



Contents lists available at ScienceDirect

Environmental Science and Policy

journal homepage: www.elsevier.com/locate/envsci

Socio-cultural values as a dimension of fisheries governance: The cases of Baltic salmon and herring

Suvi Ignatius^{a,*}, Alyne Delaney^{b,c}, Päivi Haapasaari^{a,b}

^a University of Helsinki, Ecosystems and Environment Research Programme, Fisheries and Environmental Management Group, Kotka Maritime Research Centre, Finland

^b Aalborg University, Department of Planning, Innovative Fisheries Management (IFM), Denmark

^c Tohoku University, Center for Northeast Asian Studies (CNEAS), Japan



ARTICLE INFO

Keywords:

Socio-cultural values
Fisheries governance
Stakeholder involvement
Baltic salmon
Baltic herring

ABSTRACT

The socio-cultural values associated with fish and fisheries affect the utilization and management of fish resources. However, these values often remain implicit in fisheries governance. This paper suggests addressing values explicitly to enhance the legitimacy of governance. We analyzed the values related to Baltic salmon and herring in Finland and Estonia, based on stakeholder interviews. By identifying similarities and differences between the values associated with two species in two countries, this paper demonstrates the multivalued nature of fish and fisheries. Based on our analysis, we recommend explicit and systematic inclusion of values in the early stages of governance processes to ensure morally reasoned management and use of fish resources.

1. Introduction

The way in which fish resources are utilized and managed reflects the socio-cultural values associated with fish and fisheries. Different species have different meanings in different contexts and groups (Lam, 2015; Levin et al., 2016). Values also affect management decisions, either implicitly or explicitly. Thus, governance implies choosing between or reconciling multiple and sometimes conflicting values (De Young et al., 2008; Ives and Kendall, 2014; Kooiman and Jentoft, 2009). Furthermore, values also influence the design of institutions and decision-making procedures (Kooiman and Jentoft, 2009).

However, some values seem to be more actively discussed and promoted in fisheries governance than others. Song et al. (2013) found ecosystem conservation, wealth and knowledge to be the most prevalent values in fisheries governance discourse, overall. Equality, secure livelihoods, achievement, tradition and influence were discussed to a lesser extent, whereas several other values were rarely acknowledged. The less discussed values may nevertheless be important for stakeholders, and ignoring them may reduce the social acceptability of management activities (Ives and Kendall, 2014). Therefore, addressing the whole range of values could reinforce the knowledge base of management and enhance the legitimacy of decisions (Linke and Jentoft, 2014; Samhuri et al., 2014).

In this paper, we explore the multivalued nature of fish resources and discuss its implications for governance. We do this by empirically

analyzing the values that stakeholders in Finland and Estonia associate with two regional keystone species, Baltic herring and salmon. The aims of the paper are: 1) to obtain an overview of the ways in which these fish species are important in different contexts; 2) to discuss the ways in which values are represented in fisheries governance and management at the national level in Finland and Estonia; and 3) to reflect the possibilities to systematically and explicitly engage values in governance.

We define the values relating to a fish resource as evaluations of the importance of the fish and the fishery to a society (Ignatius and Haapasaari, 2018). This definition refers to the socio-cultural dimension of values, and implies a focus on the shared ways in which the fish and the fisheries are important to human communities, and does not view values as something inherent to the environment or to individuals (see also Tadaki et al., 2017). We assume that people refer to the shared and context-dependent values when they think about the societal importance of something and communicate it.

We apply the theory of justification of Boltanski and Thévenot (2006, 1999), which recognizes seven widely shared value bases from which people draw when considering the societal importance of something. These value bases are: 1. Civic values that reflect solidarity, equality and common welfare, 2. Green values that respect nature in its own right and consider conservation important, 3. Domestic values that build on traditions and orientate towards preserving the customary past, 4. Inspirational values that are founded on an immediate relationship with the environment and the emotions it awakes, 5. Fame

* Corresponding author.

E-mail address: suvi.ignatius@helsinki.fi (S. Ignatius).

<https://doi.org/10.1016/j.envsci.2018.12.024>

Received 24 May 2018; Received in revised form 2 November 2018; Accepted 18 December 2018

1462-9011/© 2018 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

values that emphasize signs of popularity and visibility, 6. Market values that stress the acquirement of money and wealth, and 7. Industrial values that highlight the importance of the efficient utilization of resources and the importance of scientific knowledge in the management of the resource (Boltanski and Thévenot, 2006, 1999; Thévenot et al., 2000).

Although these value bases are widely shared by Western societies, their resonance and interpretation in particular cases may differ depending on context (Ylä-Anttila and Luhtakallio, 2016; Ylä-Anttila and Kukkonen, 2014). Therefore, values need to be analyzed in their context. We begin with describing the case studies of Baltic salmon and herring fisheries. We then present the methodology that we used to analyze the values related to these species. The results section presents the value themes discussed by the Finnish and Estonian interviewees. After this, we summarize and compare the cases, and discuss the implications for governance.

2. The cases of Baltic salmon and herring

2.1. Baltic salmon

Baltic salmon is one of the top fish predators of the Baltic Sea. Salmon are born in rivers, migrate to the sea to feed and return to spawn in their natal river. During the 20th century, the majority of the Baltic salmon stocks were destroyed or depleted due to the damming of rivers, habitat destruction, pollution and intensive fishing (Romakkaniemi et al., 2003). The Salmon Action Plan, introduced by the International Baltic Sea Fisheries Commission (IBSFC) in 1997, implied dealing with the stock declines in selected rivers in different Baltic Sea countries through fishing restrictions, stocking and habitat restoration. Efforts have also been made to restore salmon stocks in former salmon rivers that were dammed for hydroelectric power production in the middle of the 20th century (Erkinaro et al., 2011). Finland currently has two rivers – Tornionjoki and Simojoki – with naturally reproducing wild salmon stock (International Council for the Exploration of the Sea (ICES), 2017). The river Tornionjoki is the most important wild salmon river in the whole Baltic Sea. Minor natural reproduction has been observed in a few other rivers in Finland. In Estonia, small-scale wild salmon reproduction takes place in three rivers: Kunda, Keila and Vasalemma (International Council for the Exploration of the Sea (ICES), 2017). In addition, in several other rivers reared salmon is released to support natural reproduction.

Owing to tightened restrictions to protect stocks, commercial salmon fishing has significantly decreased in the last decades (International Council for the Exploration of the Sea (ICES), 2017). In 2016, the total allowable catch set by the EU for commercial fishing was 109 034 Baltic salmon, of which Finland's share was 36 549 salmon (34%) and Estonia's share 3364 salmon (3%). In Finland, commercial salmon fishers operate on the coast and mostly use trap nets. The majority of the catch is taken from the Gulf of Bothnia, and a smaller share is caught in the Gulf of Finland. In Estonia, salmon is mainly by-catch in the coastal fishery and the majority of salmon is caught by gillnets in the Gulf of Finland (International Council for the Exploration of the Sea (ICES), 2017).

As commercial fishing has decreased, recreational salmon fishing has increased (International Council for the Exploration of the Sea (ICES), 2017). In Finland, the recreational salmon catch was around the same size as the commercial catch in 2016. In Estonia, recreational fishers take about one-third of all caught salmon. In both countries, angling in rivers is the main form of recreational salmon fishing. In Finland, recreational fishers target salmon particularly in the rivers Tornionjoki and Simojoki, which flow into the Gulf of Bothnia, but also in the river Kymijoki that flows into the Gulf of Finland. In Estonia, recreational fishing takes place in small rivers flowing into the Gulf of Finland (International Council for the Exploration of the Sea (ICES), 2017).

2.2. Baltic herring

Baltic herring is a keystone fish species in the Baltic Sea ecosystem because of its high abundance and its role in the pelagic food web (Casini et al., 2010). It is distributed all over the Baltic Sea. Herring spawns in coastal waters, and its feeding and spawning migrations are complex. (Helsinki Commission (HELCOM), 2013). Herring is the most abundant commercial catch species in the Baltic Sea, and stocks are currently considered to mostly be at a biologically sustainable level (International Council for the Exploration of the Sea (ICES), 2018).

Baltic herring is caught by commercial fishers in all the riparian countries. In 2016, around 357 000 tons of Baltic herring (excluding western stocks) was caught, of which Finland's share was around 137 000 tons (40%) and Estonia's around 36 000 tons (10%) (International Council for the Exploration of the Sea (ICES), 2018). In both countries, Baltic herring is the most important catch species in terms of volume and monetary value. The most important herring fishing area for Finland is the Gulf of Bothnia. The majority of the Estonian herring catch is fished in the Gulf of Riga and the Gulf of Finland. Both countries also catch herring in other parts of the northern and central Baltic Sea (International Council for the Exploration of the Sea (ICES), 2016).

In Finland, 90–95% of the herring catch is taken by trawlers (Ministry of Agriculture and Forestry of Finland, 2017). Estonia trawled around 70% of its herring catch in 2015 (International Council for the Exploration of the Sea (ICES), 2016). Coastal fishing with nets and trap nets also takes place during spawning time. In Finland, coastal herring fishing takes place along the coast of both the Gulf of Bothnia and the Gulf of Finland and in the archipelagos. In Estonia, the Gulf of Riga is the most important area for coastal herring fishery, but herring is also fished in other coastal areas and on the islands (International Council for the Exploration of the Sea (ICES), 2016).

The use of the catch differs by country and over time, and is largely driven by market conditions (International Council for the Exploration of the Sea (ICES), 2016). In Finland, the majority of the catch is currently used as feed for fur animals, but in recent years the use of herring for the production of fish meal and oil has increased. In Estonia, most of the catch is exported to eastern European markets to be used in the canning industry. The domestic human consumption markets for Baltic herring are small in both countries. On average, the Estonians eat more herring than the Finns (BONUS GOHERR, 2016). In Finland, the consumption of herring has significantly decreased in recent decades, from about 1.5 kg/person/year in 2000 to 0.3 kg/person/per year in 2016 (Natural Resources Institute Finland, 2017).

2.3. Management of Baltic salmon and herring fisheries

Annual decisions regarding total allowable catches (TAC) for commercial salmon and herring fisheries are taken at the EU level, whereas recreational fisheries are managed at the national level. The decision proposals for the TACs are based on scientific stock assessments and related management advice, prepared by the International Council for the Exploration of the Sea (ICES). Stakeholders are consulted through the Baltic Sea Advisory Council (BSAC), a regional stakeholder organ representing the commercial and recreational sectors, environmental non-governmental organizations (ENGOs) and a few smaller groups.

At the national level, each EU member state has its own structures for fisheries management. In Finland, fisheries are under the jurisdiction of the Ministry of Agriculture and Forestry. In Estonia, the Ministry of the Environment is responsible for stock protection and quotas, whereas the Ministry of Rural Affairs divides the fishing possibilities for commercial fishers and collects fishing data. In both countries, commercial and recreational fishers are consulted for management proposals. In Finland several ENGOs and associations representing the people living along the salmon rivers also actively engage in fisheries management. In both countries, Fisheries Local Action Groups (FLAGs) have been organized to obtain support from the EU to develop the viability of

the local communities.

In recent decades, the management of Baltic Sea fisheries has generally been a contentious issue both at the national and EU level. For example, the annual setting of TACs has been disputed (Linke et al., 2011). The management of Baltic salmon fisheries in particular has been an issue of conflict between geographical areas, commercial and recreational fishers, and conservationists and resource users (Linke and Jentoft, 2014; Salmi and Salmi, 2010), especially in Finland (Salmi and Salmi, 2010). In recent years, Finland's Ministry of Agriculture and Forestry has tried to ease these disagreements by developing a national salmon strategy in collaboration with stakeholders.

3. Methods and material

We analyze the values related to Baltic salmon and herring in Finland and Estonia by applying the justification theory (Boltanski and Thévenot, 2006, 1999). This theory represents a communicative approach to values, as it sees them in terms of a common good that is constantly evaluated and negotiated. For example, whenever there is a public dispute or a need to provide a good reason for a public decision, people have to emphasize the generality of their arguments. In other words, it is not enough for people to consider why something is important for themselves; they must also consider how it might be important for society in general. People need to justify their claims by referring to the common good, and other people assess the appropriateness of these claims by using the common good as an evaluative standpoint (Boltanski and Thévenot, 2006, 1999; Ignatius and Haapasaaari, 2018).

The need to justify one's arguments by referring to the common good is often visible in a decision-making setting, where people with different views and interests meet and are expected to find a common resolution. References to the common good may also be made in public discussions, for example, in the media. In fact, a person needs to consider the common good and value-based justifications whenever forming a position on the societal importance of something and communicating it (See also Thévenot et al., 2000). We analyzed how stakeholders justify the importance of Baltic salmon and herring based on the common good in an interview setting. The interview material represents the positions and views of different stakeholders on the importance of these species to society.

We interviewed 30 stakeholders (17 in Finland and 13 in Estonia) during 2015–2016. The interviewees represented commercial and recreational fishers, fishing and rural tourism, NGOs, fisheries scientists, managers, and local people involved in fisheries. The interviewees were selected from organizations that take part in national fisheries governance. In regards to commercial and recreational fishing sectors, the emphasis was on regions in which Baltic salmon and herring are important in terms of the number of fishers and the quantity of catches.

We used a semi-structured interview guide (Bernard, 2002) to ensure that all participants were asked the same questions. The interviewees were asked how and why they consider Baltic salmon/herring important for their community/reference group, for other communities and for society in general. They were also invited to consider potential counter-arguments and the viewpoints of other groups. The seven value bases of the justification theory were used to formulate the thematic questions to further discuss the importance of these species. The themes included fairness of management (civic), conservation (green), traditions (domestic), emotional and recreational importance (inspiration), symbolic importance (fame), economic importance (market), and the utilization of the resource and the role of science in management (industrial). For example, regarding the importance of traditions, we asked the interviewees whether they were aware of any traditions related to these species and to consider their socio-cultural value.

The duration of the interviews ranged from 60 to 150 min. They were transcribed and grouped into themes according to the seven value bases. In the analysis we paid attention to which value-themes were

most discussed and why, and which were not so often referred to and why. We also traced similarities and differences between the value-discourses of the two contexts.

4. Results

4.1. Socio-cultural values related to Baltic salmon in Finland and Estonia

4.1.1. Finland

Among the Finnish stakeholders, fairness of management was often a dominant theme in the interviews. The interviewees acknowledged that although salmon politics has been conflicted for centuries, stakeholder groups have multiplied and diversified in recent decades. The commercial fishers felt that their position had deteriorated due to this development: *“Our numbers have decreased, and we are scattered along the coast. Therefore, our voice is becoming more and more marginalized, although we are formally consulted.”* The other groups, including NGOs, recreational fishers and people living along the salmon rivers, argued that management has become more balanced and just than earlier: *“For a long time, commercial fishing at sea was a top priority for the ministry and it didn't take into account whether some other parties also had right to the natural resource. This has now changed, quite totally.”* These groups considered that the current situation has required and will continue to require active work. Fairness was mostly discussed in the context of national fisheries management, but a few commercial fishers and people living along the salmon rivers also highlighted fairness between the Baltic Sea states as an important issue. According to them, countries in which salmon rivers are located should have priority rights in salmon fishing, because they have the biggest responsibility for the stocks.

The Finnish interviewees also frequently discussed conservation values, although conservation was often compromised with utilization values. They stressed biologically sustainable stock management. The importance of conserving wild salmon stocks was highlighted by the interviewed scientists, representatives of NGOs, recreational fishers and people living along the salmon rivers. They pointed out that emphasis on conservation values has grown in recent years, as commercial quotas have decreased: *“In recent years, quotas have safeguarded the stocks quite well, at least in the largest rivers. Of course, some of the biological diversity has been lost, but some has also been restored.”* These groups also stressed the need for more stock-specific fishing and the restoration of river habitats to support the conservation of stocks. The commercial fishers generally agreed that safeguarding stocks is important, but also felt that it has been done at their expense. They saw open sea fishing, river habitat problems and seals as the main threats to stocks: *“Commercial salmon fishing in Finland is not a threat to the stocks because it is coastal trap-net fishing, unlike in the Main Basin, where it is unselective long-line fishery.”*

The majority of the interviewees acknowledged the tradition value of Baltic salmon for the northern salmon river valleys and certain coastal areas. Salmon was described as an appreciated seasonal food among the local communities, a cornerstone for the coastal fishing livelihood and part of the local culture. In a salmon river area, Baltic salmon was considered an essential part of cultural heritage: *“In the old times and even in the 1900s, salmon fishing was a major source of wealth for our area, which heavily relied on fishing, gathering and hunting. I think the current importance of salmon stems from this tradition. It has been caught here for ages and there is a lot of folklore and documents about it.”* The commercial salmon fishers emphasized the regional importance of salmon as a seasonal dish, which they help to deliver: *“At Midsummer people want to have salmon on their tables, it's a tradition.”*

Salmon seemed to inspire strong emotions among all Finnish interviewees. This inspirational value was linked to the struggle between man and nature and between different groups. Salmon was seen as something unique and a source of both joy and sorrow. The recreational fishers also viewed salmon as an exciting, impressive sight and a provider of experiences: *“Catching a big salmon is like brawling with a man.”*

The people living along the salmon rivers explained that the meaning of salmon is mental or spiritual, and sensory observations confirming that salmon is present were regarded as important: “*It is first and foremost an experience to be able to enjoy the power of salmon, something similar to Aurora Borealis.*”

Symbolic values were also attached to salmon, which was considered “the king of fish”, “as valuable as gold”, “a symbol of nature conservation”, “a manifestation of power”, “a pet topic for the media” and “a magnet that attracts different segments of society”. Symbolic importance seemed particularly strong in the northern regions. The interviewees, depending on their position, called Baltic salmon “salmon of sea area x” or “salmon of river x”. In the river areas, salmon was seen as a symbol of hope, and its spawning run was considered an important part of the annual cycle. One ENGO representative pointed out that Baltic salmon, as such a charismatic or iconic species, had worked as a flagship for the conservation of other threatened fish species.

The interviewees also reminded us of the regional economic importance of salmon for coastal fishery and fishing tourism. The commercial fishers emphasized that their livelihood depended on salmon, which could bring over half of their yearly revenue. The people living along the rivers and the recreational fishers stressed the economic potential of fishing tourism.

The majority of the interviewees stressed the importance of natural scientific knowledge for the management of stocks. However, the commercial fishers claimed that their experiential knowledge should be included in the knowledge base. Table 1 sums up the values related to Baltic salmon referred to by the Finnish interviewees.

4.1.2. Estonia

In Estonia, the interviewed managers, scientists and recreational fishers often highlighted conservation values, referring both to the sustainable management of the stocks and to the intrinsic value of salmon. One manager expressed a humble attitude towards managing the stocks: “*Nowadays we can see that nature is the best manager, so what we could do is just help nature recover, so it can manage the natural level.*” According to one scientist, salmon was an indicator of the wellbeing of the environment: “*Salmon is closely connected to the rivers. If there are many salmon in the river, it is considered to be in good condition.*” In relation to this, salmon was seen to symbolize wild nature. A recreational fisher regarded salmon as worth preserving for its own sake: “*If there is salmon, nature has done its thing and if it's there, let it be there. It is nature. Nature has its course, and we're not allowed to mess it up.*”

Recreational fishers and one manager attached inspirational values to salmon, often combining them with conservation values. Seeing the stocks recovering with one's own eyes was appreciated: “*The place was full of big fish, and the view was like 'wow'. I'll never forget it.*” Inspirational values were also attached to recreational salmon fishing: “*It's a very interesting fish to catch, because it protects itself very much and is very powerful. You must be very smart, you have to know the place and the time, and what equipment to use.*”

The managers and fishers discussed the fairness of management to

some extent, but they did not see the representation of different interests in the national policy processes or the allocation of catching opportunities as a highly pressing issue. One manager noted: “*Salmon has been a small issue; how to divide between recreational and commercial, who has a bigger right to catch salmon during spawning time. We've come to the decision that almost nobody is allowed to catch.*” However, another manager raised the issue of fairness in relation to other Baltic Sea countries, claiming that commercial salmon fishing should be a coastal activity: “*Then it would be really equal in terms of who really is active, and if you put an effort into the recovery you also see the results.*”

The biological knowledge base of the management of salmon stocks was, overall, regarded as essential and its legitimacy was not questioned. The interviewees rarely referred to the tradition value of salmon. The economic importance of salmon for commercial fishing was regarded as minor, but the economic potential related to coastal/nature tourism was occasionally mentioned. Table 1 summarizes the values related to Baltic salmon referred to by the Estonian interviewees.

4.2. Socio-cultural values related to Baltic herring in Finland and Estonia

4.2.1. Finland

The most emphasized value theme among the Finnish interviewees was the economic importance of Baltic herring for commercial fishing in Finland. Economic value was linked to large catch quantities: “*Baltic herring is the economic backbone of the Finnish fishing industry due to its volume.*” The profitability of herring fisheries was an important theme for the commercial fishers. All the interviewees saw fish meal and oil industry as an opportunity to increase the economic value of the herring catch. One commercial fisher reflected: “*Competition for the use of herring catches has emerged only recently, as the Danish fish meal factories have started to take herring. (...) Additional competition is always positive in economic terms.*”

All the interviewees considered the use of herring as human food and for the production of fish meal and oil as morally sound. They would prioritize the use of herring as food, but because of current very low human consumption, the use of herring as feed in fish farming was seen as the second-best alternative. However, the interviewees disagreed on the acceptability of using herring as feed for fur animals. A few representatives of the commercial fishing sector saw it as efficient and profitable utilization, but one ENGO representative criticized it from the perspective of global food security: “*The majority of fish used for human consumption in Finland is imported. We consume mostly Norwegian salmon, which indirectly affects fisheries all over the world, also in those areas where local fish stocks are the most important protein source for local people. Then we have this one great, sustainable fish stock just nearby, which is fed to minks. The situation is absurd.*” The commercial fishers acknowledged the importance of herring for food security, but they saw different usages as complementary to each other.

The interviewees regarded the fishing and use of Baltic herring as an environmentally friendly activity. A commercial fisher reflected: “*Fishing herring is a very natural source of livelihood. The fish stocks are*

Table 1
Socio-cultural values related to Baltic salmon in Finland and Estonia based on stakeholder interviews.

Value-theme	Finnish interviewees	Estonian interviewees
Fairness (civic)	Social justice between stakeholder groups a highly relevant issue.	Social justice between commercial and recreational fishers a minor issue.
Conservation (green)	Emphasis on sustainable management of stocks.	Emphasis on sustainable management of stocks and intrinsic value of the species.
Traditions (domestic)	Importance of traditions related to the use and fishing of salmon in river and coastal areas.	Tradition value seldom highlighted.
Inspiration	Raises strong emotions; inspires recreational fishers and people living along the salmon rivers.	Inspires conservation and recreation.
Symbolic meaning (fame)	Carrier of diverse symbolic values.	Symbol of wild nature.
Knowledge (industrial)	Knowledge base for management partly contested.	Biological knowledge base for management stressed.
Economic importance (market)	Regional importance of coastal fishery and fishing tourism.	Minor importance of coastal fishery, potential for rural tourism.

abundant and given by nature itself. (...) If we fishers didn't take care of the fish stocks in the long term too, we'd be mad." Herring fishing was seen as a way to reduce nutrients from the Baltic Sea and herring as a more sustainable food choice than many other animal protein sources. The interviewees also believed Finnish herring fisheries to be sustainable. One representative of an ENGO commented: "I am proud of our Baltic herring stocks and their management. Bothnian Sea herring especially is one of the most sustainably managed fish stocks in the EU and in the world."

Fairness of management was an important value theme for the commercial herring fishers. They considered it crucial for the sake of justice that the sector would be more involved in the management of the fishery. The fishers also saw their involvement as a way of reinforcing the knowledge-base of management and improving the flexibility of management. The decision-making framework was seen as rigid and bureaucratic: "Bureaucracy in this sector is horrible. They don't use us active fishers enough as experts. It often feels that civil servants act mainly on the basis of their own views." The timeliness of the information used for stock assessments was also considered problematic: "The herring stocks are renewed so quickly that scientific assessments are often outdated by the time they're published. (...) Many of us fishers would like to help, for example, take samples or collect up-to-date information."

Other value themes were discussed less in relation to herring. Herring was still considered to be a part of coastal culture as traditional food, which also connects people to the sea, for example, through the annual herring markets that have been held in some coastal towns for centuries. Symbolically, herring was seen as the 'people's fish', but the image of herring as food was considered poor. Inspirational values were sometimes linked to the taste of herring, while the importance of herring for recreational fishers was considered small. Table 2 summarizes the values related to Baltic herring referred to by the Finnish interviewees.

4.2.2. Estonia

As in Finland, the Estonian interviewees often linked the importance of Baltic herring to its economic value for commercial fishing. They also emphasized the importance of herring for the processing industry: "Economically it's very important for fishermen and for the processing industry that freezes it and sells it. Actually, we have vertical integration in the sector, the fishermen's own processing and freezing and selling of it. They're covering all the chains. That makes it more profitable for them." The regional economic importance of the coastal herring fishery was also stressed: "Herring is number one in volume and income. In all the numbers. (...) It is a kind of a backbone for the fisheries' community." Although trawl fisheries have been concentrated into large units, the fishers were still worried about profitability. The majority of catches is sold to eastern European markets for human consumption, but some fishers pointed out the need to extend these markets to the fish meal and oil industry.

Table 2
Socio-cultural values related to Baltic herring in Finland and Estonia based on stakeholder interviews.

Value-theme	Finnish interviewees	Estonian interviewees
Economic importance (market)	Great importance of commercial fishery.	Great importance of commercial fishery.
Use of the catch and knowledge (industrial)	Use as human food preferred and use as fish meal/oil accepted, but use as feed for fur animals contested. Commercial fishers criticize untimeliness of scientific advice and rigidity of management.	Use for local human consumption preferred and use for export accepted, but use as fish meal/oil contested. Both faith in and critique of knowledge-base of management.
Conservation (green)	Sustainable management of stocks emphasized; fishing and use of herring as environmentally friendly activity.	Sustainable management of stocks emphasized.
Traditions (domestic)	Part of coastal culture as traditional food.	Important for preserving coastal fishing and fish-eating traditions.
Symbolic meaning (fame)	'People's fish'; negative image as food.	'National fish'; essential for identity of certain areas.
Inspiration	Taste evokes emotions; minor recreational importance.	Well-cooked herring as taste experience.
Fairness (civic)	Emphasis on use of herring in food production in context of (global) food security. Commercial fishers call for more involvement in management.	Emphasis on food use of herring as healthy and affordable food. Commercial fishers relatively content with their involvement in management.

Still, all the interviewees thought that human consumption should be prioritized over the industrial uses of herring. They emphasized that herring should be available for local and domestic consumption. Supporting the coastal traditions related to herring fishing and eating was deemed important. Herring consumption was also considered an issue of justice as it was seen as nutritious food that low-income people could also afford. Consequently, the use of herring in the production of fish meal and oil divided opinions. The commercial fishers wanted to see herring used mostly as human food, but found this difficult: "For us, the country that has been focusing mainly on fishing for human consumption, we would very much like to do this in the near future as well, but we see that the world is moving in a different direction." Thus, they saw the fish meal and oil industry as a potential means of increasing the profitability and predictability of commercial fishing. Others had reservations: "All that comes from the sea must be mostly used as human food."

The environmental values related to Baltic herring were mostly discussed in the context of the sustainable management of stocks. The interviewees agreed that biological sustainability is among the top priorities of management, and that most herring stocks are currently at a sustainable level. One manager noted: "Baltic herring is caught at a maximum sustainable yield level, and based on this you could give it an environmental certificate." The fisheries scientists expressed more caution, referring to uncertainty in stock assessments and variability in natural conditions. A commercial fisher stressed the importance of maintaining a balance in nature: "You have to be a good host. You must pay attention to how the stocks are doing. Otherwise you lose your entire livelihood."

All the interviewees acknowledged the tradition value of herring, particularly for the coastal and island communities. The tradition value was related to both herring fishing and herring consumption: "It's been consumed here since forever, and I couldn't imagine myself in Estonia or [name of community] without herring or without herring fisheries and herring meals. It's important for cultural heritage, especially on the islands." Some interviewees, including commercial fishers and scientists, referred to historical fishing documents and maps about fishing grounds, while others described the traditional know-how of preparing herring and linked it to inspirational values to a way of creating tasty herring dishes. The tradition value was also combined with symbolic values, as many interviewees emphasized the status of herring as the national fish of Estonia and the importance of herring for the identity of certain coastal areas and islands.

In regard to fairness, the interviewees, including the commercial fishers, seemed relatively content with the management. One local fisheries representative noted: "We are in a good position, we can go to our ministries, and I think this is good." Another fishery representative reflected on fairness in terms of allocation of fishing opportunities: "It always depends on who you ask. But I find it really hard to name any system that would work better." A few interviewees criticized the knowledge-

base of management while others expressed more faith in it: “We want to believe that the specialists who determine how much we are allowed to catch and how to catch are knowledgeable”. Table 2 summarizes the values related to Baltic herring, referred to by the Estonian interviewees.

5. Discussion

The interviewed Finnish stakeholders associated a wide variety of values (fairness of management, conservation, traditions, inspiration, symbolic values, knowledge, and economic values) with Baltic salmon whereas in Estonia, diversity was narrower (conservation, inspiration, fairness of management, and knowledge). The results suggest that the socio-cultural value of Baltic salmon is more multifaceted and contentious in Finland than in Estonia.

The frequent references to tradition and symbolic values among the Finnish but not among the Estonian interviewees may reflect the differing cultural histories related to salmon between these two countries, which are also related to geographical differences between the contexts. In Finland, Baltic salmon was historically abundant until mid-20th century in many big rivers and an important resource, especially in the north (Erkinaro et al., 2011). Salmon also contributed to the development of traditions and local identities in the salmon river areas (Autti and Karjalainen, 2012; Vilkuna, 1975). Our study indicates that these values are still discursively maintained. Moreover, tradition and symbolic values seem to be important motives for conserving stocks. In Estonia, where the rivers and the salmon stocks are smaller (Kesler, 2015), the importance of salmon as a resource and for local traditions and identities has been smaller. However, some of the interviewees considered whether people had been alienated from salmon, as the salmon stocks suffered from industrialization (see also Kesler, 2015), and access to fishing was restricted during the Soviet era (see also Vetemaa et al., 2006).

The finding that the Finns more often emphasized fairness in salmon management than the Estonians suggests that the inclusion of and balancing between different interests has been a long and laborious process in Finland, where the groups involved in salmon policy are more numerous and heterogeneous. The Finnish interviewees pointed out that salmon has been a source of contention from times immemorial. Representatives of conservation and river fisheries alluded to their former feelings of exclusion from policy-making and saw their current inclusion as being a result of their own hard work. They also saw maintaining their representation in policy-making as an issue of justice. However, commercial fishers seemed to find this a threat to their livelihood, which in certain areas depends on salmon. The Estonian interviewees said that balancing commercial and recreational interests was not easy, but fairness of management did not arouse meandering reflections on social justice. This could be because fewer interest groups are involved in policy-making and the economic importance of salmon for commercial fishing is relatively minor.

The relationship between hydropower and Baltic salmon demonstrates the ways in which different values related to salmon interplay within and between the contexts. In both countries, the damming of rivers for electricity production drastically reduced wild salmon stocks during the 20th century. The Finnish interviewees saw this as a major environmental, economic, social and cultural injustice, while the Estonian interviewees mostly discussed the environmental damage caused by the dams. The Finnish interviewees also talked quite a lot about the legal obligation of the hydropower companies to compensate the damage the dams caused to the fisheries. Currently the main compensation method is the annual releases of reared fish into the dammed rivers and their mouths. The commercial fishers considered this practice and its continuance crucial for the sake of justice, while the other groups criticized it as insufficient for addressing the environmental, social and cultural aspects of salmon and its fisheries.

The economic importance of Baltic herring for commercial fishing, as well as the efficient and fair utilization of the catch were emphasized

by the stakeholders of both countries. The Finnish interviewees also stressed the environmental values related to the fishing and consumption of herring while the Estonian interviewees highlighted the sustainable management of the stocks and the tradition value of herring for the coastal and island communities. These results suggest that, overall, the socio-cultural value of Baltic herring is quite similar in these countries, although distinctive nuances also exist.

The Finnish interviewees saw the use of herring as environmentally friendly behavior, whereas this was not a common view among the Estonians, who valued herring as natural and local food. We interpret that the Finns attached environmental values to the use of the catch because of its strong compromise potential for different stakeholders. NGOs, among others, see it as a way to promote sustainable eating habits while at the same time removing nutrients from the sea, whereas the fishing industry also considers it a market opportunity. The compromise between environmental and economic values is demonstrated by the effort put into the environmental certification of Finnish herring and sprat fishery (Marine Stewardship Council, 2018). The contextual differences between the market areas for herring, and public discussion concerning the environmental impacts of food production and consumption may also explain how the use of herring is framed.

The importance of herring-related traditions to the Estonian interviewees seems to relate to the fact that in Estonia, coastal herring fishing is still relatively common and is centered in certain regions. In 2015, nearly 30% of Estonia's herring catch was from spawning grounds (International Council for the Exploration of the Sea (ICES, 2016), whereas in Finland the share of coastal fishing from the herring catch was less than 10% (Ministry of Agriculture and Forestry of Finland, 2017). The Estonian interviewees also linked the tradition value of herring to the identity of certain areas, of which they seemed to be proud. Moreover, coastal herring fishing and dishes were seen as an opportunity to market their region and develop rural tourism. In other words, the stakeholders saw the tradition value of herring as being compatible with several other value bases.

The interviewees in both countries emphasized the importance of prioritizing the use of herring for human consumption. At the same time, the domestic consumption of herring has decreased, and the tendency to use the catches for industrial purposes is growing, particularly in Finland (Natural Resources Institute Finland, 2017). Including the use of herring in the policy agenda and exploring the possibilities to support the use of herring for human consumption would be in line with socio-cultural values (Pihlajamäki et al., 2018). Efforts to promote the use of herring in food production also support the aims of the Common Fisheries Policy of the European Union (Regulation No., 1380/, 2013) to ensure the contribution of fisheries to fish food availability and self-sufficiency.

Our analysis suggests that in both countries, a combination of several value bases is incorporated in fisheries governance. Economic and use values are balanced with conservation values, and expert-steered technocratic decision-making is being reconciled with stakeholder participation (see also Linke and Jentoft, 2016, 2014; Morton et al., 2016; Song et al., 2013). The emphasis of the values varied according to the contexts.

In both countries, the emphasis on conservation values in management has grown in recent decades. Ensuring the sustainable harvesting of fish stocks through optimal fishing pressure is increasingly emphasized. During the last few decades, the focus of salmon fisheries management has shifted from managing the offshore and coastal fishing of hatchery-reared released salmon towards conserving wild stocks and supporting their natural reproduction. In Finland, the former and new approaches exist in parallel, since reared salmon is stocked to compensate for the hydropower-related damage to sea fishery but some activities also aim to restore the salmon populations. In Estonia, salmon is stocked only to support natural reproduction, and conservation of the stocks is also implemented by opening salmon migration routes in rivers. These actions reflect a stronger emphasis on conservation values.

In the case of Baltic herring, reconciling the conservation values with economic and use values in governance has been less contentious, because the stocks are in better condition and interest groups less heterogeneous. In Finland, a recent governmental development plan for the Blue Economy reflects efforts to combine environmental and economic values with the utilization of the catch, as it searches for new, sustainable and value-adding purposes for the use of herring (Ministry of Agriculture and Forestry of Finland, 2016).

The Estonian interviewees seemed more satisfied with the knowledge base of fisheries management and the opportunities to participate in governance than the Finns. Several Estonian interviewees said that they have possibilities to influence and that policy-makers listen to them. The small size of Estonia in terms of both geography and population was often mentioned as a factor facilitating collaboration in governance. The differences in satisfaction could also relate to differences in governance practices and the diversity of stakeholder groups as well as attitudes and expectations towards participation and science. Overall, understanding contextual differences in satisfaction with management would require an in-depth analysis of both governance practices and management instruments from the stakeholder perspectives.

Several authors have called for acknowledging the socio-cultural values related to fish resources and incorporating them in governance in a more structured manner (De Young et al., 2008; Lam, 2015; Linke and Jentoft, 2014; Song et al., 2013; Urquhart et al., 2013). To examine possible ways to do this, it is beneficial to think of fisheries governance as a process that consists of subsequent stages. According to the framework introduced by Linke et al. (2011) fisheries governance process comprises four stages: pre-assessment; appraisal; evaluation and characterization; and management. Pre-assessment consists of defining the problem and formulating management objectives. Appraisal is about the systematic, knowledge-based assessment of the options for reaching objectives. Characterization and evaluation are for determining the most acceptable management options. Finally, management is for deciding on and implementing management measures.

Values are currently incorporated in the stage of characterization and evaluation that aims for a “broadly informed yet basically value-based judgment on the most appropriate management measures” (Linke et al. 2011, p. 140). In the EU fisheries governance this is exemplified in the work of stakeholder-led advisory councils that are consulted for management proposals. However, Linke and Jentoft (2014) demonstrated that even though stakeholders constantly refer to value issues, these issues are also subordinated to and absorbed into the discussions on natural scientific and technical issues related to data problems and stock assessment methods. The authors concluded that to establish environmental and social sustainability in the fisheries sector, value aspects need to be included explicitly and systematically in the instrumental, science-based governance process.

We agree with these observations and suggest explicit and systematic inclusion of values already in the early stages of governance process, that is, during pre-assessment and appraisal. The way in which problems become framed and management objectives formulated is influenced by value judgments regarding the factors to be included, and the scope of the appraisal (De Young et al., 2008; Haapasaari et al., 2012; Linke et al., 2011; Sarewitz, 2004). This is particularly the case if governance is viewed as a proactive and strategic endeavor rather than reacting to changes. The Common Fisheries Policy of the European Union (Regulation No., 1380/2013) highlights the need to move towards long-term planning and objective-setting. Since values serve as signposts for what should be, they need to be explicitly discussed in order to define management objectives. In practice, the existing and emerging national and/or regional policy forums could be utilized to deliberate on values and draft value-informed strategies for the management and use of fish resources. After this, different alternatives for reaching the value-informed goals and implications of management options could be assessed. This would require further inclusion of social

science in the research institutions that provide science for policy. (Linke and Jentoft, 2014.) The perspective of the justification theory could be useful in the stages of both pre-assessment and appraisal, since it acknowledges multiple categories of values, but at the same time suggests shifting attention from opposing interests to the common good, which is a requirement for the legitimacy of governance.

Utilizing justification theory as a tool for identifying socio-cultural values related to fish resources in an interview setting had both advantages and disadvantages. The seven value bases helped structure the interviews and their analysis. However, because the value bases were broad and enabled the framing of the topic in numerous ways, the interviews were lengthy and their analysis laborious. We found interviews useful for identifying the socio-cultural values that stakeholders attach to fish resources. The interviews helped us detect points of agreement and disagreement, and to identify less discussed but important values. The next step could be to evaluate these findings in a group context to build a shared understanding among stakeholders of the ways in which fish resources are important for society.

6. Conclusions

This study demonstrates the multivalued nature of fish resources and highlights the importance of addressing the diversity of socio-cultural values explicitly in governance. Although values are currently included in fisheries governance process in the evaluation of management proposals, they also need to be included in the earlier stages of governance process – during pre-assessment and appraisal – to ensure morally reasoned management and use of fish resources. Further research is needed concerning potential mechanisms or methods to incorporate values in governance processes. An approach capable of accounting for a wide variety of values and orientation towards the common good is required in order to create a meaningful dialogue and deliberation on how to govern common natural resources in a justifiable way.

Acknowledgements

This work was part of the BONUS GOHERR project (Integrated governance of Baltic herring and salmon stocks involving stakeholders), which was supported by BONUS (Art 185) and funded jointly by the EU, the Academy of Finland and the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning. We thank all the interviewed stakeholders.

References

- Autti, O., Karjalainen, T.P., 2012. The point of no return – social dimensions of losing salmon in two northern rivers. *Nordia Geogr. Publ.* 41 (5), 45–56.
- Bernard, H.R., 2002. *Research Methods in Anthropology: Qualitative and Quantitative Methods*, third edition. Altamira Press, Walnut Creek.
- Boltanski, L., Thévenot, L., 1999. The sociology of critical capacity. *Eur. J. Soc. Theory* 2 (3), 359–377.
- Boltanski, L., Thévenot, L., 2006. 1991] *On Justification: Economies of Worth*. Princeton University Press, Princeton [Published in French as *De la justification: les économies de la grandeur*. Gallimard, Paris].
- BONUS GOHERR, 2016. *Fish Consumption Study*. (Accessed 17 December 2018). http://en.opasnet.org/w/Goherr:Fish_consumption_study.
- Casini, M., Bartolino, V., Molinero, J.C., Kornilovs, G., 2010. Linking fisheries, trophic interactions and climate: threshold dynamics drive herring *Clupea harengus* growth in the central Baltic Sea. *Mar. Ecol. Prog. Ser.* 413, 241–252.
- De Young, C., Charles, A., Hjort, A., 2008. *Human Dimensions of the Ecosystem Approach to Fisheries: an Overview of Context, Concepts, Tools and Methods*. FAO Fisheries Technical Paper 489. Food and Agriculture organization of United Nations, Rome.
- Erkinaro, J., Laine, A., Mäki-Petäys, A., Karjalainen, T.P., Laajala, E., Hirvonen, A., Orell, P., Yrjänä, T., 2011. Restoring migratory salmonid populations in regulated rivers in the northernmost Baltic Sea area, Northern Finland – biological, technical and social challenges. *J. Appl. Ichthyol.* 27 (Suppl. 3), 45–52.
- Haapasaari, P., Mantyniemi, S., Kuikka, S., 2012. Baltic herring fisheries management: stakeholder views to frame the problem. *Ecol. Soc.* 17 (3).
- Helsinki Commission (HELCOM), 2013. *Species Information Sheet: Clupea harengus*. HELCOM Red List Fish and Lamprey Species Expert Group. (Accessed 3 April 2018).

- <http://www.helcom.fi/action-areas/fisheries/fish-communities/marine-species/>.
 Ignatius, S., Haapasaaari, P., 2018. Justification theory for the analysis of the socio-cultural value of fish and fisheries: the case of Baltic salmon. *Mar. Policy* 88, 167–173.
- International Council for the Exploration of the Sea (ICES), 2016. Report of the Baltic Fisheries Assessment Working Group (WGBFAS). 12–19 April 2016. ICES HQ, Copenhagen, Denmark ICES CM 2016/ACOM:11.
- International Council for the Exploration of the Sea (ICES), 2017. Report of the Baltic Salmon and Trout Assessment Working Group (WGBAST). 27 March –26 April 2017. Gdańsk, Poland. ICES CM 2017/ACOM:10. .
- International Council for the Exploration of the Sea (ICES), 2018. Report of the Baltic Fisheries Assessment Working Group (WGBFAS). 6–13 April 2018. ICES HQ, Copenhagen, Denmark ICES CM 2018/ACOM:11.
- Ives, C.D., Kendal, D., 2014. The role of social values in the management of ecological systems. *J. Environ. Manage.* 144, 67–72.
- Kesler, M., 2015. Biological Characteristics and Restoration of Atlantic Salmon *Salmo salar* Populations in the Rivers of Northern Estonia. Academic Dissertation. University of Tartu Press, Tartu.
- Kooiman, J., Jentoft, S., 2009. Meta-governance: values, norms and principles, and the making of hard choices. *Public Adm.* 87 (2), 818–836.
- Lam, M.E., 2015. Reconciling Haida ethics with Pacific herring management. In: Dumitras, D.E., Jitea, I.M., Aerts, S. (Eds.), *Know Your Food: Food Ethics and Innovation*. Wageningen Academic Publishers, Wageningen, pp. 169–175.
- Levin, P.S., Francis, T.B., Taylor, N.G., 2016. Thirty-two essential questions for understanding the social–ecological system of forage fish: the case of Pacific Herring. *Ecosyst. Health Sustain.* 2 (4).
- Linke, S., Jentoft, S., 2014. Exploring the phronetic dimension of stakeholders' knowledge in EU fisheries governance. *Mar. Policy* 47, 153–161.
- Linke, S., Jentoft, S., 2016. Ideals, realities and paradoxes of stakeholder participation in EU fisheries governance. *Environ. Sociol.* 2 (2), 144–154.
- Linke, S., Dreyer, M., Sellke, P., 2011. The regional advisory councils: what is their potential to incorporate stakeholder knowledge into fisheries governance? *AMBIO* 40, 133–143.
- Marine Steward Council, 2018. Suomen ensimmäinen MSC:n kestävän kalastuksen sertifikaatti Itämeren silakan ja kilohailin kalastukselle. (Accessed 30 October 2018). <https://www.msc.org/fi/medialle/lehdistotiedotteet/suomen-ensimm%C3%A4inen-msc-n-kest%C3%A4v%C3%A4n-kalastuksen-sertifikaatti-it%C3%A4meren-silakan-ja-kilohailin-kalastukselle>.
- Ministry of Agriculture and Forestry of Finland, 2016. Kasvua vesiosaamisesta ja luonnonvarojen kestävästä hyödyntämisestä. Sinisen biotalouden kansallinen kehittämissuunnitelma 2025. (Accessed 10 November 2018). <http://mmm.fi/biotalous/sininen-biotalous>.
- Ministry of Agriculture and Forestry of Finland, 2017. Merikalastuksessa historiallinen muutos – Kalastajat päättävät silakan ja kilohailin kalastusalueet ja -ajat. (Accessed 3 April 2018). http://mmm.fi/artikkeli/-/asset_publisher/merikalastuksessa-historiallinen-muutos-kalastajat-paattavat-silakan-ja-kilohailin-kalastusalueet-ja-ajat.
- Morton, J., Ariza, E., Halliday, M., Pita, C., 2016. Valuing the wild salmon fisheries of Scotland: the social and political dimensions of management. *Mar. Policy* 73, 35–45.
- Natural Resources Institute Finland, 2017. Statistics Database. Fish Used for Human Consumption (kg/person/year). Published 3/14/2017, (Accessed 10 November 2018). <http://stat.luke.fi/en>.
- Pihlajamäki, M., Sarkki, S., Haapasaaari, P., 2018. Food security and safety in fisheries governance – a case study on Baltic herring. *Mar. Policy* 97, 211–219.
- Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy. <https://eur-lex.europa.eu/eli/reg/2013/1380/oj> (Accessed 4 April 2018).
- Romakkaniemi, A., Perä, I., Karlsson, L., Jutila, E., Carlsson, U., Pakarinen, T., 2003. Development of wild Atlantic salmon stocks in the rivers of the northern Baltic Sea in response to management measures. *ICES J. Mar. Sci.* 60, 329–342.
- Salmi, J., Salmi, P., 2010. Fishing tourism, biodiversity protection and regional politics in the River Tornionjoki Finland. *Fish. Manag. Ecol.* 17 (2), 192–198.
- Samhour, J.F., Haupt, A.J., Levin, P.S., Link, J.S., Shuford, R., 2014. Lessons learned from developing integrated ecosystem assessments to inform marine ecosystem-based management in the USA. *Ices J. Mar. Sci.* 71 (5), 1205–1215.
- Sarewitz, D., 2004. How science makes environmental controversies worse. *Environ. Sci. Policy* 7 (5), 385–403.
- Song, A.M., Chuenpagdee, R., Jentoft, S., 2013. Values, images, and principles: what they represent and how they may improve fisheries governance. *Mar. Policy* 40, 167–175.
- Tadaki, M., Sinner, J., Chan, K.M.A., 2017. Making sense of environmental values: a typology of concepts. *Ecol. Soc.* 22 (1).
- Thévenot, L., Moody, M., Lafaye, C., 2000. Forms of valuing nature: arguments and modes of justification in environmental disputes. In: Lamont, M., Thévenot, L. (Eds.), *Rethinking Comparative Cultural Sociology: Repertoires of Evaluation in France and the United States*. Cambridge University Press, Cambridge, pp. 229–272.
- Urquhart, J., Acott, T., Zhao, M., 2013. Introduction: social and cultural impacts of marine fisheries. *Mar. Policy* 37, 1–2.
- Vetemaa, M., Eschbaum, R., Saat, T., 2006. The transition from the Soviet system to a market economy as a cause of instability in the Estonian coastal fisheries sector. *Mar. Policy* 30 (6), 635–640.
- Vilkuna, K., 1975. Lohi. Otava, Keuruu.
- Ylä-Anttila, T., Kukkonen, A., 2014. How arguments are justified in the media debate on climate change in the USA and France. *Int. J. Innov. Sustain. Dev.* 8 (4), 394–408.
- Ylä-Anttila, T., Luhtakallio, E., 2016. Justifications analysis: understanding moral evaluations in public debates. *Sociol. Res. Online* 21 (4).