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Implementation of the Traffic Light System in Norwegian salmon aquaculture – success or failure for whom?

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William Warby – Traffic Light Tree, Flickr (Warby, 2008)

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> "*Whatever I have, wherever I am, I can make it through anything in the One who makes me who I am*" – Philippians 4:13 MSG

Abstract

Since Norwegian Atlantic salmon aquaculture developed into a viable industry in the 1960s, it has grown into one of Norway's most important sectors. A crucial factor influencing this growth has been the development of a management system which has facilitated the growth in an advantageous way. In the latter part of 2017, a new aquaculture management system started, called the Traffic Light System. This system came as a result of a six years long period of public and political discourses. The Traffic Light System represented a significant shift in how the industry is managed and how the continued growth in production will happen. The aim of this thesis was to investigate if the implementation process leading up to the initiation of the Traffic Light System was a success or failure, from the perspective of the government and different interest groups. The period analysed was from the Gullestad Committee in 2011 to the initiation of the Traffic Light System. To answer the aim of this thesis, the integrated framework for implementation studies developed by Søren C. Winters was applied.

The result showed that when applying Winters framework, the success or failure of a policy depends on the perspective used when analysing it. From the Norwegian government's point of view the process has been a success, while from the perspective of the interest groups it has been neither a success nor a failure.

Keywords: Atlantic salmon aquaculture, Traffic Light System, implementation study, public policy, interest groups

Table of Content

List of abbreviations

ALI	Alta Laksefiskeri Interessentskap
Bellona	The Bellona Foundation
CPA	Climate and Pollution Agency
DN	Directorate of Nature Management
DoF	The Fisheries Directorate
EA	Environmental Agency
Fagforbundet	The Norwegian Union of Municipal and General Employees
FFSU	The Fish Farmers Sales Union
FHL	The Norwegian Seafood Federation
FNI	Federation of Norwegian Industries
FSA	The Food Safety Authority
GSF	Grieg Seafood ASA
IRBT	Interregional Biomass Limit
IMR	The Institute of Marine Research
LMI	Pharmaceutical Industry Association
LO	The Norwegian Confederation of Trade Unions
MAB	Maximum Allowable Biomass
MFC	The Ministry of Fisheries and Coastal Affairs
MTIF	The Ministry of Trade, Industry, and Fisheries
NBA	Norwegian Bar Association
NCFA	The Norwegian Coastal Fishermen's Association
NFA	The Norwegian Fishermen's Association

NFFA	The Norwegian Fish Farmers Association
NFKK	The Network for Fjord and Coastal Municipalities
NINA	The Norwegian Institute for Nature Research
NJFF	The Norwegian Association of Hunters and Anglers
NNN	The Norwegian Food and Allied Workers Union
NSL	The Norwegian Seafood Companies' National Association
SAI	Office of the Auditor General of Norway
TLS	The Traffic Light System
Tekna	The Norwegian Society of Graduate Technical and Scientific Professionals
VA	The Norwegian Veterinary Association
VI	The Norwegian Veterinary Institute
WP	White Paper
WWF	World Wide Fund for Nature

1. Introduction

Norway is a country with a long and profound connection to the sea. Norway has one of the world's longest coastlines and governs sea areas that are six times bigger than its land areas (MTIF and MPE, 2017). Since early times the sea has been an essential place for work, trade, culture, and tradition for the Norwegian people.

In the 12th century, Norway started exporting dried cod and herring from northern Norway to England (Hallenstvedt, 2018). This started what has been a 900-year long era in which the sea has been essential to Norway.The Hansa era took place between the 14th century and the 16th century, and especially Bergen and Trondheim became vital trading hubs for salted and dried fish between northern Norway and the rest of Europe during this period (Hallenstvedt, 2018) (Fjord Norway, 2019). In the 1800s, the spring cod fisheries in Finnmark together with cod fisheries in Lofoten and herring fisheries on the south-west coast of Norway became immensely crucial (Hallenstvedt, 2018). In the late 1960s, two new industries emerged that would change Norway profoundly; the oil-industry and the Atlantic salmon aquaculture industry. Over Christmas 1969, the Ekofish oil field was declared commercial sustainable and started an incredible oil adventure for Norway (Smith-Solbakken & Ryggvik, 2018). Aquaculture with rainbow trout (*Oncorhynchus mykiss*), and later on Atlantic salmon (*Salmon salar*) also became viable as a business. These are just three examples of vital sea-related industries in Norway, which have nurtured the country's deep connection to the sea.

The latter industry, Norwegian Atlantic salmon aquaculture, has in the last 40-50 years grown into an important industry. Moreover, it has become a success story that is quite unique. From being a subsidiary income for fishermen, fish landing sites and farmers in 1960s, it has become a vast and industrialized industry. Today it is one of Norway's most vital industries with a first-hand value of 61.6 billion NOK in 2017 and employed directly 7 502 and around 34 000 indirectly (SSB, 2018) (Richardsen, Myhre, Bull-Berg, & Grindvoll, 2018). It had gone from producing under 1500 tons in 1976 to 1 236 354 tons in 2017 (SSB, 2019).

A crucial factor that has influenced where the industry is today has been the ability of the people working in and with the industry to solve significant problems like diseases, breeding, and marketing, etc. This in combination with determined stakeholders, scientific institutes, different governments and the connection to the districts and coastal communities among others, has contributed to its success. Another essential factor for this success has been

the development of a management system that has been robust and had a more controlled growth of the industry than in many other countries, such as Chile (Hovland, et al., 2014)

The aquaculture management system is the focus of this thesis, more specifically the new Traffic Light System (TLS). The TLS was commenced on the 30th of October 2017, after a six-year period of public policy work. The system represents a significant shift in how the aquaculture industry in Norway is managed. In addition, it changed the way the management believes the industry should be organised and on what premise the further growth in production should happen. The reason for this focus is two-fold; 1) it represented a significant shift in how the industry is managed and 2) the system received considerable criticism during its design phase and after its commencement.

For this thesis, the six-year period of public work, will be analysed. Naturally, the thesis will not cover all the major work done during this period, since that would be too much for a masters thesis to cover. Therefore, the focus will be towards the interest groups which participated in the political process of the TLS. Moreover, the thesis will focus on how the political process defined and established the production zones and action rules tied to the production and production zones, to secure a sustainable aquaculture growth. The starting point will be the Gullestad Committee which initially laid the groundwork for the TLS. This committee recommended a number of measures they believed would be essential to secure a sustainable aquaculture industry. The angle of analysis will be on how the interest groups affected the political process and contributed to the adaption or adoption of the recommended measures, which resulted in the TLS. The recommended measures in focus here are those dealing with production zones and action rules for sustainable aquaculture growth.
In order to answer this, four research question will be answered:

1. To what extent were the measures recommended by the Gullestad Committee adjusted/adapted in the design of the TLS?
2. Which stakeholder groups were pushing these adjustments/adaptations forward?
3. Were all relevant interest groups heard during the implementation process?
4. Was the implementation of the TLS a success or failure?

The thesis is organised as follows: the next chapter focuses on the history of the aquaculture industry in Norway, starting from 1970 and up to today. This is followed by a chapter on the TLS, specifically on the TLS regulation and some of its development. Then the theory will be presented, followed by the presentation of the method used in the analysis. The

result from the analysis will then be presented, and after this, the discussion on the result will be conducted. Lastly, a short conclusion will be presented

2. The history of Norwegian salmon farming and its management

From 1981, when the first permanent Aquaculture Act was adopted, there has been carried out several licensing rounds, committees on important aspects of the industry e.g. area use and changes to the management system. The history of an evolving industry and associated management system is the theme for this first chapter, beginning with the small-scale seawater production in the 1970s and up to 2018.

2.1 The early development of the industry: 1970-1989

The 1970s was the period in which the fishermen, farmers, and fish landing site managers started as entrepreneurs within the aquaculture sector with the "learning by doing" mentality and an extensive knowledge exchanging with each other. It was also the period where the groundwork for the later district focused management was laid and the political work for making the salmon farming the industry for the coastal areas in Norway.

A number of important events took place in 1970, which would greatly affect the industry. One critical event was the invention of the Grøntvedt octagonal sea pen. This sea pen changed the primary production method for fish farming from land-based ponds and concrete dams' to open sea pen production. This invention opened the possibility of producing Atlantic salmon in a vastly bigger area along the Norwegian coast than before. The sea pen was also cheaper to produce than the land ponds and concrete dams, and it was much easier to maintain (Hovland, et al., 2014).

Another event was the establishment of the Norwegian Fish Farmers Association (NFFA). NFFA was established to be a country-wide stakeholder organisation that was to promote cooperation between farmers, give guidance to farmers and to be a liaison between the industry and the authorities. Lastly, the Devik Committee was appointed. This committee was to consider different measures that would strengthen the new industry. It was also evaluating how research should be organized and expanded to facilitate to the emerging industry (Hovland, et al., 2014).

The first major governmental initiative regarding the new industry was the appointment of the Lysø Committee in 1972. The mandate of the committee was to "investigate the possibilities of artificial hatching and farming of fish developed into a viable business" (Hovland, et al., 2014). This mandate contained the evaluation of several aspects on the management of fish farming. Firstly, it outlined how the industry should organize itself.

Secondly, it was concerned with how to organize the scientific community, support to the farmers and the need for organising the scientific community. Then lastly, the legislation of the industry was covered. The committee consisted of people from the Ministry of Fisheries, the Ministry of Agriculture and representative from the industry (Hovland, et al., 2014).

After just a year the committee saw the need for establishing a licensing system. The government needed an overview of the rapidly growing industry, both in production and in actors. This realisation led to the Provisional Act on "Construction, equipment, establishment, and expansion of facilities for hatching eggs and fish farming" (Hovland, et al., 2014). A big part of the discussion of the Act was how the size of the new fish farms was to be regulated. Several stakeholders and the committee were of the opinion that the size of the farm should be regulated through maximum biomass. The Ministry of Fisheries believed that a maximum cage size should be the regulated factor (cubic meters per cage). In the Act, the size limitation was put to 8 000 m3 in 1973, and from 1975 until the temporary stop in licensing rounds in 1987, it was put to 5 000 m3 (Hovland, et al., 2014).

In April 1977 the committee delivered its final report. The report stated a clear objective for the management of the industry. Management was to stimulate a positive development of salmon farming. This was in order to preserve existing jobs in the industry and increase business development in districts with weak livelihood possibilities. The committee was unanimous except in one question, under which Ministry was the industry to be managed. This had been a discussion since the beginning of the trout farming in the 1950s, between the Ministry of Fishery and the Ministry of Agriculture. Eventually it was decided that it should be managed by the Ministry of Fishery (Hovland, et al., 2014).

An important discussion at the end of the 1970s was how to organize sales. After several years the industries stakeholders managed to convince the government that the sale should go through a sales association. As such, the Fish Farmers Sales Union (FFSU) was established on the 31st of March in 1978. Later the same year the association was given a law-protected right for selling salmon, trout, and roe in accordance with the Norwegian Fisheries Act. That same year the government stopped granting licenses consecutively until 1981. This was done to hinder overproduction of salmon (Hovland, et al., 2014).

In 1981 the first permanent Aquaculture Act (further called the Act) was passed. The Act corresponded with the provisional act from 1973, but with some changes. Firstly, the Act said that fish farming was an independent industry and not a subsidiary income for other industries; it was to exist along the coast with one man, one farm. Secondly, the new law also authorized the system of licensing rounds as a way of regulating the growth of the industry.

Following the establishment of the Act of 1981, there followed three ordinary licensing rounds and one extraordinary round through the 1980s. A total of 334 licenses in the four rounds were granted, and many of the licenses were granted in northern Norway. These rounds hugely increased the number of farms in the 1980s, from a total of 307 farms in 1980 to 969 in 1990 (Hovland, et al., 2014).

The most significant thing happening in the 1980s was the changes to the Act of 1981, passed in 1985. This was significant not only due to the changes in the Act and the management of the industry but also because of the huge resistance against it and the conflicts leading up to the passing of the Act (Hovland, et al., 2014).

The Act of 1981 was passed with the Labour Party in government that wanted a focus on district politics and viewed the farming industry as a way of increasing employment and settlement in the rural districts. Later in 1981, the Conservative Party took government and brought an industry and capitalistic view on industrial politics. The new government wanted to liberalise the management of the industry and place more emphasis on the economic and industrial aspect, rather than the district policy aspect. This in sharp contrast to what several stakeholders believed, especially The Norwegian Fish Farmers Association (NFFA). NFFA believed the growing industry was a way of increasing employment and increasing the settlement in the districts. They also thought that the industry was growing faster than the development of the necessary infrastructure. Hence, the Act was passed in 1985, which had some big differences from the Act of 1981, in the direction of being more liberal. In particular, it made changes on important matters like the liberalisation of the requirements for giving hatchery licenses, changes in the mission statement and the removal of restrictions of minority ownership in multiple licenses (Hovland, et al., 2014).

During the years 1987-1990, there was an incredible growth in the total aquaculture production in Norway, led by Atlantic salmon farming. In this period the production grew from 56 000 tons to 159 000 tons. An important factor for this massive growth was the changes in the requirements for hatchery licenses in the Act from 1985. These changes lead to liberalisation in the requirements and therefore led to an increase in production of smolt between 1985 and 1988. In this period the smolt production increased from 25 million to 85 million smolts and thus ended the period where the availability of smolt was a bottleneck for the industry (Hovland, et al., 2014).

Another factor enabling the growth in production was the expansion in production capacity happening parallel with the licensing rounds in the 1980s. The cage volume went from 3000 m3 in 1981 to 12 000 m3 in 1988. In 1988, farms established before 1981 could

also expand their cage volume in the same manner as those established after 1981. Lastly, there was also a massive increase in production efficiency in several areas, e.g a massive increase in production per employee between 1984-1990. In 1984, one employee produced around 10 tons while in 1990 this had increased to 43 tons (Hovland, et al., 2014).

These factors contributed to an increase in the mismatch between the production volume of salmon and the ability of the markets to handle this increased volume. This mismatch would eventually lead to the biggest crisis and fundamental changes the industry has gone through (Hovland, et al., 2014).

2.2 Industrialisation and sustainability: 1990-2010

The decade of the 1990s will stand out as the decade where the most fundamental changes for the industry happened. The industry went from being the small-scale farming with one-man, one-farm in the 1970s and 1980s to an industrialized industry with a lot of research, large corporations, and structure consolidation. Inparticular, 1991 was a year of crossroads decisions where big changes in the management and the structure for the industry happened. It was also the decade where the industry became more regulated than ever, due to the fundamental changes that happened (Hovland, et al., 2014).

The entry into the decade was characterized by a continuation of the mismatch between supply and demand which led to overproduction in the industry and resulted in declining prices. By 1990, the average salmon price had fallen by almost 50% compared to the 1985 price. This decline in price and subsequent fall in profits were meet with increased production to handle the declining profits. This situation was meet with dumping and subsidy accusation from the industry's two most important markets; the USA and the European Union (EU). This chain of events became the catalyst for the culmination of the crisis in 1991 (Hovland, et al., 2014).

The FFSU wanted to meet this overproduction crisis with a freezing arrangement as a market regulation tool. The idea behind this arrangement was to freeze some of the excess production and as such stabilize the supply to the market and from there raise the prices as well. This arrangement came into force as a voluntary arrangement in 1990, but it failed quickly, mainly because the production prognosis for 1991 failed as the overproduction continued. The main reason for the failed production prognosis and a continued overproduction was that the decline in prices for fresh salmon led to a bigger profit of selling the salmon to the FFSU through the freezing arrangement than selling the salmon fresh. This led to dumping accusation from the USA and EU markets. At the same time as the dumping

accusation came, there were more and more farmers that were selling their salmon on the "black market." Because of the increasing liquidity problems for the FFSU, the imbursement time increased. This whole ordeal ended in the bankruptcy of the FFSU on the 13th of November 1991 (Hovland, et al., 2014).

At the same time as the industry and FFSU crises, there were two major changes to the owner regulations in the Act from 1985. In the Act of 1985, there were owner restrictions that said that a company/person could only have minority ownership in multiple licenses. This restriction was removed in 1991, and a company/person could then have majority ownership in multiple licenses. With this change to the statutory provision, the local ownership emphasis from the Provisional Act of 1973, was still in the text but in practice removed. The wording was "the ownership interests in a facility should as far as possible should have a local connection." (Hovland, et al., 2014). These changes came as a result of the huge crisis the industry was in, with 181 companies going bankrupt between 1988 and 1991. There was also little local funding which could have taken over the operation of the bankrupt companies as a result of the bankruptcy of FFSU. The changes also came because the industry was changing from being a small-scale and "simplistic" industry to an industrialized industry which found itself in need of big financial muscles which mostly the big corporations had available (Hovland, et al., 2014).

These changes to the Act completely changed the structure of the industry from one-owner, one-facility, to bigger companies with multiple facilities/licenses in several municipalities and counties. One would think that it was the big corporations with the needed financial strength that would lead this consolidation, but in this instance, they were not the leaders. Instead, it was the local medium-sized companies that led this consolidation and became regional actors with a vertical integration strategy that secured their future economy by securing the whole value chain, going from hatchery to processing. An example here is Bremnes Seashore AS that started with salmon farming in 1975 on the island of Bømlo in Hordaland County. From 1975 and up to 1990 the company was a local medium-sized company that had licenses around the island of Bømlo. Then with the changes to the law in 1991, the company grew to own licenses and farms in five municipalities in Hordaland by 1998 and is today one of the biggest family-owned farming companies in Norway, owning 24 licenses and 28 farms in the counties of Hordaland and Rogaland (Hovland, et al., 2014) (Sele, 1998) (Bremnes Seashore, 2019).

The last important event was the establishment of the state-owned Norwegian Seafood Council (then the Export Committee for Fish). The task for the Council was to market

Norwegian seafood based on a statutory fee of all exported seafood from Norway. The Council was filling the marketing gap of salmon after the bankruptcy of the FFSU, which up to the point of the bankruptcy was responsible for marketing of the Norwegian salmon (Hovland, et al., 2014).

In 1994 Norway became a part of the European Economic Area (EEA) and the European Free Trade Association (EFTA) and as such got free access to the inner market of the EU. Almost immediately after this, accusations of price dumping and illegal subsidies from Scottish and Irish salmon farmers lead to a long tug between the EU and Norway on how to deal with these accusations. In 1997, the EU and Norway came to an agreement. The agreement included minimum prices, increased export fee, export ceiling, and a monitoring system. The Norwegian government also introduced feed quotas and density regulations as management tools in order to deal with the accusations, especially the price dumping accusation (Hovland, et al., 2014).

Between 1997 and 2002, there was very little controversy around the agreement, and in 2002 the EU Commission indicated that they had not found evidence of dumping or subsidizing. In July 2003 the deal came to its end, and the Norwegian salmon export was again under the normal EEA and World Trade Organisation (WTO) conditions. This news led to the lowest salmon price ever recorded, 2,2 EUR per kilo. In 2004, Scottish farmers again accused the Norwegian farmers of dumping. This led to the reintroduction of protective measures from the EU-commission in 2005. This was met with strong protests from both the industry and the Norwegian Government, which in 2006 decided to take EU protection measures up to the WTO. They believed that the EU commission had no proof of dumping sales to the EU. This protective measure was considered illegal by the WTO at the end of 2007, but the EU did not end the protective measures before July 2008 (Hovland, et al., 2014).

A key characteristic of the mid-2000s was the major shift in how the aquaculture industry was managed. Before the 2000s the management was mostly discretionary in nature, where the different political goals of different governments guided the management, particularly the licensing rounds in the 1980s. The management was also focused more on who and where the farming was done rather than strictly how the farming was done. Around the early 2000s, the governments wanted to shift the management towards a more detailed, technical management based on scientific knowledge, equitability, predictability, and sustainability. This shift was not only sought by the government and the scientific community but also by the industry as a way of securing predictability for the industry (Hovland, et al., 2014).

This change started with the Food Act in 2003 and the centralisation of the county veterinary competence with the establishment of the Food Security Authorities (FSA) in 2004. A number of governmental standards for how to operate in aquaculture were established in the period. A well-known standard is the NS 9415 "Marine fish farms: Requirements for design, dimensioning, production, installation and operation" from 2009 (Norges Standardiseringsforbund, 2003). These standards are detailed and led to a very technical management of the fish farms. In 2005, the feeding quotas which were introduced in 1996 were replaced with two types of Maximum Allowable Biomass (MAB) as the new management tool on the farm level. One type was the farming permission MAB, and the other was the locality MAB (Hovland, et al., 2014).

In connection to the 2004 licensing round the government introduced licensing fees as an entry barrier into the industry. In the 2004 licensing round, this fee was set to 5 million NOK and later changed to 8 million NOK.

In 2006 the Farming Act of 1985 was replaced with the Aquaculture Act. With this new Act the governmental focus on "who and where" was shifted to "how." In the new Act, the paragraph about ownership and placement emphasis was removed. The focus of the mission statement also changed focus from "where to how." In the old Act, the mission was to ensure that the industry became a profitable and viable district industry, while the new Act was to ensure the industry's profitability and competitiveness with sustainable development while ensuring value creation for the coast. The new Act also allowed the licenses with associated facilities to be used as collateral for loans etc. (Hovland, et al., 2014).

At the same time as this shift, the focus on fish health, disease prevention and limitation became greater both for the public and the industry. This focus was a consequence of the more complex situation with new diseases like heart and skeletal muscle inflammation (HSMI) with its first occurrence in 1999, the spread of pancreas disease (PD) outside of the counties Hordaland and Sogn og Fjordane in 2003 and a steady high case of infectious pancreatic necrosis (IPN (Hovland, et al., 2014)).

Another characteristic of the 2000s for the farmers was the increased lack of suitable space for the fish farms. This lack came as a consequence of two factors. The first factor was the increase in fish farm technology which enabled the farmers to build bigger fish farms that could contain several farming permission MAB's. This limited the number of suitable places for such big fish farms, due to biological needs like oxygen availability and good water exchange. The other factor was the increase in possible conflicts of interest between the fish farmers and the other users of the coast. For the case of salmon farming, the two biggest users

with possible conflicts of interest were the fisheries and the recreation salmon fisher that uses that same area and fished for the same resource (Hovland, et al., 2014).

2.3 The further growth of the industry: 2010-2018

In the mid-2000s the government was working on changing the way that the aquaculture industry was being managed. A significant part of this change was the work of making a new management system that would eliminate the use of discretion in the management and become predictable, especially the licensing rounds. Another reason for the change was that suitable areas for big fish farms were lacking (Hovland, et al., 2014).

A big part of this change was the appointment of the Gullestad Committee in 2010. The mandate of the committee was twofold. On one side they were to come with suggestions on how the government could secure adequate space for the aquaculture industry within the coastal zone. On the other side, they were to look at how to make a new management system that would secure a more sustainable aquaculture industry and a more space efficient industry (Hovland, et al., 2014).

The committee delivered their final report in 2011. Their report contained several recommendations, but in particular three of them were ground-breaking and controversial for the management of the aquaculture industry. The first was that the Norwegian coast should be divided into several self-containing production areas in order to reduce the infection pressure in the industry. The second was indicators and action rules for different important challenges the industry faced; e.g., MAB, sea lice, and escapees would rule the pace of growth for the industry. The last recommendation was that there should be no new allocations of licenses for salmon farming before the new system was established (Gullestad, et al., 2011).

In the 2010s, the focus on biological sustainability became a central part of the industry and its management. As mention above, one of the recommendations from the Gullestad Committee was the establishment of sets of indicators and rules of actions that were to regulate the industry. These indicators were to be based on environmental factors, e.g., the salmon lice, mortality rate or salmon escapees. The reason for this was that in the years prior to 2010 there had been a lot of escapees from the farms, with the top year of 2006 with nearly 1 million escapees (DoF, 2019). The farmed salmon escapees are known to migrate to the wild salmon rivers and compete with the wild salmon for space, food, etc. The salmon lice problem has been and still is a main challenge for the industry as they attach themselves to the salmon. Prior to 2010, the industry had faced large mortality rates in production and

consequently big production losses, due to several reasons. According to Gullestad, et al. (2011) the average production loss between 1987 and 2007 was 25.2%.

Thus, in 2012 the Ministry of Trade, Industry, and Fisheries (MTIF) made a detailed and technical regulation for battling the salmon lice, which included salmon lice counting and a maximum number of sexually mature salmon lice on a salmon, etc (MTIF, 2012). Then in 2013, the MTIF announced a "green concession round." This round had as a goal to reduce the salmon lice pressure and the number of escapees. It was announced 45 licenses allocated within three groups. Within all these groups there were stricter rules for the allowed level of sexually mature salmon lice and for the use of medical treatments for reducing the level of salmon lice than for normal licenses (DoF, 2017).

In 2015 the MTIF again announced a new concession round for the industry. This time the focus of the round was to induce substantial innovation with sizable investments in order to solve industry challenges. There is one interesting difference in this round compared to the 2013 one, and the signals from the government on the new management system (DoF, 2017) (DoF, 2018). The round had considerable discretion in its nature, as it is difficult to define what substantial innovation with sizable investment is.

In the same year the Ministry also delivered the White Paper (WP) nr.16 "Predictable and environmentally sustainable growth in Norwegian salmon and trout farmings" (MTIF, 2015) to the Parliament, which reviewing the recommendation from the Gullestad Committee and discussed how to increase the value creation for the industry based on predictability, sustainable growth and environmentally friendly production (MTIF, 2015). From this delivery until the 30th of October in 2017 the Ministry worked hard with designing and introducing their proposed management system based on the Gullestad Committee report and the 2015 WP. On the 30th of October in 2017 the new management system was approved and implemented, which has been nicknamed the "Traffic Light System."

2.4 A recap

From the small beginning of the Norwegian aquaculture industry in the 1960s to the huge industrialized industry it is today, the industry has gone through a prodigious journey. It started in the early 1970s with the invention of the Grøntvedt sea pen that revolutionised the way salmon farming could be implemented in Norway and which utilized the excellent natural condition for aquaculture in Norway.

This started the long journey for both the industry and the management. The industry has had immense growth in every aspect. There has been tremendous growth in production

volume and the number of licenses as a result of the many licensing rounds conducted since the 1980s. This growth has led to some headaches for the management where the industry had been facilitated to grow immensely and then hit some barricades. The biggest of these was the bankruptcy of the FFSU in 1991, which lead to the opening of sales through the free market, and the removal of local ownership in the Aquaculture Act.

As a result of both the many licensing rounds and also the removal of local ownership in the Act, there has been tremendous growth in direct and indirect employment in the industry. In just ten years (2007-2017) the employment in the sea farming section doubled from 3 700 to 7 800. In the supply industry, this number went from just shy of 20 000 to around 33 – 34 000 people (Richardsen, Myhre, Bull-Berg, & Grindvoll, 2018).

The management has also had some significant changes, as a result of the growth in the industry which it facilitated. It started out as simple management with a focus on "where and who" of the farming in order to facilitate the coastal areas. Then in the mid-2000s, it became concerned with how the production was conducted as a result of the emerging environmental challenges in the mid-2000s. This has led to the situation where the management is quite technical and complex and consist of five levels of government, six different Ministries and nine different laws (Robertsen, et al., 2016). Today the management manages the industry from an environmental sustainability view. Where the main focuse of management is to battle the environmental challenges the industry faces.

3. What is the Traffic Light System?

The production area regulation, commonly known as the Traffic Light System (TLS) is the new management system that regulates the production capacity of Atlantic salmon in the Norwegian aquaculture sector. As written earlier, the TLS came into effect on the 30th of October 2017. The production area regulation and the TLS have its pursuant from the Aquaculture Act from 2005 and the Food Act from 2004 (MTIF, 2017).

This chapter will look at three things. 1) a brief presentation of the public work leading up to the implementation of the TLS, starting from 2007. 2) three central aspects of the TLS and some of their background will be presented. The three aspects are the production zoning, environmental indicator and the adjustment of a production zones production capacity based on an action rule with threshold values. This is based on the six measures that will be analysed in the thesis.These six measures are all part of these three aspects, which stems from the Gullestad Committees report from 2011. They state that these three aspects are the more controversial among the 25 measures they promoted (Gullestad, et al., 2011). 3) the current status of the production zones will be presented and shortly described.

As presented, the public work in 2007 can be identified as the start of the TLS. This work began with the publishing of the "strategy for a competitive Norwegian aquaculture industry" (MFC, 2007). In this document, the government examined the competitive condition for the industry (MFC, 2007). One of the measurements presented was that the government wanted to secure that the aquaculture industry operated in a sustainable way (MFC, 2007). This measurement was followed up with a new strategy document called "Strategy for an environmentally sustainable aquaculture industry" (MFC, 2009) in 2009 by the same government. This document stated that a sustainable industry is an environmentally sound industry. They state that a primary challenge for the industry was the salmon lice and its impact on the wild salmon species. As such, they presented the idea of using salmon lice level on wild salmonid species as a regulation measure for the production capacity in the industry. The idea of using production zones as a regulation tool for controlling the salmon lice level on farmed salmons was first presented as well. The idea of using these production zones to regulate the production capacity of the industry was also presented. One particularly central measure in the strategy was the appointment of a committee. This committee was to propose measures to increase the area use efficiency and a new area structure, which would lead to a better area use with the least possible environmental impact.

This committee, the Gullestad Committee or commonly known as the Area Committee, identify three main challenges that the industry faced and are facing now; sea lice, escapees and production loss at sea (Gullestad, et al., 2011). Further, they said that the new area structuring of the industry could contribute to solving these challenges. Based on this, the committee proposed 25 measures within several areas. These measures were the committee's answer to the environmental challenges raised in the 2009 report. Three of these areas are the ones that will be presented later in this chapter: production zones, environmental indicators, and production capacity adjustment based on action rules.

Following this committee and its report, there was a 3-year period where two different governments were discussing the committee's proposal. Firstly, it was the majority government led by the Labour Party until the 16th of October 2013 and from there a minority government led by the Conservative Party. Whitin this period, two WP's were delivered' discussing the design of the new regulation system for the aquaculture and the details of its components. The first WP was called "The world's leading seafood nation" and was delivered in 2013 (MTIF, 2013).

This WP dealt with the whole seafood industry in Norway, but with a separate chapter about aquaculture, the continuation of the measures from the 2009 strategy, and the Gullestad Committee (MTIF, 2013). The need for shifting the regulation from locality thinking to area thinking was discussed along with possible environmental indicators. The possible indicators were production loss, diseases, emission from the farms, and feed ingredients. MTIF also proposed two alternatives on how the regulatory system could be in the future; 1) a continuation of the current system or 2) the introduction of zoning-based regulation. Lastly, they proposed threshold value for the action rules and specific suggestions for the threshold value for the sea lice indicator - it was already decided that salmon lice were to be used as an indicator.

In March 2015, a new WP called "Predictable and environmentally sustainable growth in Norwegian salmon and trouth farming" (The Aquaculture Paper) (MTIF, 2015) was presented. Before this WP, there had been a hearing round where the consultative bodies were presented with three alternatives for the future regulation system. Two of the alternatives, were the same as in the WP "The World's leading seafood nation" (MTIF, 2013). The third and new suggestion was to have an annual growth rate. The interval for adjusting production capacity, and how big the adjustment was to be, was also presented and concretized. This interval was set to happen every other year, and adjusted by 6% each time for green and red areas. In order to make the proposed system more flexible to tackle future challenges in the

industry, the WP presents the TLS as a module-based system where the indicators can be changed after what is the most pressing challenge at the time. Lastly, the WP says that it is the alternative three (the TLS) that will be the basis for the future regulation for growth. Following this, they presented threshold values for the three categories of action rule (nothing/small, moderate and large impact) and that the division of the Norwegian coast into production zones would continue.

Following the Aquaculture Paper, the work concentrated on gathering enough knowledge to make decisions on the following: the division of the coast into production zones; salmon lice as an environmental indicator: and the colouring for each production zone based on which category of action rule it is within.

In this process, the first report was from the Institute of Marine Research (IMR) in cooperation with the Norwegian Fisheries Directorate (DoF), and the FSA called "Proposed production areas in Norwegian salmon and trout farming" (IMR, 2015). This report will be described in more depth later in the chapter. In July 2016, there was a consultation process where the MTIF, based on IMRs report from 2015, suggested how the Norwegian coast could be divided into production zones. Here it was also decided that a license could as a maine rule only be used in one production zone, but by application the license can also be used in one adjacent production zone. This hearing also first mentioned the exception rule for growth, where the MTIF tells the consultative bodies to consider four different alternatives for the exception rule.

In 2016, as part of the same working process, three working groups led by IMR and the Norwegian Veterinary Institute (VI) were established, which included ten other Norwegian institutes securing access to the best competence on wild salmonids, modelling, and aquaculture. These working groups would work with acquiring a knowledge overview on three crucial aspects of the scientific basis of using salmon lice on wild salmonids as an environmental indicator (Karlsen, Finstad, Ugedal, & Svåsand, 2016). The first group looked at the models used to calculate infection pressure and lice infestation on salmonids and the possibility of improving these models. The second working group looked at where and when the wild salmonids are in the sea and on the knowledge about the anadromous life stage of the salmonids. The last working group looked at the effects of salmon lice infestation on salmonid populations.

On the 16th of January 2017, the production area regulation entered into force and was promulgated on the 25th of January (MTIF, 2017). In March, the MTIF appointed a management group that would advise on threshold levels (colours) in the different production.

This group did appoint an expert group to carry out the assessments of the salmon lice induced morality on the wild salmonids' populations in all the production zone. Based on this, the management group gave advice to the Ministry on the thresholds colouring of the production zones (Table 1). These groups produced two reports. The first assessed the lice induced mortality in 2016 and the second report assessed the 2017 mortality, and the 2016 numbers were reanalysed. This last report gave the final recommendation for threshold levels in the zones (MTIF, 2017) (Ellingsen, et al., 2017).

Prod.-områder	2016 vurdering dødelighet	2016 variasjon metoder	2017 vurdering dødelighet	2017 variasjon metoder	2016-2017 usikkerhet ekspertgr.	Råd 2016-2017
1	< 10%	Liten (L)	< 10%	Liten (L)	Liten	< 10%
2	10-30%	Stor (LMH)	< 10%	Stor (LMH)	Stor	10-30%
3	> 30%	Middels (MH)	> 30%	Middels (MH)	Liten	> 30%
4	10-30%	Stor (LMH)	> 30%	Stor (LMH)	Middels	> 30%
5	10-30%	Middels (LM)	10-30%	Stor (LMH)	Middels	10-30%
6	10-30%	Middels (LM)	< 10%	Middels (LM)	Stor	10-30%
7	10-30%	Middels (LM)	< 10%	Middels (LM)	Middels	10-30%
8	< 10%	Middels (LM)	< 10%	Middels (LM)	Liten	< 10%
9	< 10%	Liten (L)	< 10%	Liten (L)	Liten	< 10%
10	< 10%	Middels (LM)	< 10%	Middels (LH)	Middels	< 10%
11	< 10%	Liten (L)	< 10%	Liten (L)	Liten	< 10%
12	< 10%	Liten (L)	< 10%	Liten (L)	Liten	< 10%
13	< 10%	Liten (L)	< 10%	Liten (L)	Liten	< 10%

Table 1: Summary of the management group's recommendation on the colouring of the production zones (MTIF, 2017)

On the same day as the TLS was initiated, the threshold levels were decided. This information will be presented later in the chapter.

3.1 The three essential aspects of the TLS

This section will present three essential aspects of the TLS and some of their background. The aspects covered here will be production zones, environmental indicators, and the action rules, which all are central characteristics of the TLS. These three aspects are all regulated in the production area regulation (MTIF, 2017).

Firstly, § 8 says that the production capacity in a production zone will be regulated according to its environmental status, using a set of updated environmental indicators (MTIF, 2017). Secondly, § 3 says that the Norwegian coast is divided into 13 geographically delimited production zones (MTIF, 2017). Lastly, the § 8-13 state that the MTIF every other

year decide if the production capacity in a production zone should be adjusted, based on the environmental status of the production zone (MTIF, 2017).

Currently, there is only one environmental indicator developed for the system. That is the salmon lice' (*Lepeophtherius salmonis*) impact on wild salmonids' stocks in Norway. The Aquaculture Paper (2014-2015) states:

> *There is a good correlation between the amount of farmed fish in the sea, the level of salmon lice on the farmed fish and how much impact salmon lice have on wild salmonids stocks, especially sea trout. Therefore, the salmon lice' impact on wild populations is well suited as an indicator* (MTIF, 2015).

The salmon lice' impact on the wild salmon stock is also the only measurable indicator that can directly be linked to the volume of farmed salmon in the sea. This environmental indicator has also been deciding the design of the production zones regarding how to minimize the infection of salmon lice between different areas along the Norwegian coast. The division of the production zones is as mention based mainly on the report "Proposal for production areas in Norwegian salmon and trout farming" by the IMR (2015). This report was published on the 27th of November 2015 on order from the MTIF from the 2nd of July 2015 as part of the rectification process that led to the TLSs.

In the report, IMR suggested that there should be 11 production zones based on the salmon lice indicator (IMR, 2015). This suggestion was based on several models and analytical tools. First, they used three main scattering models for calculating the spread rate and proliferation area of the salmon lice along the coast. They used the Regional Ocean Model System (ROMS) as the hydrodynamic current model. Then they combined ROMS with the NorKyst-800m model to calculate factors like salinity, temperature, and current, etc. along the Norwegian coast. These two models, in combination with IMRs salmon lice particle transport model (LADIM) modelled the spread of the salmon lice (in its first life stages), along the Norwegian coast (IMR, 2015).

Secondly, from these data they calculated the potential infection between pairs of farms, using an influence matrix to quantify the spread of salmon lice between all the farms in Norway, where the farms act both as source and target of the salmon lice infection. Lastly, with the data from the influence matrix they used cluster analysis to draw the production zone borders. This was based on where the lice infection spread between the clusters of farms is naturally small, and areas where there are few to no fish farms which could act as a barrier for

lice infections between the clusters (IMR, 2015). Based on the result, IMRs recommended the MTIF decided on 13 production zones in total, as shown in the figure below (Figure 1).

List over the production zones:

1. The Swedish border to Jæren
2. Ryfylke
3. Karmøy to Sotra
4. Nordhordaland to Stadt
5. Stadt to Hustadvika
6. Nordmøre to South-Trøndelag
7. North-Trøndelag to Bindal
8. Helgeland to Bodø
9. Vestfjord to Vesterålen
10. Andøya to Senja
11. Kvaløya to Loppa
12. West-Finmark
13. East-Finmark

Figure 1: Production zones and its borders (Lovdata, Produksjonsområder avgrensing, 2017)

3.2 Adjustment of production capacity in a production zone

Finally, the last important aspect of the TLS is the adjustment of the production capacity in a production zone based on its environmental status. This status is decided based on the status of the current environmental indicator and will happen every other year. The salmon lice impact on the wild salmon stock currently is the only environmental indicator. This indicator's status is decided by the risk of increased salmon lice-induced mortality on the wild stock. The indicator's status will result in three different statuses for a given production zone, which is where the regulation (TLS) has earned its name:

1. Acceptable (green): here the risk of increased salmon lice-induced mortality is below 10%. This status will lead to an offer to increase the production capacity in the production zone by 6%.
2. Moderate (yellow): here the risk of increased salmon lice-induced mortality is between 10-30%. Here the current level of production capacity will be maintained at its current level.

3. Unacceptable (red): here the risk of increased salmon lice induced morality is above 30%. Here the production capacity will be decreased by a %-reduction decided by the Ministry each round.

There is also an exception rule for an increase in individual licenses, regardless of the production zones colour (§12 in the production area regulation). Here the further growth can be between 0% to 6% as written in §12 of the production area regulation.

This exception allows a company to increase production despite being situated in a yellow or red zone, in two ways. The first way is by having a production method that does not release salmon lice larvae from the pen to the open sea during the last production cycle and for a minimum period of 12 months. This must be documented by an independent professional body. The second way is with an open production method. Here two requirements must be met. Firstly, there cannot be more than 0,1 sexually mature female salmon lice per salmon with all lice counting (once a week) (MTIF, 2012) within the period 1st of April to the 30th of September. Alternatively, the discard of eggs and the free-floating stages of the salmon lice into the environment from the farm, would have been the same as from a corresponding number of fish with a lice level of 0,1 sexually mature female lice on average per fish. Secondly, the salmon cannot be treated against salmon lice more than once per production cycle with drugs.

Even if the farm exceeds the 0.1 lice level, there is still a possibility to increase production capacity. This can happen through two requirements. First, there cannot be more than 0.17 sexually mature female salmon lice in one counting within the period 1st of April to the 30th of September. Secondly, there cannot be observed at lice level higher than 0.1 more than three subsequent counting's in the period presented above.

The MTIF followed the advice from the management groups report from the 15th of September on all colouring advice except for one zone. This was for production zone number seven, here the management group advised making the zone yellow, but the then Minister of Fishery Per Sandberg adjust the colour to green. Based on the Ministry's decision there was a growth of 15 308 tons for the first allocation round in 2018 (MTIF, 2018).

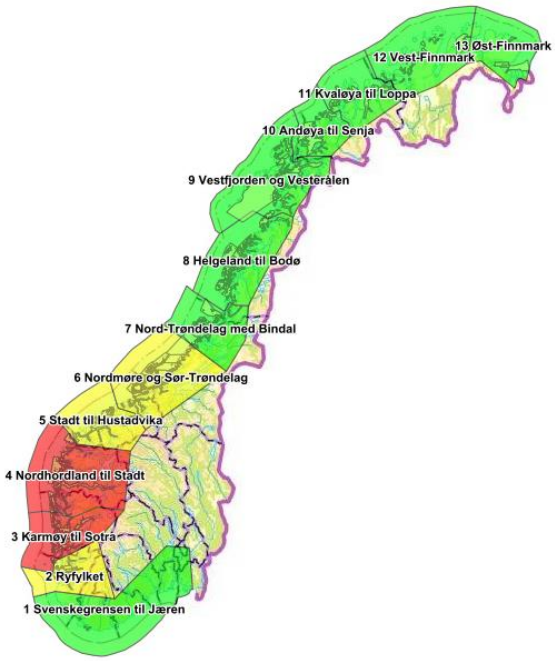

Figure 2: TLS colouring from 30th of October 2017(source: Directorate of Fisheries)

As presented above, the TLS has a twofolded goal for the Norwegian salmon aquaculture industry. The first goal is to increase the predictability for the aquaculture companies in their short- and long-term operations. The second goal is that the industry will achive an production growth which is based on environmental sustainability and the care taking of the wild salmonid populations in Norway.

4. Theory chapter

Public policy is the result of a lengthy public process often involving all levels of the state and several different interest groups. The policy is a way of altering specific aspects of behaviours for both state and interest groups that are deemed necessary in order to reach a specific political goal (Howlett, 2014).

By using the implementation theory as the starting point of analysing the different parts of an public policy, one can identify several things: wherein the creation process the change happened, who advocated these changes, when the changes came and how these changes affected the outcome of the policy.

4.1 Implementation theory

Implementation theory is an element of two sub-disciplines of political science, the public policy/policy analysis and public administration (Winter, 2012). Implementation theory is based on evaluation research carried out in the 1970s in the US, as a way of understanding why public policy failed to meet their intended goals. The first significant implementation study was the study carried out by Jeffrey Pressman and Aaron Wildavsky in 1973, in which they looked at why a federal program with the aim of providing jobs for minorities in the US failed to meet its goals (Pressman & Wildavsky, 1984).

The implementation field contains no general theory of policy implementation to use in the research, despite several attempts. Instead, the field has evolved from a narrow research field to a broader research field that considers the whole process of implementing public policies, not just the implementation phase (Sander, 2018a). In the 1970s the implementation studies only focused as explained above, on the implementation phase and based on this an explanation for why the policies failed (Sander, 2018b). Then as the implementation field evolved, it became evident that to only study the implementation phase and to attribute the policy failure on the implementers was too narrow. In addition to this realisation, the implementation researcher also learned that one should look at the whole policy process, wherein policy formulation and policy design are two other key phases (Sander, 2018a).

As mentioned, there have been several unsuccessful attempts to make a general theory for implementation. Instead, there have been numerous attempts to make models/frameworks/concepts to outweigh the lack of a general theory. One such attempt is Winters integrated framework for implementation studies from 2008 (Winter & Nielsen, 2008). This framework serves as a guideline for analysis of the implementation process of

public policy. As seen in figure three this process includes several stages and independent/dependent variables. This thesis focuses on the independent variables and the stages before implementation results (policy formulation, policy design, and implementation process) (Winter, 2012). The thesis will in addition focus on policy instruments which will be presented later in this chapter.

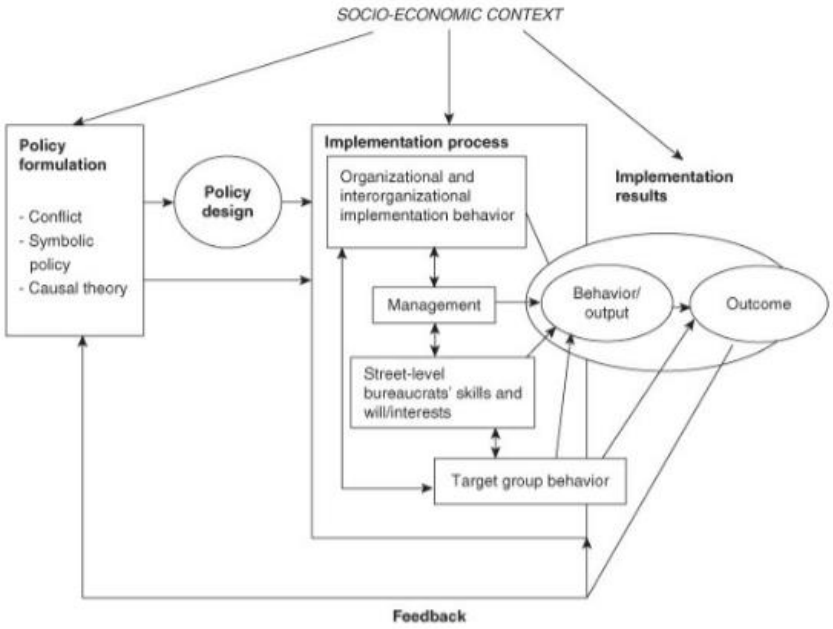

Figure 3: Winter's Integrated framework for implementation studies (Winter, 2012).

Policy formulation is the first phase in any public policy process. Here the agenda is set through political processes to attain common ways of addressing identified problems. The successive phase contains the final decision-making process leading to the adaptation of a policy. The *policy design* phase is where the adopted policy is elaborated based on the previous phase. The problems that arose from the policy formulation phase is described, the vision for the policy is expressed and a set of measures usually described in the form of policy instruments is developed. This phase also contains the distribution of responsibility and resources need for solving the allocated tasks (Sander, 2018a). Lastly, the implementation process covers the final activities of the organizations/institutions needed to put the adopted policy into practice. The output is the immediate result of the implementation process where the public policy is delivered in the form of a service or exercise of authority. The outcome is the effect of the output (Winter, 2012). Often this is measured as the difference between goal

achievement of the policy and the policy's objects (Sander, 2018a). The last two phases are part of the implementation result and will not be covered in this thesis.

As can be seen in figure three, there are several aspects in each of the phases that are important to consider when implementing public policy. In the policy formulation phase, three aspects need a particular focus. These are conflict, symbolic policy and, causal theory. If challenges arise within these three aspects, it can create problems for the rest of the implementation process, and from there offer an explanation of why a policy failed (Winter, 2012). Conflicts mainly arise when involved actors have different interests, goals for the policy and desires to get their problem definition and solution accepted (Sander, 2018b). This struggle between actors may lead to a policy that contains ambiguous or inconsistent goals (Winter, 2012). The symbolic policy appears when decision-makers are more immersed with displaying good intention, ideology or "creating alliances" than actually solving problems (Sander, 2018b). This may lead to a policy that addresses the problems without contributing anything to achieve the stated objectives of the policy (Winter, 2012). Lastly, in order to create an efficient policy, there is a need to know the cause-effect relationship between the goals and the used instruments. Here the challenge can arise because these relationships are often unknown (Sander, 2018b) or the relationships are known but are disregarded due to symbolic policy or conflicts that lead to the negligence of the cause-effect relationship (Winter, 2012).

Generally, policy-makers have been advised to set clear objectives in the policy design phase to guide the implementation process (Mazmanian & Sabatier, 1983).This advice is however unreal, as the policy objectives, policy instruments, and organizational structures are a result from the political process where the relevant actors strive to maximise their own interests and control over the implementation process (Winter, 2012). It is also unrealistic to have clear objectives in terms of averting possible conflicts because ambiguity is a way for policy-makers to achieve more things and at the same time reduce the level of conflict in the process (Sander, 2018b).

As seen in figure three, there are several aspects involved in the implementation process. Only the aspect of target group behaviour will be focused on here. Organisational and interorganisational behaviour, management and street-level bureaucrats will not be presented because it is outside the scope of this thesis (for further reading, see Winter, 2012 and Winter & Nielsen, 2008). The reason for this is that these three aspects regard the behaviour of public organisation, the behaviour of and management of the bureaucrats that are in direct contact with the citizens and enforces the regulation (Winter, 2012).

Understanding a target group/actors' behaviour is crucial because of two things. They can affect the public policy through influencing the policymakers, and they can affect the actions of the street-level bureaucrats through citizens reactive actions in co-production of public services (Winter, 2012).

A target group or individual actor can affect the implementation process or public policy by adopting certain behaviours, which in turn will display specific social signals to other actors around them. Winters & Nielsen (2008) call these motivational postures and by analysing these, there can be created an understanding of the target group/actors behaviour, network relationship in the process and ultimately what motives the target group/actors have.

There have been identified five such motivational postures with the basis in psychology and sociology (Winter & Nielsen, 2008). First is the commitment behaviour: here the target group/actor is positive towards the implementation process, the goal of the policy, its choice of methods and recognises and backs the legitimacy of the implementors. In addition to this, there is an active interaction from the target group/actor with the implementors. Then when adopting the capitulation behaviour, the actor is still positive to the implementation process but is not actively engaged in that process. Here the target group/actor displays a "tell me what to do, and I will do it" behaviour. This on the basis that they recognise the legitimacy of the implementors and by such, it is right to cooperate with that body, even though, they do not agree with the goal of the process and policy.

On the other hand, when a target group/actor is adopting resistance behaviour, they actively fight against the implementation process. This resistance is a result of not recognising either the goal of the process and policy or the authority of the implementors mixed with the will to fight for that disagreement. Going further is the disengagement behaviour where the target group/actor has the same starting point as when adopting the resistance behaviour but lacks the will to fight for the disagreement.

Lastly, the model identifies game-playing behaviour. Here the target group/actor has the same fundamentally disagreement with the implementors on the goals and methods of the implementation as when adopting the resistance behaviour, but they recognise the authority and legitimacy of the process and the implementors. Therefore, they chose to cooperate and play by the same rules rather than fight against them in order to reach their own goal and "beat them at home."

4.2 Policy instrument

An essential part of public policy is the policy instruments being used. A reason for this is that the policy instruments are the means by which the state wants to reach the goals of the policy (Howlett, 2014). Usually, a policy will contain a mix of several policy instruments in order to reach the set goals of the policy. This mix of policy instrument can say several things about the policy itself and about how the relationship between the government and the different stakeholders directly involved/affected by the policy are (Lascoumes & Gales, 2008).

The reason for this significant focus on policy instrument in this thesis is because of the scope of the research questions. As presented earlier, the thesis will focus on three essential aspects of the TLS and their changes which came during the political process of the TLS. The aspects are production zones, environmental indicator and an action rule with a set of threshold values. These three aspects are all part of the same type of policy instrument, legislative and regulatory, as defined by Lascoumes & Gales (2008). Most of the dataset used in the thesis also comes from a type of policy instrument, a consultation process, as defined by Howlett (2005). There exist several different definitions of what a policy instrument is, but for this thesis, Lascoumes & Gales (2008) definition will be used. Lascoumes & Gales (2008) defines the concept of public policy instrument as:

> *A public policy instrument constitutes a device that is both technical and social, that organizes specific social relations between the state and those it is addressed to, according to the representations and meanings it carries. It is a particular type of institution, a technical device with the generic purpose of carrying a concrete concept of the politics/society relationship and sustained by a concept of regulation* (Lascoumes & Gales, 2008, p. 9).

Moreover, Lascoumes & Gales (2008) claims that in a sociological context policy instruments can be classified as an institution. The reasoning is that in this context an institution can mean a set of roughly coordinated rules and procedures that determine the interaction and behaviour of and between actors and organizations. Hence the policy instrument will provide a stable framework in which the anticipation will reduce uncertainty for- and lead to collective action between the actors. (Lascoumes & Gales, 2008).

Howlett (2005) says that it is possible to distinguish between two main types of policy instruments crudely. The first group is called *substantive policy instruments*, which are instruments that directly affects the nature, types, quantities, and distribution of goods and service provided in society (Howlett, 2005). Included in these type of instruments is regulation. The second group is called *procedural policy instruments* and relates to how the government can both manipulate the number of active actors and affect the behaviour of the actors involved in the implementation process (Howlett, 2014). Lascoumes & Gales (2008) argues that policy instruments can be further divided into five distinct categories when considering different types of political relations that are organized by the instruments and the type of legitimacy these relations assumes:

1. Legislative and regulatory
2. Economic and fiscal
3. Agreement- and incentive-based
4. Information- and communication-based
5. De Facto and De Jure, standards and best practice

Lastly, Lascoumes & Gales (2008) argues that every policy instrument has three distinct levels within themselves that can be useful to know about when analysing a policy instrument:

1. The instrument as a type of social institution
2. The technique as a concrete device that operationalizes the instrument
3. The tool as a microdevice within a technique.

Usually, as described earlier, public policy will contain a mix of several different instruments that can be categories too both of Howlett (2005) and Lascoumes & Gales (2008) groups. The usual question when designing a public policy is how to coordinate the instruments in a way that will achieve the desired outcome (Bernelmans-Videc et al 1998 (as cited in Lascoumes & Gales (2008)) For this thesis the categories that are of most interest are legislative and regulatory (substantive policy instrument) and information- and communication-based instruments (procedural policy instrument). These have been selected since, as described earlier, the three aspects of the TLS was identified as a legislative and regulatory instrument and the consultation process was identified as a procedural instrument, by using both Lascoumes & Gales (2008) and Howlett (2005) definitions of a consultation process.

As stated earlier, Lascoumes & Gales (2008) defines policy instruments as a type of institution in the sociological meaning of a policy instrument. Hence a policy instrument can be defined as an institution that will provide a stable frame which among others will lead to reduced uncertainty. This is mostly true when it comes to the actor's anticipation of what the public policy will bring after it has been designed and has come into effect. However, when it comes to the power balance between different actors the instruments can create uncertainty both during and after the implementation process, in which the designing of the instrument is a part of (Lascoumes & Gales, 2008) (Winter, 2012). A reason for this is that the choice and design of the policy instrument mix will always benefit the worldview, interests and the interpretation of the problems of one actor group over another (Lascoumes & Gales, 2008). This, in turn, will create a higher level of uncertainty for the actor group which gets the disadvantage of the others worldview in their short- and long-term operations.

In general, the policy instrument verifies a theorized relationship between the state and the interest's groups (Lascoumes & Gales, 2008). Lascoumes & Gales (2008), Howlett (2005) and Howlett (2014) all state that any policy instrument will create a concentrated and settled form of knowledge about social control, how to exercise this control and what role different stakeholders have.

The choice of policy instruments can also be a signifier of the choices of policies, the characteristics of the policy and the result of the policies (Lascoumes & Gales, 2008). Based on this it can be argued that the type of instrument used, its features and the justification for these choices reveals changes in policies far better than the motive or rationalization of these choice (Lascoumes & Gales, 2008).

To conclude this chapter, Peters (2002) remarks on analysing the interests involved in the policymaking. He argues that analysing the interest involved in policy instrument choosing is a good starting point when analysing public policy. This is argued because politics can often be reduced into identifying the interest that gained or lost anything by the selected policy instruments. Lascoumes & Gales (2008) elaborates more on Peters (2002) point and argues that this is always a good idea from a social sciences aspect to analyse the interest groups involved. This in spite that frequently such analysis can prove insufficient by itself.

5. Methods

This masters thesis is founded upon the qualitative analysis method document analysis. The more specific document analysis tool used in the thesis is the thematic analysis (Bowen, 2009). Bowen (2009) defines document analysis as "a systematic procedure for reviewing or evaluating document – both printed and electronic material." The reasoning for only using the document analysis method is tied to the research questions presented in the introduction. The research question presented is formulated in such a way that they are possible to answer in a satisfying way just using document analysis on the used dataset.

Bowen (2009) mentions several advantages and limitations of using document analysis. According to Bowman (2009), three of the advantages are the lack of obtrusiveness and reactivity, coverage and stability.

Firstly, the documents are not affected by the research process and the researcher, as opposed to other qualitative research methods as, e.g., interview where the researcher can affect the interview object behaviour or answer (Bowen, 2009). This will make a document analysis a safe method to use because what the document contains does not change during the analysis process. Secondly, when using several documents, one can cover a broader time span and several events (Bowen, 2009) that might be difficult for e.g., an interview object to remember precisely and from there provide the exact information needed for the analysis. Lastly, documents do not become altered by the researcher and the research carried out that includes the documents. The documents also do not change over time and therefore can be categorised as stable research sources (Bowen, 2009)

Document analysis also has its limitations, which can decrease the usefulness of using document analysis solely when doing research. Firstly, Bowman (2009) points out that documents usually have insufficient details needed to conduct research. The reason for this is that the documents in question are often produced for another purpose than research and have no research agenda. This lack of research focus often leads to a situation where the documents provide little of the information needed to answer the research questions (Bowen, 2009). This is the case for the document analysed for this thesis. However, the scope of this thesis is such that by just using document analysis there should surface enough detailed information to answer the research questions.

Another challenge, according to Bowmen (2009), is low retrievability. This can happen for two reasons, either the documents are deliberately blocked, or the retrieval can be challenging (Bowen, 2009), because of paywalls for scientific journals, etc. This does not

pose a challenge for this thesis, as all the documents analysed are publicly available on the Norwegian government's website and the Norwegian parliament's website.

Lastly, a significant challenge is the question of biased selectivity of documents. This challenge will mainly arise during the data collection process. This is because all the needed documents that will result in thorough research might not be available to the researcher or it is not enough time to analyse all documents that will result in thorough research. For this thesis, there will be used mainly two different types of official documents during the analysis. The first type is documents from the three consultation processes containing 202 hearing statements and five hearing documents. The second type of documents are WP, which are documents where the government presents matters to the Parliament which do not require a decision from the Parliament (The Norwegian Government, 2019).

The challenge of biased selectivity in this thesis is primarily when selecting which consultation processes to include in the analysis. There exist seven hearings in the period of analysis, but I have chosen to exclude four of the hearings on the basis that they were not relevant or needed to answer the research questions. One of the hearings was removed because it dealt with the establishment of the Aquaculture Fund which is outside of the scope of the thesis. Another was removed, as it dealt with land-based aquaculture, which is also outside the scope of the thesis. The next two hearings regarded some specific design changes to the production zone regulation. These were excluded for several reasons: 1) the first hearing was a continuation of three proposals from the third analysed consultation process which dealt with allowing licenses to be used in several production zones and the continuation of what is called "interregional biomass limit." (IRBT) As such many of the arguments for and against these proposals will be presented in the third analysed consultation process. 2) the second hearing was conducted after the TLS entered into force. 3) the second hearing regarded some concrete changes to two already in force § in the production zone regulation and the aquaculture operation regulation. 4) combined they were so sizable that they would make the thesis too complex for a 30 ECT master. The exclusion of these four hearings removes 175 hearing statements.

During the process leading up to the TLS, there were as mentioned seven consultation processes but the thesis will focus only on three of these. The three consultation processes analysed are:

1. Report from an expert committee on efficient and sustainable area use in the aquaculture industry. This hearing process lasted between the 11th of February 2011 to

the 10th of August 2011. There were in total received 66 hearing statements from different stakeholders (The Norwegian Government, 2011).

2. Report to the Parliament on growth in Norwegian salmon and trout farming. This hearing process lasted between the 24th of November 2014 to the 10th of January 2015. In total, 60 hearing statements were recived from different stakeholders (The Norwegian Government, 2018a).
3. Proposal for regulations to implement a new system for capacity adjustments in salmon and trout farming. This hearing process lasted between the 24th of June 2016 to the 21st of September 2016. In total received 76 hearing statements were received from different stakeholders (The Norwegian Government, 2018b).

From these three hearing processes, there are a total of 202 hearing statements delivered from different stakeholders. As explained earlier, one WP and one report are also being used in the analysis and these are:

1. White Paper nr. 16 2014-2015: Predictable and environmentally sustainable growth in Norwegian salmon and trout farming. (MTIF, 2015)
1. Efficient and sustainable area use in the aquaculture industry - area for desire. This was delivered on the 4th of February 2011. (Gullestad, et al., 2011)

5.1 Choice of analysis method

Generally, when analysing if an implementation process has been a success or failure, it is usually the elements output or outcome being evaluated. This is because firstly, these two are the variables of the implementation result phase in Winters framework. Secondly, they can answer on what has been delivered to the public through the policy (output) and what effects the delivered policy have on the target groups (outcome) (Winter & Nielsen, 2008) (Sander, 2018a). When evaluating these two elements, it is typical to analyse the difference between the official goals e.g., the objective paragraph in a law and see to what degree these goals have been realised after the implementation of the policy (Winter & Nielsen, 2008).

However, only the output element has been partly evaluated in this thesis. There are several reasons for this. 1) After the production zone regulation was commenced on the 10th of January 2017, there was conducted a consultation process on some changes to one of the § in the regulation. This led to some changes in one of the § in the regulation. This changed the regulation after the period of analysis and therefore what became the final delivery to the public. 2) the TLS has not been in place long enough to evaluate its effects on the public.

This evaluation can be argued to happen during the summer and autumn 2019 as that is when the first real adjustment of the production capacity shall happen. 3) the analysis has focused on the first 2-3 phases of the implementation process: policy formulation, policy design, and implementation process. These phases have in addition been analysed from the perspective of the interest/target groups. This was done in order to see to what degree they have influenced the eventual changes to the policy and how these groups regarded the final regulation and policy process.

As such, these elements have been analysed: First, the difference between what the MTIF proposed in the Aquaculture Paper and what became delivered in the final regulation on the 10th of January when it commenced. Second, evaluating the implementation results in relation to the interests of the different actors involved in the implementation process.

The second analysis method was presented by Winters & Nielsen (2008). The reason for choosing this method was that it focuses on the target groups, which has been the focus of the thesis. When using this method, the official goals of the policy is of no interest; rather it is the result compared to the interest of the individual actor, interest group or camps. From this view, the effectiveness of a policy can be low from one actor's viewpoint, while being high from another actor's viewpoint. The end goal of such an analysis is to obtain an understanding of the actors, their behaviour and the intricate conflict and negotiation game between them.

To analyse the large amount of data that these hearings and reports produced, a thematic analysis was used as metioned. Fereday & Muir-Cochrane (2006) define thematic analysis as a form of pattern recognition within the dataset, where the emerging patterns can be categorised into different themes that will be analysed. The analysis was completed using the qualitative data analysis program ATLAS.ti (version 8.4.15; ATLAS.ti, (2019)). In this program all the hearing statements were added and categorised after which consultation process they belonged to. Then two weeks were spent on analysing each of the statements, and simultaneous a summary of each statements opinion on the aspects was made. Following this, the summary of the statements were categories after which interest group they belonged too. The starting point for the analysis is the report from the Gullestad Committee's report from 2011 (Gullestad, et al., 2011) as this was the first time the TLS was mentioned.

Lastly, I have been responsible for translating all names of documents, citations, terms and most organisations mentioned in the thesis from Norwegian to English. Therefore, the parenthesis '(my translation)' will not be used in the text, as everything listed above is translated.

6. Results

This chapter has three main parts, as it analyses three hearings. The hearings will be presented in chronological order starting with the consultation "Report from an expert committee on efficient and sustainable area use in aquaculture industry" (Gullestad Committee report) from 2011 (Gullestad, et al., 2011) and ending with the hearing "Proposal for regulations to implement a new system for capacity adjustments in salmon and trout farming" (Implementation of WP nr.16) from 2016 (MTIF, 2016). Each hearing will be divided into two parts, where the first part will present the submitted proposals from the hearing and the second part will present the reactions to the proposals per interest group. Then the first part in the subsequent hearing will be presented as both the result of the previous hearing and the submitted proposals for the next hearing.

This chapter will concentrate on the various actors' standpoint on the three aspects of the TLS. These three aspects are the production zones, environmental indicators and action rule with threshold values. Since the analysis is concerned with the standpoint of different actors, those statements that did not comment on these three will not be included. For example, some of the hearing statements were not relevant. For instance, many municipalities were more concerned with property and area tax, than commenting on the three aspects.

6.1 Hearing 1: Gullestad Committees Report

In the report "Efficient and sustainable area use in aquaculture industry" by the Gullestad Committee (Gullestad, et al., 2011) there are six out of the 25 measurements of relevance to this topic at hand. These six measures can be divided into two themes: 1) production zones and 2) action-rule based system with indicators. The first measure was "Production zones with stocking zones – coordinated stocking and fallowing" (10.4). The committee proposed to change the way the industry is coordinated with regards to its production and how and where a license is resident. To manage this, the Norwegian coast was to be divided into several production zones that were separated with "buffer zones" in-between. This measure was suggested in order to reduce the spread of diseases along the coast. The committee recommended dividing the coast into 23 production zones. Within each of these production zones, the salmon production was to be coordinated into a two-year cycle regarding stocking, fallowing and disease control. Each production zone should include four stocking zones and one out of the two mandatory fallowing months should be coordinated within the same stocking zone. Lastly, they proposed that each production zone should

become self-sufficient with smolt and slaughter capacity. This was to decrease potential infectious transportation between the zones. On that basis, they proposed that each license should be resident to a single production zone (Gullestad, et al., 2011).

The second measure also dealt with production and stocking zones, but with a focus on the process for establishing "production zones and stocking zones" (10.5). This concerned the legal process of establishing the production zones and stocking zones. The first phase should be a regulation process, which divided the coast into production and stocking areas, based on scientific criteria. The Aquaculture Act and the Food Act were to be the basis for this process. The second phase is the provision of areas for aquaculture and the division of the production zones into stocking zones. This phase should be carried out as a planning process according to the Planning and Building Act (Gullestad, et al., 2011).

The third measure was the action rule (10.11). The committee suggested that the regulation of the industry should go from being based on individual decisions to a self-adjusting action rule-based system. They argued that these action rules would lead to a more predictable and deliberate regulation of the industry, both for the industry and the management (Gullestad, et al., 2011).

The next three proposed measures were the committee's suggestions of action rules for battling three specific challenges that the industry faced at the time and are still facing today. The first of these measures regarded adjusting a production zones production capacity based on the level of production loss within the zone. It also opened the possibility to move licenses between production zones for environmental reasons (10.12). The indicator was outlined to be measured on the average loss in the previous two generations in a production zone before the evaluation. The action rule was suggested because of what the committee saw as a substantial production loss in the industry, which in the period 1998-2009 was 23% annually. The production loss was seen as a sign of inefficient use of production areas and adding: *A positive development in this indicator must also be assumed to have a positive effect on the achievement of other environmental goals* (Gullestad, et al., 2011, p. 161).

The next suggestion for an action rule regarded the need to reduce the sea lice pressure on the wild salmon and sea trout populations. This action rule was based on ongoing scientific works that showed two phaenomenas: the amount of sea lice was too high, and an increase in delicing resistance. These two phaenomenas would affect the wild salmonid populations in Norway negatively. A specific action rule for this challenge was not presented in the report. Rather, they stated that such an action rule had to initiate action at different levels based on how large the exceedance of the predetermined indicator is. It was also to be based on the

level of adult female salmon lice in the production zone. Finally, the last proposed measure was an action rule for the genetic impact on the wild salmon population from escapees (10.14) (Gullestad, et al., 2011). The reason for this suggestion is that even though the number of escapees and incidents had been significantly reduced in the years before 2011, the number of escapees was rather high when compared to the spawning stock of the wild salmon population. They also stated that the escapees and their possible genetically impact on the wild salmon population was one of the main challenges for the industry. They suggest that this action rule should have an indicator that measures if the wild population of the most important salmon rivers in Norway was genetic impacted beyond the level of what the population could handle and therefore in danger of being destroyed.

6.2 Reactions to the Gullestad Committees Report

Based on the report presented above, this section will present the opinion of the interest groups on the presented measures.

Municipalities:

The municipalities have the main role in the allocation of coastal areas in Norway, including areas for aquaculture. They must also handle local interest conflicts that may arise when allocating coastal areas for different uses. An important aspect for understanding the municipalities opinion on the report and the later hearings was a reduced willingness from the municipalities to allocate marine areas to the aquaculture industry. This reduced willingness came because the municipalities gained few economic benefits from this allocation. This was pointed very clearly by the organisation Network for Fjord and Coastal Municipalities[1] (NFKK, 2011).

In this hearing, nine relevant hearing statements represented 53 different municipalities. The hearings can be divided into two categories. The first category[2] had no strong opinion on the report, but rather some specific remarks on some measures. They claimed that a system based on production and stocking zones would pose a substantial challenge for SMEs in the industry (Austevoll municipality, 2011; Bergen municipality, 2011).

[1] NFKK is an organisation consisting of several fjords- and coastal municipalities scattered around the whole Norwegian coast. Per June 2011 the organisation had 44 members (NFKK, 2011).
[2] Austevoll and Bergen municipality

The second category was of those supporting the hearing statement given by NFKK (NFKK, 2011). The mandate of NFKK is to secure their members a reasonable income from the aquaculture industry in their coastal areas (NFKK, 2019). They were rather critical to what they were as a lack of municipality representation in the committees' work and that this had to change in the future process. Further, they stated that the continued growth of the industry had to be based on the premises laid by the municipalities. This to guarantee the municipalities a larger share of the proceeds from the industry.

Sectoral authority:

This interest group consists of five relevant hearing statements from five sectoral authorities[3]. The group was unanimous in their support of the committees' work and final report. All agencies, except the DN, supported all the measures (DN, 2011; CPA, 2011; DoF, 2011; FSA, 2011; The Norwegian Coastal Administration, 2011). They saw the action rule for genetic impact from escapees (10.14) as a lagging indicator that did not carry out a risk assessment of the possibility of genetic impact:

> *DN does not agree with the rule of action against the genetic impact of escaped salmon as proposed, because it is based on an indicator that measures an effect after the damage has occurred. The indicator must be based on a risk assessment* (DN, 2011, p. 1).

The DN, together with the CPA, viewed the report's lack of emphasis on the water regulation and Nature Diversity Act with a critical view (DN, 2011; CPA, 2011). This critical view might be explained by their mandate[4].

Interest organisations:

The interest organisations can also be divided into two main categories in this hearing. All of these interest organisations are either employer or employee organisations in the industry or in related industries. The first category was mainly positive to the report[5], the

[3] Directorate of Nature Management (DN), Climate and Pollution Agency (CPA), The Fisheries Directorat (DoF), The Food Safety Authority (FSA) and the Norwegian Coastal Administration

[4] DN's mandate was to be an advisory body for nature management while CPA was to be the central management agency for pollution issues (Store Norske Leksikon, 2013; Store Norske Leksikon, 2015)

[5] The Norwegian Confederation of Trade Unions (LO)

second mainly negative[6]. The LO as the only organisation supporting the report believed that the proposals would contribute to a more sustainable industry (LO, 2011)

The main concern the organisation in the second category was that the report, in their view, based itself on too many assumptions and on outdated scientific information (FHL, 2011; NSL, 2011; LMI, 2011). As the FHL said:

The main reasons for the criticism are that the central, concrete proposals that the committee has come up with are not based on updated and documented professional basis (FHL, 2011).

Adding onto this, the FHL and NSL were critical towards the proposals to establish production zones and use action rule to regulate the production capacity (FHL, 2011; NSL, 2011).

Industry actors:

This group had four relevant statements and represented 46 different aquaculture companies[7]. These companies were also critical to the scientific basis of the report, and added that this also applied the claim that production zones would better the control of salmon lice and lead to a more environmentally sustainable industry.

All the industry actors except Marine Harvest Norway (2011) did not support or were critical to the committee's proposal to adjust the production capacity for all licenses simultaneously in a production zone rather than adjusting the licenses individually (Salmar ASA, 2011; Mentor AS, 2011; Salmon Group AS, 2011). The summary in Salmon Group AS[8] hearing statement illustrates well the opinions of both the big companies and SMEs in the industry on the committee's proposal:

> *When it comes to the introduction of the production zones with stocking zones, we believe that this approach is not based on enough scientific evidence and will have dramatic economic consequences. Additional costs will be imposed, and locally owned aquaculture companies would get frameworks that are more difficult for operations. This will likely cause a dramatic decline in the diversity of the industry. For many communities, this will mean a lot. The corporate and socioeconomic aspects of the*

[6] The Norwegian Seafood Federation (FHL), The Norwegian Seafood Companies' National Association (NSL) and The Pharmaceutical Industry Association

[7] Marine Harvest Norway AS, Salmar ASA, Mentor AS (one behalf of Salmon Group AS) and Salmon Group AS

[8] Salmon Group AS is an aquaculture network consisting of 44 local farming companies along the whole Norwegian coast (Salmon Group AS, 2019)

measures are not sufficiently clarified in the proposal as outlined (Salmon Group AS, 2011, p. 8).

County:

The most important tasks of the County are secondary education, the operation of a number of cultural institutions and technical tasks related to roads, power production, business development, etc. (Hansen & Berg, 2018)

Seven counties answered the hearing[9]. These answers came from every county with a significant amount of aquaculture in their region except Rogaland County. All Counties supported the use of production zones in principle but had some reservations on the outlined measure. These reservations can be divided into two: those who supported the measure if the counties and municipalities would be given a central role in the establishment of these zones, particular for the counties (Hordaland County, 2011; Nordland County, 2011; Nord-Trøndelag County, 2011). The others supported the measure if the zones would consider the industry's existing structure, volunteer coordination and the differentiated owner structure that exists in the industry. This because a differentiated industry structure was viewed as a central prerequisite for local and regional value creation (Finnmark County, 2011; Møre og Romsdal County, 2011; Sør-Trøndelag County, 2011; Troms County, 2011).

Out of the seven counties, only Sør-Trøndelag did not support the use of action rule as a regulation tool (Sør-Trøndelag County, 2011). Finnmark, Hordaland, Nordland and Nord-Trøndelag Counties supported the use in principle (Finnmark County, 2011; Hordaland County, 2011; Nordland County, 2011; Nord-Trøndelag County, 2011). Finnmark, Møre og Romsdal, Nord-Trøndelag and Troms supported some of the specific suggestions for action rules (Finnmark County, 2011; Møre og Romsdal County, 2011; Nord-Trøndelag County, 2011; Troms County, 2011).

County governors:

This interest group was probably the most divided group in the hearing. They all agree that environmental sustainability was important, but not on how this should be achived.

The mandate of the county governor is to be the representative of the state in the county and to have the responsibility to follow up decisions, goals, and guidelines from the Parliament and the Government. Further, they are the regional coordination authority for the

[9] Finnmark County, Hordaland County, Møre og Romsdal County, Nordland County, Nord-Trøndelag, Sør-Trøndelag and Troms County

state in the county (County governor, 2018). The majority of the governors were mainly positive to the report and the work made by the committee, but here the similarity ends[10]. The majority supported the introduction of production zones as a way of increasing the sustainability of the industry (County governor of Finnmark, 2011; County governor of Hordaland, 2011; County governor of Rogaland, 2011; County governor of Sør-Trøndelag, 2011; County governor of Troms, 2011).

The county governor of Nord-Trøndelag was neutral about this proposal, while the county governor of Nordland believed the proposal as outlined could pose a challenge for the SMEs (County governor of Nord-Trøndelag, 2011; County governor of Nordland, 2011).

Five of the county governors specifically commented on the action rule measures. Three were positive towards the use of action rule as a way of regulating the industry's production capacity (County governor of Hordaland, 2011; County governor of Troms, 2011). However, the county governor of Sør-Trøndelag was unsure if the suggested action rules would have a sufficient effect on the environment (County governor of Sør-Trøndelag, 2011). The county governor of Troms was positive towards the outlined action rule for salmon lice, while the county governor of Hordaland supported the action rule for escapees but not as suggested in the report[11] (County governor of Troms, 2011; County governor of Hordaland, 2011).

Research institutions:

Here only two statements were relevant. These were from IMR and VI. Both saw the work done by the committee as thorough and good. IMR was positive to the use of production zones, action rules and indicators (IMR, 2011).

The VI's only commented on the production zones with the stocking zone proposal. They view this as the report's most important proposal. However, the VI believed that certain things had to be in place before the introduction of the production zones (VI, 2011). Their comment was as follows:

> *The Norwegian Veterinary Institute believed that the proposals for establishing production zones with stocking zones and coordinated fallowing are probably the most*

[10] The County governors giving statements was: Finnmark, Hordaland, Nord-Trøndelag, Nordland, Rogaland, Sør-Trøndelag, Troms

[11] The County governor of Hordaland reasoned this with the same argument as the DN (DN, 2011) (County governor of Hordaland, 2011)

important measure proposed from a fish health and infection hygiene perspective. These principles do not require the development of new technology and can be implemented in the relatively short term (VI, 2011, p. 7).

ENGOs:

This group consisted of three statements[12]. The mandate of an ENGO can, in this case, be summarized as the safeguarding and conservation of nature and the biodiversity of the Earth. The hearings from this group can also be divided into two categories.

Forum for natur og friluftsliv Finnmark believed that the report and its content was a step in the right direction in the management of the industry, but remained neutral in their position torwads it (Forum for natur og friluftsliv Finnmark, 2011). Friluftslivets Fellesorganisasjon and WWF were favourable to the report and the suggested measures (Friluftslivets fellesorganisasjon, 2011).WWF further supported the use of production zones, the use of action rules, partly supported the salmon lice indicator, but did not the escapees indicator (WWF, 2011).

Wild fish interests:

Seven statements can be placed in this group. Here all except the Norwegian Fishermen's Association (NFA) were positive to the work of the committee and towards the report. Here there are also two categories, based on the wild fish interest they promote. Firstly, was the salmon recreational fishing organisation[13]; Secondly, was the NFA.

The recreational fishing organisations were all either positive or supportive of using action rules (NJFF-Finnmark, 2011; The North Atlantic Salmon Fund Norway, 2011). The majority were also positive towards establishing production zones. NJFF and Norske Lakseelver both commenting on the escapee's action rule proposal. Both were negative towards it because they saw it as a lagging indicator instead of a precautionary indicator (NJFF, 2011; Norske Lakseelver, 2011).

NFA was supportive of most of the proposed measures with the reservation that fisheries interests were to be safeguarded in the processes (NFA, 2011). They were however neutral in their opinion on the use of action rule as a regulation tool as they were unsure if the

[12] Forum for natur og friluftsliv Finnmark, Friluftslivets Fellesorganisasjon and WWF

[13] The Norwegian Association of Hunters and Anglers (NJFF), NJFF-Finmark, Norske Lakseelver and the North Atlantic Salmon Fund Norway

outline proposal was enough to make the individual company accountable for their impact on the environment.

To summarize all the answers from this hearing, it is possible to divide all the actors and interest group into two main camps: Those that advocated industry development and the need for an diverse industry and those that advocated the need to put the environment and wild fish first.

The first category of the municipalities, second category of interest organisations, industry actors and the second county category with advocated industry development and the continuation of a diverse industry. The ones advocating for the environment and wild fish was the first interest organisation category, county governor, research institutions, ENGOs and wild fish interests. The second municipality category and the first county category were neutral in the question of industry development vs. environment and was most concerned about the continued process of developing the system and pressing the Government on the need for involving the municipalities and county more than they have in the Gullestad Committee.

6.3 Hearing 2: Aquaculture Paper

The second consultation process was for the hearing on the report "Growth in Norwegian salmon and trout farming" (Aquaculture Paper) (MTIF, 2014) which was the prework for the MTIFs WP nr.16 "Predictable and environmentally sustainable growth in Norwegian salmon and trout farming" (Aquaculture Paper) (MTIF, 2015)which were delivered after this consultation process. The consultation paper was the MTIF's continuation of the Gullestad Committee's proposals, and the subsequent hearing round focused on the production zoning, use of action rule and the use of environmental indicators. The consultation paper of WP nr.16 concerned four elements: 1) how to achieve predictability in the regulatory framework of production capacity, 2) which environmental conditions should changes in production capacity be based on, 3) which objective criterion should be the basis for changes in production capacity, and 4) how to allocate production capacity between existing licenses and new licenses. The last element has not been analysed for this thesis and will therefore not be presented in this part because it has no relevance to the research questions for the thesis (MTIF, 2014).

In terms of predictability, the MTIF proposed three alternative on how to achieve this: 1) the continuation of licensing rounds with objective criterion decided from round to round, 2) a fixed annual growth rate and 3) a system based on action rules (MTIF, 2014). Alternative

one was the existing allocation regime where the government decided when each allocation round was to be, who got to grow and how much growth there would be. This gave great political maneuverability but low predictability for the industry. In alternative two the industry grows through a set annual rate, in which the environmental sustainability would be managed through other/existing regulations. This would give the farmers the biggest predictability for growth, but at the same time could reduce the predictability in operations. Alternative three would divide the coast into production zones where a set of action rules would regulate the production capacity in the zones (MTIF, 2014). This would give both the industry and politicians predictability. In addition, in this alternative, each license would become resident in only one production zone and could not be used in any other zones than the resident one.

Furthermore, the consultation paper discussed what environmental conditions/challenge should the changes in production capacity be based on: Firstly, two requirements that a challenge must fulfill in order to be used as an indicator was presented: it must be measurable and have a close connection to the production capacity in a production zone. MTIF presented five different environmental challenges that the industry faces that could serve as indicators in an action rule. 1) diseases, 2) drug use, 3) escapees and genetic impact, 4) pollution and, 5) emissions. After discussing each of these five challenges in detail, the MTIF concluded that it was only salmon lice that at the time constituted a known measurable environmental impact on wild fish out of the five challenges. In addition, the MTIF believed that an indicator of emission should be developed to be used in the future (MTIF, 2014).

Advancing, in the consultation paper, the MTIF further explains the reason for using environmental indicators as a basis for an action rule. The MTIF argues that indicators simplify or quantify relationships that are too complicated or too costly to measure directly. By using indicators for one or more environmental challenges in an action rule, MTIF wanted to secure that the production capacity does not exceed the carrying capacity of the environment within the production zone. It was therefore proposed that an indicator should consist of a three-stage categorisation of the environmental status. These categories had different threshold values which would trigger different responses from the management. Based on the existing knowledge three categories with the corresponding threshold values were suggested: no/little, moderate and big probability for environmental impact (MTIF, 2014). In addition to this proposal, they presented six alternatives for the frequency and size of the growth.

The MTIF presents their suggestion for the design of the salmon lice indicator. The proposed threshold values for the three categories and coloures for the categories where: 1) no/little impact (green): <10% of the population has an increased probability of mortality, 2) moderate impact (yellow): 10-30% of the population has an increased probability of mortality and, 3) high impact (red): >30% of the population has an increased probability of mortality. MTIF concluded that the proposed threshold values correspond to those in the quality standard for wild salmon. The standard is a guideline of classification used to decide how well a wild salmon population is doing and serves as a guideline in cases that will have an impact on the wild salmon. (MTIF, 2014) (The Ministry of Environment, 2013).

Lastly, the MTIF proposed two exception rules from both the TLS action rule for adjustment of production capacity and from the Salmon Allocation Regulation §33, which at the time said that a license could not be used in any other of the then DoFs regions than the one it is resident to. The reason for proposing the first exception rule was that if a farmer could document that their production had no negative impact on the environment of the production zone, then it was questioned why they should endure a reduction in their production capacity. The second exception rule was the MTIFs continuation of a proposal from the Gullestad Committee. The committee argued that since the focus of the TLS was environmental sustainability, licenses should be allowed to move between production zones. This would only be allowed when moving of licenses would improve the environmental condition of the zone in which the license was moved from /resident too. However, the MTIF was negative to this proposal since in their view, it would undermine the whole TLS (MTIF, 2014).

6.4 Reactions to the Aquaculture Paper

In the following pages the opinion of each interest group on the above discussion is presented. In this hearing round, it is more difficult to find distinct categories of different overall for the statements per interest group. The main way of categorising the opinions was for the alternative for continued growth they supported.

Municipality:

For this hearing, there were only two hearing statements that commented on the consultation paper presented above. The first answer came from Alta municipality (Alta, 2014). Alta supported the action rule-based system as a basis for continued growth for the industry, but with two preconditions. The production zones had to be established, and the

regulation for reduction of production capacity had to be established. If those were not met Alta believed that the current allocation regime was the best. They also agreed that salmon lice and escapes were the two biggest challenges for the industry but disagreed with the MTIF's conclusion that escapees and drug use should not be indicators.

The other answer came from the coalition of municipalities (NFKK) which by then had 55 municipality members (NFKK, 2015). They believed that it was up to the industry to choose what growth regime was best for continued growth. Following this, they discussed the need for municipality involvement in the process of establishing the TLS, as they did in the previous hearing (NFKK, 2015).

Sectoral authorities:

For this round three hearing statements commented on the relevant measures and proposals[14]. For the most part, they had the same opinion on the presented proposals, but there was some disagreement between them, especially between the DoF and the EA.

Everybody supported the action rule-based system as the basis for the continued growth of the industry (EA, 2015; DoF, 2015; FSA, 2015). All supported the salmon lice indicator, but the FSA and the EA believed that the outlined threshold values for the indicator should be lower, as they thought the whole coast would become yellow and too high threshold values in the yellow zone would negatively affect the wild salmon populations in Norway (FSA, 2015; EA, 2015). In addition the EA referred to the quality standard for wild salmon (EA, 2015). The DoF and the EA disagreed whether escapees and pollution should be indicators. The DoF believed that they should not be, while the EA believed that they should be (DoF, 2015; EA, 2015).

Lastly, the FSA believed that drug residues were not suitable as an indicator and they supported alternative five or six for the frequency and amount of growth (FSA, 2015). These two alternatives were: 5) 3% growth and reduction each other year and 6) 5% growth and reduction every third year (MTIF, 2014).

Interest organisations:

Here eight hearing statements were delivered from this group relevant to the consultation paper. Three of the statements was generally positive[15] to the proposals in the

[14] DoF, FSA, and EA (formerly the DN and CPA)
[15] LO, The Norwegian Food and Allied Workers Union (NNN) and the Federation of Norwegian Industries (FNI)

consultation paper while the rest were critical or pointed out challenges with the proposals[16]. Again, these are either employer or employees' organisations in the industry or in industries connected to the aquaculture.

The three organisations being favorable to the consultation paper either supported the action-rule based growth system (LO, 2015; NNN, 2014) or the annual growth rate system (FNI, 2015) for the continued growth. Furthernore, the NNN did not express their opinion for any of the indicators presented in the consultation paper (NNN, 2014), whereas both the LO and the FNI did. The LO believed that salmon lice and emissions should be indicators and in addition believed that licenses should not be allowed to move between production zones (LO, 2015). The FNI agreed with the LO that there should be an indicator for salmon lice but however that this should be measured at locality level in order to: *make the individual locality owner accountable to strive for the minimum environmental impact of its production* (FNI, 2015, p. 1).

The five remaining statements somewhat supported the proposals in the consultation paper but were critical to, or saw some weaknesses in, the proposal. Of these five organisations, only the FHL did not support the action-rule based system for continued growth (VA, 2015; FHL, 2015; NSL, 2015; Tekna, 2015). However, the Fagforbundet supported that system on two conditions: the zones would not be too big and that the dividing of the zones would follow natural barriers to minimize the influence between the zones (Fagforbundet, 2015). As mentioned, these organisations saw some weaknesses with the proposal in the consultation paper. The VA saw the lack of emphasizing on fish health and fish welfare as a considerable weakness and stated that: *Good fish welfare should clearly be a goal for an ethically responsible production, which is also increasingly demanded by customers* (VA, 2015, p. 1).

The Fagforbundet and the FHL on the other hand, believed that the sustainability concept which was laid as a basis for the proposals was too narrow and especially lacked emphasis on the social sustainability (FHL, 2015), as the Fagforbundet pointed out (Fagforbundet, 2015):

> *In the Ministry's* (MTIF) *weighing between various considerations in setting the framework for further growth in the aquaculture industry, they concluded with astonishment that there was only the environmental pillar in the sustainability concept that was to be its foundation. The Ministry justifies that economic*

[16] The Norwegian Veterinary Association (VA), FHL, NSL, The Norwegian Society of Graduate Technical and Scientific Professionals (Tekna) and The Norwegian Union of Municipal and General Employees (Fagforbundet)

sustainability must be safeguarded by the industry itself. The Ministry neglects to comment on social sustainability. Why social sustainability was omitted was not justified. The further assessment and the Ministry's proposals and conclusions are thus based on a narrow and natural scientific concept (Fagforbundet, 2015, p. 4).

Going further, the industry interests (FHL and NSL) saw it as a weakness that the adjustment of production capacity was proposed to happen at zoning level and not at the company or license level (FHL, 2015; NSL, 2015). Lastly, Tekna believed that the management would face challenges when evaluating the indicators within a significant geographical area that the production zones would become. Tekna and the NSL were the only actors commenting on the alternatives for frequency and amount of growth presented in the consultation note. Tekna supported alternative five "3% adjustment in production capacity every other year" while the NSL supported alternative one "5% growth yearly, and a reduction of 7.5% every year" or three "10% adjustment in production capacity every other year" (Tekna, 2015; NSL, 2015).

Industry actors:

For this consultation process, nine statements were received by this group[17]. These statements represented a total of 117 aquaculture companies[18]. The group can crudely be divided into those that supported the hearing statement of the FHL (as presented above) and those who were not. Cermaq AS, GSF and Salmar ASA supported the FHL's statement (Cermaq AS, 2015; GSF, 2015; Salmar ASA, 2015). The statement of AkvaDesign was the only one supporting both the action-rule based system for growth, and that salmon lice and emission should be indicators (AkvaDesign AS, 2015).

Out of the nine statements only GSF, Salmon Group AS and Bremnes Seashore AS stated which alternative for growth they supported. All three supported the annual growth rate as the best alternative for growth (GSF, 2015; Salmon Group AS, 2015; Bremnes Seashore AS, 2015). Continuing, Cermaq AS believed escapees should be an indicator (Cermaq AS, 2015), while Coast Seafood AS believed that salmon lice and emission should be indicators (Coast Seafood AS, 2015). Salmar ASA on the other side believed that neither drug use,

[17] AkvaDesign, Salmon Group AS, Coast Seafood AS, Alsaker Fjordbruk AS, Cermaq AS, Grieg Seafood (GSF), Salmar ASA, Bremnes Seashore AS and Marine Harvest ASA.

[18] Salmon Group AS are owned by 44 farmers (Salmon Group AS, 2019), Coast Seafood are owned by 50 companies (Coast Seafood AS, 2019) and lastly, Alsaker Fjordbruk are owned by 12 companies (Alsaker Fjordbruk AS, 2019).

emission, salmon lice, and escapees should be indicators (Salmar ASA, 2015). Salmar ASA commented this on the salmon lice indicator proposal:

> *SalMar believes that today's "Lice Regulations" have primarily functioned as intended and we expect this regulation to be dynamic so that the positive development continues. This means that we envisage a further reduction of lice. We, therefore, consider a separate rule of action for salmon lice to be inappropriate* (Salmar ASA, 2015, p. 6).

Lastly, Marine Harvest ASA believed that an indicator for salmon lice should be connected to localities, not production zones:

> *We believe that lice control in the individual locality is the most crucial success factor for reducing infection pressure. Permission for growth or reduction in production should, therefore, be regulated per locality and not per area* (Marine Harvest ASA, 2015, p. 7).

Cermaq AS and Marine Harvest ASA, together with Bremnes Seashore AS and Alsaker Fjordbruk AS, commented on the production zones. Cermaq AS proposed that rather than having production zones one should have three production regions, this was supported by Marine Harvest ASA (Cermaq AS, 2015; Marine Harvest ASA, 2015). Bremnes Seashore AS and Alsaker Fjordbruk AS were critical to the use of collective punishment, which they believed the action-rule based system did (Alsaker Fjordbruk, 2015):

> *Collective punishment for actors such as alternative three aims at would be an unacceptable management of growth in the industry. A fundamental principle should be that the individual actor is responsible and must be held responsible for the activities that take place at their facilities, and not be penalized as a result of other actors not pursuing the regulations* (Bremnes Seashore AS, 2015, p. 2).

Lastly, both Marine Harvest ASA and Bremnes Seashore supported the use of production zones not as a regulation tool but as a way of steering the sustainability focus and for preventative measures in a zone (Marine Harvest ASA, 2015; Bremnes Seashore AS, 2015).

Counties:

Five counties delivered statements for this hearing. The group can be crudely divided into two categories: those who supported the action-based system for growth[19] and those that supported the annual growth rate as the basis for growth[20].

All counties except Møre og Romsdal commented on the action rule proposals (Møre og Romsdal County, 2014). Finnmark together with Troms supported escapees as an indicator, with Finnmark proposing drug use as another indicator (Finnmark County, 2015). In addition, Troms County, together with Sogn og Fjordane County, supported emission as an indicator (Troms County, 2014). Sogn og Fjordane also supported the MTIFs salmon lice indicator (Sogn og Fjordane County, 2015).

Troms, furthermore, believed that the adjustment of production capacity should either happen at locality, company or stocking zone rather than on production zone level. This would be a way to avoid collective punishment and increase the accountability of the companies (Troms County, 2014).

Lastly, Nordland County was the most critical one towards the hearing note. They stated that they could not support the action-rule based system as the basis for growth because they have the principle meaning that production regulation should be connected to either locality or company level and not to a production zone. This can be clearly seen in their statement:

> *The county is afraid that the proposal for area management based on action rules will become unpredictable, unclear and difficult to manage. The County, therefore, cannot support this proposal* (Nordland County, 2015, p. 8).

Furthermore, they did not support the salmon lice indicator as in their view there was no apparent cause and effect relationship between the amount of lice on wild fish and the amount of lice on farmed fish (Nordland County, 2015).

[19] Finnmark County, Møre og Romsdal County and Troms County (Finnmark County, 2015) (Møre og Romsdal County, 2014) (Troms County, 2014)

[20] Nordland County, and Sogn og Fjordane County (Nordland County, 2015) (Sogn og Fjordane County, 2015)

County governors:

Four statements were received from this group[21]. Now the statements were more in agreement than in the previous round.

Everyone supported the MTIF's proposal to use an action-rule based system as the basis for continued growth (County governor of Hordaland, 2015; County governor of Nordland, 2015; County governor of Sør-Trøndelag, 2015). The County governor of Rogaland had however, two reservations towards the outlined alternative (County governor of Rogaland, 2015); First, indicators for escapees and diseases were not included in the system. Second, that the zones borders were not defined in the consultation note. This was a reservation because they believed that different environmental challenges might have to be solved differently in different geographical areas. A system that is action-rule based on large production zones would necessarily not safeguard this (County governor of Rogaland, 2015).

All except the county governor of Sør-Trøndelag were outspoken in their support of the lice, escapees and emission indicators as outlined in the hearing note. The county governors of Hordaland, Rogaland, and Sør-Trøndelag believed that the reduction in production capacity should be reduced when the production zone is yellow and not red (County governor of Hordaland, 2015; County governor of Rogaland, 2015; County governor of Sør-Trøndelag, 2015). Lastly, the county governor of Nordland believed that the system as outlined was immature and could lead to overregulation and that there were some considerable uncertainties within the system (County governor of Nordland, 2015).

A quote from the county governor of Rogaland summarizes well the overall attitude of the governors towards the proposals:

> *The county covernor of Rogaland is satisfied that the Ministry is clear that with the current production form in the aquaculture industry any further growth must happen on nature's premises and that environmental sustainability is considered the most important precondition for further growth in the industry* (County governor of Rogaland, 2015, p. 1).

[21] Gounty governors of Hordaland, Nordland, Rogaland and Sør-Trøndelag

Research Institutions:

Three statements were received from this group [22]. The IMR and the VI supported the MTIF in the action rule based system as the best for the continued growth (IMR, 2015; VI, 2015). NINA, on the other hand, suggested that a combination of production zones, action rules and licensing rounds with objective criteria would be the best alternative (NINA, 2015):

> *Of the three options proposed, alternative one has a good potential for safeguarding environmental sustainability, but it is primarily based on discretionary assessments and gives little predictability for the industry ... Alternative three proposes clearly defined action rules, which is positive since it reduces discretionary treatment and greater predictability ... We, therefore, propose that a combination of alternatives one and three be used in assessing capacity changes* (NINA, 2015, p. 4).

With regards to which indicators should be chosen, they were somewhat in disagreement. First, all three supported the proposed salmon lice indicator. IMR believed in addition that emission, drug use, and foreign substance should be included as indicators, but where the two latter should be used for restricting drug use in a production zone rather than adjusting the production capacity (IMR, 2015). The VI also believed that emission and drug use should be indicators; in addition to that, they believed that drug resistance should be an indicator (VI, 2015). On this point, the IMR disagreed with them (IMR, 2015). Lastly, NINA believed that escapees and animal welfare should be indicators, where these should be measured on the locality level, thus avoiding collective punishment (NINA, 2015).

Environmental organizations:

Five statements that were received in this consultation process fit in this group[23]. These five statements can be divided into two categories: first, those that supported the action-rule based system for continued growth and commented on the indicators[24], and second, those that were critical to the outlined consultation paper[25].

[22] IMR, VI and The Norwegian Institute for Nature Research (NINA)
[23] The Bellona Fundation (Bellona), Friends of the Earth Hitra-Frøya. Friends of the Earth Vest-Finnmark, a joint answer from Friends of the Earth and Nature and Youth, WWF
[24] Bellona, Friends of the Earth and Nature and Youth, and WWF (Bellona, 2015) (Friends of the Earth and Nature and Youth, 2015) (WWF, 2015)
[25] Friends of the Earth Hitra-Frøya and Friends of the Earth Vest-Finnmark (Friends of the Earth Hitra-Frøya, 2015) (Friends of the Earth Vest-Finnmark, 2015)

In addition to supporting the action-rule based system for growth, the organisations in the first group commented on two indicators: salmon lice and escapees. All three were supporters of the outlined salmon lice indicator (Bellona, 2015; Friends of the Earth and Nature and Youth, 2015; WWF, 2015). Friends of the Earth and Nature and Youth argued that escapees should be an indicator:

> *Escaped farmed fish represent a considerably larger problem today than before, both because the extent of escapees has increased, but also because the farmed fish is becoming more and more different from the wild fish after many years of breeding* (Friends of the Earth and Nature and Youth, 2015, p. 4).

On the other hand, the WWF believed that escapees were not suitable as an indicator (WWF, 2015). Bellona did not comment on the escapee's indicator (Bellona, 2015). Lastly, Friends of the Earth and Nature and Youth stated that they would support the action-rule based system if the outlined threshold values would become strict enough so that the allowed growth would be environmentally sustainable. In addition, they believed that there should exist indicators on both zoning and license level:

> *As it is difficult to find indicators for all targets that work at a production zone level, we propose two different levels of indicators; some at the production zone level that determines whether new permits can be given and some at the licensing level that determines whether the individual farmer should reduce or increase its MAB* (Friends of the Earth and Nature and Youth, 2015, p. 3).

In addition to being critical to the consultation paper, Friends of the Earth Hitra-Frøya believed that the proposed action-rule system with its proposed indicators was inherent inertia and thus would not manage to become self-regulating, stating:

> *The weakness is that the indicators proposed do not capture the environmental effect with sufficient accuracy and that the environmental effect is discovered too late to function as a good self-regulating system* (Friends of the Earth Hitra-Frøya, 2015, p. 1).

The Friends of the Earth Vest-Finnmark however, believed that there should not be introduced an action-rule based system for continued growth. They also believed that no further growth for the industry should be allowed until the MTIF came up with a satisfactory solution to the Gullestad Committee's proposal and comments. Lastly, they were unsure if the goal of environmentally sustainable growth would be reached through the outlined action-rule based system (Friends of the Earth Vest-Finnmark, 2015).

Wild fish interests:

Eight statements from this group were received for this consultation[26]. These can also be divided into two categories: first the salmon recreational fishing organisations[27] ,and second the Fishermen's Association's[28].

Everyone in the first category supported the action-rule based system as the preferred system for continued growth (ALI, 2014; NJFF, 2015; Norske Lakseelver, 2015; SalmonCamera, 2015; Sogn Villaksråd, 2015). Continuing, all except Sogn Villaksråd expressed their opinion on the indicators. They all believed that salmon lice should be an indicator, as outlined in the consultation paper. ALI, NJFF and Norske Lakseelver believed that escapees should be an indicator (ALI, 2014; NJFF, 2015; Norske Lakseelver, 2015), while SalmonCamera agreed with the MTIF in their conclusion (SalmonCamera, 2015). Sogn Villaksråd had one particularly noteworthy comment in their statement:

> *To get the current situation under control, we assume that there must be an immediate reduction of the production capacity of salmon farming of between 20% and 30% along large parts of the coast* (Sogn Villaksråd, 2015, p. 3).

For the second category, the organisation only commented on how the industry should grow. NFA supported the continuation of the licensing rounds with objective goals as a basis for continued growth, arguing that this system had worked well up until the hearing (NFA, 2015). The NCFA supported the action-rule based system for continued growth as this would best balance the needs of both the fishers and the farmers (NCFA, 2015). Both expressed their

[26] Alta Laksefiskeri Interessentskap (ALI), NJFF, Norske Lakseelver, SalmonCamera, Sogn Villaksråd, NFA, The Norwegian Coastal Fishermen's Association (NCFA) and Nordland County NFA
[27] ALI, NJFF, Norske Lakseelver, SalmonCamera and Sogn Villaksråd
[28] NFA, NCFA and Nordland County NFA

opinion that the action-rule based system had to consider the marine species and fisheries in a satisfactory way. As the NCFA commented:

> *Since much of the traditional coastal fishing takes place in the immediate vicinity of the salmon farms, the NCFA asks that the division of production zones and allocation of farming localities should take into account the grazing and spawning areas of the wild fish so that one avoids placing farming facilities in those areas* (NCFA, 2015, p. 2).

Nordland County NFA on the other hand, listed ten challenges that they believed had to be solved before any growth in the industry could be allowed. These are focusing on aquaculture's impact on the wild fish stocks (Nordland County NFA, 2014).

Others:

There were two hearing statements that was not possible to put into any of the interest groups above. They were from the Sámi Parliament of Norway and Folketrygdfondet. Both organizations supported the action-rule based system as a basis for continued growth (Folketrygdfondet, 2015). The Sámi Parliament also believed that salmon lice, emission, escapees and drug use should be indicators (The Sámi Parliament of Norway, 2015).

To summarise this hearing, it is also possible to divide almost all the actors and interest groups into crudely two camps — those who supported alternative three and those who supported alternative two. Alternative three can be said to be advocating the environment and wild fish interest. While alternative two advocates industry development and predictability for the industry actors. Those supporting alternative three were: Alta municipality, the majority of the interest organisations, AkvaDesign As, the first group of counties, all county governors, all the research institutions, the first group of ENGOs, the wild salmon organisations, NCFA and lastly the Sami Parliament. Those that supported alternative two were: the FNI, the FHL, most of the industry actors who commented on it and the second group of counties

As written earlier, this consultation process was based on the prework for the WP nr.16 (Aquaculture Paper) and based on this process the WP was published. Therefore, it were in the published WP the result from the hearing was published. There were eight proposals in the paper (MTIF, 2015):

1) An indicator for salmon lice will be used in an action rule for capacity adjustment, 2) Environmental sustainability will be used as the most imperative prerequisite for regulating further growth in the industry, 3) The capacity adjustment will be tied to a module based system that is based on action rules with production zones, 4) Work of developing an indicator for emission and in the long term consider whether such an indicator should be introduced will be started.

5) The capacity adjustment of 6% every other year will be considered, 6) The process of dividing the coast into production zones and introduce the action rule for adjustment of capacity will be started, 7) Each license will be tied to one production zone and 8) allow for exceptions from the action rule in instances where the operation form do not affect the environmental challenge that triggers the reduction of production capacity in the zone.

6.5 Hearing 3: Implementation of White Paper nr.16 (2014-2015)

This consultation process regarded how the MTIF proposed the legal framework of the TLS should be designed. As a result, the proposals from this hearing is based on the result of the previous hearing. There were four main proposals that the MTIF wants the consultative bodies to address (MTIF, 2016).

The first proposal was on how many production zones the Norwegian coast should be divided into. The Ministry proposes that there should be 12 production zones, based on a report from the IMR with help from the FSA and DoF (MTIF, 2016) (IMR, 2015).

The second proposal was that each license for commercial aquaculture should be placed in one of these zones. The main rule for the placing of the license is: the license will belong to the zone where it is cleared to be used at the most localities. For cases where the license has been cleared for use in localities in several production zones, the owner of that license can choose which zone the license should be used (MTIF, 2016).

The third proposal is that there should be a main rule saying that it is not permissable to move licenses between production zones and that licenses could only be used in the zone which it is resident to, referring to the second proposal (MTIF, 2016). In addition to this, they proposed to have two exceptions from this rule:

1. The continuation of the interregional biomass branch in which a license can be used in up to three production zones.
2. To either have point a or b as a second exception:
    a. Interregional biomass limit (IRBT) in two adjacent production zones (the resident zone and one adjacent zone) for farmers who process a minimum of

15% of their salmon in the coastal areas in Norway. Either internal or external processing.

b. An general access to use a license in two production zones where one is the resident zone and the other is an adjacent zone.

Lastly, the fourth proposal is the specification of the exception rule from the action rule. This was a continuation of the result from the WP nr.16 (Aquaculture Paper). Four different alternatives were presented for how the exception rule was to be designed. They also wrote that licensees that get access to this rule could grow with 6% every other year (MTIF, 2016).

1. No adult female salmon lice and no medical treatment
2. No more than 0,1 adult female salmon lice in the period 1st of April to the 30th of September and no medical treatment.
3. No more than 0,1 adult female salmon lice in the period 1st of April to the 30th of September and maximum one medical treatment.
4. No more than 0,2 adult female salmon lice in the period 1st of April to the 30th of September and maximum two medical treatment.

In addition, to these four proposals, the Ministry suggested that Skjerstadfjorden, due to its unique character, should be exempt from the system (MTIF, 2016).

6.6 Reactions to the Implementation of White Paper nr.16 (2014-2015)

The opinion of each interest group on the presented proposals will now be given.

Municipality:

In this group, only Alta municipality and the NFKK sendt in hearing statements. Alta municipality believed the proposals would lead to increased bureaucratization, more complicated management, and less predictability. In addition, they were critical to the suggestion of using an exception rule, but they understood it on the basis that the proposed production zones were as big as they were (Alta Municipality, 2016). They supported the exception rule alternatives 1-3, stating:

The Ministry believes that alternative 1-3 will represent production areas where the lice status is so good that production can be increased. If the farmers are to be

stimulated to limit lice levels as much as possible, strict exemption criteria should be set and one of the options 1 - 3 should be chosen (Alta Municipality, 2016, p. 2).

The NFKK (representing 59 municipalities in this hearing) was favorable to the TLS, as it proposed that it would contribute to sustainable growth for the industry and at the same time safeguard the interests of the municipality. However, they doubted if the proposal of production zones would work as intended and that the sustainability term was too narrowly defined in the hearing note. Lastly, they were very doubtful over the collective punishment as proposed in the system (NFKK, 2016).

Sectoral authorities:

It is the same organization as in the previous hearing that delivered statements[29]. Both the DoF and the FSA were worried that the proposals in the hearing note regarding the safeguarding of the industry actors need for predictability would weaken the gain of introducing the TLS (DoF, 2016; FSA, 2016).

The DoF supported proposal number one and two and did not support proposal three except the continuation of interregional biomass limit (IRBT) in up to three production zones. They proposed that proposal on the second exception rule should have the clarification that what decided which zone the license should be resident to be the zone that has the most localities tied up to the license (DoF, 2016).

The FSA supports proposal number one in principle and supports proposal number two and three if there is an environmental gain for doing so and lastly, they believed that proposal four was unfortunate. Further, they proposed to split production zone (from the Swedish boarder to Karmøy) one into two separate zones with the boarderline being with Ryfylke so that there would become 13 production zones in total. Lastly, they believed that the whole proposal, mainly number four would lead to increased bureaucratization and administration (FSA, 2016).

The EA stated that they could not support the outlined proposal because of two things: firstly, the threshold values in the red area is too high compared to the quality standard of wild salmon and secondly, with the outline proposal the goals in St.prp.nr.32 “About the protection of the wild salmon and the completion of national salmon rivers and salmon springs” and the quality standard for wild salmon would not be reached (EA, 2016).

[29] DoF, FSA and EA

Interest organisations

In this hearing round, there were six relevant hearing statements representing a total of seven organizations[30]. In addition to the employee and employer organisations, the Norwegian Bar Association delivered a statement.

Everybody in this group was generally sceptical to the proposed system as outlined in the hearing round (The Norwegian Bar Association, 2016; HardangerFjordLauget, 2016; FHL, 2016; NSL, 2016; FHL, NSL and FNI, 2016). The VA had the same focus in this hearing as in the prior hearing and they also stated that they supported alternative four for the exception rule (VA, 2016).

Everybody else said in different ways that the system as outlined in the hearing note did not have a good enough legal basis, which would lead to a weakened rule of law for the industry actors. They also believed that the proposal was based on an uncertain scientific basis and that a regulation system cannot be introduced when the system is based on models that are unfinished, untested and lacks validation and calibration (FHL, 2016; NSL, 2016; FHL, NSL and FNI, 2016). Here both the Norwegian Bar Association and Hardangerfjordlaug believed that the Aquaculture Act §9 did not have a good enough basis for reducing production capacity. The Bar Association also referred to the Diversity Act §8 and the legal question for the reduction of production capacity based on the scientifically uncertain knowledge (The Norwegian Bar Association, 2016). As the Hardangerfjordlaug stated:

> *We believe that there is an insufficient legal basis and knowledge base for introducing such an all-encompassing new system for production regulation that the consultation paper proposes. We, therefore, ask that such a change of law must be introduced through legislative amendments and not regulations and that the knowledge base and the final model be put forward together with the legislative amendment* (HardangerFjordLauget, 2016, p. 5).

Industry Actors:

Several of the same actors from the previous hearing delivered hearings statements for this hearing. Cargill AS and Europharma AS (a feed company and a fish health company) also delivered statements (Cargill Aqua Nutrition Norge, 2016). In this hearing, the industry was

[30] The Norwegian Bar Association, Hardangerfjordlauget, VA, FHL, NSL and a joint answer from FHL, NSL and FNI

almost unanimous in its statements. There was a total of 30 statements representing 74 industry actors. 20 of the statements, however, were identical to each other. All supported the Salmon Group AS hearing statement and are the owners of Salmon Group AS[31] (Salmon Group AS, 2019).

Several of the companies rejected the whole proposal either directly in their hearing statement or through supporting the hearing statement of the FHL[32]. Several companies also had the same arguments as the interest organisations with regards to the legal basis of the system and their criticism of the scientific basis and models the system is based on[33]. To show the industry actors scepticism towards the proposal one of Alsaker Fjordbruk AS's points is particularly useful:

> *The proposed introduction of production zones and the associated traffic light system will, in Alsaker's opinion, constitute one of the most significant regulatory changes within the aquaculture industry since the introduction of the Aquaculture Act (in 2005). The restructuring affects the very basis of the business - the aquaculture license - and can have substantial consequences to the companies, the employees and the society* (Alsaker Fjordbruk AS, 2016, p. 2).

Counties:

Several of the same counties from the previous hearing round took part in this round as well, but there were also some new ones. A total of six hearing statements was recieved from this group[34] (Rogaland County, 2016).

The counties of Nord-Trøndelag, Sør-Trøndelag, Sogn og Fjordane and Troms had either an expectation or a concern that can be generalized as follows:

[31] (Blom Fiskeoppdrett AS, 2016; Engesund Fiskeoppdrett AS, 2016; Eidesvik Laks AS, 2016; Flokenes Fiskefarm AS, 2016; Fylkesnes Fisk AS, 2016; Isqueen AS, 2016; K. Strømmen Lakseoppdrett, 2016; Landøy Fiskeoppdrett A/S, 2016; Lofoten Sjøprodukter A/S, 2016; Marø Havbruk AS, 2016) (Mortenlaks AS, 2016; Osland Havbruk AS, 2016; Pure Farming AS, 2016; Steinsvik Fiskefarm AS, 2016; Sulefisk AS, 2016; Svanøy Havbruk AS, 2016; Telavågen Fiskeoppdrett AS, 2016; Troland Lakseoppdrett AS, 2016; Trombre Fiskeanlegg AS, Quatro Laks AS, Fjord Drift AS, Drageid Laks AS, 2016; Øyfisk AS, 2016)

[32] (Cermaq AS, 2016; Eide Fjordbruk AS, Engesund Fiskeoppdrett AS, Erko Seafood AS, Lingalaks AS, Kobbevik og Furuholmen Oppdrett ASA, Tombre Fiskeanlegg AS; Europharma AS, 2016; Firda Seafood Group AS, 2016; Sinkaberg-Hansen AS, 2016)

[33] In addition to the actors in footnote 31 and 32 (Alsaker Fjordbruk AS, 2016; Cargill Aqua Nutrition Norge, 2016; Marine Harvest ASA, 2016) also argued this.

[34] Møre og Romsdal, Nord-Trøndelag, Rogaland, Sogn og Fjordane, Sør-Trøndelag and Troms

1. The model which would become the basis for the adjustment of capacity was fully developed and verified before introducing the system (Nord-Trøndelag County, 2016; Sogn og Fjordane County, 2016; Sør-Trøndelag County, 2016).
2. The outline proposal would lead to an unnecessarily complicated regulation system, both for the management and the industry: (Nord-Trøndelag County, 2016; Sør-Trøndelag County, 2016; Troms County, 2016). As Nord-Trøndelag County described it:

   The management system described in the consultation paper is perceived as complex. Sound management has contributed significantly to the fact that the Norwegian aquaculture industry has been a success story, which other nations envy us. The County is concerned that this new system becomes unnecessarily complicated, both for management and industry (Nord-Trøndelag County, 2016, p. 1).

Lastly, Møre og Romsdal, Troms and Nord-Trøndelag Counties expressed their opinion on the proposals of which exception rules should be chosen. All three counties supported the proposal of "allowing general access to use a license in two production zones, one zone is the resident, and the other is an adjacent one" to be the second exception rule (Nord-Trøndelag County, 2016). In addition to this, Møre og Romsdal stated that they supported the alternative of "No more than 0.1 adult female salmon lice in the period 1st of April to the 30th of September and no medical treatment" as the specific exception rule from the action rule (Møre og Romsdal County, 2016). Troms, on the other side, believed that it instead should be "No more than 0.1 adult female salmon lice in the period 1st of April to the 30th of September and maximum one medical treatment" (Troms County, 2016).

County governor:

Several county governors from the previous consultation process delivered statements for this round. Five statements were received in this round[35].

Every county governor except Rogaland believed that the system should have more indicator than just the salmon lice one (County governor of Aust- og Vest-Agder, 2016; County governor of Hordaland, 2016; County governor of Nord-Trøndelag, 2016; County governor of Rogaland, 2016; County governor of Sør-Trøndelag, 2016). For example, both the county governors from Trøndelag thought that the escapees and emission should become

[35] Aust- og Vest-Agder, Rogaland, Hordaland, Nord-Trøndelag and Sør-Trøndelag

an indicator (County governor of Nord-Trøndelag, 2016). This was because, in their view, escapees constituted a considerable negative effect on the wild salmonid populations (County governor of Sør-Trøndelag, 2016).

The county governors from Aust- og Vest-Agder and Rogaland supports the notion that production zone one (from the Swedish border to Karmøy) should be split into two separate production zones with the borderline being with Ryfylket (County governor of Aust- og Vest-Agder, 2016; County governor of Rogaland, 2016).

Lastly, the county governors from Aust- og Vest-Agder, Rogaland, and Hordaland regarded the proposed threshold values for the salmon lice indicators as too high, especially between yellow and red (County governor of Aust- og Vest-Agder, 2016). Both the County governors from Rogaland and Hordaland believed that the threshold values were not in accordance to the quality standard for wild salmon (County governor of Hordaland, 2016) and the county governor from Rogaland went as far to say that they could not support the outlined proposal due to this (County governor of Rogaland, 2016).

Research institutes:

All the consultative bodies from the hearing on WP nr. 16. except Nofima delivered a statement[36]. This group was somewhat divided.

All institutes supported the proposals put forth by the Ministry (IMR, 2016). However, the NINA supports the dividing of the coast into 12 production zones while the VI endorsed the proposal of 13 production zones. The NINA was also against the exception rule proposal while the VI was favourable to the proposal (NINA, 2016) (VI, 2016).
An noteworthy result for this group is in the VI's answer. They stated that they have made an alternative scattering model that they believed should be the basis for the TLS system:

> *Through the work on the validation of the two infection-spring models in the spring of 2016, the result was that the distance-based model was considerably more precise than the current-based model. At the same time, the distance-based model is much simpler in its construction and thus also much easier to use for calculating lice pressure. This latter also means that it is easier to validate and to use to evaluate the effects of various measures within the production zones. Until more complex current-based dispersion models are evidently predicting lice pressure in time and space more*

[36] IMR, VI and NINA

precisely than distance-based models, VI believes that a distance-based model should be the basis for the decision-making process now (VI, 2016, p. 3).

Lastly, the VI thought that the system appeared premature based on the fact that the calculation of the lice pressure in the used model was not related to time (VI, 2016).

Environmental organizations:

Four answers were received from the ENGOs[37] in this hearing. Everybody here supported the principle of using the TLS to regulate production capacity. Everybody, however, believed that the limit values proposed for the salmon lice indicator were too high in both red and yellow area, but especially in the yellow area. They also mentioned that the outlined limit values did not reach the goal of the quality standard for wild salmon (Bellona, 2016; Friends of the Earth, 2016; Nature and Youth, 2016; WWF, 2016).

*Here (*in the consultation paper), *the quality standard for wild salmon is used to argue that it is tolerable with up to 30% mortality from migrating, salmon smolt before it has an effect on the production capacity in an area. This is a gross misinterpretation of the quality standard, which in its categorization only grades what the size of the impact is, not what is an acceptable impact* (Bellona, 2016, p. 3).

The group was divided in their opinions towards the proposal of an exception rule. Nature and Youth were opposed to the proposal and believed that such a rule/practise would undermine the goal of the TLS (Nature and Youth, 2016). The others, on the other hand, thought such a rule should not be based on established criteria's but rather on one based on a strict individual discretionary assessment (Bellona, 2016; Friends of the Earth, 2016; WWF, 2016).

Wild fish interests:

In this round, there were six hearing statements from this interest group[38]. Again, this group can be divided into two categories: the wild salmon interests and favourable to the proposals and the Fishermen's Associations and negative to the proposals.

[37] Bellona, Friends of the Earth Norway, Nature and Youth and WWF

[38] NJFF, NFA, NCFA, Norske Lakseelver, Sabima and Foundation North Atlantic Wildlife Fund Norway (NJFF, 2016) (NFA, 2016)

All in the first category had the same opinion on the proposal about the proposed exception rule as the ENGOs (Foundation North Atlantic Wildlife Fund Norway, 2016; NJFF, 2016; Norske Lakseelver, 2016; Sabima, 2016):

> *We, therefore, believe that the original exemption proposal (described in the Aquaculture Paper) is both suitable and sufficient. It is strict, predictable and has the advantage that it takes on new environmental indicators when they are being introduced at a later date. Therefore, propose that the original proposal be maintained, with the following wording:*
> *Exceptions to the rule of action relating to the reduction of production in an area can be granted to licensees who can document that the operation at the site the license is associated with has not affected the environmental indicator that triggers the production reduction* (Norske Lakseelver, 2016, p. 7).

The wild salmon organisations were also unanimous with the ENGOs in their opinion about the proposed threshold values and the relationship to the quality standard for wild salmon (Foundation North Atlantic Wildlife Fund Norway, 2016; NJFF, 2016; Norske Lakseelver, 2016; Sabima, 2016).

In the second category, the NCFA had a lengthy statement. They started by saying that they could not accept the outlined proposals, due to several factors. First, they were critical to the system only having one indicator, which they did not believe would guarantee sustainable and environmental growth. Second, they supported the FHL and NSL in their criticism towards the lack of scientific knowledge. Third, they supported the criticism of Friends of the Earth Norway towards the dividing of the production zones. Lastly, they supported the FHL in criticism of the decision-making process towards the colouring of the production zones (NCFA, 2016). As they write in their statement:

> *The Norwegian Coastal Fishermen's Association, as with the Norwegian Seafood Confederation, is critical of the fact that modelled values must be assessed discretely before an area will be provisionally classified as green, yellow or red. The final decision will then be made at the political level. Here, professional services should play a more decisive role* (NCFA, 2016, p. 2).

The NFAs main comment towards the proposals was which alternative for exception rule they supported. They supported the two strictest ones: no adult female salmon lice and no medical treatment (alternative one) or no more than 0.1 female salmon lice in the period 1st of April to the 30th of September and no medical treatment (alternative two). They, however, did not believe the proposed system in the consultation paper would contribute to reduce the salmon lice development of resistance or to reduce the emission of drugs in the industry (NFA, 2016).

Others:

Lastly, two statements was relevant to the analysis which could not be put into any of the interest's groups above. They came from the lawyer Halfdan Mellbye and the Norwegian Better Regulation Council. Halfdan Mellby had three comments to the proposals that are of interest. He was of the belief that the current authority of the FSA is good enough to handle the salmon lice pressure from aquaculture to wild fish. Secondly, he questions the professional basis for deciding the adjustment of the production capacity in a zone is legally good enough. Lastly, he believed that the reduction of production capacity in a zone would create legal issues ref: The Aquaculture Act §9 and the Norwegian Constitution §97 (Mellbye, 2016).

The Norwegian Better Regulation Council did not comment on the specific proposals but did evaluate the full hearing note and if the necessary assessments had been carried out in accordance to the Instructions for Official Studies and Reports (The Norwegian Better Regulation Council, 2019). They did conclude that the assessments were carried out in accordance with the instructions.

To summarize this hearing, it is possible to divide the interest groups into the same categories as the first hearing: those advocating industry development and the industry's need for flexibility, and those advocating for the environment and securing the wild fish first.

Those advocating for industry development in this hearing were: the municipalities, interest organisations, industry actors, and some of the counties. These were mostly focused on what they saw as a lack of sound legal and scientific baisis in the MTIFs proposals. Those advocating for the environment were: county governors, research institutions, ENGOs and wild fish interests. These were mostly focused on what they saw as too high threshold values in the salmon lice indicator and the lack of sound connection to the quality standard for wild salmon.

7. Discussion

In this chapter three elements will be presented. First, there will be a short recap of the situation that led to the change in the regulation of the aquaculture industry. Second, the research questions will be presented again and answered. Last, a short description is given of what further research I believe is necessary in order to get a better understanding of the political process that led to the establishment of the TLS in 2017.

The result above showed the political processes that led to the design of the present TLS through the three most central consultation processes and the actors who were involved. In general, the result shows that during the implementation process there developed two camps of interest groups which advocated two different views on the industry and its development. These will be presented in depth when answering research question two "What stakeholder groups were pushing these adjustments/adaptations forward?".

Moreover, the TLS can be said to come as a result of mainly two groups' dissatisfaction with the old management system. The first group was the salmon farmers who were dissatisfied with the randomness in the licensing rounds, the substantial use of discretion and a system that gave little predictability in both short- and long-term operations for the companies. Simultaneously, there was an industrialization, as well as increased production and value of their main product. In addition, the increasing demand for licenses, localities, and unpredictable allocation fed the farmers' dissatisfaction with the old system. Hence, they pushed for a more predictable and non-discretional system for the future growth.

The second group pushing for a new management system were the environmentalists, wild salmon interests, some research institutes, and some sectoral authorities. These organizations saw the increase in production of salmon with scepticism and were mostly concerned with the growing environmental challenges that followed the increase in production. The most important of these challenges were salmon lice, escapees and production loss.

As a response to this dissatisfaction, the then Ministry of Fisheries and Coastal Affairs (now the MTIF) in 2009 appointed the Gullestad Committee (Gullestad, et al., 2011). As described, this political process ended the 30th of October 2017 with the commencement and initiation of the TLS.

The goal of the study has been to answer four research questions regarding the implementation process and policy instrument used in the TLS;

1. To what extent were the measures recommended by the Gullestad Committee adjusted/adapted in the final design of the TLS?

2. Which stakeholder groups were pushing these adjustments/adaptations forward?
3. Were all relevant interest groups heard during the implementation process?
4. Was the implementation of the TLS a success or failure?

Since research question two and three regards the implementation process, these will be answered first, as these were actively contributing to the design of the final TLS. Following this, research question one will explore how the final measures in the TLS differed from those proposed by the Gullestad Committee, in which specific measures will be presented. Then last, the fourth research question will be answered, in which it will be discussed whether the TLS is seen as a success or failure.

7.1 What stakeholder groups pushed for the adjustments/adaptations?

Before discussing the first research question, the implementation process of the TLS will be presented. This is because when discussing which of the two camps that developed during the process managed to push for adjustments, it can be advantageous to have the whole process laid out first.

Based on Winter's (2012) integrated implementation framework, the whole six-year period from the Gullestad Committee's proposal to the initiation of the final TLS (2011-2017) can be seen as one long implementation process, in which both the policy formulation phase and implementation process phase were present. I argue that the policy formulation phase can be divided into two phases: 1) the work and outcome of the Gullestad Committee and 2) the official work done concerning the WP nr.16 (Aquaculture Paper) (MTIF, 2015). The Gullestad Committee had no real political consequences, as no political decision was taken based on it, and no politicians from the national level were involved in the committee's work. Rather the committee's work was the start of the policy formulation and outlined, for the first time, a new management system that resembled the TLS. In the following consolation process, relevant interests had the opportunity to express their opinion on the report and its proposal. Then the work prior to WP nr.16 (Aquaculture Paper) started in 2014 and was initiated by a consultation where the MTIF presented a hearing note summarizing measures that would secure predictable continued growth within the framework of environmental sustainability, while also enhancing the industry's competitive edge and secure jobs along the coast (MTIF, 2014). Relevant interest was, again, able to present their views in the following consultation, which were the basis for the finalized WP nr.16 (Aquaculture Paper). The WP was discussed in the Parliament, and from this, six political decisions were made, where two

of the decisions are relevant to this thesis. These were: Decision 678; The Parliament asks the government in a suitable manner to present to the Parliament the final proposal for production areas. Decision 683; White Paper 16 (2014–2015) - on predictable and environmentally sustainable growth in Norwegian salmon and trout farming - is attached to the protocol (Stortinget, 2015).

Then the implementation process started based on these six decisions that guided the work of the government. During this phase, four reports were published. Two of them discussed the production zones and the knowledge status on salmon lice (IMR, 2015) (Karlsen, Finstad, Ugedal, & Svåsand, 2016). The last two reports dealt with assigning colours to the production zones (Ellingsen, et al., 2017) (MTIF, 2017). These four together with the third consultation process were some of the last activities conducted before the TLS was initiated on the 30th of October 2017.

As described, in the implementation process two camps advocating two very different views on the management system materialized. These two camps also formed two natural alliances, which lasted through the whole implementation process.

The first camp and alliance were those advocating for industry development and consisted of the industry actors, most interest organisations, some counties, and Nordland County governor. The interest organisations in this alliance were the ones advocating industry development from the viewpoint of the industry[39]. This camp adopted a combination of resistance and game-playing behaviour (Winter & Nielsen, 2008). By adopting this combination of behaviours, they signal that they recognise the authority of the implementers while lacking the recognition of the goal and methods of the implementation. As such, they chose to cooperate with the implementors and to "beat them at home" in order to reach their own goal. Even though the camp did recognise the authority of the MTIF, they actively fought against the main proposal in all the consultation processes. They agreed on the MTIFs goal of securing a predictable growth within the framework of environmental sustainability, while enhancing the industry's competitive edge and securing jobs along the coast. In the second hearing, they also lifted the challenges with adjusting the production capacity in a zone collectively and saw this as introducing collective punishment. Finally, in the last hearing, they criticized what they saw as a lack of a good legal basis for the regulation. On this issue, several of the industry actors adopted the resistance behaviour fully by either correcting a grave criticism or rejecting the whole proposal from the MTIF.

[39] VA, FHL, NSL, Tekna, LMI, Fagforbundet and FNI which entered the alliance in the last hearing

The second camp and alliance were those advocating environmental sustainability and preservation of the wild salmonid populations in Norway. This camp consisted of the ENGOs, wild fish interests, research institutions, sectoral authority and all county governors except Nordland. This camp adopted commitment behaviour (Winter & Nielsen, 2008) during the two first consultation processes. By adopting the commitment behaviour, they signal that they were positive towards both the goal, methods and the authority of the implementors. They were also actively interacting with the implementors (Winter & Nielsen, 2008). This however changed in the last consultation process where they adopted the resistance behaviour. The alliance was positive to the goals and proposals in the two first hearings and especially that environmental sustainability became the centre of discussion. In the second hearing, everybody was positive to the MTIFs work and proposal. Almost all actors supported the action rule-based system for continued growth. However, the governmental groups, sectoral authorities and county governor, were critical to the proposed threshold values for the salmon lice indicator, as they had reached the conclusion that the system as outlined would lead to a state where the whole Norwegian coast would become yellow. Based on this conclusion, they believed that the threshold values in the yellow zone were too high and as such the TLS would negatively affect the wild salmon populations in Norway. They also believed that the reduction in capacity should happen when the zone was yellow and not red.

In the last consultation process, no one was outspoken positive towards the proposals. The sectoral authorities believed that the proposals would undermine the purpose of the TLS. The county governors were more concerned with advocating the need for more indicators in the system. Both the ENGOs and wild fish interest were neutral or negative towards the proposal. The salmon recreational fishing organisations, together with the ENGOs, were also critical towards the proposed threshold values. Lastly, the NCFA could not accept the proposal at all.

As per the aforementioned description of the two camps involved, the camp advocating for the environment manage to incorporate a wider amount of interest groups than the camp advocating for industry development. This imbalance between the two camps might offer an explanation on why the environmental camp managed to push successfully for the adaptation of their interests in the form of; the action rule-based system as the basis for continued growth in the industry. The argument of this camp might have captured more of the society and possibly the society's concerns surrounding the aquaculture industry. This camp had also the backing of several governmental organisations and research institutes. All these organisations were those who have the government mandate of securing different aspects of

the environment. During the second consultation process, the MTIF adapted the action rule-based system, the adaptation of using action rules for the regulation and the adaptation of the environmental indicator for salmon lice.

The industry camp however managed during the same consultation processes to push for the adoption of the exception rule for reduction in production capacity and the allowance for using a license in two production zones. An explanation for this may be that the camp managed to gather massive participation from a virtually unanimous industry in the second consultation processes. In the first hearing, there were three companies representing 46 aquaculture companies. Then in the second hearing, this had increased by around 2.5 times, to 117 companies which represents almost the whole industry in Norway.

The main phase where the interest groups managed to push for the adaptations or adjustments of their preferred measures was during the second consultation process. Here the "battle of winning" the TLS happened. It was here as mentioned, that the only set of political decision was taken. As such it was here the basic design of the new management system was decided. After the political decision was taken, the process went over into the implementation process phase, deciding the details of the system and development of the needed models for the system.

In conclusion, it seems that it was the environmental alliance that managed to gain the most support for their view on the industry and its management in the first stages of the process. The industry development alliance managed, however, to gain several acknowledgments on their need for flexibility in the final design of the system towards the end of the process.

7.2 Were all relevant interest groups heard during the implementation process?

As elaborated in the theory chapter, the government uses procedural policy instruments to regulate access into the implementation process. They can do this by manipulating the number of active actors and affect the behaviour of the actors involved in the implementation process. In the implementation of the TLS the procedural instrument used was the consultation process (Howlett, 2005). The consultation process as a policy instrument involves a high level of state manipulation of access during the implementation process (Howlett, 2005). The reason for this is that even if the consultation process is an open process, the state decides who will receive notice that the consultation process has started. Those

which do not revice notice on the hearing will have to actively seek out the hearing themselves.

In Norway, a consultation process is used to facilitate the possibility of its citizens, organisations, and industries to express its opinion and control what the management is doing. In addition, the government writes that a consultation process is part of the democratic right people have of contributing to the design of public policy in Norway (Regjeringen, 2015). The timeframe of a consultation process that has significant effects is defined in the assessment instructions (The Ministry of Finance, 2016). This instruction says that any consultation process that has significant effects within its area should as a rule be three months and not less than six weeks. The consultation process for the Gullestad Committee lasted almost six months (Regjeringen, 2011). The consultation processes for the Aquaculture Paper lasted almost two months (Regjeringen, 2014). Lastly, the consultation process on the implementation of the Aquaculture Paper lasted almost three months (Regjeringen, 2016).

I would argue that given that all relevant governmental and non-governmental organisations were invited to comment on the consultation papers and that all the relevant interest group were heard equally well during the implementation process. This is because the MTIF used the consultation process as their primary procedural policy instrument. During the last consultation process, all holders of a commercial aquaculture licenses for salmon and trout were included as well. This was done because the MTIF regarded that the consultation process acted as advance notice for these holders, and that a decision affecting their licenses would be taken based on this process (MTIF, 2016). In conclusion, it seems that the government managed to mobilize the essential stakeholders' groups in a satisfactory way, through the use of the consultation process. They also followed the advice of the assessment instruction on the timeframe of an consultation process.

7.3 How were the measures recommended by the Gullestad Committee adjusted/adapted in the design of the TLS?

As elaborated in the theory chapter, an essential part of any public policy is the policy instruments used. Policy instruments are essential because they are the means the government uses to reach the goal of the policy. They are also an essential part of understanding public policy. Howlett (2005) defines a substantive policy instrument as instruments that directly will affect the nature, types, quantities, and distribution of goods and services provided in the society. By using this definition, there can be identified two such instruments in the final design of the TLS, which contains the three levels described by Lascomes & Gales (2008);

Name	Instrument	Technique	Tool
Regulation of area access	Production area regulation	Regulation of production capacity	The borders of the production areas
Regulation of production capacity	Action rule	Environmental indicators	Threshold values

Table 2: Identified substantive policy instrument used in the TLS

The first policy instrument "Regulation of area access" uses a statutory regulation (production area regulation) to facilitate the reduction of uncertainty for the target group (Lascoumes & Gales, 2008). This is undertaken by using the concrete device of regulating production capacity, through the §8-13 in the regulation (MTIF, 2017). These § are operationalizing the regulation by controlling the MAB in the area, and the access through giving or adjusting the MAB. Lastly, it is the tool (borders of the production areas) which defines the areas in which the area access and production capacity are being regulated. This instrument will reduce the actor's uncertainty in their operations. This is in view of the fact that the borders and number of production zones area fixed within the system for the foreseeable future. Based on this the industry actor knows that their production capacity will be regulated based on the action rule instrument within the production zone which they are resident too.

The second policy instrument "Regulation of production capacity" uses an action rule-based system (action rule) to facilitate the reduction of uncertainty for the target group. This is done using environmental indicators, which is the concrete device that operationalizes the action rule. This operationalizing is undertaken by deciding which environmental challenges at a given time becomes an indicator. Lastly, this device uses the threshold values as its tool to decide what effects the indicator will have upon the action rule, which regulates the production capacity.

This instrument will only partly reduce the target groups uncertainty. This since the action rule system that regulates the production capacity, is module based. The system is module-based in the sense that the number of indicators and what challenge becomes an indicator is not fixed. This will change as the environmental challenges' changes, or the rise of new scientific knowledge makes a current indicator obsolete. This setup was chosen so that the system would become a reactive system that "interacts" with its surroundings and updates itself in the face of new scientific knowledge or challenges. However, the use of action rule as a basis for regulating will be fixed for an extended period so in this sense the instrument

reduced the actor's uncertainty and can lead to cooperation between them. The aspect of this instrument that could, however, lead to uncertainty due to the module aspect of it, as the industry actors do not know which and how many indicators that will regulate their production capacity in the long run. Hence, in the future, challenges like escapees or emission could be included as indicators. Let's say that in 20 years, escapees and emissions become indicators, while salmon lice are removed as an indicator. Then during a short amount of time, the farmers must consider two new regulating factors and disregard the regulating factor they have been evaluated against 10 times. Such a shift could have a potentially significant impact on their short and long-term operations.

The two instruments embody the finalized form of all adapted measures from the Gullestad Committee to the TLS, except the measure on the legal process of establishing the production zones. This measure was a prerequisite for establishing the first instrument. Of the two phases this measure regarded, only the first phase on the division of the coast into production zones was approved. This was to be based on scientific criteria, the Aquaculture Act and the Food Act.

The instrument on "regulation area access" embodies the measure on production zones. The production zone and collective adjustment of production capacity were selected and included in the instrument, while the stocking zones and "buffer-zones" was not. The MTIF stated in the hearing note for the Aquaculture Paper that they believed that the stocking zones and "buffer-zones" was not a prerequisite for the establishing of the TLS and was something the industry themselves should adapt over time.

The instrument "regulation of production capacity" embodies the measures of the action rules. The measure connected to the general use of action rule was approved by the MTIF without changing it from the original proposal by the Gullestad Committee. However, out of the three suggested action rules, only the action rule for salmon lice was decided relevant at the time and included in the final TLS. The twofold action rule on production loss and environmental based moving of licenses were partly adopted into the TLS. The action rule for adjusting the production capacity based on the zones production losses was not seen as relevant, while the environmental-based moving of licenses was seen as relevant. The moving of licenses was adopted to be a part of the first instrument. The action rule on salmon escapees and their genetic impact on the wild salmon populations was discarded.

All these measures were endorsed and ratified by the MTIF after the consultation process for the WP nr.16 (Aquaculture Paper). However, the specifics of two of the measures were decided after the last consultation process. First, it regarded the number of production

zones, which was based on the governmental appointed work lead by the IMR after the publishing of the Aquaculture Paper. Second, it regarded the specifics of the environmental-based moving of licenses.

Lascoumes & Gales (2008), Howlett (2005) and Howlett (2014) all stated that the chosen policy instrument creates a concentrated and settled form of knowledge about social control, how to exercise this control and what role the different stakeholders have. The instrument can also say something about the relationship between the state and the interest groups /user groups as seen by the state.

In the case of the TLS, I will argue that the used policy instrument, as presented above says a number of things: 1) that the individual aquaculture company does not possess the ability to handle the different environmental challenges that they face alone, e.g., salmon lice. 2) since point one is true, therefore, the government can force the companies to cooperate by collective adjustment of production capacity in their zone until scientific evidence says that the challenges are at an acceptable level. 3) that the industry actors themselves are responsible for the economic sustainability and lastly 4) the government wants to use knowledge-based regulation over discretional political regulation.

Furthermore, both instruments (regulation of access and production capacity) emphasise mainly the environmental sustainability of the industry. This is because they are based on natural scientific research, with a focus on resource and environmental management and this research is the basis for the political decisions of the TLS. An example of this is how the borders of the production zones were based on a long scientific process (IMR, 2015) where it was the natural division of the coast and not the administrative division of the coast that mattered.

Moreover, the action rule emphasises environmental sustainability since it is based on environmental monitoring of some pre-determined indicators for specific industry challenges. In the case of the TLS, it was decided that only the salmon lice was suitable as an indicator. This decision was based on scientific research and the discussion during the whole implementation process. This indicator's threshold values were not changed after the MTIF presented them in the WP nr.16 (Aquaculture Paper). The MTIF argued and based these thresholds on the quality standard for wild salmon (MTIF, 2014) (The Ministry of Environment, 2013). Lastly, it also emphasises the environment since the indicator is based on measurements done on wild salmonids in the production area as opposed to farmed salmon.

This main focus on the environmental sustainability, placing the economic sustainability onto the industry and the complete lack of focus on social sustainability was, as shown in the results, a substantial criticism from the camp advocating industry development. Today the economic position of the industry is strong, but the industry can be categoriced as a pork cycle industry[40] which varies in economic sustainability. Solås, et al,. (2015) demonstrates this by saying that the industry is cyclic, where periods of good profitability are replaced by periods of weak profitability and direct losses. 16 years ago the lowest salmon price ever recorded was only 2,2 EUR. 28 years ago the biggest crisis in the industry occurred, which changed the industry forever. As a consequence of that crisis, the number of aquaculture companies dropped by almost 50% in just ten years (1990-1999) (SSB, 2017). The production costs has also increased substantially over the last years, and as discussed by Iversen, et al., (2015) this increase is tied to the challenges and regulations tied to salmon lice.

The lack of focus on the social sustainability can pose challenges for the industry and the management. Solås, et al., (2015) particularly points out that this lack of focus is surprising with regards to the municipalities' reduced willingness to allocate areas to the industry, as seen in the results. Solås, et al,. (2015) indicates this a main challenge for the continued exspansion and development of the industry, which regards the social sustainability. The municipalities want more economic incentives, such as wider economic impacts, employment, payment for allocation etc: in order to fulfil the allocation of marine areas that the industry needs for its exspansion.

Lastly, as indicated by the Bruntland commission in 1987, without satisfactory development within the three pillars of sustainability (economic, environmental and social), society will not manage to optain a sustainable development (WCED (1987) as cited in Andreassen, Karlsen, Robertsen, & Solås, (2016)

In conclusion, one can say that the Gullestad Committee proposed a satisfactory groundwork for a new way of managing the aquaculture industry. It changed the way the industry is managed and how the public sees the industry and its responsibilities as producers of seafood. However, these instruments are mainly focusing on the environmental sustainability of the industry. This sole focus might pose a challenge in the future both for the industry and the management.

[40] An pork cycle industry is describing the situation of livestock industris where the supply and prices have cyclical fluctuations. This term together with the cobweb model, which explanes fluctuations in the agricultural markets (Revolvy, 2019), and can explain why the aquaculture industry varies in economic sustainability.

7.4 Was the implementation of the TLS a success or a failure?

As mentioned in the methods chapter, the two common elements analysed when evaluating the success or failure of an implementation process will not be possible to use here. These two elements are the output and outcome of the implementation (Figure 3). These two says something about what has been delivered to the public through the policy (output) and what effects the delivered policy has had on the target group (outcome) (Winter & Nielsen, 2008) (Sander, 2018a). The reasons for this are that the TLS has not been in place long enough that an evaluation of its effect has been conducted. In addition, the focus has been on how the interest/target groups influenced the TLS in the phases of policy formulation, policy design and implementation process (Figure 3). Therefore, as mentioned in the methods, it is first the difference between what the MTIF presented as their approach towards the new management system and what became delivered in the final regulation on the 10th of January 2017 (MTIF, 2017). The reason for focusing on the MTIFs proposal and not the Gullestad Committee is as explained earlier; the Gullestad had no real political consequences for the management. The other focus is to evaluate the process and final design in relation to the interests of the different groups and actors involved in the process and their relative gain or loss during the process.

From the perspective of the MTIF, the implementation process was mostly a success. The MTIF presented their design of the TLS in the WP nr.16 (Aquaculture Paper) (MTIF, 2015). The MTIF wanted production zones with action rules as the basis for the future growth of the industry. Furthermore, they saw only salmon lice and emission as suitable indicators. They suggested threshold values for the salmon lice indicator should be: <10% (green), 10-30% (yellow) and >30% (red). They also suggested to including a general exception rule for adjusting the production capacity mainly to avoid a reduction in the red zone. Lastly, the suggestion of allowing environmental based moving of licenses between several production areas was presented, even though they believed that this should not be allowed.

In the third hearing, the MTIF also proposed that the placement of licenses in the production zone and adjustment of production capacity should happen through regulation. Furthermore, they had no opinion on which alternatives for the specification of the exception rule should be chosen. The only opinion they had was that the evaluation for the rule should be based on counting mature female salmon lice at the facility which the license was linked to, for a specified period. Furthermore, the number of production zones was presented, based on IMR's report (IMR, 2015). The proposition contained 12 production zones. Lastly, they

believed that the Skjerstadfjorden in Nordland should be a geographical exception from the TLS because it is a sound[41] and consequently has special water conditions inside the fjord. (Busch, et al., 2014)

Through the process, the MTIF got acceptance for every proposition except 1) not to include the environmentally based moving of licenses between production zones 2) Skjerstadfjorden as a geographical exception and 3) the proposal for production zone one (Swedish border to Karmøy). This production zone became split into two areas with the border being at Jæren in Rogaland. Hence, for the government, this was a success as seven out of ten proposals were accepted with only minor changes.

As described in the methods chapter, Winters & Nielsen (2008) says that when evaluating the implementation result/process in relation to the interest groups, the interesting thing is the conflict and negotiation game happening. Analysing the implementation process from this view the TLS is neither a success nor a failure. To show this, the three aspects in the policy formulation from Winter's framework (Winter, 2012) will be analysed: 1) conflicts, 2) symbolic policy and, 3) causal theory.

The fundamental conflict which laid as a backdrop during the whole implementation process has briefly been described from the viewpoint of the two camps/alliances in section 7.1. This conflict between industry development and environmental sustainability started long before the Gullestad Committee delivered their report in 2011. However, it became a determining factor in the design of the TLS. This conflict was most visual during the first consultation process. This is because not only were the two sides disagreeing on the presented measures, they did not agree on what the goal the industry should have for its future growth. The industry developers wanted to secure a predictable and flexible system and to protect the diversity in the industry's structure. They also believed that the outlined system would lead to an even more complex management system that would hinder good management, not improve it. On the opposite end, the environmentalists wanted to make the industry environmentally sustainable, and believed that this should also be the industry's, main goal, trumping the economic and social sustainability of the industry. They also believed that the population of wild salmonids in Norway should be better protected and that the industry should do much more to protect these populations.

In the second hearing, the conflict lessened somewhat, as the interest groups managed agreed on the goal presented by the government for the industry in the second hearing. This

[41] A sound is a ocean inlet which is deeper than a bight and wider than a fjord (Wikepedia, 2019)

reduction in conflict could have stemmed from the change in the sender of the propositions from the first to the second hearing. The Gullestad Committee, without any political power, presented the goal and measures in the first hearing. Then in the second hearing, it was the government, which had political power, presenting the goal and measures. In addition, the presented goal contained the wishes of both camps. Therefore, the potential consequences of the second hearing were more realistic, than in the first hearing. This can be especially seen in the massive increase in the number of aquaculture companies mobilised in the second hearing, as presented earlier. The political decisions based on the hearing "locked" the basic design of the TLS. In the last hearing, both camps were dissatisfied with the proposals from MTIF. The industry camp was very sceptical to the legal basis of the TLS, while the environment camp was very sceptical to the proposed limit values for the salmon lice indicator.

The second aspect, symbolic politics concerns situations when decision-makers are more immersed with displaying good intention, ideology or "creating alliances" than actually solving the problems (Sander, 2018b). In the instance of the TLS, there were three cases of symbolic politics: 1) the Solberg cabinet adding of the exception rule and continuation of the proposal of environmental based moving of licenses between production zones, due to their pro-industry development politics. This can be argued to be symbolic politic because the cabinet wanted to display good intention towards, and creating an alliance with the industry rather than more efficiently solve the environmental problem. This was because the exception rule and the environmental-based moving of licenses could undermine the gain of introducing the TLS, as pointed out by the DoF and the FSA, as shown in the result for the last hearing (DoF, 2016) (FSA, 2016).

2) the Solberg's cabinet goal of having a fivefold growth in production of salmon towards 2050 and the need for this growth will be environmentally sustainable.

3) the inherent conflict in the industry's need for flexibility and need for predictability. This might seem solely a paradox rather than symbolic conflict, which the Solberg cabinet themselves pointed out in the hearingnote for the Aquaculture Paper:

> *It is by definition not possible to achive both flexilibility and predictability. One excludes the other. In order to achieve predictability, the policy must essentially be fixed, and the criteria for weighting must be clear* (MTIF, 2014, p. 37).

In the case of the TLS, I would argue that this also is an act of symbolic politics from the Solberg cabinet. This because it seems in the light of the proposals put forward, that the

government wanted to show good intentions by trying to solve two huge challenges that the industry faces in the operations, their need for a predictable system, but also their need for a level of flexibility within this predictable system. They tried to solve this by advocating a system that shows much more predictability in several aspects, like; when the growth will happen, on what criteria it will happen, how much growth there is each time etc. At the same time, they proposed the exception rule for reduction in production capacity and environmental based moving of licensenses between two zones, this despite being warned from the environmental camp that this would weaken the purpose of the TLS.

Lastly, it is important to discuss the aspect of the cause-effect relationship between the goals and the used policy instruments. As seen in the result chapter several interest groups on either side of the spectrum were sceptical to the outlined TLS because of what they saw as a lack of cause-effect relationship between the goals of the TLS and the used instruments. The biggest critique for lack of cause-effect relationship came from those who wanted to secure industry development, as the outlined TLS was based on premature models that were unfinished, untested and were not validation or calibration. This is pointed out by Karlsen, Finstad, Ugedal, & Svåsand (2016) saying that there were some large deficiencies in the model serving as the basis for calculating the salmon lice pressure, especially the consistency in the model's prediction ability.

This criticism came mainly from the interest organisations and industry actors. A second significant criticism was that there existed no scientifically sound basis for claiming that using production zones, as a regulation tool, would improve the control of the salmon lice and secure a more environmentally sustainable industry. This lack of scientific basis is partly admitted by several of the research instituties in the report "Knowledge status as the basis for capacity adjustment in production areas based on salmon lice as indicator". They point out for example that there are several knowledge gaps in the salmon farming's environmental impact on the wild salmonid's stocks in Norway (Karlsen, Finstad, Ugedal, & Svåsand, 2016)

Lastly, another criticism from this group was the MTIFs decisions to adjust the production capacity at the production zone level and by regulation. This decision was seen as weakening the rule of law for the industry actors. The biggest consequence of adjusting the capacity at the production zone level is that by collectively adjust the capacity, the possibility of unfair reduction of capacity can happen.

There is a stark difference between regulation and individual decisions[42] in their public and legal procedure. The biggest is how the target group is legally safeguarded: when using individual decisions the target group has a legal right of notification, access to the procedure papers, the right to demand a good reason for the decision and the right to appeal if the decision is perceived as unfortunate (Mellbye, 2018). On the contrary, when using regulation there is only a need to ensure that the target group gets a notice on the case and opportunity to express their opinion on the regulation matter (Mellbye, 2018). In my opinion, there is not a possibility for an infinite number of actors in the Norwegian aquaculture industry, and therefore no need to use regulation over individual decisions[43][44].

The biggest critique from the environmental organisations and the wild fish interest was that the proposed and approved threshold values for the salmon lice indicator did not align with the threshold values in the quality standard for wild salmon.

Another critique was that the proposed TLS would lead to a state where the whole Norwegian coast would end up becoming yellow. Therefore, the threshold values for the yellow and red area were not sufficient, and this, in turn, would lead to a reduction in wild salmonids population in Norway.

To conclude, the success or failure of implementing the TLS depends on what perspective one has when analysing the process. From the governmental perspective, the process seems like a success, based on the acceptance of a majority of their proposals. Then seen from the interest groups, it was neither a success nor failure. The environmental camp gained a system based on environmental sustainability, although with more flexibility than they wished. The industry, on the other hand, gained the wish for a predictable system, ending the discretional management. However, the system was not to their liking, but in the end, they managed to press for some increased flexibility in the last round.

[42] Regulation is defined as "a decision that concerns the rights or obligations of an infinite number or an indefinite circle of persons" (Ministri of Justice and Public Security, 1970). Individual decision is defined as "a decision concerning the rights or obligations of one or more specific persons" (Ministri of Justice and Public Security, 1970)

[43] There is three reasons for this: First, the number of companies has had a downward trend since 1996 when it was registered 321 companies; in 2017 this number was 82 (DoF, 2017) (DoF, 2009). Second) the price and allocation of licenses before and after the TLS. After 2005 the licensing fee was set to five million NOK[43], then during the first allocation round of the TLS in 2017 the lowest license price for a lic ense was 102.96 million NOK and the highest was 181.74 million NOK (Regjeringen, 2018). Third, the substantial investment cost and time of clear and build a locality (Robertsen, et al., 2016) (Bjørndal, Holte, Hilmarsen, & Tusvik, 2018).

[44] One license contains a MAB of 780 tons or 945 tons in Troms and Finnmark County (DoF, 2017)

7.5 Further research

This thesis has tried to analyse the implementation process of the public policy of TLS using the implementation theory and public policy instrument theory. The thesis has achived this by analysing three consultation processes starting from the Gullestad Committee in 2011 to the MTIFs consultation on how to implement the regulations of the TLS in 2016. However there are several points that need to be further researched:

Firstly, the two consultation processes following the MTIF's consultation on how to implement the regulations of the TLS in 2016 needs further attention. Both processes were in 2017, where the first one was from the 15th of December 2016 to the 10th of January and regarded the industry's need for increased flexibility between production zones. The second was between the 19th of May to the 30th of June and was about some changes to the production area regulation the MTIF wanted to carry out in order to increase the industry's need for flexibility. Both were smaller consultation processes than the three analysed in this thesis but to analyse this might give a wider image of the implementation process of the TLS since both happened before the TLS was initiated on the 30th of October 2017.

Another thing that should be done to understand the implementation process of the TLS better, is to interview several relevant interests which participated in the process. This should be done in order to understand better the different interests' groups view on not only the TLS as a management system but also how they did view the political process and if they view the TLS as a legitimate system and have trust in the TLS.

Furthermore, the other aspects in Winters integradet implemetaion framework, in regard to the TLS, should be analysed. This thesis has mainly been focused on the interest groups and their response to the new management system and the political process of the TLS. Other aspects in the framework like organizational and inter-organizational implementation behaviour, street-level bureaucrats' skills and will/interest should be analysed. Furthermore, the output and outcome should be analysed after the TLS will have its second adjustment now in the summer/autumn of 2019, as this will be the system's first real trial to see if the system works as intended from the government's side.

Lastly, one thing that also should be analysed is the scientific basis on which the TLS system is based on. This is imperative in order to see if there is something to the points of the interest organisations and industry actors. The reason for saying this is because this was one of the main points of criticism from the interest organisations and the industry actors. This is a criticism that must be answered from both the government and the research institutes like the

IMR because these are valid points coming from these groups. If this criticism is answered in a good way, then the TLS might become an excellent regulation system that will develop the industry towards a more sustainable future.

8. Conclusion

The purpose of this thesis was to analyse the implementation process of the new management system in the Norwegian aquaculture industry called the TLS. The reason for this was that this system poses a significant shift in how the aquaculture industry is managed. In addition, during the whole political process leading to the commencement, the system has received considerable criticism. To analyse this implementation process Winter's integrated framework for implementation studies and theories revolving policy instruments were applied.

The in-depth focus on this implementation process was to look at how the interest groups included in the political process affected the design of the system. This has been answered by looking at six measures presented by the Gullestad Committees report from 2011 and how these measures changed due to influence from the different interest groups up until the commencement of the system in 2017.

Typically, when analysing an implementation process of public policy the standard aspects to analyse are the output and outcome of the policy. In the instance of the TLS, this, however, was not possible because the system has not been in place long enough to analyse these aspects. Therefore, two other aspects deemed appropriate to analyse were used. These were 1) difference between the MTIFs policy formulation and the final regulation and 2) analysing the success or failure of the TLS based on the interest groups position.

When adapting these two aspects of analysis, the analysis gave two different results. Using the first aspect of analysis, the implementation process was mostly a success. The government managed to gaine a broad enough acceptance for seven out of ten proposals that were presented in the White Paper nr.16 (Aquaculture Paper). Using the second aspect of analysis, the implementation process was neither a failure nor a success. This is because all interest groups, especially the non-governmental groups, were equally disappointed about the final design of the TLS. The pro-industry development groups got their wish for a more predictable management and the end of discretional use in the regulation. The system however, was in their view, to focused on the environmental sustainability. On the other hand, the pro-environment sustainability groups got their wish for an increased focus on the wild salmonid population in the management. The system however, had in their view, to much flexibility to function as intended.

The TLS seems to be the result of a government that in an attempt to not be viewed as paralyzed in the discussion on the future of the aquaculture industry, commenced a system

that was unfinished and unvalidated which has received considerable critic from several sides. The system's grand trial will happen in the summer/autumn 2019 when the first real adjustment of the production capacity will be made. If the system manages that round and resolves some of the issues that has received a lot of critics, the TLS can become a satisfying system which can lead the industry into the future where it is sustainable in all aspects and becomes a significant and vital industry for Norway.

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