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Framing the environment – disputes and developments in the management of Norwegian salmon fjords

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ABSTRACT

Fish farming is an important industry in Norway. However, it is perceived to have negative environmental impacts on the wild salmon through infections and genetically impacting wild salmon populations. These environmental threats led to the establishment of national salmon fjords as a form of area protection, initiated under the Act on Farming Fish, Shellfish etc. (Act of 14 June 1985). The authors study the discourses around the establishment of national salmon fjords, through process documents such as White Papers, management reports, statements in hearing processes, and press releases by involved actors. Document analysis revealed two partly competing *frames*, which the authors label *the conservation frame* and *the technology frame*. The two frames are interrelated. They seem to be developed as part of the policy formation process, and partly as tools in the struggle between different actors. Analysis of the similarities and differences between the frames in terms of, for example, rationality, strategy, and understanding of the environmental threats leads to an enhanced understanding of the nature of environmental controversies around fish farming and the protection of Norwegian salmon fjords.

Keywords: environmental frames, nature management, coastal zone planning, Norwegian salmon fjords.

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1 INTRODUCTION

1.1 The problem: fish farming and wild salmon

Environmental management influences the allocation of resources, and this in turn may create conflicts. Such conflicts are exemplified in the relationship between the management of wild salmon and fish farming. Fish farming is an important industry in Norway, and has substantial national and regional economic importance. At the same time, the protection of wild salmon is a major concern. Primarily, there are concerns regarding the influence on the wild salmon stock of salmon that have escaped from fish farms, due both to genetic influences on wild stocks and to concerns over the spread of diseases and parasites such as the salmon louse (*Lepeophtheirus salmonis*). Wild salmon stocks have traditionally been important for high-status river fishing and for coastal fisheries. Hence, environmental, economic, and social issues contribute to placing salmon high on the agenda regarding nature management in Norway.

Parallel to conflicting interests, there are also diverging perceptions on the nature of the problem and how the issue of escaping salmon should be handled. The discourse on salmon management is therefore also an arena where different actors try to shape public perceptions in accordance with their own points of view. In this article, we focus on how different actors *frame* problem descriptions, scientific knowledge, and argumentation in the discourse on salmon fjords, and we discuss some effects of such framing.

The main purpose of establishing salmon fjords was to protect wild salmon against negative influences from salmon fish farms in the form of genetic pollution and the spread of parasites and diseases. Further, the establishment of salmon fjords has been a response to a long dispute

regarding the management of wild salmon in Norway. This dispute has had several 'front lines' and a longer history than the conflict between the preservation of wild salmon and the salmon fish farming industry. Initially, the conflict was between salmon conservation and salmon river fishing on the one side and fjord-based fishers on the other side, and ended in strong regulations on fjord-based salmon fishing (NOU 1999:9). [1] However, the protection of salmon fjords started with the establishment of temporary safety zones in 1989, based on § 5 of 'Act on Farming Fish, Shellfish etc.' The safety zones were part of the LENKA programme,[2] which focused on coastal planning (NOU 1990:22). The LENKA programme later developed into an integrated coastal zone management (ICZM) process. The LENKA programme focused on zoning based on the suitability of coastal areas, and established temporary safety zones for salmon species in important salmon rivers (Sønvisen 2003: 49). The temporary safety zones were evaluated (Sjåstad 1996), and a White Paper on salmon management proposed the establishment of protected salmon fjords and rivers (NOU 1999:9). In a first phase, in 2002, a total of 21 salmon fjords and 37 salmon rivers were protected. In the second phase, in 2007, and additional 8 fjords and 15 rivers came under protection.

The establishment of designated salmon fjords and salmon rivers has been disputed. Different interest groups have very different perceptions of the process, the concepts, and reasons behind the establishment of salmon fjords, and the current management of fish farming and

[1] Norwegian Official Reports (NOU) are published by governmental or ministerial committees or working groups. A NOU generally forms the basis of a proposal that the government submits to Parliament and is often quoted and cited in reports. NOUs are referred to by year and number.

[2] LENKA is the Norwegian abbreviation of Landsomfattende egnethetsvurdering av den norske kystsonen og vassdragene for akvakultur (A Nationwide Assessment of the Suitability of the Norwegian Coastal Zone and Rivers for Aquaculture).

wild salmon. The main actors involved are (1) the aquaculture industry, consisting of firms ranging from large multinational firms to local-based companies, and organised under, for example, the Norwegian Seafood Federation (Fiskeri- og havbruksnæringens landsforening (FHL)); (2) farmers and landowners with a focus on wild salmon; (3) nature conservation organisations, and (4) several public agencies, such as the Directorate for Nature Management under the Ministry of the Environment, and the Directorate of Fisheries, under the Ministry of Fisheries and Coastal Affairs.

There are different understandings of what are rational strategies, and the actors seem to 'frame' the discourse in directions that favour their interests. It is therefore important to identify what frames the involved actors promote and the extent to which the frames overlap or conflict. Accordingly, the focus of this article is to address the following questions:

- What frames can be identified in the discourse on wild salmon versus fish farming, and to what degree can those frames be linked to specific actors in the debate?
- To what degree can the frames be seen as strategies of rationalisation of interests?

1.2 Conceptualising environmental management: from discourses and ideologies to frames

Several studies have focused on environmental discourses and perceptions. Before the discourse concept gained popularity, other types of concepts were favoured, such as ideology, paradigm, and worldview. Those categorisations group ideologies, paradigms or worldviews into being more or less environmentally-oriented. Eckersly (1992) differentiates between ecocentric and anthropocentric worldviews. O'Riordan & Turner (1983) similarly

differentiate between ecocentrism and technocentrism. Other older typologies differentiate between an old 'dominant social paradigm' (DSP) and a 'new environmental paradigm' (NEP) (Dunlap & Van Liere 1978, 1984). A further example is Næss's (1989) influential differentiation between 'deep ecology' and 'shallow ecology'. Many of these typologies have an underling normative assumption that the ecocentric or deep ecology positions are 'better' or more environmentally friendly than anthropocentric or 'shallow' ecology. Some typologies also have intermediate ideologies or paradigms. Colby (1990), for example, differentiates between five ideologies ranging from unlimited entrepreneurship to deep ecology, where positions between them include recourse management and eco-development. In Colby's (1990) typology, the intermediate position is perceived as better than environmentally-unfriendly unlimited entrepreneurship, and more realistic than the somewhat idealistic deep ecology. These conceptualisations were common when the World Commission on Environment and Development published its report *Our Common Future* (1987), which introduced the concept of sustainable development. Sustainable development can also be seen as a intermediate position, as mentioned above. Related to discourse analysis, and following the introduction of sustainability, Hajer (1995) introduced his influential work on environmental discourses.

At a more specific level, also other types of discourses can be identified. The 'fortress conservation' discourse argues in favour of traditional nature conservation. A discourse arguing that nature is best protected when separated from civilisation (Adams 2004; Brockington 2002). Another discourse is the 'win-win discourse', arguing for an ideal situation in which area protection is implemented in a way that benefits local communities (community conservation) as well as nature protection (Adams & Hulme 2001). Yet another

discourse is the 'critical discourse on area conservation', claiming that the win-win discourse is nothing more than the old fortress conservation in disguise (Benjaminsen & Svarstad 2008; Benjaminsen et al. 2006). We can see that there are links between general environmental discourses and conservation discourses. For example, the fortress conservation discourse is clearly influenced by a dichotomous view of civilisation and nature (Aasetre 2000; Castree 2001), one that still dominates the different discourses on nature conservation.

The idea of ecological modernisation has also influenced other aspects of environmental work, such as the focus on management schemes and procedures for best practices. In industry and society this has lead to 'life cycling' approaches (Brattebø et al. 2009) and 'certifications frameworks' (Delmas & Montes-Sancho 2011) where technology and procedures are at the core. This development is of particular interest for our case, as 'production' meets 'conservation' and it could be hypothesised that conflict of interest correlates with conflicting approaches to environmental management (a production-oriented approach versus a conservation-oriented approach). Translated to our case, the hypothesis would be that fish-farming, which tend to not benefit from conservation, chose a production-oriented approach rather than a conservation approach.

The concept '*frame*' can be traced back to Goffmann (1974). As an approach, framing is conceptualised differently in different research traditions, and consequently Entman (1993: 51) refers to framing as '*a scattered conceptualization*'. Even so, frames may be defined as a core organizing idée or storyline that assigns meaning to an event (Gamson & Modigliani 1987). Chong & Druckman (2007:104) claim that framing '*refers to the process by which people develop a particular conceptualization of an issue or reorient their thinking about an issue*'. In this regard, framing is based on a social constructivist approach (Scheufele 1999).

Some (e.g. Hamill & Lodge 1986) hold that there only are terminological differences between concepts such as frame, script, and schema. A schema points in the direction of cognitive and psychological interpretation. In psychology there are well-established theories on cognitive schemas (Eckblad 1981; Brunswik 1957), and such schemas are perceived as important for enabling people to interpret and organise stimuli from the surrounding world.

Scheufele (1999: 106) distinguishes between '*media frames*' and '*individual frames*'. Individual frames are rather close to the psychological concept of schema. By contrast, media frames can be defined as '*a central organizing idea or story line that provides meaning to an unfolding strip of events ... The frame suggests what the controversy is about, the essence of the issue*' (Gamson & Modigliani 1987: 143). This definition is the basis of our article.

Scheufele (1999) refers to several other descriptions of media frames, all of which highlight patterns or organising schemas that provide media audiences with tools for interpreting specific events. Hence, there is a connection between media frames and individual frames. We find it fruitful to use an understanding that assembles the idea of media frames even though management documents and disputes differ from traditional media coverage. Scheufele (1999) also distinguishes between frames as dependent or independent variables. The latter can be used to identify the effects of media frames on people's attitudes and behaviour. Such studies my for example study the effects of media coverage on, for example, political support (Jacoby 2000). In cases where frames are treated as dependent variables, studies focus on how a given issue is framed in a manner that is perceived as beneficial for certain goals. Scheufele (1999) has combined the two dimensions (media versus individual frames and frames as dependent or independent variables) into a typology of framing studies. In this article we primarily focus on media frames as dependent variables.

In a process perspective, looking at media frames as dependent variables implies a frame-building approach, i.e. a process whereby actors, ideologies, and other factors shape media frames. Frames have been used in the analysis of environmental conflicts by, for example, Shmueli (2008), Fischer & Marshall (2010), and Gifford & Comeau (2011).

As an approach, frames have similarities to other concepts, such as storylines and discourses. Conversely, Gamson & Modigliani (1987) use the label storyline with reference to frames. The same label is also used in, for example, Hajer's (1995) approach to discourse analysis. Probably framing differs from most discourse perspectives by focusing more on intentional actors, whereas a Foucauldian tradition perceive power and discourses as intimately interwoven, as illustrated by the concept of governmentality (Flyvbjerg 1991, 2003; Foucault 1969). Still, in this article we also want to focus on the concept of frame because it represents an attempt to give a coherent description of an issue, and by framing issues actors also try to exercise power over how a management issue should be understood.

We will therefore use the "frame" concept to identify different ways of arguing in the dispute around establishing salmon fjords and rivers. Frames will be perceived as structures of meaning used by the actors in communicating there interests into the public debates. As such they may be used as ways of express public policies by public agencies, or by different stakeholder groups in trying to influence (or lobby) the public decision making process. In some situations some frames may have a hegemonic position dominating the perceptions of an issue. In other situations two or more frames may compete defining the realities in a controversy, and we have a more pluralistic situation. Often the situation will be some place in between. The actual situation in the controversy around the salmon fjords will of course be an empirical question.

2 METHOD

This article is based on a study of selected texts related to the controversy regarding establishing designated salmon fjords in Norway. It is not our intention to describe the issue of salmon farming in Norway as such. Rather, we restrict ourselves to study texts and frames used by actors involved in controversies regarding the designation of salmon fjords in Norway. The identification and analysis of frames is based on qualitative analysis of the selected texts.

2.1 The analysed texts

The analysis is based on a strategically selected sample of 16 texts. We have limited the sample to publicly accessible texts written by key actors in the discourse. E-mails, and other more informal texts are not included.

In qualitative methods representativeness in a statistical sense is not relevant. Rather, it is more important to capture variance in the content of analysed texts (Alvesson & Sköldberg 1994). We selected texts in order to capture variance in following dimensions:

- Time – the selected documents were written between1996 and 2008, thus covering both the planning period and implementation of salmon fjords in Norway.
- Actors – document were selected to cover key actors in the disputes, such as management agencies, business organisations, and environmental NGOs.

- Type of documents – the selected documents included White Papers, management reports, press releases, and letters (only those accessible through Internet).

By strategically selecting documents for analysis, we tried to ensure that we could identify the variety of frames used in the conservation and management processes. Some texts represent documents produced by public agencies and public comities. Other documents, as press releases, seminar presentations, letters or hearing statements by the aquaculture industry or environmental NGO's, were also included into the study. The last type of texts illustrates how the aquaculture industry and environmental NGO's tries to influence the decision making process or changing the public opinion in their favour. The chosen texts are presented in Figure 1, which shows the timing, document type, and authors of the texts.

< Insert Figure 1 approximately here >

2.2 Analytical approach

The sample texts were analysed based on a hermeneutic approach. Hermeneutics can be described as a combination of induction and deduction, or alternating between looking at 'specific parts' and the 'totality' (often labelled the 'hermeneutic circle') (Alvesson & Sköldberg 1994). In our work we did several rounds of the 'hermeneutical circle', each time making adjustments to the main findings based on our interpretation of specific texts. This type of analysis can be characterised in the words of Kvale (1988) as condensation of meaning, in contrast to, for example, categorisation. The results of our analysis are presented in the description of the two main frames and quotations from the texts are given to illustrate

the essence of the frames. Traditions of discourse analysis (e.g. Foucault 1969; Hajer 1995) are an important source of inspiration for us regarding the frames identified from the statements and texts. Still, analyses such as the one presented here undoubtedly have potential weaknesses. One possible weakness is that our presuppositions on fish farming and wild salmon management influence our interpretation. However, by alternating several times between induction and deduction we have probably strengthened the reliability of our interpretations.

3 RESULTS

In this section we present our interpretation of the analysed texts, and the frames identified through our analysis.

3.1 Labelling the frames

Based on our reading of the selected documents we ended up with two different frames that describe how the different actors have argued around the subject of salmon fjords and salmon rivers. We have labelled the two frames as follows:

- The conservation frame
- The technology frame

The two frames both have similarities and differences. Both are based on rational argumentation, but at the same time the two frames include contradictory elements. The two frames may be described in terms of four dimensions: rationality; territorial strategies; technical strategies, and; sense of urgency.

The relation between the content of the two frames can be illustrated as shown in Figure 2. In the following sections we will document how the two frames vary along the four dimensions. We use references and quotations (our translations) from documents to illustrate the content of the two frames for each of the four dimensions.

The two frames are ways different actors structures their argumentation in the salmon fjord controversy. That also means that even if actors base their argumentation in one frame they have to relate their argumentation to the frames used by other actors.

< Insert Figure 2 approximately here >

3.2 The conservation frame

In this section we describe the content of the conservation frame, and illustrate this through quotations from the analysed texts.

3.2.1 Instrumental rationality

An important characteristic of the conservation frame is the presentation of planning and management as a rational and linear process. In relation to this frame we use a debate within planning theory to demarcate different interpretation of the concept. In his discussion on planning, Sager (1992) uses a classification of three types of rationality, namely instrumental, social, and communicative. The key concept in our analysis is instrumental rationality. In this context, rationality is recognised by i) a distinct goal orientation; ii) a sequential process, and;

iii) objectiveness as a norm – which means that argumentation is presented in a factual, neutral, and descriptive style.

The *goal orientation* can be seen through the justification of choices given with reference to political documents such as governmental White Papers and policy statements. Such goal and policy formulations are gradually built up through the process from general policy goals to specific choices of action. In the case of NOU 1999:9 the defined goal of the committee was to look at possible solutions to a defined problem, i.e. to '*consider the overall situation of the wild salmon stocks and propose management strategies and action. Questions regarding regulation, management of rivers, and salmon farming should be given special attention*' (NOU 1999:9: 30). In the quoted formulation there exists a normative definition of the problem that should be in focus, i.e. the situation of the wild salmon. Later in the same section (in NOU1999:9) there are several subsections interpreting how the mandate for the committee should be understood. As such, the mandate can be seen as the normative starting point of the whole management process.

During the process normative choices are made with reference to governmental White Papers, and Parliamentary approvals. The White Paper (St.meld. nr. 79 (2001–2002)) states that the '*Ministry of the Environment proposes … that there should be established a system of salmon rivers and salmon fjords. The purpose is to give a special protection to the most important salmon stocks in rivers and fjord areas.*' This indicates that the formulation of policy goals and actions become more explicit as the process develop into its final stage. St.meld. nr. 32 (2006–2007, p. 5) repeats the intention of having a second phase of establishing a system of salmon rivers and salmon fjords.

Many of the analysed documents combine a normative point of departure with a descriptive and 'factual' part. NOU 1999:9 and St.meld. nr. 79. (2001–2002) are mentioned as normative premises by the Directorate for Nature Management (Direktoratet for naturforvaltning 2004) in their discussion document on the second phase of establishing salmon rivers and fjords. The reference to the earlier White Papers are used as normative (and legal) justifications.

The *sequential process* is actually a gradual process whereby documents follow one after another, building up to decisions and subsequently to implementation. This is a long-established step-by-step process, which started with the establishment of the temporary safety zones. The evaluation report on the zones (Sjåstad 1996) may be seen as the starting point of the documentation process that ended in the salmon fjords and rivers. This was followed by NOU 1999:9, which presents a broad analysis of the situation and ends with recommendations for further action. The subtitle '*On the causes of the decrease in the Norwegian wild salmon stock and proposals for strategies and measures to improve the situation*' indicates much of the intention with this White Paper. The NOU report was produced by a committee of 14 persons from a wide spectrum of interests. The intention was that the committee members should represent themselves. The report is therefore also a split document including elements from both the technology frame and the conservation frame. The report gives several different recommendations. The section headed 'Strategic principal measures' contains a proposal for the establishment of salmon fjords and rivers. In this section it's also mentioned that the majority of the committee members suggest that 50 rivers could be given the status of 'salmon rivers'. The next step in the process was that the suggestions presented in NOU 1999:9 were forwarded to Parliament in two White Papers: St.meld. nr. 8. (1999–2000) and St.meld. nr. 33. (1999–2000). Based on those White Papers the political process of establishing salmon

rivers and salmon fjords started. The next step was a more focused White Paper (St.meld. nr. 79 (2001–2002)), that discussed which rivers and fjords should be protected. This ultimately led to the establishment of the first 21 salmon fjords and 37 salmon rivers on 25 February 2002. The process included hearings where public and non-governmental actors were present. Interestingly, the Directorate for Nature Management, the professional agency responsible for nature management, made critical remarks on how the system of salmon fjords and salmon rivers should be established. The Directorate was critical of the proposal and '*believes that it involves a clear deterioration in relation to both the 'Salmon Commission's' recommendations [i.e. reported in NOU 1999:9] and in relation to the system of temporary protection zones*' (St.meld. nr. 79. (2001–2002, start of section 3.1.2).

The second phase of the establishment of salmon fjords and rivers ended on 15 May 2007 with the decision to establish a further 15 salmon rivers and 8 salmon fjords, thus giving a total of 52 salmon rivers and 29 salmon fjords.

The description above documents the stepwise process of policy-making and implementation. This is in many ways a standard political process, even though there will always be some special features in each case. Notwithstanding, this is demonstrates the hegemonic position of instrumental rational decision making. The normality of the process confirms this. The position is not challenged in other frames in the dispute around salmon fjords.

The last element in the rational position to be discussed is the weight placed on objectiveness. In the policy processes, when arguing for specific policy choices, the end objectives are clearly understood as political. However, the judgments included in the selections of means to achieve those ends are justified by being described as neutral 'facts'. In the White Paper NOU 1999:9 there are several factual sections describing, for example, salmon biology, the

interaction between man and salmon, and salmon management. The White Paper also includes several 'factual' attachments written by scientists. Also the White Papers presented to Parliament as St.meld. nr. 79 (2001–2002) and St.meld. nr. 32 (2006–2007) include factual sections describing salmon biology and developments in salmon stock. At a later date in the evaluation of possible locations for the establishment of salmon fjords and rivers, references to a set of criteria are often given, such as in the draft on salmon rivers and salmon fjords prepared by the Directorate for Nature Management (Direktoratet for naturforvaltning 2004). The draft is in many ways regarded as a catalogue, in which each river system and fjord is evaluated individually, accompanied by descriptions of their key attributes. The descriptions are written in a neutral language. Further, the paragraphs for the fjords are uniformly structured under the headings 'Geographical delimitation', 'Anadromous stocks and fishing in the fjord area', 'Salmon farming', and 'Impacts' etc. The paragraphs also include the same type of data for all fjords included in the report, thus giving a rather standardised description of the evaluated fjords.

The same types of criteria as described above are used in the recommendations regarding the selection of salmon stocks to be protected in St.meld. nr. 79 (2001–2002). In this context, the criteria are listed as follows: numerous salmon stocks with high productivity; stocks with great potential for high productivity; stocks with large salmon, and; salmon populations with a special genetic character.

The style of presentation, highlighting criteria, providing facts, and using standardised layouts, demonstrates the emphasis placed on objectivity in the conservation frame.

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3.2.2 Territorial strategy

The establishment of salmon rivers and salmon fjords gives specific areas special status. This may be seen as a territorial strategy that has similarities to protection processes on land. Also other familiarities exist. Salmon fjords are a form of area protection whereby specific areas have specific management rules and principles that differ from those applied in the surrounding area. In St.meld. nr. 79 (2001–2002) the proposed protection regime includes, for example, a ban on the issue of new licences for fish farming and salmon hatcheries. In addition, there are recommendations for specific regulations to protect against fish escapes, and for improved health controls for existing fish farms. The White Paper also discusses voluntary action to remove existing fish farms from salmon fjords. Such rules and restrictions have the character of what in a land context has been labelled *fortress conservation*, but in a lighter version since the conservation proposals only limit specific types of use, i.e. aquaculture. This is evident in the description of how the salmon fjords should be selected:

It is emphasised that each particular fjord area must be sufficiently large to give the salmon protection. The size of rivers, the fjord's size and shape, as well as the possibilities to establish natural geographical boundaries are also assessed. (St.meld. nr. 79 (2001–2002), section 4.4.1)

Further, the criterion that '*salmon rivers should have a good geographical distribution*' (Direktoratet for naturforvaltning 2004: 7) is very similar to criteria used when establishing terrestrial conservation areas. In the latter case, the ideal is that conservation areas should cover a representative spectrum of Norwegian nature types (St.meld. nr 68 (1980–81)).

The territorial strategy is also supported by non-governmental organisations such as the Norwegian Society for the Conservation of Nature (Naturvernforbundet 2004) and Norwegian

Salmon Rivers (NSR) (Norske lakselver 2004), which want even stronger areal protection than that decided upon by Parliament. The non-governmental organisations probably see it as their role to counterweight lobbying activity from the aquaculture industry, and by this working against reductions in the numbers of areas protected as salmon fjords and salmon rivers.

3.2.3 Technical strategy

Although the conservation frame advocates territorial strategies, it does not deny the need for technical solutions. White Paper (NOU 1999:9) mentions several types of measures to protect wild salmon, such as measures and objectives regarding the reduction of the lice problem in farmed salmon. Regarding escapees, NOU 1999:9 (pp. 174–175) discusses several preventative measures, such as technological developments of fish farms, closed installations, and farming sterile salmon. Later documents mention technical solutions to a minor degree, but probably because they focus directly on salmon rivers and salmon fjords and not on the wider salmon management discourse (e.g. Direktoratet for naturforvaltning 2004). The fact that other measures are not mentioned in these documents cannot be seen as an indication that the conservation frame does not cover such measures.

3.2.4 Sense of urgency

The impact of fish farming on wild salmon stocks appears to be perceived as very problematic. In a report on the status of the country's salmon stock published by the Directorate for Nature Management it is claimed that '*Escaped farmed salmon are evaluated*

to be a significant problem for the wild salmon' (Hansen et al. 2008: 40). The same concern is expressed regarding salmon lice, but in somewhat more neutral words (Hansen et al. 2008: 48). On its web page the Directorate for Nature Management expresses that '*Fish farming today is a great threat against the wild salmon, and aquaculture would exterminate whole stocks if the development is allowed to continue*' (Direktoratet for naturforvaltning 2009). This quotations show the sense of urgency perceived by the Directorate.

The Norwegian Society for the Conservation of Nature (2004: 1) has reacted more strongly, stating that the situation of Norway's wild salmon stocks is extremely serious. Again one can see that environmental non-governmental organisations argue in a way that seems to counterweight the influence of the aquaculture industry.

3.2.5 Summary of the content of the conservation frame

The various texts used to document the conservation frame have been produced by different actors. Some of the documents are governmental White Papers presented to Parliament, while other documents have been written by expert commissions. Also texts produced by the Directorate for Nature Management have been used to describe the frame. In addition to the works by the mentioned governmental or bureaucratic institutions, also documents produced by environmental non-governmental organisations have argued in ways that are congruent with the conservation frame. Among the documents referred to above, the White Papers presented to Parliament seem to argue the case for the lowest level of conservation, whereas an environmental non-governmental organisation as the Norwegian Society for the Conservation of Nature wants the most comprehensive conservation of salmon rivers and

salmon fjords. By contrast, the Directorate for Nature Management holds an intermediate position.

Our presentation of the conservation frame may give readers of this article the impression that Norway has a rational and correct process where there is no bias, and where just decisions are made, such that critique and opposition are difficult. Even if the processes appear objective, they are more complex than just formal procedures and fact-based argumentation. As Flyvbjerg (1991) has shown, power and rationality are intimately connected. Thus, it is first when we combine the dimension of rationality with the other dimension in the frame – and in comparison with other frames – that the power of rationality may be studied as a rhetorical and powerful tool.

3.3 The technology frame

In this article, we have labelled the second frame discussed as '*the technology frame*'. Most documents within this frame are produced by stakeholders representing the aquaculture industry. In the following subsections we discuss this frame based on the same basic dimensions as the conservation frame, and identify similarities and differences between the two frames.

3.3.1 Instrumental rationality

In common with the conservation frame, actors within the technology frame also base their argumentation on instrumental rationality, or at least take the dominant public decision-making process based on instrumental rationality for given. In its response to hearing of the

Directorate for Nature Management's draft document on salmon rivers and salmon fjords, the Fiskeri- og havbruksnæringens landsforening (FHL) (Fiskeri- og havbruksnæringens landsforening 2004a) uses factual argumentation in the same way as used in the conservation frame. The hearing answer is full of statistical-based argumentation supported by graphs and several tabulations designed to document claims. A factsheet titled *Aquaculture and the wild salmon*, published two years earlier by the (FHL) (Fiskeri- og havbruksnæringens landsforening 2002), uses the same factual way of arguing against area protection. Even if also the FHL uses facts and an objective form of argumentation, the involved parties do not necessary agree on the facts or how facts are used in the argumentation.

In our discussion on the first frame (the conservation frame), we place weight on how the argumentation is linked into a *sequential* process with different documents related to different stages in the process. In the hearing document produced by the FHL (Fiskeri- og havbruksnæringens landsforening 2004a) they relates to the process without questioning the main problem (i.e. protection of wild salmon stocks), but at the same time they are critical towards the policy of establishing salmon fjords. In this regard, FHL also accepts the traditional rational process, at least as something they have to relate to. Interestingly, in this frame other parts of the sequential process are highlighted, i.e. evaluation of salmon fjords (Fiskeri- og havbruksnæringens landsforening 2004a). This is probably because FHL believes that the policy on salmon fjords would be abounded if the evaluation concludes that the measure has non-positive effects.

The last criterion of instrumental rationality is the divide between factual argumentation and normative goals, or '*ends and means*' as it expressed in a classical article discussing rational planning (Banfield 1959). The documents presented by the FHL (Fiskeri- og

havbruksnæringens landsforening 2002, 2004 a, 2004b) do not question the main goal; rather, the argumentation is that the proposed means (salmon fjords) will not lead to the desired end (protecting wild salmon stocks).

3.3.2 Territorial strategy

The technology frame 'opposes' the territorial strategies that are at the core of the conservation frame. As Valland (2005) puts it: '*Active salmon protection [should come] before passive area protection*'. In a press release, the Norwegian Seafood Federation stated:

'*FHL Aquaculture doubts the effect of area protection, but presents a solution that will ensure the future of wild salmon and also protect the interests of aquaculture and economically weak local communities along the coast. We disagree that area conservation is an acceptable way to ensure the future of wild salmon. We believe active action directed against the specific threat factors is what works. When the system of salmon fjords and salmon rivers is to be completed, we have chosen to give politicians a solution that all parties should be able to live with, said Chairman of FHL Aquaculture Lisbeth Berg-Hansen*'[3]. (Fiskeri- og havbruksnæringens landsforening 2004b)

Also in the published version of the hearing regarding the second phase of the establishment of salmon rivers and salmon fjords, the FHL Aquaculture Seafood Federation (Fiskeri- og havbruksnæringens landsforening 2004a) start their statement with '*The Aquaculture Seafood Federation (FHL) disagrees that area protection is the prevailing way to go in order to*

[3] Interestingly, Lisbeth Berg-Hansen later became the Minister for Fisheries and Coastal Affairs in the center-left government.

secure the future for the wild salmon.' The quotation given above indicates a critical view towards establishing salmon fjords. Still, even if critical towards the establishment of salmon fjords, the FHL Norwegian Seafood Federation hold that if salmon fjords are to be established, this must, and may, be done without harming the aquaculture industry (Fiskeri- og havbruksnæringens landsforening 2004a). In that way their primary argumentation are based on the technical frame. At the same time they give response to policy formulations based in the conservation frame e.g. by suggesting which fjords are acceptable to protect as salmon fjords or not. Through such a secondary argument they try to influence policy outcome even if their primary argument is not accepted.

3.3.3 Technical strategy

The technology frame argues for alternative and more technical solutions to the problems in question. In the hearing answer to the Directorate for Nature Management, the FHL (Fiskeri- og havbruksnæringens landsforening 2004a:9) lists possible actions against fish escapes as:

Mandatory education; Improved routines (internal control); Increased research and development; Increased focus how internal and external boats call at installations; a commotion investigating accidents; Technical standards for fish farms; Stricter punishment in cases of negligence or if escapes are not reported.

Also, regarding salmon lice, the same document places weight on the amount of work that has been done to reduce the problem. This is documented by a graph showing how the number of lice per fish has fallen and at the same time production has risen. It is therefore claimed that effective actions are taken against the lice problem. Also other documents argue along the same lines (Fiskeri- og havbruksnæringens landsforening 2002, 2004a, 2004b). We therefore

conclude that in this frame technical action or action targeting on-site improvements in the fish farming industry is preferred to area protection.

3.3.4 Sense of urgency

Even proponents of the technology frame accept the existence of threats against Norway's wild salmon, but their reactions are not dominated by the same sense of urgency as those arguing in favour of the first paradigm. They accept that the wild salmon are under stress, but do not accept the level of severity claimed by environmental authorities. All of the documents referred to in this article give the impression that the problem is something that can be managed (Fiskeri- og havbruksnæringens landsforening 2002, 2004a, 2004b).

3.3.5 Summary remarks on the technology frame

The technology frame is mainly articulated by actors connected to the aquaculture industry. The documents used for describing this frame have all been produced by the FHL Norwegian Seafood Federation, who organise and coordinate policy inputs from a broad range of actors within the industry.

The content of the technology frame creates an impression of the frame as being reasonable and cooperative through being constructive regarding official policy. This is clearly stated, for instance, in the following sentences from a letter from the FHL Norwegian Seafood Federation to the Minister of the Environment (Fiskeri- og havbruksnæringens landsforening 2006: 1): '*The Norwegian aquaculture industry still intends to take their share of responsibility for the wild salmon.*' At the same time, however, they argue against area

protection of salmon fjords and emphasise that active measurement is much more efficient than passive area protection. In this way, they also try to give the impression that the protection policy is biased and based on myths rather than reality. In a press release, the FHL Norwegian Seafood Federation also make reference to all of the negative effects of the protection policy on local communities, and claim that the combined impact of all conservation measures, both terrestrial and marine, could 'be catastrophic for future economic development in many communities on the coast' (Fiskeri- og havbruksnæringens landsforening 2004b: 2). Instead of passive protection, representatives of the salmon industry want active management that works. They argue that one has to look at the specific threats against the wild salmon, and target them individually. In listing the threats, they also show that the salmon industry is not responsible for all of the named threats (Fiskeri- og havbruksnæringens landsforening 2004b). In addition, when discussing threats and judging the policy for salmon rivers and fjords in relation to their interests, representatives of the fish farming industry also use a 'objective style'. Clearly, the use of rational argumentation to underline that what they label as '*passive protection*' is not the best way to tackle the threats against the wild salmon. Thereby they try to signalise that they are not against protecting the wild salmon against negative influences from the aquaculture industry, but that they do not see establishing salmon fjords (passive protection) as the most efficient tool for protecting the wild salmon. They also stress the need for evaluation and impact assessments regarding the establishment of salmon rivers and fjords (Fiskeri- og havbruksnæringens landsforening 2004a).

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3.4 Comparing the two frames

The above presentation of the two frames – the conservation frame and the technology frame – documents their similarities and differences. This reveals an interesting pattern where both frames place emphasis on rationality, but it could be claimed that the latter frame (the technology frame) to a larger degree is subordinated to a common rational process, whereas the former (the conservation frame) is more formative in shaping the content of the rational process (which both frames relate to). Further, both frames approve of technical strategies, but with slightly different emphasis. The technically oriented frame to a larger degree sees technical strategies as a substitute for, or more appropriated than, territorial strategies. That both frames are characterised by rationality is not surprising, given the hegemonic position of instrumental rationality in western societies. It would also be difficult for any actor to argue the case against technical strategies to reduce levels of sickness or escapes from fish farms.

It is in relation to territorial strategies that the biggest differences occur between the two frames. The conservation frame strongly advocates territorial strategies, or supports the official policy of establishing a system of salmon rivers and salmon fjords. This is also difference in the sense of urgency of the threats to wild salmon stocks. In the conservation frame, arguments are based on the view that the situation is more urgent than is recognised by the technology frame. Even if critical to territorial strategies representatives from the fish farming industry goes into discussions on which areas would be the least negative for the aquaculture industry to protect as salmon fjords. In that way they show flexibility in their argumentation.

The technology frame includes the argument that targeting specific problems at various aquaculture installations is a better and more appropriate strategy. This approach seems to be

influenced more by industrial thinking and engineering related to how environmental problems are conceptualised. However, even if the policy for salmon rivers and fjords is an area-based approach, also representatives of the nature management agencies agree that such measures are insufficient, and that active action in line with the technological approach advocated by the aquaculture industry is needed.

In sum, it could be claimed that the two frames are like Siamese twins, partly locked together by 'rational process', but divided by views on means of action. Table 1 sum up the main traits of the two frames.

< Insert Table 1 approximately here >

4 DISCUSSION

In this article we have analysed documents produced by actors involved in the controversy around the establishment of salmon rivers and salmon fjords in Norway. Demarcating such controversies is not straightforward, and often such controversies are bound together in a hierarchical manner, including broad controversies such as those related to coastal zone management, and sub-controversies such as the one related to escaped farmed salmon. There has been a harsh debate between different actors on what are appropriate types of actions regarding salmon rivers and fjords. Close examination of the documents produced as result of this controversy has revealed two different but interwoven frames. The two frames are connected through the ideal of rational processes, but divided in terms of the means for action. There are two interesting findings, which are unified on process, but divided on strategy.

The first finding may be seen as natural and almost indisputable. Since Weber (1978) described the link between modern capitalism and a rational bureaucracy, it has been clear that rationality has a rather hegemonic position in Western democracies. It is therefore very difficult to handle environmental disputes without using a rationalistic approach if one wants to be taken seriously. This 'objectivistic' tradition is deeply rooted in a Weberian tradition of bureaucracy and the tradition of comprehensive rational planning (Banfield 1959; Davidoff & Reiner 1962; Weber 1978). Even if most people were to try to attain a rational process without questioning, theory developments in planning and political science have shown that the ideal is highly problematic (Flyvbjerg 1991; Lindblom 1959; Simon 1957).

The second finding is the differences regarding choice of means to attain the preferred end, i.e. protection of threatened wild salmon stocks. Many will see the difference between the two frames as a simple conflict of interest. This is just part of the picture. The technology frame is mostly articulated by representatives from actors rooted in the aquaculture industry, whereas the conservation frame is mostly articulated by public or private actors working with conservation policies. When arguing based on the technological frame the aquaculture industry can be seen as a stakeholder lobbying for their interest. To some degree this is true. It's also a legitimate activity in a pluralistic western society as Norway.

Still, there is more to the controversy than just conflicting interests.

As Flybjerg (1991) has shown, knowledge and science are always influenced by power (and intention). In the two frames, we have two types of solution. Both frames, on the basis of 'objective and factual knowledge', argue that 'their solution' is the best. The rational approach is that a decision on strategy is taken based on the best argument. This is not necessary the case. The factual controversy continues. Furthermore, parts of the scientific

community are enrolled into the controversy. For example, the Norwegian Institute for Nature Research (NINA) has done a lot of research showing the seriousness of the problem of escaped salmon (Diserud et al. 2010; Fiske et al. 2006; Hansen et al. 2008). On the other side, a recent report from the research institute Nofima downplays the problem of escaped salmon (Jacq et al. 2011). According to Sarewitz (2004:title), this is typical of '*How science makes environmental controversies worse*'. Sarewitz, who comes from the Science and Technology Studies (STS) tradition, claims that more science will not solve this type of conflict, but will instead accelerate such conflicts. He suggests that a clear political decision would serve to find a better end to the dispute. As we see in our case, the two frames endorse rationalism, but continue to argue on means, based on their own strategies and knowledge base. Different actors trying to convince other that their framing of the controversy is the most rational way of handling the issue.

The two contested knowledge-based frames can be seen as more than just two interest groups arguing as rational actors for their self-interests. They can be seen as two conflicting paradigms of knowledge spinning around each other. In nature conservation there is a long history of what has been labelled 'fortress conservation'. This tradition is based on ideas that the nature manages itself best when protected from human impact, or what Commoner (1971) called the third law of ecology, '*Nature knows best*'. In relation to terrestrial ecosystems, such ideas have been developed based on island ecology and landscape ecologies. This way of thinking focuses on landscape elements and disturbances changing patches of land (Forman & Godron 1986; Hansson et al. 1995). Further, such forms of analysis are highly territorial, and in our judgment it seems that this approach has been transferred to salmon management. If that is the case, then a total knowledge system or paradigm supports the conservation frame.

On the other side, the fish farming industry's arguments are based more on the technology frame. In the documents we found arguments for measures such as improved routines (internal control), increased research and development, increased focus how internal and external boats call at installations, a commotion investigating accidents, and technical standards for fish farms. In our judgment, such arguments are more in line with an industrial discourse that has diverted from the discourse of ecological modernisation. Such environmental governance systems focus on quality standards, certifications, and technological developments. This may be seen as an alternative knowledge system to the territorial conservation paradigm. Based on two different knowledge systems, it is not very likely that just reason would bring about agreement between different frames and contesting actors. Rather, it is more likely that the conflict would continue, as Sarewitz argues. It also serves to demonstrate that knowledge itself is both contested and positioned.

5 CONCLUSION

In this article we have documented the existence of two different frames regarding the debate on the establishment of salmon rivers and salmon fjords in Norway. We label the first frame '*the conservation frame*', and the second '*the technology frame*'. The similarities and differences between the two frames can be summarised as follows:

- The two frames have similarities and differences. The similarities are a commitment to a rational management process, and partial advocacy of technical strategies.
- The differences relate to disagreements on territorial strategies and the sense of urgency. The conservation frame places more weight on the territorial strategy, and

perceives a higher sense of urgency to address the treats towards the wild salmon. The technology frame is somewhat critical of these two positions, and is more in favour of technical and targeted solutions.

- A further difference relates to the type of actors advocating the different frames. The conservation frame has been promoted mainly by governmental or bureaucratic actors in alliance with environmental NGOs, whereas the technology frame has been advocated by the aquaculture industry and fish farming interests.

In one sense, this picture may be seen as the result of rational actors in conflict. However, when looking at the underlying discourses and use of science, we see that this is bounded rationality. The two frames have to be understood in their discursive contexts.

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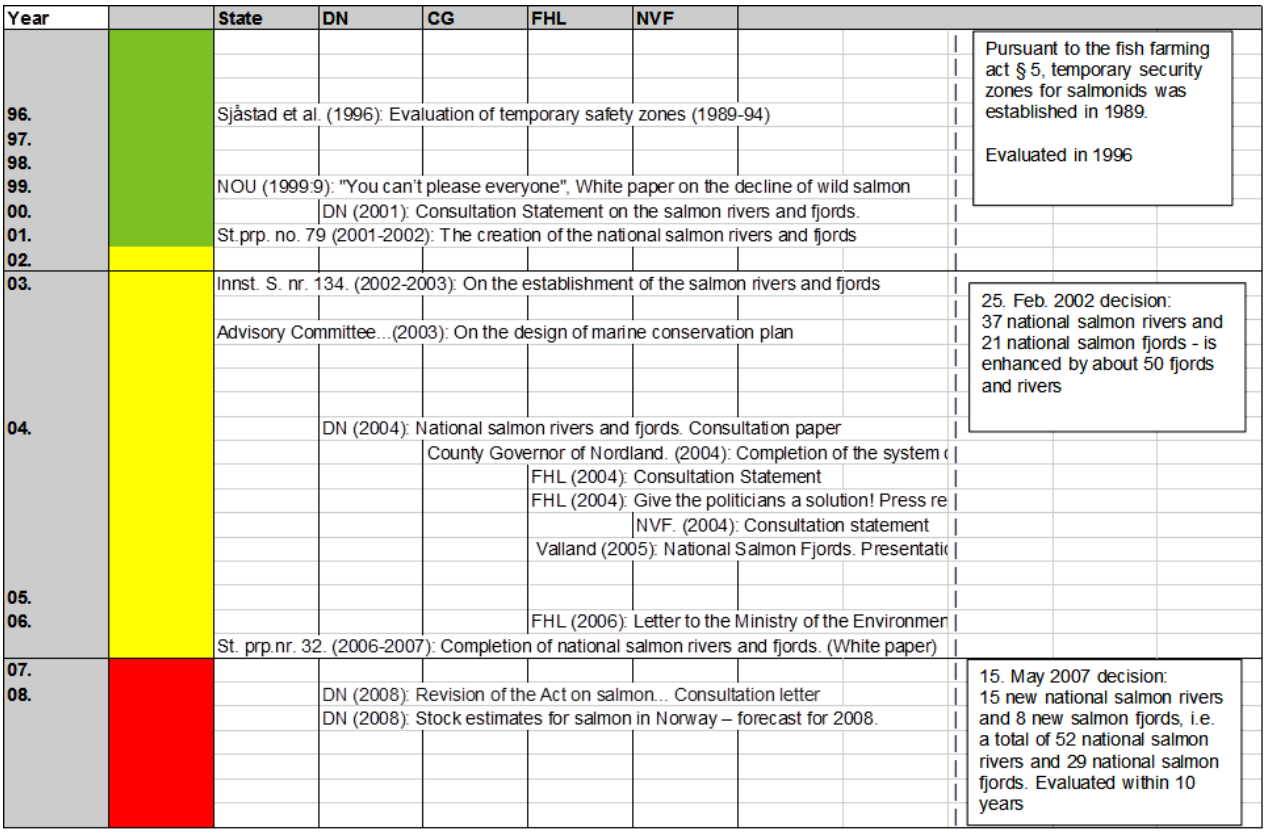

Fig. 1. Selected documents sorted by time (vertical) and producer (horizontal).

State = Norwegian Government, DN = Directorate for Nature Management, CG = County Governor, FHL = Norwegian Seafood Federation, NVF = Norwegian Society for the Conservation of Nature.

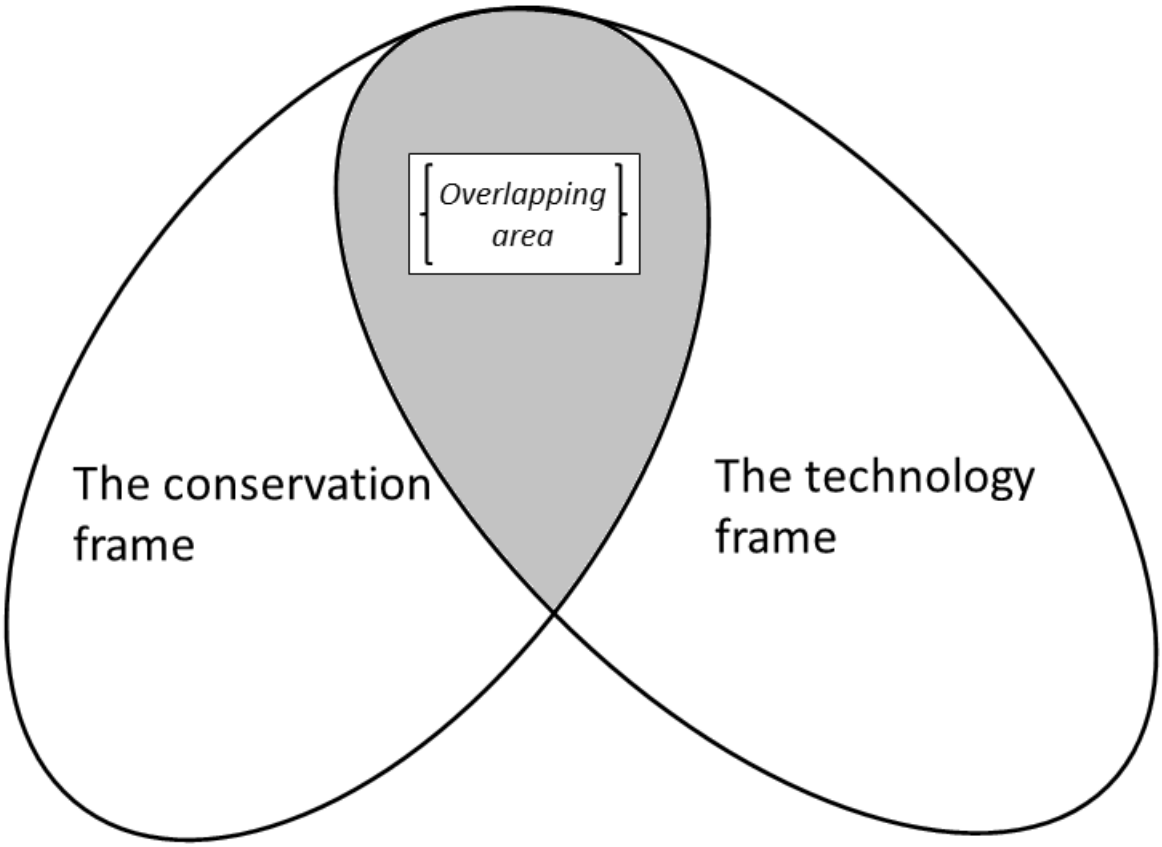

Fig. 2. Partly overlapping content of the conservation frame and the technology frame.

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Table 1. Comparison of the content of the conservation frame and technology frames.

	The conservation frame	**The technology frame**
Instrumental rationality	Yes	Yes
Territorial strategies	Yes	No
Technical strategies	Yes, but in combination with area conservation	Emphasis on technical solutions
Sense of urgency	Strong sense of urgency	Acceptance of threat, but lacks sense of urgency