

Integrated Coastal Zone Management (ICZM): The Allocation of Space in Norwegian Aquaculture – from local lottery to central planning?



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15th of May 2003



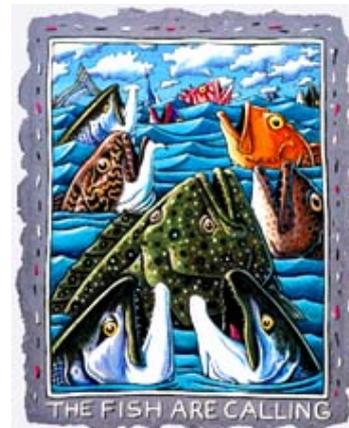
Acknowledgements

First of all I would like to thank my supervisor Bjørn Hersoug. I would never have been able to start or finished this thesis without him. I have learned a lot from him. Then I would like to thank all the co-ordinators and teachers that have contributed to making these two years here at the Norwegian College of Fishery Science very memorable and educational.

I would like to thank my classmates. It has been wonderful to get to know you all. Keep in touch. Good luck wherever you go.

Through my research I have met a variety of different people, but there is one person that I especially would like to mention, Einar T. Karlsen at the Norwegian Animal Health Authority in Harstad. He was of great help and he showed me what public service is supposed to be like.

Finally, I would like to thank my boyfriend, Frode Valnes, for an amazing patience and help.



Source: www.ichthyology.homestead.com

Tromsø 15.05.2003

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Abstract

Resource management in the coastal zone involves a large number of stakeholders and resource users, from traditional fishermen and recreational housing owners to state and municipal government. The aim of this study is to show how spatial scarcity in Norwegian aquaculture is not solely a technical definition, but scarcity also depends upon the social context in which it operates. That is, what has influenced Norwegian aquaculture policy in spatial terms? This question is answered by looking at how allocation of space has developed from the early 1970s and to the present, what actors were involved, what arguments did they use and what was the spatial outcome of the chosen policies. Through a literature review, I have shown how discourses of regional policy, industrial policy, environmental policy and health policy have affected the spatial allocation of aquaculture licenses in the past. Moreover, I show that these discourses are a part of a larger coastal zone management discourse, which is becoming increasingly popular. Thus, scarcity of space in aquaculture is defined within the discursive framework that it operates.

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Chapter 1 – Introduction

The Norwegian coastline is long. If we include the coastline along inlets and islands it turns out to be over 57 000 km (Sandersen, 1996:2). This area includes a large number of invaluable natural resources, such as fish, shellfish and seaweed. The Norwegian coastal waters are not only large in area, they are also sheltered, have good circulation of water, and the Gulf Stream ensures a yearly middle temperature of 8.4°C. These are characteristics that are favourable for aquaculture (Thomassen, 1985).

The Norwegian aquaculture industry has experienced an immense growth since its introduction in the 1950s and has become a large industry of great value (Berge, 2001). Norway has become the largest producer and exporter of farmed Atlantic salmon and produced 446 000 tons in 2002 (NHL, 2003).

World production of Atlantic salmon. Tons		
Country	2000	2001
Norway	419 000	415 000
Great Britain	124 000	149 000
Chile	150 000	219 000
Canada	77 000	86 000
Others	86 000	106 000
	856 000	975 000

Table 1: World Production of Atlantic Salmon in tons (Fid, 2002 (Exportutvalget for fisk)).

Production and sales of farmed fish create both employment and revenue on national and regional levels. In 2002, the Norwegian aquaculture industry exported a total of about 500 000 tons salmon and trout (round weight) at a value of 9 billion NOK. A total number of about 3 700 persons were employed in the farming of salmon and trout in 2001 (SSB¹, 2003).

To produce healthy and clean food an environment devoid of pollution and disease is required. Localities with suitable conditions minimize the risk of pollution, and disease. Thus, a location with good water exchange and recipient is required, such conditions are usually found in rural fjords. Consequently, due to the strict requirements to the physical environment, aquaculture is a regional industry. Moreover, these regions have the advantage of having settlements all along the coast and a relatively well-developed infrastructure, such as roads, bridges, airports, service industry, health services, and so forth. In addition, the people along the coast are,

because of ties to traditional coastal fisheries, well adept to working with fish. Consequently, aquaculture farms have usually been placed in such rural areas.

That these areas are sparsely populated does not imply that coastal areas have not been utilized. The Norwegian population has traditionally used natural resources for survival and recreation. As a result, a number of interests in the coastal zone exist. The fast expansion of aquaculture has, however, imposed limits to the traditional uses and created conflicts with respect to user rights.

Large funds have been invested in aquaculture research and Norway has become one of the leading nations within this field. The majority of research has been carried out on salmonid species, hence the great success in the salmon industry. Nevertheless, other countries have also invested in research and improved their methods. As a result, the world production has increased to a point where the price of farmed salmon has, in periods, stagnated. This led to more research, with special attention to new species (Thomassen, 1985). At the moment one of the species in focus is cod.

The future of cod farming might seem bright, but there are many barriers before cod becomes as successful as salmon. One barrier is the high cost of producing cod fry. Another is the declining number of suitable sites for aquaculture in general (www.netfisk.no, 06.01.2003).

The main idea behind this thesis is that “space” is not only “a region of the earth’s surface” (Hornby, 1986). With respect to aquaculture, space will therefore include the physical occupation of a farm, plus the area “confiscated” by the farm, which excludes other types of uses. What is more, space is also a result of various socially constructed discourses related to regional policy, industry structure, health and environmental issues, and coastal policy.

Value-added activities in the marine sector are predicted to increase from 35 billion NOK in 2001 to 150 billion NOK by 2020. The majority of the economic activities will take place in the coastal zone (Seterås, 2001; Sandbæk, 2003:64). Access to suitable area in the coastal zone is the basic requirement for continued growth and development of aquaculture. In 1993, Heen et al. claimed, “The future of the salmon farming industry is not limited by the availability of suitable sites for production...”. This is an essential assumption, if we are to increase production as predicted. However, is this assumption realistic?

It has been argued that the total number aquaculture net pens, if placed on the Gardermoen International Airport, will only occupy one runway (Sandbæk, 2003:65). Thus, considering the long coastline and the large area within the baseline (90 000 km²), it is not surprising some actors have difficulties to fully comprehend that space may be limited. Moreover, technocrats argue for almost an unlimited aquaculture expansion - depending upon technological solutions. Similarly, space is not seen as a limiting factor by the technological foundation SINTEF¹ as they state, “Terrestrial areas are now fully utilized, and one does not expect limited space in the ocean” (Sandbæk, 2003:63).

On the other side, actors such as Per Chr Holm in the Directorate of Fisheries argue that, with the present organization of the aquaculture industry, space will become a scarce input factor. A normal permit for salmon is presently at 12 000 m³ and has a surface area of 2 800 m² (White Paper no. 43 (1998-99); Sandbæk, 2003:55,65). With a minimum requirement of one km between farms, a farm occupies at least an area of about 0.785 km². If we use five km between farms, then each farm will occupy 19.5 km². In addition, each license needs between 2 and 3 localities for periodical abandonment (see appendix 2). The area within the Norwegian baseline is 90 000 km². Using five km as a minimum requirement will allow for 4 600 localities. In 2001, there were about 3 000 localities for salmon, trout, rainbow trout, shell fish and marine fish in Norway – salmon alone occupy 1 700 localities. This calculation, however, does not include the introduction of National Salmon Fjords and the planned marine conservation areas. Thus, depending upon the discourses being utilized and its accepted requirements and considerations, the predictions of spatial scarcity may be fulfilled. Moreover, a growth as the one predicted above, may seem somewhat unrealistic – given the existing technology (Seterås, 2001; Sandbæk, 2003:65).

The discussion between the “optimist” and the “pessimist” has primarily been centred on technology. Obviously, the type of aquaculture technology determines where a farm can be located. With new technology (larger and/or submergible pens) aquaculture may be able to move farther ashore, thus escaping spatial limitations and some conflicting interests. However, the question of space is more than a technical

¹ The Foundation for Scientific and Industrial Research at the Norwegian University of Science and Technology: NTNU.

question. The requirements put upon the salmon industry are also the results of social processes – requirements are socially constructed. This is evident if we compare Norwegian aquaculture industry with those in other countries, for instance, Chile, United Kingdom or Ireland, where spatial requirements are different.

Hence, whether there is scarcity of space or not, depends also on how the discourse over space has been framed, which demands have been accepted and how these demands have been transformed into minimum requirements through laws, regulations and practices.

One of the questions in Norwegian aquaculture that needs answering is whether or not space is scarce, given the present technology. To answer this question, a number of subordinate questions need answering:

1. How has the physical use of space changed in Norwegian aquaculture since the early 1970?
2. To what extent can these changes (in spatial use) be traced back to social discourses, that is, to various discussions relating to the development of the aquaculture industry?



Fish farm on Måløy.

Photo: Tor Jarild
Source: Aftenposten, 14.05.2001

To answer these two questions another four questions need answering:

3. How has policies related to the use of space in aquaculture been represented from 1970 onwards?
4. What types of actors and interests have influenced the development of these policies?
5. To what extent have the various discourses resulted in laws, regulations and practices affecting the aquaculture industry?
6. Finally, to what extent can coastal zone management (CZM) be seen as an attempt to harmonize various competing interests and discourses?

The paper is organized as follows: in chapter 2, the methodology and the theory used in this paper will be presented. In chapter 3, the paper will briefly wander through the history of Norwegian aquaculture from the 1970s to the present. Chapter 4 to 7 divide the whole period into different eras and examine spatial development in each era. In chapter 8, Integrated Coastal Zone Management will be presented and a few key interests in the coastal zone will be examined. Chapter 9 will provide a discourse analysis of spatial use in aquaculture, before concluding.

Chapter 2: Methods and Theory

This paper is, in general, founded upon qualitative materials collected through literature review, including public documents and archives. Secondary literature, such as research, newspaper and academic periodicals, was actively used. Some texts have been more central than others, such as certain Odelsting Propositions and White Papers. Berge (2001) was central in developing the historical developments in aquaculture and Neumann (2001) provided the basis for the theory.

The document analysis was supplemented by interviews of a few key actors, such as regional veterinary for Troms and Finnmark, Einar T. Karlsen; as well as Ulf Magne Nilssen at the Ministry of Fisheries, Ingebrigt Austevoll fisheries advisor in the municipality of Austevoll, and Pål Erik Jensen at the Norwegian Animal Health Authority. These interviews, however, do not qualify as scientific interviews.

The graphs used in chapter 8, are only relative numbers. The idea is to illustrate how different actors perceive conflicts in the coastal zone.

The paper is limited to salmonid aquaculture in sea. I am aware of the spatial implication smolt and fish processing plants may have; however, that is beyond the scope of this paper. Hence, this paper does not discuss any matter dealing with smolt, sea ranching or other species than salmonids.

The analysis had a main focus upon the written word, especially public documents. However, discourses tend to exist orally prior to publications, e.g. within political parties. Discourses may also exist abroad, before they are introduced in Norway; these perspectives are also outside the scope of this paper. Another limitation is related to translation. I translated most of the documents from Norwegian to English, this therefore influence the text.

The timeframe of the paper is set to the period 1970 to 2003 and the spatial limit is Norwegian aquaculture. The timeframe was chosen because modern aquaculture, with eight-sided sea pens, took off in the seventies. The year 1970 is also an important year, as Norwegian Fish Farmers' Association (NFF) was established this year. Moreover, the first temporary aquaculture act was implemented in 1973. Hence, 1970 is a natural and convenient point of departure.

Discourse Theory

This paper will present the main aspects of discourse analysis: analysis of regularities in expression to identify discourses; analysis of the actors producing, reproducing and transforming discourses; and spatial impacts and policy outcomes of discourses (based on Adger et al, 2001).

Discursive formations in aquaculture policy covered in this paper focus on spatial issues, thus the analysis deliberates on the spatial implications of the different discourses. In describing the discourses, data concerning the three aspects with an emphasis on identifying the characteristics of the discourses and the spatial impacts and outcomes will be presented. The analysis will use Neumann's three steps (2001) to develop a model of the discourse.

Adger et al (2001) define discourses broadly as "a shared meaning of phenomena". They specify that:

"These phenomena may be small or large; and small or large groups on local, national, international or global level may share the understanding. The actors promoting the discourse participate in various degrees to its production, reproduction and transformation through written and oral statements" (Adger et al, 2001:683)

Based on Foucault (1972) "discourses will be viewed as a broader set of linguistic practices embedded in networks of social relations and tied to narratives about the construction of the world" (Hovden and Lindseth, 2002:2). Discourses enclose a body of expressions in which we can find homogeneity in message as well as in expressive means (Adger et al, 2001:685). Thus, expressions share a particular knowledge and perception of the phenomenon in question, and there may be shared beliefs regarding causes of problems and appropriate response.

Hovden and Lindseth (2002) claim that discourses define the range of policy options and operate to empower specific actors and exclude other actors. They also serve as a site of resistance, forming counter discourses. Thus, discourses exclude some people, as they do not allow certain issues to be raised; only certain people are authorized to participate (Hovden and Lindseth, 2002 (Hajer, 1995.49)).

Allison (1971) states that policies are discursive struggles, rather than a product of institutional factors or product of actors' interests (Hovden and Lindseth, 2002 (Sabatier, 1999)). However, without actors to promote discourses and to

struggle over them or identify with them, discourses would not exist (Hovden and Lindseth, 2002 (Litfin, 1994)). Institutions and individuals can reproduce, maintain and be carriers of discourses. The actions of these agents occur within the framework of discourses, which exist independently of the intentions or the motive of the agents.

Discourses are continually reproduced and developed further as central actors use discourses to be heard, understood and validated. Discourse analysis will therefore be used to deconstruct the aquaculture policy from the 1970s to the present and to examine how central actors in public debate relate to and influence the discourse context, with a specific focus on space.

According to Adger et al (2001), within discourse analysis, expressive means have been analyzed in terms of narratives (Petersen, 1997), storylines (Hajer, 1995) and metaphors, and other rhetorical devices (Dryzek, 1997). In this paper, expressive means will be analyzed in terms of narratives. Narratives have two important aspects.

First, a narrative has a chronological order (beginning, middle and end). Roe, for example, defined a ‘development narrative’ that emphasized chronology. He focused on political implications of development narratives, for instance the appeal of ‘tragedy of the commons’ for privatization. Further, Roe stressed that development narratives is not necessarily displaced by negative findings, rather he proposed to create a ‘counter-narrative’ that tells a better story (Adger et al, 2001 (Roe, 1991, 1995, 1999)). Thus, this paper will try to develop the narratives in the various discourses chronologically and show that various narratives were not displaced. Rather, the narratives in each discourse developed a ‘counter-narrative’ that told a better story (from the carriers’ point of view), which grew in influence parallel to other discourses. Thus, a counter-narrative may, or may not, replace the original narrative. In the case of Norwegian fish farming, although counter-narratives became increasingly dominant, they never completely replaced the original discourse. The original narrative co-existed, but with a weakened position.

Secondly, a narrative has a particular structure related to an involved “cast” of actors. This paper will try to show how a particular set of actors follow a discourse from the 1970s to the present, and how some does not. This does not imply that *one* particular discourse is the dominant discourse throughout the entire period. A discourse is hegemonic if it dominates thinking and is translated into institutional arrangements (Adger et al, 2001). Thus, this analysis will show that the hegemonic discourse varies from the beginning of the 1970s to the present. In the 1970s, for

instance, the hegemonic discourse was focused on regional-policy. Today, the hegemonic discourse is based upon health arguments. This paper will find the dominating and alternative discourses throughout the development of aquaculture-policy with respect to space.

In aquaculture politics, the establishment of key reference points – such as concepts, terms and phrases - play a crucial role in terms of reinforcing arguments associated with these contextual factors. The power of discourse is to: determine the linguistic frame of reference within which the debate takes place. Thus, aquaculture policies are struggles between various institutions and political coalitions, where politicians, scientists, fish farmers and other interests participate. The participants may be divided into groups that maintain and further develop ways of approaching a problem – as parts of various discourses (Hovden and Lindseth, 2002).

Models are socially reproducible facts, known as representations. Representations are things and phenomena the way we perceive them. That is, not the thing in itself, but things filtered through what comes between the world and us: the language, the categories and so forth. Representations decide what is being sensed and communicated and must be repeated with more or less variations. The carriers of the same representations are institutionalized in a position in the discourse and promote a similar reality. Thus, discourse analysis makes it a scientific assignment to show how representations are constituted and diffused, and what variety of different representations that at a point in time makes up the discourse (Neumann, 2001).

Neumann's Three Steps to Discourse Analysis

To analyse “the discourse of space” in Norwegian aquaculture policy the three steps used by Neumann (2001) will be applied.

Step 1: Choosing and Limiting the Discourse

Humans need models to separate sensed impressions. Social reality exists in discourses (in clusters) and one discourse cannot be completely separate from others. How we limit the discourse in relation to others is a question of what meaning the discourse is given by its carriers. Thus, the scientific assignment is to show the affinity and differences between these representations and to demonstrate that these belong to the same discourse. This can be shown by demonstrating that the

representations shows up in the same text with a certain regularity and that there is an affinity in the use of metaphors in them.

Step 2: The Discourses' Representation

The second step is to make an inventory of the representations that exist in the chosen discourse. Representation is the reality or arguments. It should be noted that discourse analysis is built upon an acceptance of uncertainty and conflict between representations.

The chosen discourse often contains a dominating reality of one or more alternatives. It is impossible to completely limit a discourse; there is always an influx. Also, it is difficult to imagine a discourse completely open over a longer period of time. Methodically, we try to find these different representations.

There are a number of formal and informal practices the carriers use to keep up a given limitation of a discourse. That is, what representations are allowed into a discourse? Political conflicts between clearly defined positions often find resonance in a large number of carriers. Methodically, because politics is a structured activity between groups, usually there is a situation where politicizing of a discourse happens just when two or more patterns of opinions are isolated. Thus, it should be possible to differentiate between opinions that unifies and those that differentiate.

Step 3: The stratifying of the Discourse

The third step is to identify whether all the features of a representation are always the same. Some features unify and some features differentiate. Some features are easier to use to define some pattern of opinion than others. This is the assignment of the discourse analysis. There is an "inertia" regarding representations of material things; accordingly, some representations will be slower to change, e.g. material things. It is harder to change the representation of a car, than the driver. The final question is then: how does power penetrate and keep up the discourse? How is the social energy mobilized in order to keep up the dominating representation?

Chapter 3 - Norwegian Fish Farming: A Brief Historical Overview

To examine the change in spatial use, this chapter will give a brief historical view of the history of Norwegian aquaculture. As the politics of Norwegian aquaculture has to a great extent been focused on licensing, this is a natural point of departure. To enter the business of fish farming an aquaculture license is required. A license is a permit to do something that is generally prohibited (Hallenstvedt et al, 1985 (Eckhoff, 1984)). This exclusive right to a few chosen applicants limits competition. Moreover, competition is limited through volume restrictions. Hence, the licensing system is a form of direct regulations of the aquaculture industry. A license in aquaculture is an industry-political tool to manage: who is allowed to enter, where to establish and the size of farms (Hallenstvedt et al, 1985).

A Foundation is Being Laid (1950s and 1960s)

This paper focuses on Norwegian fish farming in the period from 1970 to the present. Still, there is a need to look back at the beginning of “modern” aquaculture. The foundation of modern Norwegian aquaculture was laid in the 1950s. In this decade Agricultural farmers were experimenting with rainbow trout in freshwater on land, based on Danish technology (Hallenstvedt et al, 1985). They were pioneers with a variety of backgrounds and competences (Aarset, 1998; Didriksen, 1987).

To illustrate the small-scale and experimental nature of Norwegian fish farming at the time, Arne Ratchje – a policeman and experimental fish farmer on the west coast- heard in 1959 about a man who hatched trout fry in a tank. Subsequently, Ratchje wanted to try and imported fry from Denmark. The experiment was a success. The fry grew so well on a diet of whale liver, that he had to expand his tanks. Next, he engorged a small bay with solid cement walls, which allowed for a good influx of fresh seawater. Then 5 500 trout fry were released into this dam in 1962. Many died, but the survivors got accustomed to the seawater and had an immense physical growth. The biology seemed to function well, but there were other obstacles to overcome. The reinforcement steel in the cement walls rusted and Ratchje realised he had to build free-floating net pens. These pens came to be known as the “Grøntvedt-cage”, which is the most used net pen today (Ratchje, 1995; Tilset et al 1991).

The technology of the 1960s was unproven. Most of the production took place in ponds along the coast (as described); however, further experiments with sea pens

were carried out. Simultaneously, agricultural farmers began commercial aquaculture production of trout, as a supplemental income (Vassdal, 2001).

The investments were relatively small. This trial phase was characterized by the lack of commercial character and aquaculture was usually a secondary income. The experimenters were generally small entrepreneurs who shared knowledge. Farms were geographically spread, using different technologies and making little profit (Berge, 2001). At this point in time, the degree of processing was low and the interest from the external capital-intensive industry was minimal.

Expansion of Norwegian Fish Farming (the 1970s)

By the early seventies, a number of small entrepreneurs were experiencing good results in the eight-sided net pans – usually no larger than 500 m³. This technology resulted in an increased production capacity of saltwater aquaculture. Technological expertise and innovations improved, and aquaculture experiments expanded and slowly formed into an industry. Thus, the number of fish farmers increased and production increased as well (Hallenstvedt et al., 1985).

There were several reasons for the great expansion in the 1970s:

1. Aquaculture production moved from land to sea.
2. Production techniques improved (sea cages) and cost of equipment was advantageous.
3. The market was advantageous; the price of salmon was high.
4. Norwegian Fish Farmers' Association (NFF) was established and distributed information and knowledge to its members.
5. Public research institutions started research on aquaculture (Ot.prp. 46 (1972-73)).
6. There was a low volume of wild salmon being caught.

These factors encouraged investments in the aquaculture sector and were the preconditions for the take-off in the industry.

The Lysø-Commission and The Start of a Regulation Regime

In the early 1970s a commission, chaired by Lysø (Minister of Fisheries 1955-1963), was founded to look at the potential of aquaculture and a possible management regimes for the rapidly expanding aquaculture industry. Due to fear of overproduction and resulting low profits, the Lysø-commission recognized the urgency to regulate the

industry. The committee proposed a temporary aquaculture act that lasted until 1981. The final report of the Lysø-commission (NOU 1977:39) became a major influence upon shaping the future of Norwegian aquaculture policy.

This temporary legislation was characterized by being an industry-political regulation with an aim to manage and control Norwegian aquaculture. Thus, the objectives were to control production and ensure regional development. A structure consisting of small units and “owner-operates” was believed fulfill the objectives of the act (Berge, 2001; Bjørndal et al, 1985, Heen et al., 1993).

Four types of societal considerations were to be maintained. First of all, the regime would adjust the total production to the market demand. Second, to regulate the number of licenses to smolt production. Third, it would avoid socio-economical losses of overproduction. Finally, it would allocate licenses to strengthen the economies of rural fjords and coastal areas (Ot.prp. nr. 46(1972 -1973)).

The Allocation Moratorium (1977-1981)

The licensing system was practiced liberally and functioned more like a registration system until 1977, when allocations were temporary stopped. That is, an applicant satisfying the requirements with respect to locality, pollution and disease was seen as having a legal right to a license (Ørebech, 1988 (Ørebech, 1982); Thomassen, 1985). The moratorium lasted until the summer of 1981 (Thomassen, 1985; Hallenstvedt et al, 1985). According to Bolle (the Minister of Fisheries for the Labour Party from 1973 to 1981), allocations stopped because of deficiency of smolt (Ot.prp nr. 30 (1980-81)). However, according to Listau (Minister of Fisheries for the conservative government from 1981 to 1985), the moratorium was implemented because of uncertainty with respect to market demand (Ot.prp nr. 53. (1984-85)). The Norwegian Fish Farmer Association (NFF), who feared overproduction and negative impacts upon existing farmers, supported the moratorium (Hallenstvedt et al, 1985).

Organization of Sales – the Establishment of FOS

Increased production called for an organizing of sales and marketing. Thus, Norwegian Fish Farmers Sales Organizations (FOS) was founded at the annual meeting of NFF in 1978. The sales organization consisted of aquaculture producers, with the objective to organize firsthand sales of farmed fish. It would also try to achieve good and stable prices

There were, prior to the establishment of FOS, discussions regarding what legal framework to use: the framework of the fishing industry or the framework of the agriculture industry. From the Lysø-commission there were four alternatives put forth:

1. *Free sales.* The Lysø-commission advised against it, as earlier experiences in the sales organization for trout (Norsk Ørretomsetning SL) were negative.
2. *Sales on voluntary basis.* The Lysø-commission did not advice to use this system either, as a similar system had taken a long time to function in the agricultural sector.
3. *Sales under the Raw Fish Act and the existing fisheries sales organizations.* This was also advised against from the Lysø-commission. The existing fisheries sales organizations had the authority to implement moratorium upon fishing and this could be disadvantageous to fish farmers. The sales of farmed salmon would be organized through six different cooperatives, which could lead to problems of coordination.
4. *Firsthand sales by sales organizations organized by the fish farmers and protected by law.* This was the alternative that the Lysø-commission advised to use, which became the FOS (Didriksen, 1987).

The Liberating 80s and the First Permanent Act of 1981

The first conservative government of Willoch came into office in the early 1980s. There was an amazing growth from 1980 to 1990 in the aquaculture sector and in some years the annual growth exceeded 50%. This increase was partly due to increased use of inputs – more localities were opened; however, most of the increase was due to technological change (Vassdal, 2001:3). At this point in time, the capital-intensive industry had a growing interest in the profits being made in aquaculture. Simultaneously, laws regulating the financial markets were liberalized.

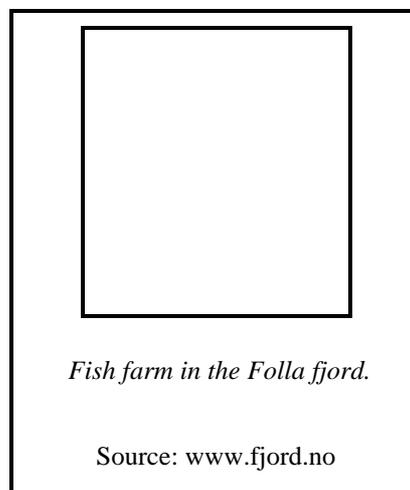
The first permanent aquaculture act was implemented in 1981 (15th of May 1981, no. 19). Due to market imperfections and the use of common property, fish farming needed to be regulated through a licensing system (Bjørndal et al, 1985 (Gravell and Rees, 1981:511)). The permanent law was almost identical to the temporary law and was characterized by the central authorities willingness to manage and control the industry, as well as regional development (Thomassen, 1985, White Paper no. 71 (1979-80)). The aim of the law (from the Lysø-committee) was to spread

the volume to get the best regional effects (NOU 1977:39). The decentralized structure would consist of small and medium sized farms, localized in rural communities and with the owner as the operator. To ensure that farms were placed in the districts, certain areas would get a geographic priority, e.g. Northern-Norway (Bjørndal et al, 1985 (White paper no. 71, p.42)).

The first concession round, according to the law of 1981, took part in May 1981. Licenses were allocated according to a strict regional allocation regime. Even during the government of Willoch, which claimed their opposition to a license regime, was the licensing system practiced strictly (Ørebech, 1988 (Ot.prp. nr. 53(1984-85))).

An Attempt to Deregulate - the Aquaculture Act of 1985

A new Aquaculture Act was implemented in 1985. This act, as the previous acts, regulated the number, the size, the location and the ownership of farms. The main amendments to the law were with respect to smolt production, farming of new species and farming of salmon in fresh water. That meant, for instance, it was free entrance into “the hatchery business”, if the requirements to environment and health were satisfied. The requirement to owner-operator relations was relaxed. Majority interests should be only “as far as possible” on local hands and could only be held in one farm - to avoid large concentrations on the owner side. Minority interests could be held in more than one farm (Berge, 2001; Bjørndal et al, 1985 (Ot.prp 53, 1984-1985); Heen et al 1993 (Aarset, 1988)). The requirement to adjust to market demand was removed. The objective was to balance development to the infrastructure, such as: supervisory services, education, training and research (Bjørndal et al, 1985; Heen et al, 1993).



Therefore, although the law was similar to the act of 1981, it was to some extent liberalized.

Due to the general and somewhat opposing objectives in the legislation, there was a need for regulations to accompany the act. These regulations further emphasized the regional-political characteristic of the act (Thomassen, 1985).

At the end of the 1980s the industry was still characterized by small entrepreneurs, low vertical integration and local ownership. However, there were

tendencies of increased industrial ownership and horizontal integration. The bank crisis affected the aquaculture business and a number of fish farms went bankrupt and the optimism regarding new species declined. As technology improved, the size of the farms grew and the density within the pen increased. Thus, environmental pollution and disease on the locality became an increasing problem. With an increased focus on locality and environmental problems, environmental and veterinary regulations became limiting-factor to allocation of licenses. The Ministry of Environment had become a production-limiting department (Berge, 2001).

The Re-regulating 1990s

At the beginning of the 1990s the Labour Party came into office. This government continued the deregulations started by the previous conservative government. The focus was still on increased and inexpensive production; however, due to the resulting overproduction of salmon, there was an increasing pressure from the European Union (EU) and the United States (USA) to regulate (Berge, 2001).

Norwegian producers were accused of dumping by American and Scottish/Irish producers. In 1990, the European Commission concluded that dumping had taken place. No counter-levy was launched against Norway, but a system to freeze the overproduction and a minimum-price-policy was established by the Norwegian government that same year. In 1991, the European commission set a temporary minimum price and 2% import levy on Norwegian salmon. Similarly, the US found Norway “guilty” of dumping and subsidizing, and a tariff of 26% was imposed on Norwegian salmon. This terminated the export to the U.S. (Heen et al, 1993:18; Berge, 2001).

This conflict led to what Berge (2001) called “re-regulation”, which materialized at first in a temporary feed moratorium (quotas) in 1991. The result was a reduction in production in 1991-92 of about 30 000 tonnes (Heen et al, 1993:18; Berge, 1985). The monopoly sales organization (FOS) was in financial difficulties and started negotiating with government to sell the overproduction to non-commercial markets. The government was not willing to support such sales and the sales organization went bankrupt. A number of farms also went bankrupt - due to low prices and the bankruptcy of FOS. The government and the large producers saw this as an opportunity to restructure the aquaculture industry. The sales structure has changed and today a number of wholesalers and exporters operate, as opposed to the

previous monopoly. Subsequently, there was an increase in both vertical and horizontal integration, and also in differentiation of farms (Heen et al, 1993).

In 1997 the Norwegian producers were once more faced with accusation of dumping from the EU. The EU is the most important export market for Norwegian farmed salmon. In order to avoid corrective actions from the EU was an agreement between the EU and Norway signed (“The salmon agreement”). They agreed to a minimum price for Norwegian salmon and a maximum limit on export to the EU markets. The intension of the agreement was to regulate the European salmon market. To demonstrate the ability to regulate the Norwegian production, feed quota was imposed on all producers in Norway (Vassdal, 2001:4).

A First Attempt to Regulate Space: LENKA

In the mid-1980s, the aquaculture industry struggled with environmental problems and economic losses due to disease and escapements. Furthermore, the fast growth in the business called for a well-formulated policy with respect to locality. There was a recognition that locality was a limited resource that had to be managed. As a result, the project LENKA (NOU 1990:22) was initiated in 1987 (Aarset, 1998).

LENKA assessed the suitability of the coast for aquaculture. The goal was to develop a planning device for industrial development by reviewing interests, infrastructure and environmental conditions in the coastal zone. LENKA would, additionally, try to simplify procedures, increase involvement of local government and provide central government with an overview of total potential capacity for coastal aquaculture. LENKA estimated, at the time, a potential increase of 600 000 tons of farmed fish without detrimental environmental effects (NOU 1990:22).

The History of the Allocations of Farms - An Increase in Size and Numbers

The temporary Aquaculture Act of 1973 was practiced liberally – until October 1977. Only 6 of 97 applications were rejected in the period (Heen et al, 1993:15 (Aarset, 1988)). The temporary act also regulated the farms size – cage volume. In 1973 the maximum size was set at 8 000 m³ (Heen et al, 1993) and 287 producers produced 171 tons of salmon (Tilset et al., 1991). Although the production limit was set to 8 000 m³, there were farms like MOWI that had nearly unlimited volume, as they blocked off sounds. The size regulations did not, at the time, apply to farms that existed before the law was implemented.

The size of the farm was reduced to 5 000 m³ in 1975 and further reduced to 3 000 m³ in 1981 (Aarset, 1998). In the same period, the production increased to a total of 8 418 tons (NHL, 2003). From the 800 applications only 50 were approved. The low number of concessions given was due to industry political considerations and increased the production capacity by a mere 10% (Thomassen, 1985:43).

In the spring of 1983 came new and promising signals, 100 concessions were allocated at a size of 5 000 m³ (Aarset, 1998:197). At the same time, existing farms were permitted to increase their size to 8 000 m³. Hence, the production capacity of salmon and trout increased by 70-80% (Thomassen, 1985:43; Ørebech, 1988:14 (Ot.prp. nr. 53(1984-85))).

Another round of concessions took place in July 1985. A total of 150 concessions were allocated at the size of 8 000 m³. This year the total production of salmon had risen to 29 473 tons (FHL, 2003).

The pen volume increased to 12 000 m³ in 1988 and Norwegian farm salmon was about 70% of the total production in the world that year (Tilset et al, 1991:2). The production increase continued; however, the production actually fell from 1990 to 1992 and so did the Norwegian share of the world.

From 1992 the production of farmed Atlantic salmon increased again and has exploded since 1997, despite stringent regulations. By the year 2002, the production has reached an all time high of 446 000 tons (FHL, 2003).

To illustrate that the growth has been beyond imagination, the Lysø-commission estimated that the potential production volume for salmon in 1985 would be between 8 000 and 15 000 tons (NOU: 39, 1977). The actual production in 1985 was close to 30 000 tons. Obviously, aquaculture in Norway has had a growth that exceeded what anyone was able to foresee (see appendix 1).

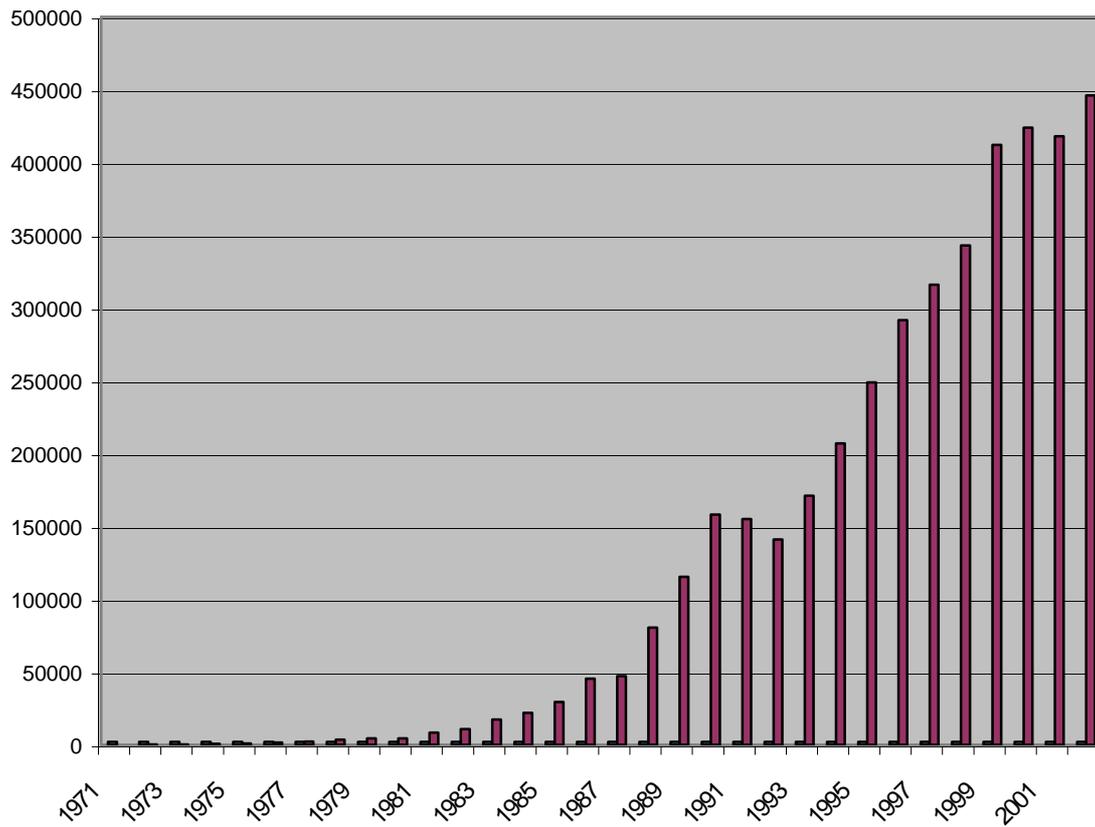


Figure 1: Volume of Slaughtered Atlantic Salmon from 1970-2002 in tons (FHL, 2003).

The growth in the aquaculture industry has been based upon three factors: 1) there was an existing infrastructure – from wild salmon, 2) workers in the regions were familiar working with fish and 3) there were cheap or free research and support.

Chapter 4: The Formation of an Industry (1970 to 1980)

In order to analyse the spatial influence of aquaculture in the period from 1970 to 2003, an examination on the separate eras is essential. The entire period is split into four eras: the formative years (1970-1980), the era of growth (1981-1985), the era of financial crisis (1986-1991) and the era of health interests (1991-2003). Within each era three different elements are discussed: the policy, the actors involved and the outcome of the policy.

Small farms and entrepreneurs characterized the aquaculture industry in the 1970s. A number of entrepreneurs experienced good results with the eight-sided net pens, and the total production of salmon increased from 98 tons in 1971 to 4 312 tons in 1980 (NHL, 2003).

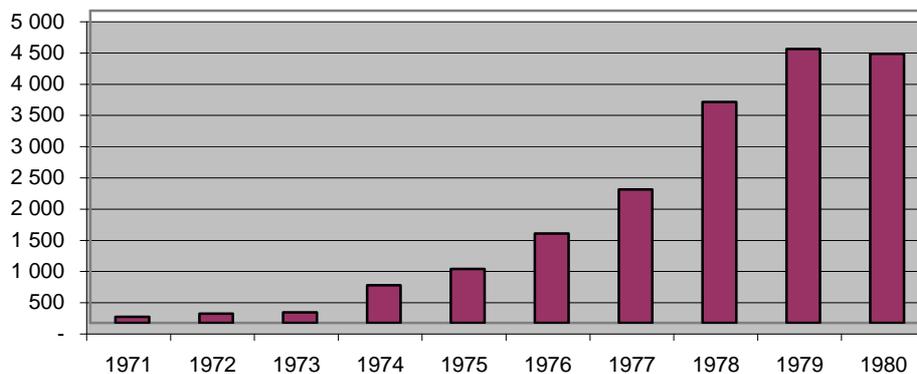


Figure 2: Produced Atlantic Salmon 1971-1980 in tons (FHL, 2003).

There were four reasons for the expansion in the 1970s. First of all, farms and production techniques developed. Secondly, the price of salmon was advantageous. Thirdly, Norwegian Fish Farmers' Associations (NFF) was established, and distributed information and knowledge. Finally, public research institutions started research on aquaculture (Ot.prp. no 46 (1972-73)).

The period from 1970 to 1980 is recognized for one event in particular, the temporary Aquaculture Act in 1973. The establishments of (NFF) in 1970 and the Fish Farmers Sales Organization (FOS) in 1978 also affected the industry in the period. These events established a regime characterized by political selectivity and rationality, through limiting entry into the industry. In addition, ties to the Ministry of Fisheries were strengthened through legislation in the period (Berge, 2001).

The regime was a result of political conflicts and compromises. The central arena for these conflicts was the Lysø-commission, established in 1972. The Lysø-commission laid, according to Hersoug and Holm (1992), the premises for the future aquaculture politics. The commission would evaluate the possibilities that artificial hatching and aquaculture developed into a vital industry, including organization of it (Berge, 2001).

The Lysø-commission observed the rapid growth in the industry and the need to regulate its development. Hence, they proposed a temporary Aquaculture Act in 1973. The temporary Aquaculture Act of 1973 introduced a license regime into the aquaculture industry. The objectives were, first of all, to strengthen the economies of coastal communities by increasing employment, through allocating licenses to economically weaker rural regions. Secondly, they wanted small-scale industry structure and promoted small and medium sized farms. These objectives would be achieved by: limiting the number licenses, regulating the ownership and limiting the size of the farms. The act would also try to balance the production of farmed salmon with the marked demand. An unregulated production would result in overproduction and a downward pressure upon price. This in turn would lead to bankruptcies and negative regional effects (NOU 1977:39).

The objectives were further stressed through the regulations and contained absolute requirements that *had* to be satisfied to receive a permit. A permit would not be given if:

- a) There was a risk for spreading disease.
- b) There was a risk of polluting.
- c) The technical standards were not satisfied.
- d) The farm had a poor location.

The commission suggested a quantity (ton) regulation on production of salmon and rainbow trout. This became a central conflict and was, as suggested by the Directorate of Fisheries, not included in the temporary of 1973. Rather, production was regulated through volume limitation and were in 1973 set to 8 000 m³ (Forskrifter, 1973). This regulation continued until January 1975 when the limit was reduced to 5 000 m³, and further reduced to 3 000 m³ in 1981- for new entrants, existing farms were exempt. It ought to be mentioned, at this point in time, there were no clear aversion towards non-local ownership of aquaculture farms.

The temporary Aquaculture Act was practiced liberally, until the moratorium in 1977. Only 6 out of 97 aquaculture applications were rejected (Aarset, 1998:197) on the accounts of risk of disease or pollution (Heen et al, 1993:15 (Aarset, 1988)). Private applications that fulfilled the requirements (§2) with regards to disease, pollution, technology and location were seen as having a legal right to issue a license (Ørebech, 1988:13 (Ørebech, 1982), Thomassen, 1985).

Actors and interests

The political conflicts regarding ministerial affiliation arose when actors from two sectors entered the scene: those tied to fisheries and those tied to agriculture. Fish farmers were, due to historical ties to the seine fisheries, “representatives” of the fisheries sector.

Fish farmers wanted farms large enough to run an economic efficient operation as a full-time occupation. They did not want an industrial-like structure. Nevertheless, the production limitations must have been a handicap to many fish farmers, especially to those already planning expansion, as such limits would hinder the natural advance in the industry – into larger units (Berge, 2001). Moreover, requirement regarding disease, pollution, technical standards and location would ensure a small-scale structure (Ot.prp. no. 46 (1972-73)). Aquaculture had, because of its nature, to take place in the rural regions. Regulations would hinder farms in taking advantage of the growing experience to improve efficiency and market conditions, and obstruct the competitiveness of the industry. Hence, fish farmers opposed the regional-political arguments used in favour of production regulations (Ot.prp. no. 46 (1972-73)).

The representative of Norwegian Fishermen’s Association (Norges Fiskarlag) in the commission, Sivert Grøntvedt, did not have the same reservations to a production restriction as the fish farmers. His association saw maximum allowable size as a tricky issue, and thought the development of aquaculture should maximize benefits in the districts.

Regarding production, the Director of Fisheries claimed the limit was set too low, but it was only a temporary act. He also suggested giving dispensations to the production regulation (Berge, 2001).

The Ministry of Fisheries did not want an industrial structure, but emphasised the difficulties in setting an upper limit to size. The allocation regime chosen would

strengthen the economies of coastal regions, they claimed. Many small farms, rather than one large farm, would achieve the political objectives. They also asserted that market demand and regional considerations, as well as economical and technical requirements should be evaluated when allocating licenses.

Although the agricultural sector agreed with the proposed temporary law, they perceived the volume limitation to be set too high. For the best regional effects, aquaculture had to become a side-occupation tied to agriculture. If the farm size was set too high, a smaller number of actors would be able to enter the business (Ot.prp no. 46 (1972-73)).

Principally, the environmental interests supported the proposed act. However, there were already farms exceeding the suggested maximum limitation and a volume limitation would be impractical to control production. Smaller, usually economically weaker farms would have difficulties in sustaining losses. The Ministry of Environment was, therefore, in doubt regarding the maximum limit, but claimed that socio-economical and regional-political consideration points in the direction of production limitations.

As a result of the opposing interests, the Lysø-commission's proposal was a compromise. The general pattern was that opinions of the agriculture sector opposed those of the fisheries sector. Thus, three models seemed to evolve in aquaculture: the Agriculture-model, the Coastal-model and the Industrial-model. The first model was supported and argued for by the agriculture sector. Aquaculture should be a side-occupation to agriculture and farms should be small and regional. The second model, the Coastal-Model, would counteract declining traditional fisheries. Thus, fishers and fish processors should have a priority. Owner should operate the farm and the size should be adequate for an economical operation. Still, the industry should not have an industry-like characteristic. Allocations would depend upon the regional need for employment. Finally, the Industrial-Model had its ties and supporters externally among the capital-intensive industry and internally among the large-scale producers. It would allow industrial interest to enter the aquaculture business to improve economic and market competence. No restrictions on size or ownership would be necessary and farms would be located where it would be most profitable. This model opposed a concession (licensing) system, and argued that standards with respect to technology, environment, and disease would be satisfactory (Hallenstvedt et al, 1985).

The majority of the commission rejected the Agriculture-model, as well as the Industrial-Model. The Coastal-model dominated in the 1970s.

The Spatial Outcome of the Temporary Act of 1973

The direction of Norwegian aquaculture policy was laid by the Lysø-commission. The majority of this commission favoured the Coastal-Model and the discourses centred on regional development. Ot.prp. no. 46 (1972-73) - resulting in the temporary act of 1973, and NOU 1977:39 - the final report of the Lysø-commission, were both influential public documents that lead to the institutionalization of the Regional-Policy (RP) discourse.

The NFF was, at the time, in support of a policy based upon the Industrial-Model and the Industrial-Policy (IP) discourse. The fishermen's organizations were not clear on their choice of discourse, but was influenced by both the RP- and the IP-discourse. The Ministry of Fisheries and the agricultural interests were a part of the RP-discourse; however, they had different approaches. The Ministry of Fisheries tied aquaculture to the fisheries sector, whereas the agricultural interest tied aquaculture to the Ministry of Agriculture and the agricultural sector. The industry was included in a discourse that integrated aquaculture in a regional-policy context, where none of the actors saw space as a potential problem. Hence, scarcity of space was not yet an issue.

Thus, starting in 1970, the first sea-based aquaculture farms did not represent any significant problem with respect to space. This can be illustrated through the liberal practice of the law and its regulations. Due to the liberal practice, farms were normally situated outside the land area owned by the farmer or on a locality controlled by family, friends or business partners. At the time nobody foresaw a conflict over sea space.

One important reason for the low level of conflict over space was the fact that a large numbers of fish farmers were former fishers or they combined fish farming and processing. In addition, nearly all the operators were locally based; aquaculture was perceived as a "salvation" for small, peripheral communities where traditional fisheries were declining. Fish farmers were a part of the community and no one, except for occasional protests from recreational interests (farming disturbing the views from their cabins), would try to limit the new industry by focusing on conflicts.

With the license regime in place, space gradually developed to be a key factor. Not only did the first operators discover that some locations were better than others

(exposure and interchange of water), but the regional policy aspects implied a spreading of farms all along the coast. Even if one of the main objectives of the regime was related to market demand, the result was many, small farms in a large number of municipalities.

However, some local fishing administrations saw the threat of the moratorium in 1977, registering a large number of farms just before the temporary closure. The municipality of Austevoll, just outside Bergen, submitted 40 applications when the moratorium was introduced (Austevoll, 27.03.2003). Thus, a number of operators had as early as 1977 started to feel the problems of few good localities.

The moratorium stunted the growth of aquaculture in northern Norway, which at the time had most space available. However, the permanent act in 1981 and the accompanying regulations, introduced a stricter regime regarding space (see chapter six).

Although production regulations intended to keep a small-scale and regionalized structure, one may question the efficiency of this. The maximum allowable volume was in 1974 set to 8 000 m³ (Aarset, 1998:197). However, the average size of farms receiving licenses was in 1974 only 3 000 m³ - under half of maximum allowable volume (Berge, 2001:132). Thus, technology was the factor that ensured a small-scale industry, neither politics nor legislation.

There was a decentralized profile of the industry throughout the decade. The regional pattern was mainly because of two factors: environmental requirements and gear skills. Aquaculture required clean and sheltered water found in remote fjords and the technological transformation into sea net-pens introduced seine fishermen into the business. Seine fishermen were settled along the coast; hence, competence also influenced regional development.

Chapter 5: An Era of Growth and Attempts to Liberalize (1981 to 1985)

There was a continued growth in production in the 1980s. Production rose from 8 418 tons in 1981 to 29 473 tons in 1985 (NHL, 2003). Although the production increase was primarily due to increased net pen volume; increased number of entrants, as well as improved knowledge, experience, research and education also contributed to this growth (Aarset, 1998).

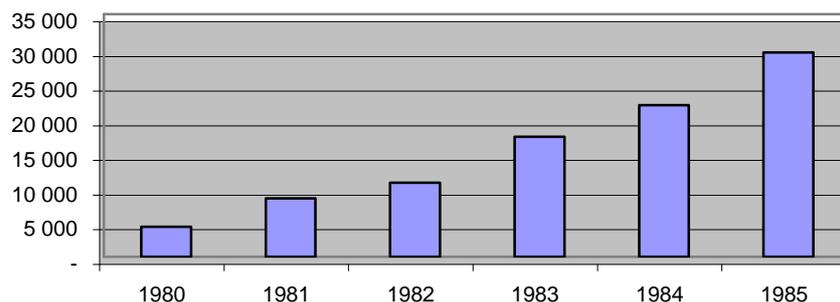


Figure 3: Produced Atlantic Salmon 1980-1985 in tons (FHL, 2003).

A Permanent Policy and the First Liberalizing Influences

The Lysø-commission's final report was delivered in February 1977. The commission saw an increased need to regulate and direct the development and proposed the temporary act to be made permanent (NOU 1977:39).

The basis for the new act was the White Paper no. 71 (1979-80). The objective was to achieve maximum social benefits by creating employment in rural areas. Spreading farms along the coast, as well as geographic prioritizing, would realize this objective. Additionally, adjustments of production to market demand was upheld. As a result, the main characteristics of the temporary act continued into the new act. The issues discussed in this white paper were formulated into a law proposal (Ot.prp. no. 30 (1980-81)). The main objective of the Act of 15th of May 1981 was of an industry-policy nature. The emphasis would be on:

1. Balance between production and marked demand.
2. Economically feasible farms.
3. Maximum benefits to rural regions.
4. Safe and good employment.
5. An ownership structure based on "owner-operates".

As in the temporary act, some absolute requirement *had* to be satisfied to issue a license. Licenses should not be issued if:

1. The farm presented a hazard for spreading of disease.
2. The farm presented a hazard for pollution.
3. The farm had a poor location or was not technically satisfactory, or if,
4. Societal interests indicated such (e.g. recreational fisheries).

Temporary regulations of 1981 further emphasised the objectives of the act. The regulation focused on situating farms in regions with little present and/or future economic activities. Activities tied to agriculture, fisheries and fish processing should not be disqualifying for issuing a licence, and persons or firms with significant industrial activities of another type should not issue licences. (Ot.prp. no. 30 (1980-81)).

The maximum allowable size was, through the temporary regulations set to 3 000 m³. The reduction was due to increased density; smaller volume grew the same amount of fish. Moreover, sizes of about 5 000 m³ had proven to be more profitable. Thus, decreasing the size would have no economic consequences (Ot.prp. no. 30 (1980-81)).

The first permanent regulation was implemented in 1983 and was similar to that of 1981. This regulation emphasized localizing farms to economically weaker areas, but was more explicit in the objective to use licenses to compensate for declining capture fisheries. (Berge, 2001). The maximum allowable size was set to 5 000 m³ (Midlertidige forskrifter, 1983).

Actors and Interests in the 1981 Act

The Ministry of Fisheries stated, in White Paper no. 71 (1979-80), two main reasons for a license regime: to adjust production to market demand, and to distribute and organize production to achieve the greatest regional effects. As a regional-policy tool, the Ministry recommended a work intensive structure. The more jobs a given production volume created, the better. Although small-scale production was preferred, a feasible economy and income would also be taken into consideration when setting farm dimensions. The arguments of the Ministry were contradicting, as they wanted both small-scale and economies of scale.

The Ministry alleged that ownership structure greatly influences regional effects; thus the owner was essential. There should, as far as possible, be an owner-

operator structure. Licenses should not be allocated to persons or companies with significant owner interests in other farms and exclude those speculating in the industry (Berge, 2001).

The representatives of the fish farmers in the Lysø-committee opposed production regulations and envisaged a dynamic business with an industry-like characteristic. The NFF did not see external capital as a threat. The NFF also maintained its aversion to production limitations. For established farmers, limitation would have negative effects and stop expansion of farms that were close to the maximum limit. Another concern was that newcomers would start with large capacities and cause overproduction. The NFF opposed using aquaculture as an instrument for regional-policy. Focusing solely on regional benefits of aquaculture would make the industry more regional- and socio-political, than industry- and fishery-political. Thus, not paying attention to the needs of the industry, such policies could endanger the foundation of the business and result in a non-sustainable development. The NFF had to make a compromise. NFF feared over-establishment and wanted to regulate entrance into the business. Thus, to limit entrance, the farmers had to compromise and agree to production regulations (Berge, 2001).

The Farmers' Association (Bondelaget) linked fish farming to agriculture, as this would generate valuable employment. This included a complete integration of aquaculture into agriculture – also administratively. NFF asserted that fish farming could not, due to the capital and risk involved, be a side-occupation (Berge, 2001).

The most influential response came from the Directorate of Fisheries. The amendments to industry-policies were taken from the report of this directorate. The feedback concerned two issues: ownership regulations, and regional-policies. Ownership regulations included: local ownership, limited numbers of ownerships and owner-operator requirements. In addition, a person could not have significant owner interests in other industries, had to reside in the municipality/region and had to be active in the operation. The directorate suggested geographic requirements, as expansion in aquaculture had been slow north of Vesterålen. Hence, the directorate proposed specific criteria for Northern Norway - such as exemption of production limitations. The directorate also recommended establishing fish farms in conjunction with smaller fish processing plants to strengthen community economies. A competitive industry had to be secured, where settlement in the rural regions through employment in the new industry was a key. Subsequently, the director questioned

whether a size of 8 000 m³ ensured a profitable operation; hence argument of aquaculture as a side-occupation was eliminated (Berge, 2001).

The Parliamentary Committee for Shipping and Fisheries agreed, in general, with the Ministry of Fisheries. However, the Conservative Party's members (Eian, Listau and Talleraas) wanted to abolish the license system and replace it by an approval and registering system. Subsequently, they proposed the discontinuation of the industry-policies – except regional policies, and suggested removing production adjustments and societal considerations (Innst.O. no. 31 (1980-81)).

The Ministry of Fisheries' proposal was implemented on 15th of May 1981 (Innst.O. no. 31 (1980-81)). One should notice, as opposed to the act of 1973, this time there was an opposition. The opposition was in a liberalizing direction and the source was the Conservative Party - the minority (Berge, 2001). The aquaculture legislation was still motivated by regional-policy considerations, whose narratives still had a hegemonic position in aquaculture politics. The RP-discourse therefore regulated the political rhetoric in the industry.

One should also notice, the arguments of the agriculture sector were not an issue - neither in the Parliament nor the Odelsting proposition.

The First Attempt to Deregulate

From 1981 had politics and management an increased influence upon the development of the industry. The existing law was seen to be too limited, as there were production and ownership regulations. The institutional system and practices excluded investors from the key resources: the site. As a result, the industry's innovations were marginal in the mid 1980s and price-volume mechanisms led to situations where producers produced at a loss (Aarset, 1998).

Thor Listau, of the Conservative Party, became Minister of Fisheries in the fall of 1981 and started to work toward liberalization of the Act. This work led to a new Aquaculture Act in 1985. Listau presented the first signal of shifts in aquaculture policies at the annual meeting of the NFF in 1982. He wanted to remove the industry-policy requirements and replace these with an approval system that would ensure environmental, veterinary and other necessary conditions - it was not a government task to adjust production to markets. The explicit regional consideration was toned down. Aquaculture was, no matter what, a regional industry. Instead of a work intensive line, Listau focused on an economical and rational operation. The best

regional effects would come if aquaculture developed into a profitable and vital industry. Artificial attempts to distribute the industry could damage the business in the long term (Berge, 2001:204 (Norsk Fiskeoppdrett, 1982)).

The size of the farms had, according to Listau, to be between 8 and 10 000 m³. This was drastic compared to the limits set the previous year - 3 000 m³. Still, it is worth noting, Listau wanted production limitation and regulation of ownership was not removed. Rather the law would secure capital and an owner structure where operators owned the farms - in general.

The Hearing in 1982

Based on Listau's work, a preliminary hearing was presented in November 1982. The contents of the hearing were in general:

- a) Eradication of the licensing system and introduction of an approval system with stricter requirements to pollution and veterinary conditions.
- b) Operators would hold at least 51% of the owner interests, but this requirement could be bypassed, if local interests held 51% of the interests.
- c) Majority shares in more than one farm would not be allowed, but there would be no limitations to minority interests.
- d) An upper limit of 10 000 m³.
- e) The specific regional-policy objectives were removed. There was no need for specific public mechanisms to achieve effects beyond those related to water quality, pollution, navigation, traffic and so on.

The majority of the institutions in the hearing wanted to keep the existing licensing regime. The Director of Fisheries was critical to deregulating the act and removing industry policies, but production regulations had never been used to actually regulate production. The only effect the existing regime had was to distribute new farms to particular areas. Further, they advised the Ministry of Fisheries to keep the existing ownership regulations (Berge, 2001).

NFF and FOS wanted regulation of production and they emphasised the importance of adjusting expansion to infrastructure (Berge, 2001:207 (Norsk Fiskeoppdrett nr. 12 1982)). They suggested a maximum allowable volume of 8 000 m³, as the industry did not master the technology and limits had to be set accordingly. The priority should be to expand existing farms, rather than allocating new licenses.

NFF supported the suggested amendments to ownership structure, but they wanted to limit the number of minority interests.

A total of 108 municipalities and 11 counties commented on the hearing and the majority opposed deregulating industry-policies, as they feared overproduction and price drop. They focused on allocating to economically weaker regions to benefit agriculture and capture fisheries (Berge, 2001).

The Ministry of Local Government, through the Regional Development Bank, opposed liberalization of ownership regulations.

The negative response of the hearing was a great disappointment to the Conservative Party. The party's Petter Thomassen explained the result with the traditional composition of the hearing institutions. There was a lack of voices that could have brought new perspectives into the issue (Thomassen, 1985 s 44).

Liberalising and Compromising 1984-1985

The existing act of 1981 was in 1984 still seen as being too restrictive, when a draft of a new aquaculture act was distributed. The Ministry of Fisheries found aquaculture licenses to be necessary, but industry-policy requirements were removed. Annual allocations would ensure a balanced growth - understood as the size of the industry related to its infrastructure. Geographic priority would secure a wide dispersion and regional development. Operators should hold majority interests and 51% of the ownership should, as far as possible, be tied to local interests. This could be bypassed if the majority interests were on local hands. "Local" was defined as within the same county/region as the farm. Local ties would stimulate personal interests and responsible operation; requirements to technical standards were unnecessary. The industry was capital intensive and risky; too stringent requirements to ownership could make access to new capital difficult, thus there were no limits to minority interests. However, to avoid concentration of ownership, majority interests could only be held in one farm. Societal interests should be taken care of by other legislation and was removed (Ot.prp. no. 53 (1984-85)).

The Ministry's political administration claimed there was a need for competence from external, industrial interests. The secretary of state, Munkejord, argued that Norwegian aquaculture should take advantage of the large companies' competence. Large firms could be the ones to bring the industry forward, he claimed. (Berge, 2001). Production restriction was no longer believed to be the proper tool for

market adjustments, which should be taken care of by the industry itself. Thus, the aim of the new act was to ensure a balanced development and a profitable and vital industry (Ot.prp. no. 53 (1984-85)).

This law had, as the previous, absolute conditions that *had* to be satisfied.

Licenses should not be given if:

1. The farm presented a hazard for the dispersion of diseases to fish and shellfish.
2. The farm presented a hazard for pollutions.
3. The farm had clearly a poor location relative to surrounding environments and legal traffic or other use of the area.

The Ministry of Fisheries wanted a balanced development of the industry; entrance was regulated and a limited number of licenses were to be allocated. The ministry would give guidelines for how to allocate and the following characteristics should be emphasized:

- a. That the industry contributed to a positive development in the regions and for the industry.
- b. That majority interests would be, as far as possible, local.
- c. That the operator had the necessary competence.

Although the Aquaculture Act of 14th of June 1985 represented a deregulation, salmon and trout kept its existing licensing system. The industry-political objectives were kept - both with respect to market adjustment and infrastructure, and the regional focus was kept. Ownership regulations were also kept, but these were somewhat liberalized. Operators did not have to own or have majority interests, but ownership was, as far as possible, to be tied to “local” or regional majority interests. Nobody could hold majority interests in more than one farm, without special considerations.

Regulations of 1985

The characteristics of the regulations of 1983 were repeated in the regulations of 1985, though more general and moderate. The motivation was to keep the close ties to the fisheries sector. Thus, a significant numbers of licenses were given to firms in the traditional fisheries sector (White paper no. 65 (1986-87):40)). The regulations emphasize regional-policy and stated that:

- 1) Farms should be placed in economically weaker regions, where regional effect would be maximized.

- 2) Applicants with ties to local industry, for instance fish processing plants, should be prioritized, if this would benefit local activities.
- 3) Active participation by the applicant should be emphasised
- 4) The applicant should, as far as possible, have the necessary professional competence (Forskrift, 1985).

These regulations were applied in the allocations in 1985. Therefore, in the light of these regulations, there was not a significant practical liberation of ownership regulations. Further, according to Berge (2001), the interpretation of the Directorate of Fisheries was still in the direction of increased regulation and did not represent a shift in paradigm.

In 1985 was the total number of applicants 2000. Of this 150 approved and 70 licenses went to Northern Norway (excluding Namdalen). As a result, the number of licenses increased from 307 in 1981 to 562 in 1985 (Aarset, 1998; Berge, 2001:174). The allocations of 1981, 1983 and 1985 represented a relative shift of the aquaculture business towards the north. The regional shift meant that the industry's ties to traditional fisheries were at least not weakened (Berge, 2001). The maximum size from 1980 to 1985 was set between 3 000 and 8 000 m³. However, up to 1984, the size of licenses granted were only between 3 000 and 5 000 m³ (Heen et al, 1993:15)

Actors and Interests in 1985

The Odelsting Proposition was sent on a hearing in March 1985 (Ot.prp. no. 53 (1984-85)). The final proposal was “a total evaluation of the growth and development of the industry, including market conditions”. Thus, it included an industry regulation, similar to previous acts.

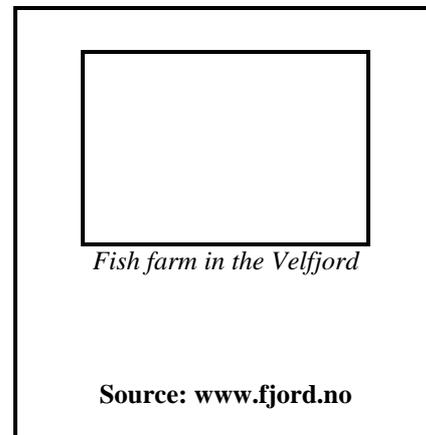
The proposed removal of industry-regulations was the most marked changes in the new act. Due to concerns of overproduction, the majority of the institutions in the hearing wanted production regulations. The Fisheries Director opposed the removal of industry regulations; he did not see the existing act, the way it had been practiced, as a genuine regulation of production. The only effect could have been a geographic prioritizing.

The Norwegian Fish Farmer's Association (NFF) agreed to the removal of industry-policies, but wanted a total evaluation of the market; infrastructure was just as important as marked demand. NFF was critical to liberalization of ownership. It

would undermine the fundamentals of the industry as a regional industry, if it were opened up for external capital and unlimited minority interests (Innst.O. no. 94 (1984-85)).

The Directorate of Fisheries was, just as in 1982, critical to deregulation of the act and to the changes in ownership regulations (Berge, 2001).

The Regional Development Bank still opposed liberalization with regards to industry-policy and ownership. An overproduction could be risky; hence, marked conditions also had to be evaluated. The existing ownership structure strengthened the industry, as it kept it as a regional industry (Berge, 2001).



The Ministry of Local Government and Administration delivered this time its own comments; however, these opposed those of the Regional Development Bank. The Ministry of Local Government and Administration, led by Conservative Party, was positive to the liberalistic tendencies. The marked would ensure maximum benefit for society, they claimed. A license system would result in fewer farms than socio-politically optimal, and would not benefit rural regions. Liberalization of ownership was essential to allow large actors to satisfy the need for competence and capital (Berge, 2001).

The Ministry of Environment opposed to the removal of societal interests. In addition to the proposal, licenses should not be issued when:

1. The farm conflicted with the plans in the Plan and Building Act.
2. The farm was poorly located or technically unsatisfactory.
3. The farm presented a hazard for important salmon populations and freshwater fish, or was expected to impose a significant damage or disadvantage to outdoors recreation or to the environment of animals and plants.

The Ministry of Fisheries replied by arguing that these considerations were being taken care of through the established routines.

The Ministry of Environment suggested that: When developing the industry, the emphasis should be on:

1. Locating the farms where it would generate the best regional effects.
2. Ensuring, as far as possible, an ownership structure with local ties.
3. Ensuring safe and good employment.

4. Securing a production balanced with market demand.
5. Ensuring the possibility to run a technically sound operation (Innst.O. no. 94 (1984-85)).

The Labour Party wanted to keep the industry-policy regulations and supported the suggested changes proposed by the Ministry of Environment. This represented a narrowing of the 1981 act (Berge, 2001). It should be noted, like the other parties, that the Labour Party tied ownership to geography and did not resist the liberalization of ownership regulations. The Labour Party's members in the Shipping and Fishing Committee proposed: "No one may own majority interests in more than one farm, without specific considerations"(Innst.O. no. 94 (1984-85)). They also proposed the following guidelines: "The Ministry sets the number of licenses to be allocated and gives guidelines as how to allocate these, including which districts should be prioritised. When allocating licenses, the following should be emphasised:

- a. That the industry contributed to a positive development in the regions and for the industry.
- b. That, as far as possible, the industry got an ownership structure where the majority interests were owned by one or more specific persons or judicial persons with local ties.
- c. That the operator had the necessary competence.

These actors were obviously very influential, as these amendments were taken into the new law.

The Spatial Outcome of the Permanent 1985 Act

The intention of the Aquaculture Act of 1985 was to contribute to a positive development in the regions and the industry, and to ensure an ownership structure that, as far as possible, had local ties. A balanced production, which focused both on market demand and infrastructure, was introduced. According to Berge (2001), there was no major shift in policy with respect to salmon or trout and no liberalization in practice, as regional-policy was accentuated in the regulations. Moreover, the Directorate of Fisheries (that created and applied the regulations) interpreted the legislation very strictly. Although the intention was a more liberal act, the practice had become more stringent.

In light of limited available space in the 1970s and the doubling of aquaculture licenses from 1981 to 1985, space was increasingly becoming a limited factor and the

potential of conflicts in the coastal zone rose. The maximum allowable volume declined and fish density increased, resulting in local pollution and reduced physical health of the fish.

The external capital-intensive industry had, until 1985, efficiently been kept out of the aquaculture industry by stringent regulations. Another reason for increased conflict in this period was the increased interests and entrance from external industries. Local ownership decreased and so did the local tolerance towards aquaculture. The chosen policy, however, increased the number of licenses in the north, causing internal conflict in the industry as more developed municipalities did not receive as many licenses as they applied for.

The industrial argumentations were heard in the new act, as operators did no longer need majority interests, local ties were only “as far as possible”, majority interests in more than one farm were allowed in special circumstances, and there were no limits to minority interests. This opened for the entrance of industrial interests and a more industrial model, which would become more influential in the period between 1985 and 1991 (see chapter seven).

When licenses were allocated to Finnmark in 1984, only 2 of 20 concessions were given to municipalities that could, in Norwegian terms, be defined as large². Licenses were given to places where most other industrial activities were difficult and had problems keeping the population. This was also the case in Troms, Nordland, and Nord-Trøndelag. Therefore, it seems the guidelines put forth in White Paper no. 71 (1979-80) was being practiced (Ørebech, 1988).

In the 1970s the majority of the farms were located in the south-eastern Norway and from the coast of the county of Rogaland to the county of Sør-Trøndelag. However, the allocations in 1981 and 1983 favoured the north - 97 of 154 licenses went to the north. By 1985, Nordland had become the county with the majority of licenses. This development, with the clear change of focal point toward the north and towards more peripheral coastal municipalities, would not have been possible without public management by the government (Hallenstvedt et al, 1985).

According to Hallenstvedt et al (1985) the Aquaculture Act has been successful in achieving the objectives of regional developments, as it has been

² The one license allocated to the county of Alta was not given to the town Alta, but to Kåfjord, a small town experiencing declining settlement.

beneficial to economically weaker coastal municipalities. This is also the only reason that the system was continued in the new legislation of 1985.

The regional-policy interests, such as the Directorate of Fisheries and the Labour Party, were influential actors maintaining the narratives of the RP-discourse. Thus, although industrial interests and arguments were gaining a stronger position in the aquaculture debate, the policy outcome illustrates that the regional development discourses were still very influential. The Coastal-Model continued to be the dominating model in aquaculture, through limits to production and geographical bias in distribution. Regional discourse was actively employed.

Chapter 6: Financial Crisis (1986 to 1991)

The total production of salmon increased by a five fold in the period 1985 to 1991. The production was 29 473 tons in 1985 and in 1991 this had increased to 155 000 tons (NHL, 2003).

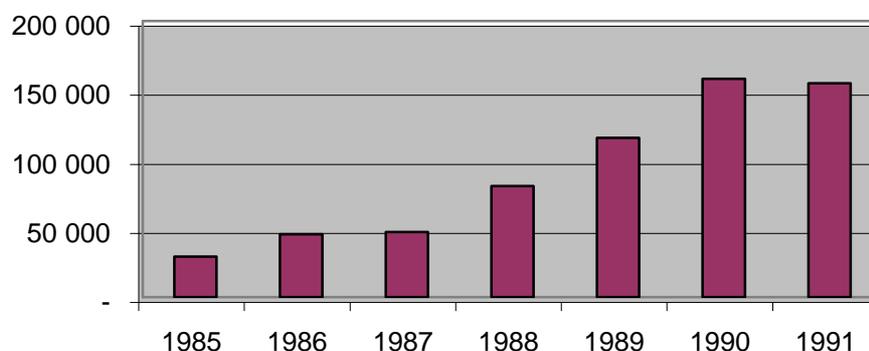


Figure 4: Produced Atlantic Salmon 1985-1991 in tons (FHL, 2003).

There was, however, a decline in the number of active licenses between 1990 and 1991 from 739 to 584; the financial crisis had materialized fully (Berge, 2001:234). Almost the entire growth was in production of salmon; trout production declined to become marginal by 1991. The growth was partly because of increased number of farms. More importantly, it was due to: a rise in maximum volume, an increase in fish density and change in method for measuring volume. Firstly, the maximum allowable volume increased to 8 000 m³ in 1985 and again to 12 000 m³ in 1989. Secondly, production per m³ grew all through the 1970s and the 1980s (NOU 1992:32, p.34). Finally, method for measuring net pen volume changed in 1985 and resulted in new ways of evading the regulations – volume was measured only down to 5 m, while pens could be 35 m deep (Berge, 2001).

Increased production of Atlantic salmon was supplemented with good catches in the wild salmon fisheries, consequently prices dropped. Price of salmon was halved between 1985 and 1991, causing financial crisis in the aquaculture industry (Berge, 2001).

The license system for smolt was abolished (Aquaculture Act of 1985) and replaced by an approval system. Combined with the deregulations of financial policies, the number of smolt producers increased. The number of smolt producers grew from 372 in 1985 to 692 in 1988. As a result, 1988 was the first year with overproduction of smolt. Hence, the price of smolt dropped and lowered the cost of

producing salmon, which in turn gave incentives to further increase production. Hence, the overproduction of smolt was an argument for increasing the maximum allowable volume to 12 000 m³ in 1989. Due to the financial crisis in the industry, a number of larger companies took over the operation of smaller farms with financial problems. It was argued, by some people, that the political compromise in the Aquaculture Act of 1985 was the reason for the crisis (Berge, 2001).

The financial crisis resulted in a shift in ownership structure and external industrial interests got more involved in aquaculture. Although the crisis changed the structure of the industry, it was still characterized by small units, one-license firms, low vertical integration and local ownership in the early 1990s (Berge 2001 (Holm et al, 1990, Berge and Bjarnar 1998)).

A First Stunted Step Towards Deregulation

White Paper no. 65 (1986-87) was released in June 1987. This paper was, according to Berge (2001), a consolidation strategy and in some areas a reversal of the liberalization that characterized the act of 1985. It was in general agreement with the policies of NFF, of prioritizing existing farms. Thus, the Ministry of Fisheries limited entry by discontinuing the annual allocations. Furthermore, they increased the maximum allowable volume. Politics had changed between 1985 and 1991 and become more attuned to the politics of the NFF; thus, NFF supported the amendments.

This White Paper resulted in amendments to the Aquaculture Act (Ot.prp no. 74 (1988-89)) in April 1989. The proposal was more conservative with respect to smolt and other species, than the existing act. In addition, it defined bankruptcies as change in ownership and new license would be needed, as well as it introduced sanctions and penalties for illegal activities. It should be noted, however, that the problems of continually increasing production and evasion of volume restrictions were not mentioned explicitly.

The Directorate of Fisheries supported this line of consolidation, as the Directorate wanted a more restrictive regime. The majority of the Parliament agreed to the amendments, except Centre Party. They wanted to keep the compromise of the 1985 Aquaculture Act and, together with the Conservative Party; opposed the amplified regulations of smolt and other species. The Conservative and the Progressive Parties favoured liberalization and wanted Finnmark and Northern-Troms

exempt from the license requirements. Ideally, they wanted the license system removed and replaced by an approval system. The opposition and majority, the Labour Party and the Christian Democratic Party (Krf) wanted to tighten the regulation of smolt to counteract overproduction. Thus, industry-political regulations were back (Berge, 2001; Innst.O. no. 100).

The Ministry of Consumer and Administration, the Ministry of Finance and the Ministry of Industry supported liberalization. The industry should not be hindered, through strict regulations, from a healthy development. A small-scale structure would make the industry dependent upon public services, e.g. research and infrastructure; restrictions to majority ownership and “owner-operates” would increase public expenditure. The public was not to be responsible for neither the competition nor the economy in aquaculture (Berge, 2001). They called for a liberal practice with respect to ownership, size and allocation.

The banks were included in the hearings because of the financial crisis in the industry – they had become active actors. In situations of bankruptcies, the banks feared a smaller possibility to utilize the collateral financially - regulations limited the number of interested buyers. They also feared that the Ministry of Fisheries would seize licenses to reduce production capacity. A liberalization of the ownership structure was in the interest of the banks. The Bank of Regional Development responded as a finance institution and supported the amendments, but wanted a flexible practice (Berge, 2001).

It had become clear, there was a need to protect aquaculture farms from trafficking and fishing. Ot.prp 74 (1988-89) limited fishing and trafficking in the vicinity of farms to 100 and 20 meters, respectively. The Saltwater Fishing Act (3rd of June 1983, §28) had a similar restriction, but it only applied to fisheries in the ocean with the exception of salmon, trout and char. The Act regulating Salmon and Inland Fishing (6th of March 1964) contained no regulation of fishing or trafficking. Thus, the salmon in the ocean was not protected and the Ministry of Fisheries included such protection in the Aquaculture Act (Law of 16th of June 1989, no. 58).

The Directorate of Fisheries supported the Ministry’s argument. These acts did not secure safety zones for aquaculture farms. Moreover, regulations of trafficking were possibly applicable only to fishing vessels and not for recreational boats or ferries (Ot.prp. no74 (1988-98)).

It should be noted that, as late as 1989, the majority was in favour of a consolidation of the 1980s regulatory regime (Berge, 2001 and Innst. O. no. 100). The suggested amendments went through parliament in June 1989.

A Second Step Toward Liberalization

The Conservative Party got into government in 1989 and the Minister of Fisheries, Munkejord, started to work towards a liberalization of the Aquaculture Act. Norsk Hydro accused the authorities for being responsible for the unfortunate situation in the aquaculture industry. They wanted a radical change in the Aquaculture Act and a removal of the sales monopoly and the FOS. They blamed the authorities for the low degree of processing, the overproduction crisis and the dumping accusations.

A hearing regarding industry-political exemptions of Northern-Troms and Finnmark was sent out in March 1990. The King could, through regulations, decide which activities would be exempt from ownership regulations. This was only a formalizing of the exemptions that had been used in the extra ordinary allocations for Northern-Troms and Finnmark in 1989. The Odelsting Proposition was almost finished and ready for further processing in Government and Parliament, but never made it that far.

The process was stopped because the conservative administration in the Ministry of Fisheries took an initiative to liberalize ownership regulations. Munkejord argued, with the drop in prices and increased problems of disease and capital-drain, there was a danger of reduced health and environmental standards, as well as product quality. Thus, there was a need for capital from the outside and Northern-Troms and Finnmark were exempt from regulations of industry-policies and majority ownership. However, the Ministry could in special circumstances limit the number of licenses held by one owner - to limit the concentration of licenses. Thus, the problem of concentration of ownership was turned upside down. Previously, the Ministry could allow for majority ownership in more than one farm in special situations. Now, the Ministry could only limit majority ownership in special circumstances. Ownership interests should, as far as possible, have local ties. This new proposal was a compromise to the right of the one in 1985 (Berge, 2001).

Although the Conservative Party produced the amendments, it was a Labour Party government that would present the amendments in March 1991. The only

difference was the exclusion of the exemptions for Northern-Troms and Finnmark the grounds of production control and the EU. Otherwise, it was identical to that of the Conservative Party, even the arguments used were identical.

The Union (Fellesforbundet, LO) became an active actor in this period. As an increased number of aquaculture workers were being unionized, there was a call for regulated working conditions through tariff agreements. The workers' unions greatly influenced the Labour Party and wanted, initially, to liberalize and remove the Aquaculture Act. External capital and large firms would secure employment and improve working environments. Still, they agreed to keep the Aquaculture Act and supported the Ministry of Fisheries' proposal to liberalize ownership, but felt that the Ministry could have further liberalized.

The NFF was negative to liberalization of local ownership and opposed amendments that could increase external ownership. They supported the allowance of majority interests in more than one farm, but emphasized that a structure with the owner as the operator would guarantee an operation in harmony with the environment. An expansion in Norwegian aquaculture was accepted, but from within the industry and with a basis in local management. They also claimed, the existing law would control the industry with respect to the EEA and EU (Berge, 2001).

Norsk Hydro repeated the arguments from the winter of 1990, as they delivered a response to the hearing, without being invited. Norsk Hydro agreed removing the requirement of local ownership for majority interests and for allowing majority interests in more than one farm.

The Regional Development Bank had changed its point of view from the earlier hearings. It was also affected by the financial crisis and advised to the amendments. They went further, and wanted to remove the term: "owner interests should, as far as possible, have local ties", because of problems with refinancing. It did not matter where the capital came from as long as production and employment were in the regions.

The Norwegian Bank Union agreed to the suggested amendments to ownership. In addition, they wanted to increase public control of product quality, disease and contamination (Berge, 2001).

The Directorate of Fisheries opposed deregulation of the Act and defended the existing act.

The term “sustainable development” was included for the first time (objectives paragraph - §1). This illustrates the increased environmental focus by authorities (FiDir, 2002). Similarly, the annual report of the NFF and FOS were concerned with fish-health and environment. Another addition was, due to the inability to control production, a quota upon fodder. The motive was entirely based upon health and environment. Thus, it was easier to get political accept for production regulations based upon environmental arguments, than industry-political arguments. Environmental considerations dominated over industry-political considerations (Berge, 2001).

The Ministry of Fisheries used environmental arguments to liberalize ownership. They claimed, serious environmental work needed economically strong units; thus, there was a need for increased influx of capital.

The Ministry of Environment agreed that the industry needed an improved financial base. However, they doubted the arguments used to remove requirements to local ties. On the one side, increased units could increase competence of environment and health. On the other side, distance between owner and operator could reduce environmental concerns (Berge, 2001).

No changes were made to the proposal and it was presented for the Parliament in Odelsting Proposition no. 55 (1990-91). There was a wide agreement to allow majority interests in more than one farm. Regarding local ties, The Conservative Party, The Labour Party and the Progressive Party supported the removal of it. The Centre Party, Krf and the Socialist Party opposed its removal. This amendment was a marked change with respect to ownership; however, it was not a total deregulation.

LENKA: Locality as a Scarce Resource

The position of environmental interests was reinforced. In a paper to the County Governor (T-3/86), the Ministry of Environment opened up for restricting the size of farms in accordance with the Pollution Control Act. A double set of production regulations arose - one based on environmental argumentation and the other based on industry-political arguments (production). While the fisheries administration liberalized the size regulations, the Ministry of Environment intervened. In 1990, the County Governor in Hordaland rejected an application for an emission permit related to volume expansion in Austevoll. The County Governor also introduced its own limits in tons. Similar incidences were reported in Sogn and Fjordane. Thus, several

actors criticized the increase in control by the Ministry of Environment and accused the Ministry of arrogance (Berge, 2001:267 (Norsk Fiskeoppdrett no. 2. 1989 and Norsk Fiskeoppdrett no. 10 1990)).

Through the Plan and Building Act (PBL) and its coastal zone plans, a new area of activity in aquaculture arose in the Municipalities. Municipalities had previously commented on hearings. However, there were no "normal" allocation rounds between 1985 and 1991; the foundations of municipal influence disappeared. With the new PBL, the municipalities' responsibility changed from being industry-political, to area-political (Berge, 2001). In the wake of a new Plan and Building Act a new project was initiated, the LENKA project.

Growth in the aquaculture industry led to increased pressure on sensitive and sometimes stressed areas, and increased competition for coastal space (Ibrekk et al, 1993). The government's aim became finding optimal management of the coastal zone; to ensure economic and social benefits for the populations. In 1987 the Ministry of Environment, The Ministry of Small Government, the Ministry of Environment and the Ministry of Agriculture initiated the LENKA project. LENKA was a nationwide assessment of the suitability of the Norwegian coasts and watercourses for aquaculture and was a response to increased pressure on both coastal administration and environment. The goal was to develop a planning device for industry development by reviewing interests, infrastructure and environmental conditions; as well as, simplifying procedures and increasing involvement of local governments. LENKA would also provide central governments with an overview of the total capacity for coastal aquaculture in order to design a strategy (NOU 1990: 22).

Guidelines and principles for classifying and selecting rivers and marine areas for aquaculture were developed. As a part of the LENKA-methodology, a model for calculating total area available for production of farmed fish (The Capacity-Model) was developed. The total coastal area was divided into 320 zones, which were evaluated on basis of area and recipient capacity, as well as other user interests and infrastructure. The zones were separated into different recipient groups, called A-, B- and C-zones, based on water exchange and ability to tolerate organic stress. An A-zone had the best water exchange and C-zones had limited water exchange. Recipient capacity and area capacity for each zone was calculated, which expresses the total available capacity for fish farming (NOU 1990:22). Due to limitation upon fishing and trafficking (100 m and 20 m, respectively), the actual area used by aquaculture

was found to be greater than the physical area occupied by the net pen only (Ibrekk et al, 1993).

LENKA analysed the total farming potential of the coast in the pretext of future utilizations and defined the coastal zone resources as under-utilized and under - developed, especially in A-zones. An increase of about 600 000 tons without detrimental effects to the environment was estimated (NOU 1990:22).

Ibrekk et al (1993) states that the pressure upon the costal zone may change as a result of changing requirements, such as: distance between farms, increased exploitation of coastal zone by activities that cannot coexist with aquaculture, new farmed species may compete with traditional aquaculture, and development of new technology may allow for exploitation of areas that are not presently used.

In the early to mid 1980s, there was a shift from management of the Norwegian salmon farming industry per se, to a total management of the coastal area (Aarset, 1998). LENKA introduced a shift in management focus from farmer to farming site and recognized the fact that locality could become a scarce resource that needed to be managed (Berge, 2001). It should be noted, few institutions are using LENKA for localizing fish farms today. Some municipalities and counties use part of the LENKA method, but very few uses the entire method (Gulowsen et al., 1991).

Environmental and Conservation Interests and Spatial Impacts

In 1988, the alga *Chrysochromulina polylepsis* arrived at the Norwegian coast and a number of farms were moved into the fjords to avoid this lethal alga (Ot.prp. no. 79 (1987-88)). Thus, to minimize the economic losses other considerations, usually hindering such movement, became secondary. As a result, farms intruded upon other users in the coastal zone. This alga, therefore, caused an increase in space utilized by fish farms for a short period of time and possibly increased conflicts.

Wild salmon migrating to and from the rivers may be exposed to farmed organisms and there is a risk for contamination from the farmed fish. This risk is assumed to increase as closer to the river a farm is located.

The LENKA project established temporary safety zones for anadrome salmon species in some of the most important salmon rivers (LD, 1993). The zones included fjord and coastal zones, as well as all watersheds emptying into these zones. The aim was to hinder genetic pollution and the spreading of *Gyrodactylus salaris* (LD, 1989).

Thus in 1989, the Ministry of Fisheries established 52 temporary safety zones for salmonids outside 125 salmon rivers. The purpose was to conserve vital salmon populations as biological and genetic foundation for continued growth and development in aquaculture, and to preserve the wild salmon stocks.

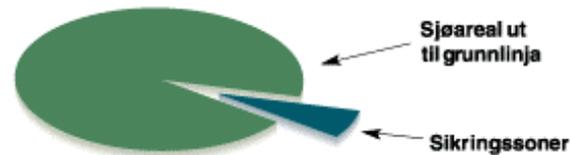


Figure 5: Temporary safety zones for salmonids make up 6,7% of the sea area within the baseline (White Paper no. 43 (1998-99)).

It is not permitted to establish new fish farms within the safety zones; existing farms were allowed to continue operating.

The system of temporary safety zones was originally intended to last for five years. Thus, in 1994 an evaluation committee was set up. The committee advised in 1996 to prolong the safety zones, with some adjustments. In addition, they advised to establish buffer zones outside a number of the safety zones where new and existing farms would be subject to stricter regulations (White paper no 43 (1998-1999)).

Increased use of Space – Veterinary Guidelines in 1989

Due to increased energy content of fodder, farmers were able to grow more fish within the same volume. In addition, the size of the farms rose. As a result, health and environmental problems were amplified on the localities and the use of antibiotics soared.

The Fish Disease Act shall prevent fish diseases in both domesticated and wild fish and its objective is to “prevent, limit and exterminate diseases in aquatic organisms” (Fish Disease Act no. 54, 13th of June 1997, (Ot.prp 52 (1996-97))). Most of the regulations accompanying the act were implemented in the period 1990 to 1992, when there were large problems with disease such as furunculosis and ILA.

The Ministry of Agriculture delegated, in May 1987, the authority to approve and set requirements for fish farms to the county veterinaries. The first set of guidelines was produced in 1989 to prevent disease and point-pollution, as well as to ensure uniform processing of applications across the country. Since 1985, the practice

has been a minimum distance between farms of 1 000 m, which was stated in the guidelines (LD, 1989).

However, during the outbreak of furunculosis in Northern-Trøndelag in the mid-1980s, a distance of 1 000 m between farms was not enough to prevent water-carried contamination. Thus, county veterinaries are free to demand larger distances when necessary. Local conditions such as currents, topography, geography, and density of fish farms and migration routes of wild fish are evaluated in each individual case (LD, 1989).

The Practice of Minimum Distance in Different Counties

The minimum requirements to distance vary between the different county veterinaries. It is difficult to give the exact minimum distance used, as the distance is based on judgment related to the local conditions and the actual risk for spreading disease. Thus, it is common to enforce distance requirements to exceed the minimum requirement (Fid, 2002).

The veterinary of Hordaland and Sogn and Fjordane try to achieve a minimum distance of one to two km between localities for salmon. The distance between localities is increased with increased number of licenses on each locality (size); however, there is usually a ceiling of 36 000 cubic meters, or three licenses per locality.

In Trøndelag, localities with different generations have a minimum requirement of three km, if the licenses belong to the same owner, and five km if the licenses have different owners. They do not take the size of the locality into consideration.

The county veterinary for Finnmark and Troms use a minimum distance of one to two km between localities of same generation. There is a requirement of three to five km between localities of different generations and even stricter requirements to large localities approved for large-scale production.

All of the county veterinaries emphasised more stringent requirements to distance on localities and to activities with an increased potential to spread contamination over large distances (Fid, 2002).

FOS Bankruptcy and Changing Organization of Sales

Price-volume mechanisms led, by the mid 1980s, to a situation where the fish farmer produced at a loss. Moreover, the Fish Farmers' Sales Organization (FOS) folded in 1991. Consequently, the Raw Fish Act was removed and the right to sell was returned to the farmers. Additionally, the removal of the ownership regulations in 1991 resulted in a major reorganization of the industry, with an increase in large companies' dominance at all levels. Thus, by 1995, licenses held by companies with more than one licence were between 70 and 90% in each county (Aarset, 1998:188). Therefore, this reduced the government's responsibility, which induced a major redistribution of the access rights to the coastal zone, where the local residents were the losers and external investors were the winners (Aarset, 1998).

The Spatial Outcome of Legislation Amendments and Area Conservation

Conservative industrial interests were attaining an audience. These actors and their discourses were therefore able to influence the legislative and discursive framework in the period. However, other arguments were also gaining strength, namely health and pollution discourses.

The profile of the industry was characterized by being decentralized though the 1980s. However, the amendments to the Act in 1991, coupled with the bankruptcy of the FOS the same year, changed the structure of the industry and the dominance of larger companies increased at all levels. Thus, investors from outside the communities entered aquaculture. As a result, actions that previously had been accepted by the local community were no longer accepted – including the occupation of sea space.

Advances in technology allowed farms to be located farther outwards in rougher water with better recipient and water exchange. Hence, aquaculture was moved out of areas with conflicts. In theory, there should have been a reduction in conflicts with respect to space; however, the number of licenses allocated from 1985 to 1989 increased by 180 – almost half allocated to Northern-Norway. To further increase the use of space, the size of the farms increased from 8 000 m³ to 12 000 m³ in 1989. An additional, not so obvious, increase in spatial use took place as the method of measuring fish farms changed. To protect the farms from trafficking and fishing a limit on 20 and 100 meters respectively was introduced in 1989 and inflicted a reduced freedom of movement and fishing for the general public. LENKA was established to evaluate the spatial use in aquaculture. Although this project never

became widely adopted, it did introduce safety zones and reveal space as an increasingly scarce resource in some areas. As a result of the changes described in this chapter, there was an increased pressure upon area available for aquaculture and other uses and the levels of conflict rose.

Industrial narratives positioned themselves in the aquaculture discussion, as size increased and ownership was deregulated. However, due to the appearance of environmental and health concerns in the mid-1980s, these discourses ensured that the industry discourse never became as influential as the regional development discourse. During the next decade, health interests would further restrict the aquaculture industry.

Chapter 7: The Era of Health Interests (1992 to 2003)

After the decline in production 1991-92, the production continued to rise from 1993. In the worst year 1992, the total production of Atlantic salmon was 141 000 tons, whereas in 2002, the best year so far, the production was 446 000 tons (FHL, 2003).

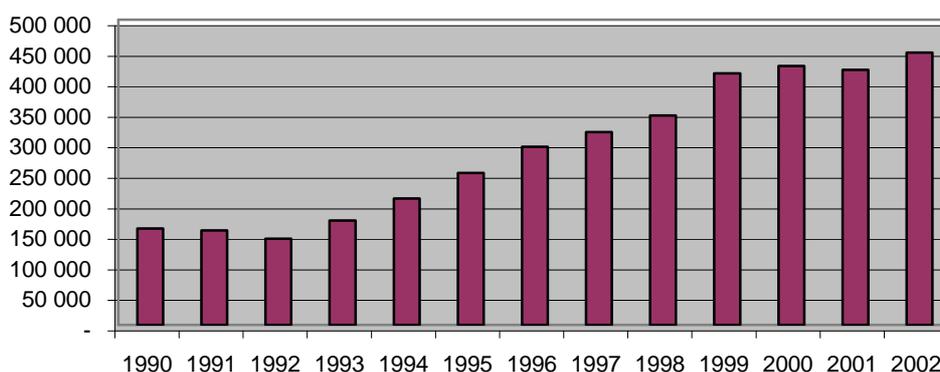


Figure 6: Production of Atlantic Salmon 1991-2002 in tons (FHL, 2003).

Although the industry in the 1990s was characterized by trade obstruction, this era experienced an exceptional production growth. This growth was within the same production volume of 12 000 m³. The production increase was because of better vaccines and localities (Berge, 2001 (Fiskaren 19th of August, 1997)). In addition, technological development allowed for localizing farms in more exposed areas with better recipient (Berge, 2001 (Berge and Bjarnar, 1998:110)).

Prizes stabilized in the period 1991 to 1994. In 1995, however, the prices dropped drastically and the profitability of fish farming declined (Berge, 2001:348). The shift in regulation regime led Norwegian fish farming into an integration process, both horizontally and vertically. Increased concentration of ownership was a fact. The ten largest companies were responsible for 7% of the total production in 1990. By 1997, however, the ten largest companies were responsible for 35% of the total production (Berge, 2001:348). Ten years ago, the industry was characterized by homogeneity, mostly consisting of small companies. Today the industry has become heterogeneous, consisting of both small and large companies. By January 1998, 120 autonomous one-license companies were still operating (Berge, 2001:349). Few companies are integrated “all the way to the market” and the degree of processing is

small. The spot-market dominates in all categories of fish farming; about 80% of the production was in 1998 sold in the spot-market (Berge, 2001:351 (Borch et al, 1998:71)).

The aquaculture business went through structural changes in the 1990s. Central historical characteristics have survived and adapted to the new structure. Since the freezing of overproduction and the FOS bankruptcy in the beginning of the 1990s, Norwegian aquaculture legislation has been subjected to the political processes in the EU. Thus, since 1995, the continuous threat of anti-dumping measures has forced Norway to regulate production. These over-national considerations have led to an industry that is more production regulated than ever before.

Combating Disease: Generation Separation and Alternative Localities

The first set of guidelines was produced in 1989 (as outlined in the previous chapter). Another set of guidelines, to supplement those of 1989, was produced in 1993. Although this was a guideline for marine species, it was also used for salmonid species (Karlsen, 2003). It included requirements to distance between farms, as well as periodical abandonment of localities. The minimum distance is, however, only a guideline and available knowledge regarding the nature of contamination and locality conditions must also be considered in each individual application.

A minimum distance of 5 km has been recommended with respect to diseases such as ILA (LD, 1993:18). Smaller distances between localities may be approved in areas with exceptional conditions. However, this requires that all farms must be a “unit of contamination”; that is, have identical year-classes in order to synchronize abandonment of localities. Consequently, due to the increased concentration of farms in an area, there is a need for increased distance between the different “units of contamination”. Therefore, approved and coordinated plans for operations, including separation of generations and periods of abandonment, are necessary.

Generation separation and periods of abandonment to disinfect localities are important tools to prevent build-up of contamination in farms and localities. These regulations (1989 and 1993) have been preventive in fighting diseases. Norway has constructed a well-developed system for disease control and has significantly reduced damage from the most serious diseases - though problems are not solved. As a result, the use of antibiotics has been reduced by over 99% in the last ten years (Ot.prp 52 (1996-97):20)).

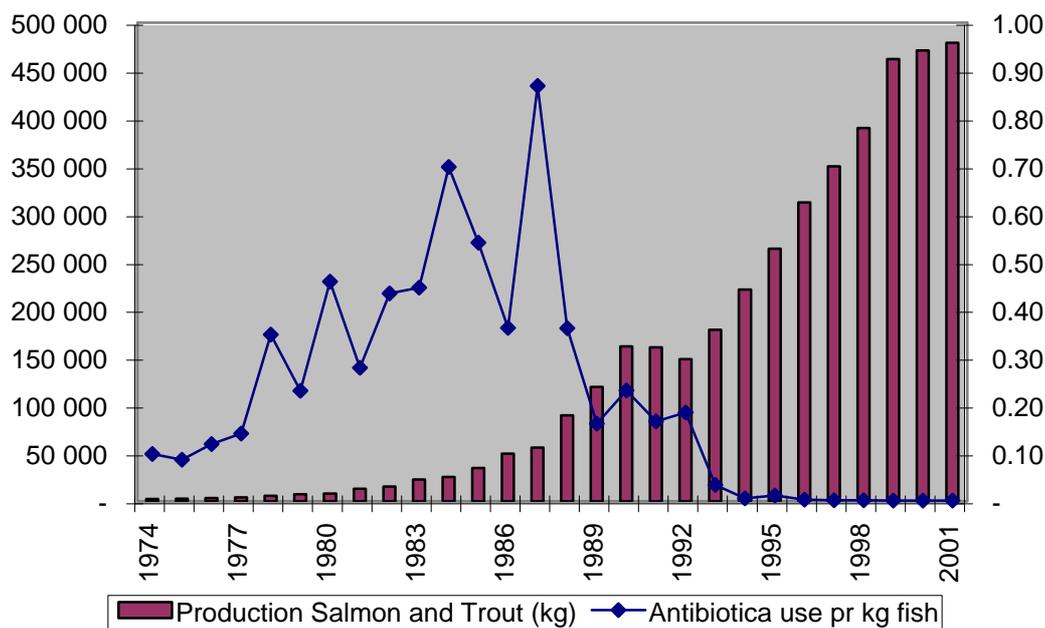


Figure 7: Use of antibiotics per kg salmon and trout produced, relative to total production of salmon and trout (Norsk Medisinaldepot AS).

An outline for a regulation for abandonment was produced, but was never sent on a hearing. Still, the outline is presently used as a guide for abandonment. This regulation tries to achieve an abandonment of 6 months, or a minimum of 2 months, every 36 months. On the west coast, where salmon grows fast and farmers are able to slaughter 1 to 1.5 years after releasing the smolt, each license needs two locations. Farther north, where salmon does not grow as fast and is slaughtered 1.5 to 2 years after release, three locations are needed (Karlsen, 2003). Areas where farms are situated closer than the recommended minimum should coordinate a joint abandonment, in accordance with plans approved by the County Veterinarian. At the present permanent guidelines are being produced by the Norwegian Animal Health Authority (Pål Erik Jensen, 12th of May 2003).

Veterinary distance requirements are presently the primary factor guiding the siting of fish farms. The aquaculture industry sees these requirements as a primary limiting factor. Some actors claim that it would be a catastrophe if the present distance requirement should be applied to established farms. County veterinarians believe it is easy to locate established actors, but it may be difficult to locate new actors.

Further, the county veterinaries claim distance requirements do not only reduce the risk of contamination, but also increase the possibilities of expansion within the established localities. Thus, they want to avoid licenses in the “buffer zones” between different localities and generations (Fid, 2002).

Aquaculture organizations and parts of the management, including the county veterinaries, believe that the situation of area will worsen, unless alternative methods for operation and/or vaccines are developed (Fid, 2002).

National Salmon Watercourses and Fjords

A Royal Decree appointed the Wild Salmon Commission in 1997 to «review the overall situation of the wild salmon stocks and propose management strategies and action programmes. Issues associated with the regulation of fishing, watercourse management and salmon farming would be given particular attention.» (NOU 1999 9:18). The background for the Committee's work was the sharp decline in wild salmon stocks in recent years. Escaped farm fish together with salmon lice were regarded as the biggest environmental problem of fish farming. In addition, *Gyrodactylus salaris* had affected several of the country's most important salmon stocks. The Committee concluded that the situation for salmon in Norway was serious and in some areas the crisis was acute (NOU 1999:9). This situation called for the establishment of special protected areas for wild salmon. The Committee proposed increased protection for a number of the most important salmon watercourses and migratory areas in fjords and along the coast.

In sea, protection was directed at salmon farming operations and their intervention in estuaries. A system of national salmon watercourses and national salmon fjords could protect and strengthen the largest and healthiest salmon stocks. In essence, this entailed a prohibition on further intervention and watercourse regulation in the national salmon watercourses and a ban on salmon farming in national salmon fjords.

The Committee proposed 50 specific watercourses and nine fjords or coastal stretches to be incorporated in the scheme. Outside national salmon watercourses, where national salmon fjords would not be established, the Committee recommended protection and action zones. The Committee proposed to abolish temporary safety zones outside watercourses not proposed as national salmon watercourses (NOU 1999:9).

Based on NOU 1999:9, the Ministry of Environment proposed a White Paper (no. 79 (2001-2002)) to establish a system of National Salmon Watercourses and Fjords. The White Paper presented proposals that collectively would give a more comprehensive management and secure the restocking of the salmon populations, similar to the NOU 1999:9.

New activities in the national salmon watercourses that could damage the wild salmon populations would not be allowed. The salmon fjords were about the same size as the temporary safety zones (1989) and were to have two management regimes: zones of prohibition and zones of restriction. Fish farming would not be permitted in zones of prohibition and existing farming activities were to move out of the zone within five years. New farms were not to establish in the zones of restriction and existing farms would be subjected to stricter regulations. Ten of the national salmon fjords were suggested as zones of prohibition. Five commercial farms and four research farms would be affected. National Salmon Watercourses and Fjords were to be permanent, but new knowledge and technology may lead to adjustments.

The difference compared to NOU 1999:9 was that the national salmon fjords and watercourses were to be implemented in two rounds. White paper. no. 79 suggested establishing 37 national salmon watercourses and 21 national salmon fjords in round one and 12 watercourses and four fjords in round two. The proposal was sent on a wide hearing in the summer of 2001.

There was a general support of the commission's suggestions. Still, the proposal was contested. The Directorate of Nature Management (DN) was critical to the proposal and thought it was a clear weakening relative to the Wild Salmon Commission's suggestions and the temporary safety zones. Thus, national salmon fjords had to be closed to all salmon farming.

The Directorate of Fisheries supported the introduction of salmon fjords as a substitute for the existing temporary safety zones. Similarly, the Norwegian Animal Health Authority supported the main principle of National Salmon Watercourses and Fjords, but questioned whether the proposal would give the wild salmon a better protection than the temporary safety zones. It should not be opened for additional fish farms of marine species inside the prohibition zone, they claimed.

The majority of the County Governors were critical to the proposal and to the abolishing of temporary safety zones. They claimed the situation for the wild salmon would be worsened, as the proposal was not enough to increase protection in

migrating areas in the fjords. The municipalities could be divided into two groups: those with aquaculture interests and those with interests in the wild salmon. The first group opposed the proposal and the second group supported the proposal.

NFF was critical to the proposal and felt there were efforts fighting the fish farming industry. Area restrictions to protect wild salmon would have, due to the pattern of migration, limited effects. It was seen as unreasonable that an important industry, such as aquaculture, would be limited without evaluating consequences. The scientific basis for the proposal was deficient and they opposed making the system permanent.

For the Norwegian Salmon Rivers' Association the proposal weakened the protection of Norwegian wild salmon populations. National salmon fjords had to be free of all farming of salmonids and temporary safety zones had to be kept. The Norwegian Association of Hunters and Anglers (NJFF) and Norwegian Society for the Conservation of Nature (NNV) were of similar opinions (White Paper no. 79 (2001-2002)).

The Spatial Effects of Health Regulations and Area Conservation

The aquaculture industry today is characterized by biological production with a strong industrial element, where the majority of salmon and rainbow trout producers take a part in vertically integrated structures. Actors are becoming increasingly differentiated (Sandbæk, 2003).

During the 1990s, market considerations and industry-policy were toned down; still, due to the markets in the EU, the industry has never been more strictly regulated. These market considerations have led to several production regulations, such as volume, density and feed quotas.

Veterinary regulations dealing with distance between farms were introduced in 1989 and greatly increased the spatial use in aquaculture. In 1993, spatial use was further increased, as regulations of periodical abandonment were introduced. The result was an increased need for alternative localities. Thus, in the north of Norway the total area requirement per license was increased by a three-fold, whereas on the west coast the area requirement doubled.

Environmental considerations, such as temporary safety zones and National Salmon Watercourses and Fjords, affected aquaculture by not permitting fish farm in particular areas. Although these safety zones do not constitute a large percentage of

the total area within the baseline, the zones may include areas suitable for aquaculture.

The momentum of the industrial discourse was effectively stopped by environment and health arguments. These discourses led to increased use of space, as well as reduced the space available for aquaculture. In the end, the pressure upon available space has intensified.

Chapter 8: Integrated Coastal Zone Management (ICZM)

The coastal ecosystem is productive and has valuable habitats. It is also the home of a growing number of people, a source of food, a communication link and a recreational area. The human use of the coastal zone leads to pollution problems and conflicts between users (Ministry of Environment, T-1389, 2002). According to O'Hagen and Cooper (2001), it is the variable conditions and functions that make coastal zone management difficult. Similarly, heterogeneity in the coastal zone makes collective action more difficult to organize. The conflicts of interests are many, the bargaining power is unequally distributed, some have more at stake than others and there are usually incompatible values among user groups (Jentoft, 2000).

The coastal zone has been an open commons, but in the last 50 years the commons have closed because of fishing quotas and aquaculture licenses. Thus, there has been an increase in special uses in the coastal zone. Moreover, aquaculture activities exclude other uses and its area demand has increased, because of increased maximum allowable volume, introduction of safety zones and stricter veterinary regulations. Expansions in the aquaculture industry led to conflicts and have been a reason for initiating coastal zone planning (Sandersen, 1996). Thus, suitable areas for aquaculture are becoming increasingly scarce in a number of municipalities (Sandersen, 1996). The future level of conflict will depend on how well coastal municipalities, administrations and industry are able to co-operate. To minimize conflicts in the coastal zone, an overview of available area for aquaculture is essential.

Therefore, we need an integrated and flexible system to deal with these problems, e.g. Integrated Coastal Zone Management (ICZM). ICZM addresses problems of managing conflicts among different users and uses in the coastal zone.

Coastal Zone Management in Norway

The Norwegian coastline is 57 000 km long and 80% of the Norwegian populations lives along the coast. So far, the Norwegian coast has been blessed with a healthy



environment. Only a few limited fjord areas and major harbours have experienced pollution. Coastal areas play an important role in settlement, employment and the economy. Various economic activities take place here, such as: fisheries, aquaculture, transport, oil processing, service industry, tourism and recreation (Sandersen, 1996; www.kystsone.no). In addition, there are various agencies of government and research at different levels with differing interests, responsibilities and ambitions in the coastal zone (Jentoft, 2000).

Norway has an efficient system for coastal governance, including a good legal and institutional framework. The system is based on principles of ICZM promoting a holistic, collaborative, participatory and bottom-up approach (Fid, 2002).

Coastal zone planning (CZP) is defined in Sandbæk (2003) as planning that unites sea areas and land areas along the coast. If a municipality produces a plan that includes the area in the sea, we could call this a coastal zone plan. Coastal zone plans are voluntary and the legal mandate is the Planning and Building Act (1985), which co-ordinates and facilitates decentralised planning.

Municipalities make legally binding decisions, within national and regional frameworks, to secure a sustainable development of coastal resources for the benefit of the coastal communities and the entire nation. Different parts of Norway have different needs for coastal zone management. A total of 280 coastal municipalities, 16 counties and various ministries and interests groups are involved in the coastal zone (Sandersen, 1996:2).

A coastal zone plan contains: objectives, long-term goals and programmes for sustainable development in the coastal zone. It also includes action for nature conservation and management, as well as pollution abatement (Ministry of Environment, 2002). Of 65 municipalities with more than four aquaculture licenses, 52 (80%) used coastal planning (Sandbæk, 2003:22). In the south, environmental and recreational interests have a large influence; thus, coastal zone plans are more defensive, conserving and restricting the use of area. In the north, the focus is on industry interests and employment and there is less pressure upon area. Thus, coastal zone plans are offensive and lay the premises for aquaculture. The motives for coastal zone management depend upon the structure of settlement, the pressure on area and the structure of the industry, but a typical aquaculture municipality use coastal zone plans more often than a fisheries municipality (Sandersen, 1996).

Conflicts of Space in Aquaculture

Conflicts of area arise when two or more area-uses compete for the same area and co-use is not possible (Sandbæk, 2003). Although area has not been a major limiting factor for Norwegian aquaculture in the past, area is becoming scarcer. The lack of localities is a result of the rapid growth in number of licenses, accompanied with stricter veterinary regulations. Aquaculture is in conflict with a great variety of area interests, but conflicts are generally fewer in the north (Fid, 2002).

Motivations for rejecting applications have changed in the past. Rejections due to wild-salmon interests and pollution have been reduced, partly because technological developments allow the use of more exposed localities. Veterinary requirements have become the most important limiting factor, due to requirement to distance between localities and periodic abandonment of localities. Rejections due to fisheries and traffic interests have also risen. Presently the main motivations for rejecting applications are based on veterinary arguments, fisheries interests and nature conservations interests (see graph below).

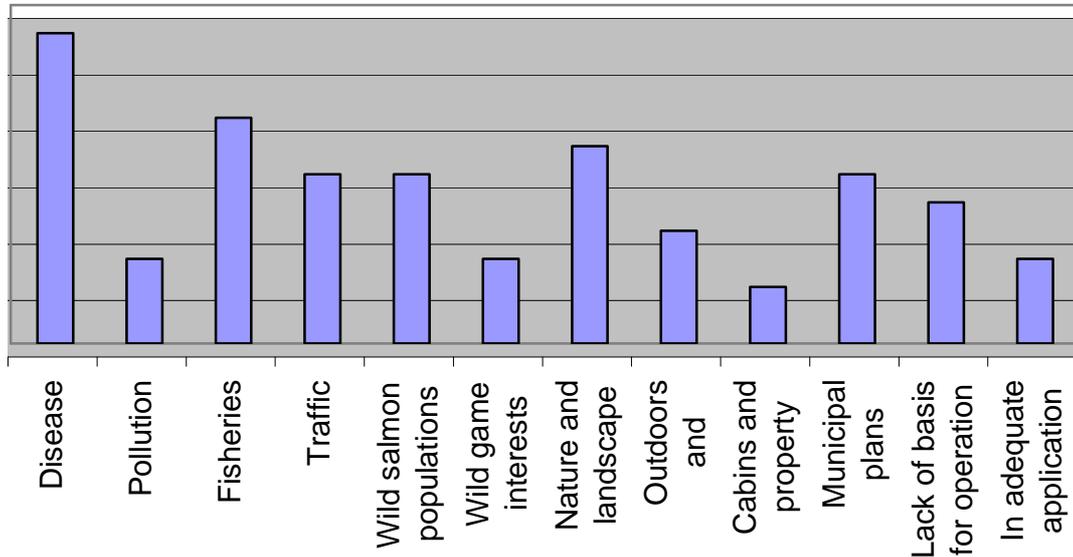


Figure 8: Reasons for rejections of aquaculture applications (FiD, 2002).

The majority of the actors in the coastal zone consider coastal zone plans to be a good instrument to resolve conflicts. Thus, there are great expectations to the ongoing revision of the Plan and Building Act.

Conflicts of Space Within the Aquaculture Industry

Problems of finding suitable and not conflicting locations for aquaculture is growing. Space has become relatively restricted on the south coast (Sørlandet), Rogaland, Hordaland and partly in Møre and Romsdal. The Directorate of Fisheries, as well as aquaculture organizations experience finding new localities as relatively difficult (Fid, 2002).

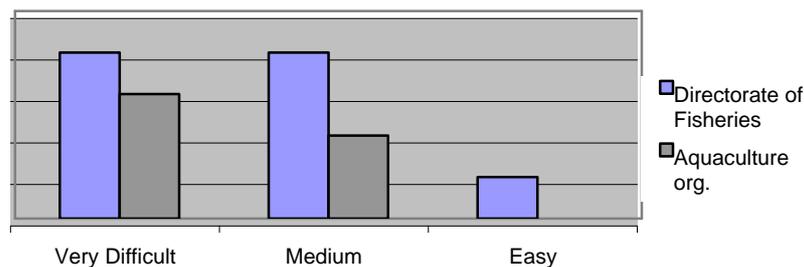


Figure 9: Perceived difficulties in finding new localities for aquaculture (Fid, 2002).

It is believed that finding localities for aquaculture will become more difficult in the future. The reasons are:

- a) Increasing numbers of applications for shell and marine specie farming.
- b) Increasingly stringent veterinary regulations related to distance.
- c) Conservation plans (marine conservation plans and national salmon fjords).

There are, however, expectations that problem of area will be reduced if co-localization and poly-cultures are allowed. It is also expected increased production on the best localities and a possible increase in the “artificial” size limit. Thus, there are enormous expectations to the upcoming allocation guide being prepared by the Norwegian Animal Health Authorities.

Conflicts Between Aquaculture and Fisheries

The traditional fishery is important, especially for the settlement in Northern Norway. Norway has a large coastal fishing fleet consisting of small vessels. A total of 13 700 fishers had capture fisheries as the main occupation in 2001. That same year, a total of 2.6 million tons marine fish (round weight) was landed, at a value of 11.2 billion NOK (SSB², 2002). The fishing areas for the coastal fleet is in the coastal zone and need protection from activities that may adversely affect the fisheries.

Conflicts between fisheries and aquaculture rise as fishers are hindered in using trawls and nets in specific areas and because farms are situated in spawning areas. Parts of Norway have also experienced concerns related to pollution, medicine use and genetic pollution. The level of conflict between captures fisheries and traditional aquaculture interests vary from medium to low.

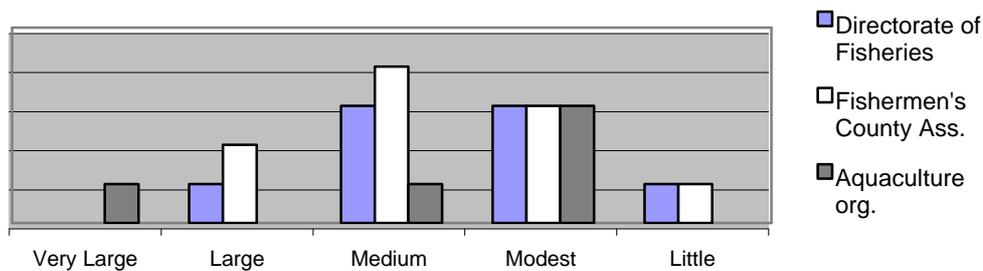


Figure 10: Degree of conflict between fisheries and aquaculture (Fid, 2002).

Due to a good dialog between fisheries and aquaculture, disagreements are usually easily solved. Conflicts are greatest in municipalities with an active coastal fleet, lacking a good coastal zone plan and/or where aquaculture is relatively new.

It is expected an increase in the level of conflict between capture fisheries and aquaculture in the future, especially due to the expected expansion in farming of shell and marine species. In case of conflicts, capture fisheries and established activities have usually been prioritized. Capture fisheries have taken place long before aquaculture and important localities for fisheries are less mobile than fish farms. The aquaculture industry believes future conflicts will depend upon veterinary restrictions and whether alternative models of localizing farms are developed (Fid, 2002). A factor that might contribute to a lower level of conflict may be the fact that for each year, fewer fishers and fewer vessels land the same amount of fish (Sandbæk, 2003). However, it should be noted that, according to Sandersen (1998), fishers are often passive in coastal zone planning, as they do not perceive it as a tool to solve the problems in the capture fisheries.

Nature Conservation Areas

The level of conflict between established conservation areas and aquaculture varies along the coast. However, the general level of conflict is moderate. The regional offices of the National Federation of Fish and Aquaculture Industries (FHL)

experience the level of conflict as relatively high. County governors, however, perceive the level of conflict as limited, because of limited numbers of conserved areas in many counties and these are usually unsuitable for aquaculture. The conflict is highest during the decision making process.

The level of conflict for planned nature conservation an area is experienced as relatively high, because the industry expect to be excluded from otherwise suitable areas. Future level of conflict will depend on actors' participation. The majority of the actors believe in an increase in level of conflict in the future, mainly due to the process of marine conservation plan and National Salmon Watercourses and Fjords.

Wild Salmon Interests

Because of escaped farmed salmon and salmon lice, the level of conflict between wild salmon interests and aquaculture is relatively high. Some county governors claim there are large “dark-numbers” related to escapes. Due to risk of genetic pollution, aquaculture applications may be rejected from otherwise suitable areas. The conflict level is further increased because of national salmon fjords and temporary safety zones. Fish farmers' organizations and a large part of the management are critical to the use of area-conservation. Knowledge regarding the effects of area protection is poor and has rarely been evaluated. County governors, on the contrary, claim area-conservation is insufficient. An increase in conflicts in the next few years is expected, but will decline when national salmon fjords and marine conservation plans are implemented.

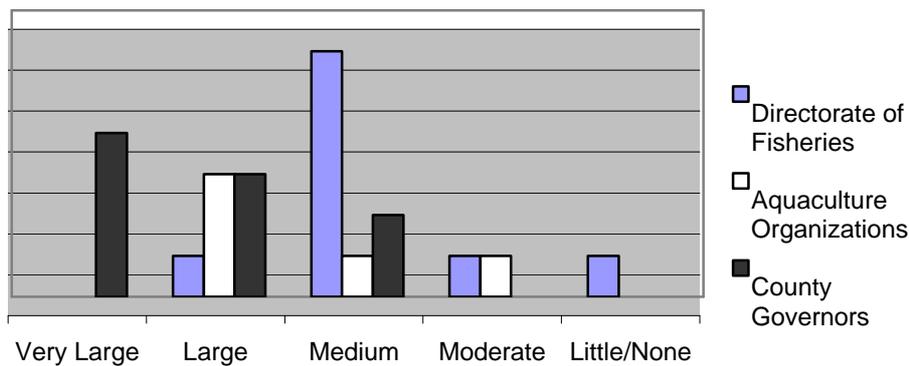


Figure 11: Level of Conflict Between Wild Salmon Interests and Aquaculture (Fid, 2002).

Aquaculture and Traffic Interests

The Coast Directorate sees the growing number of fish farms as a problem with respect to trafficking and rejects an increasing number of applications. The conflicts are mostly related to shell farming. A small increase in the future level of conflict is expected, because of the anticipated growth in aquaculture, new traffic routes for speedboats and a priority to protect recreational boat routes.

Conflicts with Other Farmed Species (cod as an example)

Salmon has dominated Norwegian fish farming, but is increasingly being accompanied by farming of marine species such as cod, halibut, turbot and wolffish. Price of cod increased to historical heights in the second half of the 1990s and was followed by a decline in price of salmon in 2001-2002. This gave rise to an increased optimism and increased research on cod farming. For cod to become as successful as salmon, problems with production and production cost of fry must be conquered. Moreover, there is an acute lack of suitable sites for salmon farming in parts of Norway; salmon already occupies the majority of the localities. Thus, if locality is a scarce resource, then priorities have to be made. Which specie gives the best marginal contribution? It is most likely that salmon will be most profitable for some time still. Thus, cod may lose in the initial phases to its established “big brother”, the salmon (Vassdal, 2002). One may therefore question whether localities for cod and other marine species will be available. Nordlys reported (23rd of March 2003) that two fish farmers in Northern Troms – an area that should have plenty of space - had problems of finding new localities (Enoksen, 2003).

To illustrate potential conflicts in cod farming, let's look at an example from the Argyll Coast in Scotland. Cod farming is seen, by some actors, as the last chance to save the Scottish cod and to maintain an independent supply of cod.

Salmon has been controversial because of pollution, threats to wild populations and chemical use. The cod, [the stakeholders] claim, does not have any of these problems. The stakeholders also claim cod farming will create 1 600 jobs and produce 25 000 tons of cod each year. As an additional advantage, farmed cod consume less food than its ocean-going relative. Thus, cod farming will allow the wild populations to recover.

The Scottish Fishermen's Federation does not believe in such “fairytales” and question the sustainability of this business. Because farmed cod feed on wild fish

from capture fisheries, cod farming will increase the pressure upon wild cod stocks. Recreational fishermen also oppose cod farming, as cod farms will be located close to one of the last Scottish rivers still receiving spawning salmon. They worry about the effects cod farms may have on wild salmon (Khan, *The Observer*, 6th of October 2002).

It is possible, according to the large smolt producers and the Ministry of Fisheries, the annual production 10-12 years from now will be close to the present production of salmon (400 000 tons). This is 100 000 tons more than what the cod fisheries in the North Sea landed in the peak year 1981. The FAO (Food and Agriculture Organization) said in 2000: "Cod farming has the potential to produce 1.5-2.0 million tons in 2015". Obviously the ambition regarding cod farming is high (Sandbæk, 2003:64).

The challenge of the authorities is therefore to allocate areas to provide opportunities for cultivating a wide variety of species – even combining cultivation of several species in one locality (Gregussen, 2001).

Military Areas and activities

The military use coastal areas for training. There are about 60 marine training areas along the Norwegian coast (White paper no. 43 (NOU 1988:8)). Conflicts arise as aquaculture is completely banned from these areas. The level of conflict is especially high in Southern-Troms, where the military occupies large areas suitable for aquaculture. Most actors believe the level of conflict between the military and the aquaculture industry will keep constant or decline in the future, if aquaculture could enter some of the military training areas.

Wild Game Interests

At the present there is 335 000 hunters in the Norwegian hunting register (Sandbæk, 2003:78). Hunting is an essential part of the Norwegian peoples outdoors recreation. The increase in populations of seal and otter is problematic for the aquaculture industry. Otters cause escapes if they make holes in net pens; as well, Heron and Cormorants feed on smolt. County governors are concerned aquaculture will increase the pressure to hunt certain species and report of some illegal hunting. The level of conflict is expected to further increase.

Pollution

The level of conflict because of pollution is medium. Although the level of pollution is claimed to be low, there is a concern about increasing pollution. County governors claim that emissions in harbours and fjord areas are under control and the challenge is to clean up “old sins”. However, the uncertainty of diffused and transported environmental pollution, such as, dioxins, PCB, PAH and radioactive elements, is far greater. There are also concerns about emissions of processing waters from the petroleum industry and accidents with shipping of petroleum and radioactive waste along the Norwegian coast. Various actors believe the level of conflict will increase, because increased knowledge will increase the requirements related to environmental pollution.

Outdoors and Recreation Interests

Public access to boating, fishing, swimming and hiking is deeply rooted in Norwegian culture. Conflicts between outdoors and recreational interests and aquaculture are predominantly in the south and southeast of Norway, as well as Rogaland and Hordaland. According to the aquaculture industry, trafficking by recreational boats, recreational fishing, and areas for swimming limit aquaculture in some areas. The county governors evaluate conflicts in or close to important recreational areas as high and want fish farms distanced from recreational areas. A rise in level of conflict related to farming of salmon is not expected.

Recreational (salmon) Fishing and “Fishing-Tourism”

Recreational fishing is something the settled population carry out. Foreigners and tourists perform ”fishing-tourism”, usually executed by local operators. In 2001, a total of 225 000 tourists came to Norway to fish (Sandbæk, 2003:77). The Norwegian College of Fisheries estimated that fishing-tourism left about two billion NOK in Norwegian coastal communities annually (Fid, 2002:66). The level of conflict is in general limited, but is significant in Rogaland and on the south coast (Sørlandet).

Due to concerns about genetic pollution, county governors are especially restrictive when recommending farms in or near the mouths of salmon rivers. The practice has been that applications are rejected if the Directorate for Nature Management (DN) does not recommend it (Ørebech, 1988:70 (Ot.prp nr. 53 (1984-85), s 9-10)).

According to aquaculture organizations, most conflicts have been because recreational fishing hinders the establishment of aquaculture. A number of county governors give a lower priority to aquaculture than recreational fisheries, as aquaculture may lower the quality of the wild fish. A moderate increase in the conflict level is expected.

Esthetical and landscape interests

The level of conflict with respect to aesthetics is in general moderate. There has been large improvement with regards to esthetical values. Aquaculture organizations state, conflict level is low in areas where aquaculture has been present for a long time. Some claim owners of recreational housing (tourists) complain far more often than people settled in these areas (Katranidid et al., 2003)³. The conflict level will stay constant or be reduced in the close future.

Other Interests

Large areas are needed when reindeer herds migrate between pastures every spring and fall. In the coastal zone, areas for swimming across sounds and pastures are important; hence, reindeers must not be excluded from these areas (Troms Fylkeskommune, 1999). Finnmark has in some instances included migration routes for domestic reindeer in coastal zone plans.

The extraction of petroleum on the continental shelf is important to the Norwegian economy. Part of this industry's activities takes place in the coastal zone - for instance, pipes and installations for landing oil and gas (White paper no. 43 (1998-99)). Still, the petroleum activities are limited.

The mineral industry includes mining of sand in the coastal zone and mining of shell sand in the ocean. Mining of shell sand is takes place in shallow waters, mainly in the counties of Agder, Rogaland and Hordaland (White paper no. 43 (1998-99)). The level of conflict is presently low.

The largest concentration of population in Norway is along the coast. The coastal zone is therefore exposed to a large pressure because of expansion of cities, villages, infrastructure and industry, especially oil refineries. In addition, the

³ Study by Katranidis et al. was done on two islands in Greece. It found that local people are in general more positive to aquaculture development than tourists, as it contribute to the local economy. This has also been noted in Norway.

Norwegian people enjoy outdoors recreation; we are a people of hunters and gatherers. Parts of the coast are particularly attractive for recreational housing. Thus, we own as many as 350 000 recreational cabins (Sandbæk, 2003:76). As the level household income increases so does the pressure to build more recreational housing, resulting in an increased pressure upon the coastal zone.

Limitations and Weaknesses

The Planning and Building Act (PBL) gave the municipalities the same planning possibilities in the sea as on land. As the coastal zone is under water, the sea floor is inaccessible, marine resources are mobile and there is a limited protection from terrestrial run-off. Thus, the role of the PBL is unclear, e.g. private property reaches to a depth of 2 m; water outside this limit is public property. Thus, what area is to include in the coastal zone is not clear and a complete autonomy is difficult to achieve. Further, it is questionable whether the geographic scope of coastal zone planning is adequate to solve problems transecting local and regional boundaries. The county council may be a more appropriate unit to solve such problems.

Because of the large number of actors in the coastal zone, planning may create new and activate old conflicts. There may also be conflicts between the municipality acting as a representative for state, and acting as an independent local authority (Sandersen, 1996). Agencies guard their objectives and the responsibilities and recourses that accompany them. Survival of the agency depends upon maintaining the objectives and resources intact. Anything that threatens the objectives or the resource base tends to be protected with vigour and persistence (Jentoft, 2000 (Cincin-Sain and Knecht, 1998)). The coastal zone may become what Sandersen (1998) calls an “institutional battlefield”, where the winner so far has been the central government and sector interest, such as the fishing industry. The Losers have been the municipal and regional authorities that are concerned with their own coastal areas (Jentoft, 2000).

Further, it may be less “profitable” for local politicians to accept responsibility for increased management, as these responsibilities tend to cause conflicts and reduce popularity. Some municipalities may be too small to allow for political or bureaucratic decisions without partiality.

Sandersen (1996) identified four problematic areas in coastal zone management (CZM).

1. CZM may increase requirements to administration and knowledge in the municipalities. It also poses a challenge for politicians' knowledge.
2. Municipal intervention in the coastal zone may lead to new or increased conflicts between sectors internally in the municipality. A new management system change power structures and new groups of actors will be activated.
3. The existing PBL does not clearly specify the opportunities of environmental and industrial management of municipalities.
4. The expansion of the management system threatens the domain and competence between municipal and governmental sector authorities, and amongst governmental sector authorities.

Municipal coastal zone plans are tools supposed to reduce conflicts in the coastal zone. These plans are juridical binding and the plan processes are usually comprehensible and uncomplicated. The experience with coastal zone plans is greatest on the west coast, in Trøndelag and in parts of Nordland. In the last few years have the majority of coastal municipalities produced coastal zones plans, especially in connection to aquaculture - the number one motivational factor for producing coastal zone plans.

The premises for a good plan is based upon a solid database, a high quality planning process, participation and periodic revision of plans. Also, there has to be a political will to make priorities and municipalities must respect approved plans and not give too many dispensations. Further, a condition for success seems to depend upon the way in which planning processes are organized and how actors are involved (Jentoft, 2002 (Bennet,96)).

Powerful Actors in the Coastal Zone

The "conflict-energy" between user groups in the limited coastal zone has increased in the recent past. Conflicting use of area in the coastal zone is in general between use and conservation. However, there are also conflicts between sector and territory interests, and jurisdiction of fish authorities and municipal governments

(Jentoft, 2000). Institutions, such as fisheries management, environmental management, aquaculture management, municipal administration and so forth, collide in the coastal zone and make communication between the different groups difficult (Sandbæk, 2003).

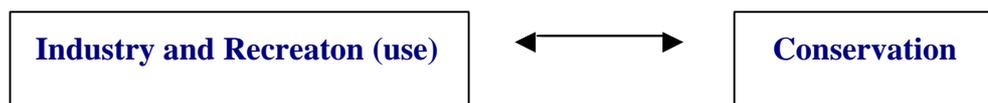


Figure 12: An Illustration of Conflicts in the coastal zone (Sandbæk, 2003:42).

The motivations for planning in the coastal zone varies, but there is a general desire for a holistic and co-ordinated use of space in the coastal zone to solve existing or expected conflicts with respect to area (Sandersen, 1996; 1998 (Vassdal, 1992; Bennet, 1996b)).

The attitudes toward coastal zone management differ. How coastal zone planning is perceived depend on if the municipality has a tradition for planning. Further, according to Sandersen (1998) it also seem to matter who is responsible for coastal zone planning, whether it is the business (industry) or the environmental coordinator. Moreover, the presence of aquaculture also influences the attitudes towards coastal planning, as aquaculture is the source of conflict in many municipalities. Thus, municipalities with well-developed aquaculture industry tend to be more positive to coastal planning.

A number of municipalities sees coastal zone planning as a way to realize their ambitions for a more extensive local management of marine recourses within the baseline. However, many municipalities have been disappointed when they understood how limited their freedom of action actually is within the framework of coastal zone planning (CZP). For other municipalities, the plans are seen as obstacles reducing political freedom of action and make local politics increasingly bureaucratic. Thus, CZP may be perceived as a narrowing of the freedom of action, rather than as an opportunity (Sandersen, 1996, 1998).

Similarly, actors in the industry experience the CZP as rigid and limiting, relative to the previous flexible adjustment in the coastal commons. How much weight is put on the aquaculture industry varies between regions in Norway.

Municipalities on the northwest coast and Northern-Norway greatly emphasize industry development in their coastal plans. This may be because municipalities farther north have weaker economies and that activities such as outdoors and recreation is relatively less important (Sandersen, 1996, 1998 (Vassdal, 1992; Bennet, 1996a, Jørgensen and Kjørsvik, 1996)

Bureaucrats and planners believe coastal zone plans to be a relevant answer to the increasing pressure on area (Sandersen, 1996,1998)).

Environmental considerations are the most important reason for coastal planning in the south of Norway, but become less important farther north. If we separate conflicts into two sectors: those due to resources and those due to localities, then there are indications that conflicts in Northern-Norway are due to resources (Sandersen, 1998 (Astrup, 1991)).

CZM tries to incorporate all the different discourses, thus it encompasses a large number of discourses. Moreover, CZM activates various narratives and various actors. Hence, different actors, operating within different discursive framework and with different agendas influence coastal zone management. Thus, coastal zone planning becomes an arena for struggling discursive practices. What becomes a dominant discourse depends upon the setting the aquaculture industry operates within. Thus, coastal zone management is not a “neutral” or even a just process. The influences of actors, even within a municipality, tend to differ – bargaining power varies. The fisheries industry, for instance, tend to be passive in coastal zone planning processes; they do not perceive CZM as a device to solve their problems. Similarly, who is responsible for the planning process will also influence the management. If the environmental coordinator is in charge of CZP, then it should not be surprising if the plans focus on conservation. If the business co-ordinator, however, were in charge of the plan, then it would be likely that industry would be in focus. Moreover, the outcome of a CZP also depends upon where in Norway it takes place. A plan in the north of Norway tends to be more focused on industry than in the south, where it tends to be focused on conservation. Therefore, powerful actors in municipalities, industry or government drive the process of coastal management according to their own set agendas.

Chapter 9: A Discourse Analysis Related to Space in Aquaculture

The purpose of this thesis is not only to describe the discourses, but also to show how discourses operate in the public domain. Thus, this thesis will show how discourses play a role and act as a reference point when actors argue in the debate concerning allocation of space in aquaculture. The analysis will use the discourse theory outlined in chapter 3.

Actors place themselves within a certain discourse, which they employ in discussions regarding aquaculture policies. The paper has identified five aquaculture policy discourses:

- 1) The Regional-Policy discourse (RP).
- 2) The Industrial-Policy discourse (IP).
- 3) The Environmental-Policy discourse (EP).
- 4) The Health-Policy discourse (HP).
- 5) The Coastal Zone Management discourse (CZM).

First of all, the RP-discourse emphasizes a policy based on a small-scale, “owner-operates” and regionalized structure. Secondly, the IP-discourse focuses upon liberalization of legislation, economies of scale, international competition and industrial competence. Thirdly, the EP-discourse emphasises regulations based upon environmental concerns. This discourse contains environmental issues such as emissions, genetic pollution and biodiversity. The HP-discourse represents veterinary regulations with respect to animal and consumer health. Finally, a management that is holistic, participatory and flexible characterizes the CZM-discourse. In spatial terms the CZM-discourse sees aquaculture in relations to other uses in the coastal zone.

The Formative Period and “Subordinate” Discourses

The temporary Aquaculture Act of 1973 and the permanent Act of 1981, both had their origins in the Lysø-commission. The commission laid forth the premises for the future aquaculture development. The RP-discourse was hegemonic in the 1970s and emphasized regional development, small-scale structure and production adjustments related to market demand. The RP-discourse contained two subordinate discourses: the Fisheries discourse and the Agriculture discourse. The Fisheries discourse related aquaculture to fisheries. Fishers, fish farmers and a majority of politicians supported this discourse. Two influential actors were the Ministry of

Fisheries and the Directorate of Fisheries. Most of the amendments in 1981 were taken from the feedback of the Directorate of Fisheries, whose frame of reference was the “Coastal-Model” (described in chapter 4).

The Agriculture discourse saw aquaculture as a side-occupation to agriculture and was supported by farmers and agricultural interests. This discourse, however, lost ground as the Aquaculture Act, hence aquaculture, was administrated by the Ministry of Fisheries.

The IP-discourse was also present in the Lysø-commission. Conservative politicians and large-scale fish farmers supported it, using the “Industrial-Model” as a frame of reference (described in chapter 4).

Although, the NFF wanted economically feasible farms, the majority did not want an industrial structure. A registrations system with requirements regarding disease, pollution and locality would secure this. Regulations would hinder farms in taking advantage of their growing experience to improve efficiency and competition. The NFF worked for their members – the existing fish farmers. As a result, they worked to maximize the benefits of the member; thus, entry into the aquaculture industry had to be limited. With a limited entry, the individual production would be maximized; as a result, volume restrictions on farms were not desired.

The RP-discourse was hegemonic throughout the 1970s and most of the 1980s. Central actors such as the Ministry of Fisheries, the Directorate of Fisheries and the Labour Party - which had governmental power throughout most of the period - participated to maintain the dominance of the RP-discourse.

A Shift in Discursive Practices

The IP-discourse took increasingly root in the public debate from 1981. By 1985, Listau (Minister of Fisheries from Conservative Party) proposed to deregulate the license regime. Conservative politicians, large-scale fish farmers and the NFF supported this policy.

In the hearings in 1982, the NFF wanted production regulations related to infrastructure – it was just as important as marked demand. They also proposed a limit of 8 000 m³ - as technology was not yet mastered, and to give priority to existing farmers. They also supported the liberalization of ownership. Similarly, in 1985, the NFF wanted a total evaluation of the market - including infrastructure. However, this time, they were critical to liberalizing ownership, as it would undermine the regional

nature of the industry. Thus, NFF had changed their frame of reference from an IP-discourse argument to an increasing use of RP-discourse arguments.

The Directorate of Fisheries, still a significant actor, was in 1985 critical to deregulation of the act. Moreover, this directorate formulated and applied the regulations that accompanied the act; thus the practice of the legislation was in regional-policy friendly hands. Hence, the process leading to the Aquaculture Act in 1985 was initiated by the IP-discourse, but became dominated by the RP-discourse.

New Discourses Emerge

As the maximum allowable size and the fish density in farms increased, the late 1980s experienced environmental and health problems. Thus, environmental and health issues appeared in the public debate.

LENKA and temporary safety zones introduced issues of pollution and limitation of space. The Ministry of Fisheries, with the support of the Ministry of Environment and the Ministry of Agriculture, implemented the temporary safety zones in 1989, thus institutionalizing the EP-discourse.

Guidelines for allocation of licenses for the regional veterinaries were produced in 1989. These guidelines regulated the minimum distance between farms and were supported by the veterinaries and environmental interests. The industry had an increasing acceptance of veterinary regulations; veterinary regulations prevented disease and economic losses. The HP-discourse was institutionalized through these guidelines. Thus, two “new” discourses entered the scene from the late 1980s, immediately became very influential.

Liberalization and Restrictions

Ownership regulations were deregulated in 1991, with the Conservative Party as the designer and advocate and the Labour Government as a presenter. Other pro-liberalization actors, previously not apparent in the aquaculture debate, became influential, such as: the Ministry of Finance, the Ministry of Industry, the labour unions and the private banks. The Directorate of Fisheries still opposed liberalization, but the RP-discourse was losing ground to the IP-discourse – due to politics of liberalization and powerful actors.

The EP-discourse further penetrated the public debate, as amendments to the Aquaculture Act included the term “sustainable development” in 1991. The inclusion

of the term was not contested; thus politicians and administrations were accepting the EP-discourse as a term of reference.

Two years later another guide to the regional veterinaries was produced. To combat diseases, the guidelines introduced generation separation and periodic abandonment of localities. Thus, the HP-discourse was re-represented and has become the regime that influences the use of space in aquaculture the most.

The work towards the suggested National Salmon Watercourse and Fjords was initiated in 1997, based on environmental terms of references, such as point-pollution and protection of wild salmon stocks. Environmental interests, salmon interests and fishing interests supported the project. However, the industry, the regional veterinaries and parts of the management questioned the actual effects of the project. Although the IP-discourse gained ground in 1991, so did the EP- and the HP-discourses.

Spatial Outcomes of the Different Discourses

The RP-discourse was institutionalized through legislation, as the rhetoric was transformed into practice. Thus, the RP-discourse caused small and medium sized farms to be allocated along the entire Norwegian coast and fulfilled the objective of regional development.

Although first presented in the Lysø-commission in 1973, the IP-discourse slowly penetrated the public debate to dominate in the late 1980s and early 1990s. As this discourse deregulated ownership, it caused an increase in domination of large companies and a reduction in local ownership, as well as increased size.

The EP-discourse produced temporary safety zones in 1989 and was revived in 1997 and 2003, due to the suggested National Salmon Watercourses and Fjords. These projects excluded fish farming from areas that otherwise would be suitable for aquaculture; thus, increasing the pressure upon the remaining area and raising the potential for conflicts. The influence of the EP-discourse has increased since the end of the 1980s, due to a focus on environmental issues.

Finally, the HP-discourse was conceived in the wake of diseases and materialized through the guidelines in 1989 and 1993. Veterinary regulations have become the most important agent influencing the use of space in the coastal zone. With the exception of the IP-discourse, all of the discourses have, in general, resulted in an increased spatial use in Norwegian aquaculture.

Discursive Struggles among Powerful Actors

There has been a struggle between discourses since 1973 and the powers of the discourses seem to fluctuate. In the beginning there was primarily a struggle between the RP- and the IP-discourse. The leading discourse of the two has changed throughout the period, but regional policy arguments have dominated the debate until the late 1980s. Although IP arguments were gaining support, the institutionalization of the RP-discourse, through legislation and practice, made the shift to an IP-discourse difficult. Moreover, when institutions like the Directorate of Fisheries was producing as well as implementing the regulations, the transformation into a new frame of reference was not easy. The IP-discourse was institutionalized through policies in the early 1990s, but has struggled with the EP- and the HP-discourse ever since.

The RP-discourse continued to be the dominant discourse throughout the 1980s due to the powerful actors projecting and maintaining its terms of reference in the public debate. The IP-discourse increased its institutionalization and an increasing number of actors entered the IP framework. As a result, the influence of the discourse grew, but it was never to completely replace the RP-discourse.

The reason for the limited dominance by the IP-discourse could be that it never was able to get a good footing within the public debate. EP- and HP-discourses were gaining ground at the expense of the IP-discourse. Attempts to promote IP arguments, such as increased scale of production, were “killed” by environmental and veterinary arguments. Over time the HP-discourse has grown to become the dominating discourse. Problems of animal and human health threatened profits; thus, both management and industry were willing to accept the veterinary regulations. As a result, the discourse was institutionalized. The EP- and HP-discourses will continue to be terms of reference as long as these factors influence production.

An interesting point is that two important actors changed discourses throughout the period. The NFF went from primarily using the IP framework, to a framework increasingly influenced by the RP-discourse. For instance, in the early 1973, they promoted a registration system, rather than a license regime. By the early 1990s, however, the same organization wanted to limit entrance into the industry. The NFF has an objective to protect its member - the existing farmers. Thus, a shift into a more protective framework (RP-discourse) should not be surprising.

Another important actor that shifted discursive framework was the Labour Party. In the 1980s the Labour Party was in support of a regional development policy using the RP-discourse. By 1991, when they proposed amendments to the Aquaculture Act, they had adopted the pro-liberalization arguments of the Conservative Party; thus, adopting the IP framework.

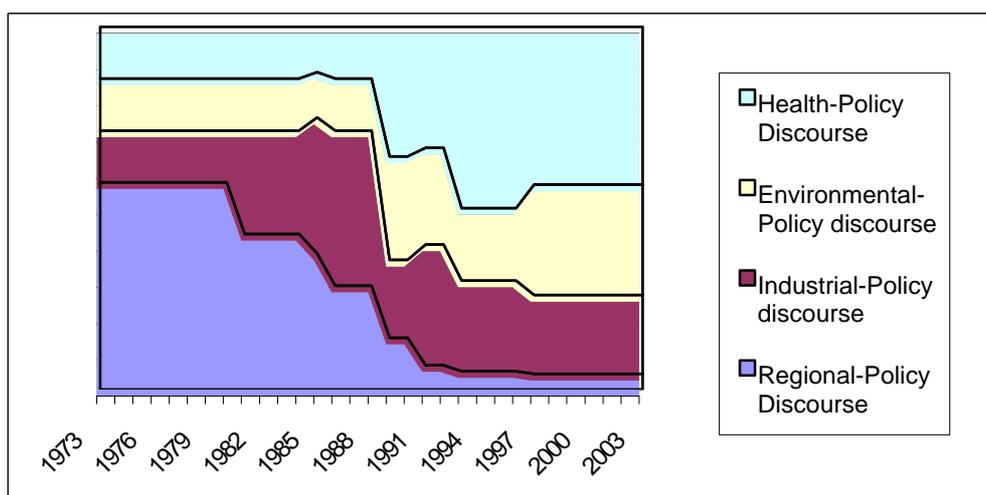


Figure 13: Graphical illustration of the Influence of the Different Discourses upon Space

A New Discourse: The Coastal Zone Management Discourse (CZM)

The Plan and Building Act (PBL) of 1985 gave the municipalities the planning authority in the coastal zone and it was extended to the base line in 1989 (Sandbæk, 2003:90). A municipality produces a legally binding plan for the coastal zone according to the PBL, hence a coastal zone plan.

Because aquaculture's spatial use has increased tremendously in the recent past and because aquaculture is an activity that excludes other uses, it will cause conflicts. Thus, there is a need for ICZM.

The CZM-discourse tells narratives of a dynamic management in a multidisciplinary and iterative process, in order to promote sustainable management in the coastal zone. CZM uses informed participation and cooperation of all stakeholders to assess societal goals in the coastal zone. In the long term, CZM try to balance environmental, economic, social, cultural and recreational objectives, within limits set by nature. It also integrates all relevant policy areas, sectors and levels of administrations, in time and space (EEA, 9th May 2003).

Those in favour of a coastal zone management system argue that it is a holistic, participatory and bottom-up approach; as well as an integrated and flexible system that addresses problems of managing conflicts among different users. The act co-ordinates and facilitates decentralized planning and includes plans for nature conservation and pollution abatement.

Actors usually in favour of an ICZM system are municipalities believing that it will lead to increased freedom of action, and bureaucrats and planner believing CZM to solve problems of space as a scarce resource.

However, there are actors involved that do not support the implementation of a CZM system and see such a system as a municipal “colonizing” of the coastal zone – that used to be a public commons. Thus, some municipalities view the CZM plans as obstacles reducing political freedom and increasing the bureaucracy. Moreover, the actors of the industry experience the plans as rigid and limiting. Some even claim coastal zone plans may create problems that otherwise would not be there, as every actor tries to secure their share. In addition, in small coastal communities, coastal zone planning is what they always have done, though often through more informal adjustment. Thus, CZM could be experienced as artificial and limiting.

Still, there is an increased interest for ICZM. An increasing number of coastal municipalities are producing coastal zone plans, especially those with an aquaculture industry. The Norwegian Research Council is funding research on coastal zone management and the Norwegian College of Fishery Science is starting a master program in coastal zone management.

Conclusion

The main aim of this paper has been to show how physical use of space has changed in Norwegian aquaculture since the early 1970s and what factors have led to this change. In general, we can say that pressure upon available space has increased and it has become more difficult to establish aquaculture farms in Norway. What factors have influenced space to become scarcer? First of all, veterinary requirements and conservation of area has led to an increase in area used by each individual fish farm, but also to a decline in available area.

Secondly, the changes in spatial use may also be traced back to social discourses related to the development of the aquaculture industry. Use of space in aquaculture depends upon the discursive framework and arguments being used. As,

mentioned in the introduction, there are “optimists” and “pessimists”. Thus, one can say, the optimist does not see space as a limited input factor (e.g. Heen et al., 1993), whereas the pessimist see space as increasingly becoming a scarce resource (e.g. Vassdal, 2002).

The Regional-Policy (RP) discourse, which dominated in the 1970s and the 1980s, influenced spatial use by ensuring regional development through small-scale farms dispersed along the entire coast. In physical terms, this implied that each farm occupied a small area. However, the socially constructed discourse was the main driving force behind the size of farms. Thus, the small-scale and regional characteristics of the industry in the 1970s and 1980s can be traced back to the hegemonic discourse at the time – the RP discourse.

Similarly, the outcome of the Industrial-Policy (IP) discourse was influenced by the physical requirements in aquaculture, as well as the socially constructed discourses. The discourse promoted an increase in maximum allowable volume, thus, an increased physical influence by each farm increased. This spatial outcome was a result of a socially constructed discourse, where the narratives were of economies-of-scale and deregulation of ownership to secure the financial basis and competence in the industry. As a result, not only did the volume increase, but the spatial distribution of farms also changed, as local ownership declined. Thus, we can say that the physical outcomes of both the RP- and the IP-discourse were in essence based upon socially constructed discourses. These discourses materialized through physical demands and were institutionalized through laws, regulations and practices. The RP-discourse, due to its institutionalization and dominance, was difficult to change, especially because governmental agencies (e.g. the Directorate of Fisheries) were carriers of an RP-discourse long after the political landscape had moved toward an IP-discourse. The influential actors in these discourses were mainly government agencies, the industry and politicians. The carriers of the RP-discourse in the 1970s and the 1980s were government agencies and politicians (e.g. Directorate of Fisheries, Ministry of Fisheries, The Labour Party). The carriers of the IP-discourse were the NFF, the Conservative Party and over time various ministries such as the Ministry of Finance. It is interesting, however, that both the Labour Party and the NFF changed their discursive frame over time – in opposite directions. The Labour Party adopted an IP-discourse, whereas the NFF adopted the more protective RP-discourse.

Although the IP-discourse had its most influential period (so far) in the 1990s, it was never to become as hegemonic as the RP-discourse. This was because environmental and health problems in the aquaculture industry introduced another two discourses: the Environmental-Policy (EP) discourse and the Health-Policy (HP) discourse. Environmental interests constructed the EP-discourse, based on arguments of genetic pollution and protection of the wild stocks. The HP-discourse was based on arguments of animal and human health, socially produced by actors, such as the veterinarians. The physical outcomes of these discourses have been a reduction in available space and an increased use of space in Norwegian aquaculture industry. Both of these discourses have become institutionalized through laws, regulations and practices. The EP-discourses was institutionalized, first through the temporary safety zones and now through the plans for National Salmon Watercourses and Fjord. The influential actors in this discourse has been environmental interests, county governors, the Ministry of Environment, as well as a number of NGOs, e.g. recreational fishermen. The HP-discourse has been re-represented through the continued presence of disease and was institutionalized through the guidelines produced by the Norwegian Animal Health Authorities. Thus, the veterinary authorities have, by far, been the most influential actor in the implementation of health regulations.

Due to the rapid growth in aquaculture and the resulting increase in conflicts of sea space in the coastal zone, we are now moving toward a Coastal Zone Management (CZM) discourse. This discourse capture a number of other discourses, including the four discussed.

$$\text{RP} + \text{IP} + \text{EP} + \text{HP} < \text{CZM}$$

Figure 14: Contents of the CZM-discourse

The CZM-discourse was institutionalized through the Plan and Building Act (PBL) of 1985, which addressed participation of stakeholder. Thus, there are a large number of actors in a CZM-discourse. The central actors, though not necessarily the most influential, are the municipalities. Agencies administering sectoral laws, such as the Salt Water Fishing Act and the Aquaculture Act, also have large influences in the CZM. In addition, the aquaculture industry is influential, however, more in the north

than the south, and may be the actor that gains them most from a proper coastal zone planning.

Thus CZM may harmonize various competing interests and discourses, as it calls for participation of all stakeholders. However, it may also result in artificial conflicts between actors. The coastal zone will continue to be an arena for struggling discourses, where the aim is to have a discourse's idea of reality established as the only legitimate one.

The question whether there is scarcity of space or not in Norwegian aquaculture depends upon a number of elements. First of all, the limitations of space will clearly depend upon the future development of technology. More advanced technology, such as rougher and submergible cages, will move aquaculture out of areas with limited space and high levels of conflict. Secondly, the use of space in aquaculture will also depend upon the number of fish farmers, as well as the size of each fish farm. However, given today's technology, there is a limited supply of aquaculture localities available. Thirdly, the development of veterinary regulations will greatly affect the spatial use in aquaculture. There could be a possibility for increased production on each locality and localities situated closer; however, this will depend upon the characteristics and development of diseases and vaccines in the future. Fourthly, environmental interests, promoting conservation of sea area, will reduce available space for aquaculture. Finally, scarcity of space will to a great extent depend upon how different interests are successful in influencing the shaping of regulations and practices. Thus, the question of spatial scarcity will therefore be a question about what discourses dominate and what requirements are promoted through the discourses.

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Appendix 1: Calculation of Area Used by Fish Farms

Year	Penvolume	Number of Licenses Allocated	Total Production
1973	8000		1172
1975	5000		2517
1977	5000		3932
1981	3000	50	13042
1983	5000	100	22703
1985	8000	150	34615
1988	12000	30	89874
2002	12000	40	528000
2003	12000	50?	??

Sources: FHL, 2003, Aarset, 1988

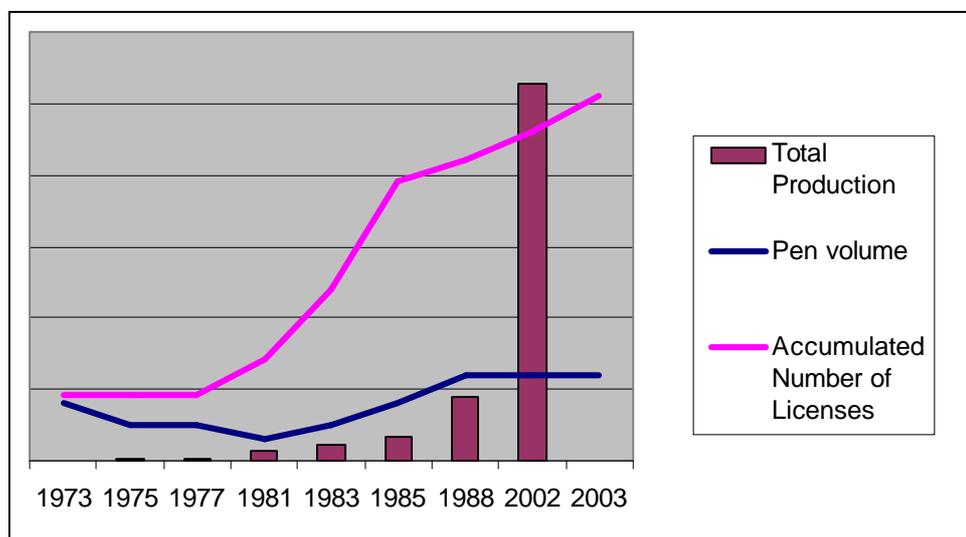
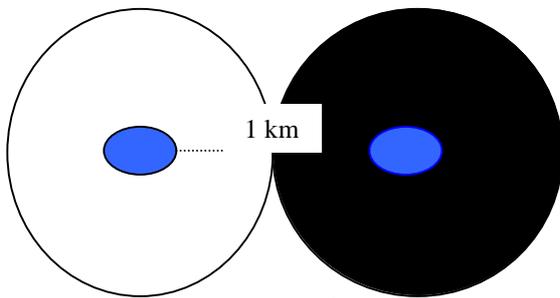


Illustration: Trends in Total Volume, Pen Volume and Accumulated Number of Licenses.

Appendix 2: Calculations of Area Used by a Fish Farm

1 000 m between farms



$$\begin{aligned}\text{Area} &= ? * r^2 \\ \text{Area} &= 3.14 * 500^2 \\ \text{Area} &= 785\,000 \text{ m}^2 \\ \text{Area} &= 0.785 \text{ km}^2\end{aligned}$$

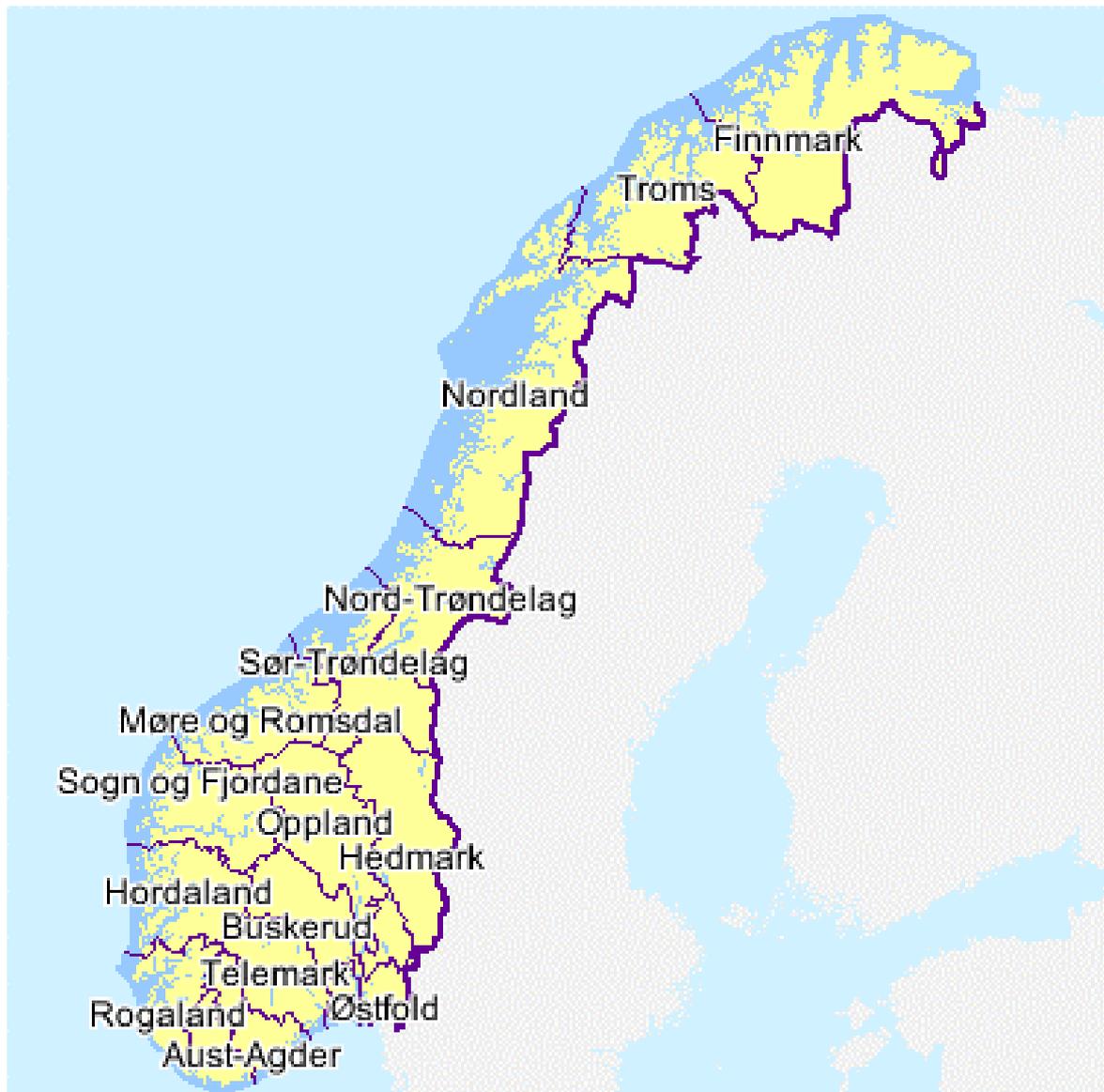
5 000 m between farms

$$\begin{aligned}\text{Area} &= ? * r^2 \\ \text{Area} &= 3.14 * 2\,500^2 \\ \text{Area} &= 19\,625\,000 \text{ m}^2 \\ \text{Area} &= 19.63 \text{ km}^2\end{aligned}$$

If we have 90 000 km² then we have 4 600 localities (using 5 km minimum requirement). Today we use about 3 000 localities, of which 1 700 are salmon. This means that we have room for about 1 500 to 2 300 licenses.

Source: White Paper no. 43 (1998-99); Sandbæk, 2003:55,65

Appendix 3: Map of Norway with Counties



Source: <http://kart.norge.no/>

Appendix 4: Presentation of Discourses

	RP	IP	EP	HP	CZM
Established	Lysø 1970s.	Lysø 1970s.	LENKA and Safety zones, 1989.	Guidelines 1989.	1983: NOU 1983:15 "Planlov".
Re-represented	1981 Act 1985 Act. 1991 re-regulation.	1985 Act. 1991 Deregulation.	Act amendments in 1991. Rieber-Mohn 1997. National salmon fjords 2003 (?).	Guidelines 1993.	Ot.prp nr. 53 (1984-85) "Ny plan- og bygningslov". 1989 – Plan and Building act extended to baseline.
Narratives	Regional industry. Regional employment. Fisheries/agriculture : one-occupations/side-occupation. Regional development. Owner-operates. Local ownership. License regulation.	Regional because of nature. Economies of scale. Liberation with respect to ownership. Remove license system.	Environmental conditions: Gyro and genetic pollution. Save wild population.	Concerns of animal and human health.	Holistic management. Flexible management. Participatory. Bottom-up management. Needed to solve conflicts in the coastal zone.
Actors	LYSØ Costal communities Fish farmers Farmers Min. of Fisheries Dir. Of fisheries NFF Political parties	LYSØ Political parties Fish farmers Min of Fisheries Dir of fisheries Ministries wanting to liberalize Union Banks	Ministry of Environment Ministry of Local Government Min of Fish Min of Agr Fish farmers Environmental interests Country vets	Veterinaries Fish farmers Animal health inter Human health inter	Municipalities Fishers Fish farmers Recreational fishers Military Environmental interests. Transportation Health interests (vets). Wild salmon Wild game Nature and landscape Property etc...
Impacts on Space	Regional localization Small scale Production Regulation License system	Larger Scale Increase in production	Increased pressure on remaining space, due to limitations in specific areas.	Increased distance between farms. Increased use of space as more localities were needed.	???

(Based on: Adger et al, 2001)