For securing fish stocks, restricting the use of one’s fishing rights based on where the person lived, was considered appropriate. Since the cabin owners must have been aware of such restrictions when they bought the properties, and since they can still buy tourist fishing licenses, their rights were not considered violated. However, as stated above, strengthening the position of “the cabin owners” was set as a priority by the Finnish government representatives, and in the new agreement the cabin owners were the only group to gain more rights, while all other groups had their rights significantly reduced. The argument for strengthening the position of cabin owners could not have been based on rights, since the whole national justice system and the ECHR concluded

¹⁰¹ Considering that when the estates (*dálut*) with fishing rights were established, nearly all of them were owned by Saami (Tenjoen kalastustoimikunta, 1985), and looking at the changes that have happened in property ownerships in the Deatnu valley (Burgess, 1996; Länsman, 2012), it can be concluded that a majority of people, who had left properties as inheritance, were Saami.

that the previous fishing agreement did not violate their rights. Therefore, this priority must have been purely political. Since with the new agreement non-local Saami, who had inherited their fishing rights, lost their right to take part to traditional fishing, the protection of Saami right to culture was not given similar priority as the strengthening of the rights of cabin owners – whose rights were not violated in the first place.

5.7. Impact of the new regulations to distribution of catches

It is noteworthy that the previous agreement of 1989 (Article 7), would have allowed setting restrictions to tourist fishing in order to limit their fishing pressure. However, this was not done, despite worries of overfishing. Though the new restrictions did cause a strong decline in the total number of visiting fishing tourists and the number of daily licenses sold – a harsh blow to the local economy on the Finnish side – the total estimated catch of tourists did not fall remarkably in 2017. Even though in 2016 there were three times more daily licences sold on the Finnish side than on 2017, the estimated catch of tourists fell just by 35% to 2017 (LuKe, 2018). The catch of tourists on the Norwegian side simultaneously increased nearly threefold, due to many Finnish fishing tourists buying their licences on Norwegian side when the Finnish quota was sold out.¹⁰² There are a few possible explanations for this situation. The exceptionally high waters in 2017 made it difficult to fish with nets and weirs, and might have left more fish for the tourists to catch, as the high water did not impact rod fishing as much. Another explanation might be that at the height of the tourist season in July especially, the best fishing spots used to be crowded with tourists, with many queuing in the shore to wait their turn (Burgess, 1996, p. 49). The new regulations might only have made the queue shorter, meaning that a smaller number of tourists divided a similar amount of salmon as was caught by a much larger number of tourists previously. In any case, based on the season of 2017, tourists' fishing pressure did not decrease remarkably with the new regulations, while the total catches in Deatnu were at a record low (LuKe, 2018). As the main goal of the new regulations was to protect salmon by limiting fishing pressure, the 2017 season indicates that this goal was not achieved regarding tourist fishing, but only limited traditional net fishing – while increasing the fishing pressure of the cabin owners.

¹⁰² The new quota system divides tourist licenses equally between Norway and Finland, 11 000 each (Article 5 on the regulations).

5.8. Tana research group responses to new regulations

Jaakko Erkinaro, a member of the Tana research group, has commented the regulations at a general level saying that stronger restrictions were required for fishing, especially to improve the salmon strains in the higher tributaries. However, he stays out of the debate on what specific kinds of limitations should be put in place and leaves this to management officials (YLE, 2017). The members of the Tana research group agree on the need to limit fishing pressure and have mostly refrained from commenting the new regulations any further. However, the new regulations have gained strong criticism from Eero Niemelä, who has done research on Deatnu since 1980's and who was a member of the Tana research group until the 2015 report. He has commented the new regulations by saying: "Deatnu has 35 salmon strains, of which many are doing well. The proposal [for new fishing regulations] is completely unfounded and a wrong interpretation, to which no research findings give any grounds to."¹⁰³ (Kansan Uutiset, 2017) This very strong critique coming from someone with decades of experience in researching salmon in Deatnu and raises questions on how much the new regulations are in fact supported by research, and what are the motives behind the new regulations if not of a scientific nature.

5.9. Opposing discourses on salmon, culture and self-determination

A letter titled "A joint Saami position on the proposed Tana agreement"¹⁰⁴ endorsed by all net fishing rights holders' cooperatives and various Saami organisations¹⁰⁵ was delivered to the states of Finland and Norway during the hearing process for the new regulations (Public letter, 12.8.2016). In this letter the collective states: "The state claims that the salmon stock¹⁰⁶ is in a state of emergency in Deatnu

¹⁰³ My translation, the original: "Tenossa on 35 lohikantaa, joista useat voivat hyvin. Esitys on täysin perusteeton ja väärä tulkinta, johon mitkään tutkimustulokset eivät anna perusteita."

¹⁰⁴ Sámi: *Oktasaš Sámi oaivil Deanu soahpamuševttohussii*

¹⁰⁵ Endorsed by all fishery cooperatives on the Finnish side, and on the Norwegian side by the Net-fishing rights holders association (The "salmon letter holders" association, see part 2.3, Sámi. *luossabravaeaiggádat*), Rod fisher's association, together with local Saami organisations Badje-Deanu siida, Sámi Ealáhussearvi, Deanu Sámiid Searvi, Deatnogátte Sámiid Searvi and Goahtegearret.

¹⁰⁶ See part 4.3.4. Singular of 'salmon stock' is used in the letter, which shows that for a lot of Saami fishers there is just "salmon", not 30 genetically distinct salmon populations.

... This is not true, there are enough salmon in the watershed.”¹⁰⁷ The rationale for the government proposal for the new Tana agreement leans on another kind of truth: “The weak situation of salmon stocks in Deatnu is a consequence of too heavy fishing, since other impacts of human actions towards the watershed are very small.”¹⁰⁸ (Parliament of Finland, 2016) This sentence has some claims considered false by some Saami TK holders. As mentioned, many reject the claim that salmon in Deatnu would be in a weak situation. Some of those who agree that some stocks have declined do not agree that it is due to overfishing and point out various other causes as discussed in parts 4.5-4.8. Some of those who agree that overfishing is taking place, disagree that it is caused by Saami fishing, pointing out to the strong decline in the use of traditional fishing methods, and instead refer to the large number of fishing tourists, as discussed in section 4.4.1.

The salmon (see part 4.3.4) of the Agriculture and Forestry Committee (AFC) is *nearly in an alarming state* (MmVM, 2017).¹⁰⁹ The AFC commented concerns raised by the Constitutional Committee on the Saami rights aspects of the agreement, stating that *by securing salmon stocks the continuation of Saami salmon fishing culture is as well secured*. Undoubtedly, securing salmon stocks is in the interest of the Saami salmon fishers, however, in the face of strong Saami opposition against the new regulations, this kind of statement comes out as patronising; as if the state is doing a favour for the Saami, who do not know what is best for themselves and their culture. Moreover, the AFC states that “it is still possible to practice those fishing methods that are part of Saami culture to an extent, that the know-how and skills related to these traditions are not in danger of *completely disappearing*.”¹¹⁰ (MmVM, 2017, my italics) However, there are no inquiries about the situation of *árbediehtu* (including the know-how) and *árbemáhttu* (skills) related to various fishing methods, nor on the impacts of the new regulations to them and to Saami culture. Therefore, there are no arguments to support this claim by the AFC.¹¹¹

¹⁰⁷ Original in North Saami: “Stáhta oaivvilda luossanállli lea heahtedilis Deanus ... Dat ii doala deaivása, luosat leat doarvái čázádagas.”

¹⁰⁸ Original in Finnish: “Tenon lohikantojen heikko tila on seurausta liian runsaasta kalastuksesta, koska ihmistoiminnan vaikutus vesistöön on muuten hyvin vähäinen.”

¹⁰⁹ A dissenting opinion was left to the decision of the committee, where the signatories required, among other, that protective measures must have local support.

¹¹⁰ My translation, the original in Finnish: “saamelaiseen kulttuuriin kuuluvia pyyntimuotoja voidaan harjoittaa tulevaisuudessakin siinä määrin, ettei perinteeseen liittyvä tietotaito ja osaaminen ole vaarassa hävitä kokonaan.”

¹¹¹ When considering the level of expertise of the ministry’s officials for estimating the cultural impacts of the new agreement, the following incident is of relevance: Tapio Hakaste, the ministry-appointed chair of the negotiating team was present in a meeting in Geavu on 17th of May in 2016, when the proposed agreement was already public. When he was asked about these excessive [sic] restrictions to drift netting, he replied that he does not in fact know what drift netting is, but it has been considered at which time fishing should be limited.

Some forms of traditional fishing are threatened by the new agreement: for example, *golgadeapmi*, drift netting, is now allowed only four days in a year, which is a very limited time to learn how to *golgadi* in various places, during various water-levels and weather, and to learn how to fix the nets.¹¹² There is a question as to if people will even consider it worth the effort of making the special nets required for *golgadeapmi*,¹¹³ just for a few days of fishing in a year. Difficult weather conditions can mean that the time for *golgadeapmi* is even less than four days a year. Moreover, based on Article 35 of the fishing regulations, additional restrictions can be made on short notice, which can limit *golgadeapmi* to just three days a year. If a person with fishing rights want to drift net, based on the new regulations they cannot have a *buoddu* (a weir) or *fierbmi* (gillnet) at the same time, as used to be possible. The high flood usually takes place early in the summer during the drift netting time, and during high flood a specific kind of weir is used, *dulvebuoddu*, a ‘weir of the flood’.¹¹⁴ Considering the amount of work it takes to make a *dulvebuoddu*, it is hardly realistic to consider that one would even be built just for two days of fishing in a week. Since knowledge is often transferred within the close family, if a family can practice only one type of fishing, either *golgadeapmi* or *dulvebuoddu*, there is no possibility to transfer the knowledge on both these fishing methods. Moreover, one effect of the agreement is that on the Finnish side non-local Saami are not able to take part in traditional fishing methods. On impact of this is that youth wanting to study¹¹⁵ will either have to break the law, or refrain from participating in these traditions – meaning the continuation of the knowledge (*árbediehtu*) and skills (*árbemáhttu*) is threatened.

The Finnish Government’s proposal for Tana agreement states that “The constitutional right of the Saami to have cultural self-determination does not mean an unrestricted right to decide over traditional livelihoods.”¹¹⁶ (Parliament of Finland, 2016) The discussion on the extent of the Saami right to self-determination in Finland is not taken further than this – rather it is just noted that it is not a right to veto. However, as discussed in part 2.2.1, in certain cases indigenous peoples’ right to self-determination and culture means that consent must be obtained, which also grants the right to say no. Due to the crucial importance of the salmon fishery for Saami in Deatnu, as well as both recognised and unrecognised property rights of the Saami to Deatnu and salmon (see part 2.3), it can be argued

¹¹² This is often needed during the actual fishing time, if the net that best suits that water-level and place gets stuck to the bottom and gets torn.

¹¹³ See footnote 57 on page 41.

¹¹⁴ *Dulvebuoddu* is usually in a different place than a *buoddu* used during low water-levels. Setting up a *buoddu* needs to be learned separately in each place, since each place is different.

¹¹⁵ There are no higher education insitutions in the Ohcejohka municipality, so if one chooses to get educated beyond high school, one will have to become a “non-local” and lose their right to take part in traditional fishing.

¹¹⁶ Original in Finnish: “Saamelaisten perustuslaillinen oikeus kulttuuri-itsehällintoon ei tarkoita rajoittamatonta oikeutta perinteisistä elinkeinoista päättämiseen.”

that the fishing regulations to Deatnu would be a case where obtaining consent is required (Heinämäki, et al., 2017, pp. 72-76).

5.10. Conclusions

An underlying argument throughout the policy discourse seems to be that Saami rights and protecting salmon are somehow oppositional and cannot be achieved simultaneously – though clearly this is not the case. Saami knowledge has no place in the policy discourse and *the salmon* of the policy discourse seem to be doing even worse than *the salmon* of the TRG, as it is “nearly in an alarming state”. Clearly, it seems more justified to strongly limit Saami fishing when the situation is presented as a crisis, instead of stating that it is likely that some of the 30 salmon strains are not doing very well. Saami culture is considered to be taken into account and secured as the states are not completely banning traditional fishing methods, and as it is assumed that *árbediehtu* and *árbemáhttu* will not *completely disappear* due to the new regulations – even if there are no inquiries on their status, nor the impacts of the new regulations to them. In closing, the debate on the Saami right to self-determination is bypassed with references to existing national legislation, which bring only procedural requirements – and are not being abided by.

6. Concluding remarks

This thesis has provided a view on the traditional knowledge and a glimpse into the situation of the contemporary Saami community of *luossabivdit*, ‘those who catch salmon’ – those who ask for salmon. *Bivdit* is a community of people fostering an ancestral instinct of striving for self-sufficiency as a part of the challenging nature of Sápmi. However, today struggling against the governance system seems to be even a greater challenge. *Luossabivdit* are a part of Deatnu. Therefore, Deatnu, as it is, would not exist without *luossabivdit*. While aware of the changes that have happened and are happening, traditional Saami fishers in Deatnu seem to consider their livelihood more endangered than the salmon. In the words of a traditional Saami salmon fisher in the Fanasgieddi meeting: “The biggest threat to Deatnu and the culture is that we don’t have descendants who know how to *buodđut* or *golgadit* – people who understand Deatnu.”¹¹⁷ (Community meeting, 2018) And yet, those traditional fishing methods are dealt the hardest blow with the new regulations.

The content and extent of indigenous peoples’ right to control their traditional livelihoods and resources is not part of the states’ agenda in relation to governance of salmon fishing in Deatnu. The state authorities make the decisions, and the fishing agreement of 2017 for Deatnu shows that even the procedural rights of the Saami are not respected by the states of Norway and Finland. This resulted in an agreement that threatens the preconditions for maintaining Saami fishing culture and knowledge. Currently, the Saami are not allowed to manage their natural resources based on their knowledge and in accordance to their customs. As *árbediehtu* is maintained in practices, while the Saami are not practicing traditional management strategies, it means that this part of the knowledge system is threatened – not to mention the impacts the new regulations have on actually maintaining *árbemáhttu* by fishing.

Discourse gives considerable weight to questions of power, since it is power, rather than the facts about reality, which makes things “true” (Hall, 2006, p. 167). One truth in the science discourse is, that based on the estimates of the TRG, their *salmon* (see 4.3.4) is threatened: based on their estimates, all tributaries in the Deatnu watershed do not annually have the number of salmon spawning to reach the maximum juvenile production capacity (see 3.4). Deriving from the science discourse, *the salmon* of the policy discourse is *nearly in an alarming state*. On the other hand, *the salmon* of a traditional Saami fisher in Deatnu mainstream is doing quite well. During the 15 years my father and I have

¹¹⁷ *Buodđut*: To fish with a weir. *Golgadit*: to fish with a drift net. Original in Sámi: “Stuorámus áitta Deanu ja kultuvrra vuostá lea ahte mis eai leat maŋisboahitit geat máhttet buodđut, golgadit – geat áddejit Deanu.”

fished with a *buodđu*, a weir, there has been no declining trend in our catches. A typical fish in our *buodđu* is a *Deanu diddi*, a salmon under three kilos that is of the Deatnu mainstream population (see 4.3.3). There is no lack of *Deanu diddi*; not based on the research of the TRG nor based on *árbediehtu*. Then again, this does not mean that all salmon populations in the watershed are doing well.

The material I presented does not allow to draw any final conclusions on what a Saami approach for strengthening specific salmon populations would be. However, I suggest that this approach could be to limit the fishing of non-rights holders, and to compensate the possibility of not reaching the spawning goal annually by enhancing the survival and living conditions of salmon parr. This could be done in a program, considering how Saami knowledge on salmon and Deatnu will be maintained and implemented into the knowledge construction and the management of human activities in Deatnu. Maintaining this knowledge should have an emphasis, as there are so few youth involved in traditional fishing. Such a program should look into how Saami care for a salmon river, for example by habitat restoration and mapping old ways and strategies of restricting predator populations. The Ecosystem Approach encourages localised, holistic and adaptive approach to management. Therefore, it provides a framework under which to address the concerns of the Saami knowledge holders, as well as the Saami right to control traditional livelihoods and resources. In the rapidly changing sub-arctic there are many unanswered questions to all knowledge systems. For understanding ecosystem change approaches such as co-construction of knowledge, which would combine the “thousand years of experience” of TK with scientific approaches, are especially needed in Deatnu.

Mun maid bivddán juoidá dáinna čállosiin. Bivddán atnit árvvus dan dološ vuoimmi man vuohtán vuorrasiin čiekjalis gamus: dárbbu háhkat birgejumi luonddus. Áhččán šaddá luossabivdoáiggi hui mášoheapmin, gitta beassá bivdui. Bođeš guolli dahje ii, vuoijastit ii bálle ovdal lea beassan bivdit. Sin buolva diđii, ii oktage boađe sin biepmat. Mun gal in dieđusge nealgái jámášii, vaikko in beasašige bivdit luosa. Juoga mus goit jámášii. Dát geađgegietskka, sámimáná ruoktu, lea biepman min agibeavve. Eadnihan gal mánáidis biepmá, vaikko mii leš. Luonduálbmot ii ceavcce, jos diet čanastat boatkana. Min máhttu eallit luonddus, goaritkeahhtá, lea mávssolut go miige eará. Mishan lea dušše okta máilbmi. Jos mii bivdit, de dat máhttu seailu, ja nu seailut miige.

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