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-Master Thesis-

***“Everyone is just sitting and waiting:
Organisational barriers to sustainability work
in the Atlantic Salmon Farming Industry”***

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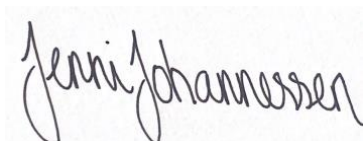
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Abstract

Humanity has become aware of the world's dangers, rapid climate changes, species going extinct, and oceans becoming acidified. The Atlantic salmon farming industry is currently the fastest-growing food sector in the world. However, the activities of the salmon industry use resources from the ecosystem it lays within and produce changes in the ecological system, threatening the natural habitat. Norway is Brundtland's country, with a high profit and a leading supplier within technology development. Nevertheless, the highly profitable industry continues to grow on a non-sustainable path while everyone in the pioneering nation is just sitting and waiting for something to happen. Hence, we were triggered to dig deeper into the industry and determine how major actors reason around stimuli to organisational sustainability work and possible responses.

Through semi-structured interviews and archive data, we have managed to explore real-life cases and identified five major patterns of defence mechanisms: (1) Avoiding Financial risk, (2) Questioning the Need and Forms of Regulations and Measures, (3) Waiting for Technology Development, (4) Complaining about Media Misinformation and (5) Blaming others.

These defence mechanisms inhibit long-term sustainable growth, moral non-sustainable activities, and organisational learning. However, our findings raise awareness of the industry's moral neutralisation techniques, thereby contributing to further research on sustainable development.

“It seems like everyone is just sitting and waiting for something to happen. They are waiting for it to get cheaper or something. So, it really depends on who is first in line.” [Lucas, Fish feed]

I Introduction

1.1 Introduction

The aquaculture industry is currently the fastest-growing food sector in the world, with a continuously growing demand from consumers (Godfray et al., 2010; Gentry et al., 2016). However, the industry's activities use resources from different ecosystems, leading to ecological system changes and threatening the natural habitat (Vassallo et al., 2007). Aquaculture has the theoretical potential to fill in the protein shortage caused by the increasing world population because it is relatively more manageable to a greater extent than traditional farming of land-based meat production (Gentry et al., 2017).

Sustainability became globally relevant after the UN introduced its sustainable development goals (SDGs) in 2015. These goals provide a way for businesses to cherry-pick the goals they want the general public to see. An organisation carefully selects a limited number of goals from a list that are beneficial to them and does not necessarily select the goals that demand change. However, to be genuinely sustainable means not compromising the future generation's needs. For example, a salmon farm is successful when the system only includes by-products that can contribute to the ecosystem and economy instead of waste (Folke & Kautsky, 1992). The discussion shows that the industry has to deal with challenges about complex sustainability far beyond simply proclaiming the product itself is sustainable (Boons et al., 2013).

Moreover, a business is either a part of the sustainability problem or the sustainability solution (Mittelstaedt and Kilbourne, 2008). Either way, businesses have been encouraged to find innovations contributing to sustainable economic growth (Hall, 2002). Researchers seem to agree on significant problems emerging when expanding the salmon farming sector in current and new environments. The most noteworthy are sea lice, pollution, interbreeding, and habitat destruction (Vormedal & Skjærseth, 2019 & Gentry et al., 2016). Currently, 75% of farmed

Atlantic salmon's carbon footprint comes from the feed mainly of imported soy from South America (Archived Data, Hauge, 2021).

Norway, already the largest producer of farmed Atlantic salmon globally and a nation at the forefront of developing technical solutions, presents the opportunity to be a role model in delivering sustainable protein from the ocean to the world (Archived Data, Regjeringen, 2021). In addition, Norway's climate and nature give a competitive advantage, having deep fjords, good ocean currents, and perfect temperatures for Atlantic salmon farming (Archived Data, Regjeringen, 2021). Quoting Bjørnar Selnes Skjæran, Norway's minister of fisheries and ocean policy, from the opening ceremony of Norway day at Expo2020 Dubai (23.02.2022),

"Like few other nations, Norway has the experience, knowledge and technology to lead a sustainable transition within aquaculture."

Sætre and Østlie (2021) describe in detail all of the major and minor problems the Norwegian salmon farming industry has encountered over the years and express anxiety about how the sector will continue to operate. Vormedal and Skjærseth (2019) highlight the inconsistent results of environmental legislation, the competitive benefits and drawbacks for small and large businesses in the salmon farming industry, and how this might impact future market competition and a healthy rate of expansion. Looking at salmon farming as a whole, it is a mystery of how an industry that often adorns itself as a pioneering nation, is not at the forefront of sustainability.

This thesis will explore how major actors in the Norwegian Atlantic salmon farming industry reason around organisational sustainability work and possible responses. We wanted to gain an overall understanding of the industry and included different salmon farming companies alongside stakeholders to seek different opinions and points of view. Accordingly, we used archived data including newspaper articles, tv interviews, reports and books about the salmon

farming industry to enrich our findings. A qualitative approach was used together with abductive reasoning, basing our findings on semi-structured interviews and archival data.

1.2 Research Question

We aimed to understand how the people are working in/ or with the industry reasons around the challenges and opportunities presented by researchers and the government. Therefore, we wanted to investigate sustainability work in the Atlantic salmon farming industry, including salmon farms that work with sustainability and how (some of) the stakeholders are involved (Vormedal & Skjærseth, 2019 & Gentry et al., 2016).

Furthermore, we were intrigued by the impulses and reasoning to become truly sustainable. The following research question evolved as a result of the investigation:

How do major actors in the Atlantic Salmon farming industry reason around stimuli to organisational sustainability work and possible responses?

1.3 Outline of Thesis

Firstly, we will examine existing literature on the field of sustainability work in organisations, sustainability work in the salmon farming industry and innovation and learning for sustainability change. To make it easier to understand what we already know about the origin of our study and answer our research question. Secondly, we will present our research method, including research setting, design, data collection, sampling, data analysis, quality of the data, and ethical considerations in our study. Thirdly, our main findings from the analysis will be presented and discussed. Here we will introduce patterns of five major defence mechanisms identified. Lastly, we will summarise the findings and

further discuss our findings in the light of the theory and contribution to the theory. Limitations and recommendations for further research will also be addressed.

II Theoretical Foundation

2.1 Introduction

Our thesis will investigate how major Atlantic salmon farming actors reason around stimuli to organisational sustainability work and possible responses. In order to do so, we will examine theories and definitions of the broad term sustainability and sustainability in organisational studies. The theoretical foundation is threefold. First, the field of sustainability work in organisational studies, including Corporate Social Responsibility (CSR) and UN's sustainable development goals (SDGs), to build a foundation for our investigation and to truly understand the complexity of the term.

Second, sustainability work in the salmon farming industry. Considering sustainability is a broad term, we strive to define it for both the organisational context and the Atlantic salmon farming industry.

Third, innovation and learning for sustainability change, including theories about Sustainability Oriented Innovation (SOI), Design Thinking (DT), Sustainability Maturity Model by Kane (2011) and Organisational Learning. These theories provide us with tools to investigate how participants work with sustainable innovation and development.

2.2 The Field of Sustainability Work in Organisational Studies

Over the last 50 years, humanity has become aware of the danger humankind has put the world in, rapid climate changes, species going extinct, and oceans becoming acidified. Unfortunately, these are severe problems that humanity is unprepared for and unfamiliar with solving (Ergene et al., 2021).

Sustainability is a term that has been and still is diligently used worldwide by the general public, business and academia (Jarzabkowski et al., 2021). It has been a popular term since first presented in the Brundtland report, released in 1987. The Brundtland report highlights environmental protection, economic growth and social equity, where sustainability is defined as “*development which meets the needs of the present without compromising the ability of future generations to meet their own needs.*” (Archived Data, WCED, 1987).

Most people want the same opportunities as their parents and pass these opportunities to their children. The same logic also applies in business; most managers want their business to be as profitable or even more profitable as it was in the past and want it to grow in the future (Bansal & DesJardine, 2014). In order to define *business sustainability*, Bansal & DesJardine (2014) build on Brundtland’s definition; “*the ability of firms to respond to their short-term financial needs without compromising their (or others’) ability to meet their future needs*”.

However, the complexity, particularly the ability to enable intra-organisational activities, processes, and management agency, is poorly understood. We need to understand that sustainability work is impossible to generalise. It is a term that acts as an umbrella because it consists of mediating agents within identity and social-symbolic context (Williams et al., 2021).

Looking further into existing literature, researchers have created numerous definitions. In conclusion, the term has different meanings for different people (White, 2013). Gimenez et al. (2012) write that the mentioned definition of sustainability lacks guidance on identifying current and future needs and solving and dividing responsibility between stakeholders. Further, researchers agree that sustainability can be divided into three pillars; social, economic, and environmental (Moldan et al., 2012). Elkington (1998) first defined these three pillars as “*triple bottom line*”, a more profound development of the term sustainability, which considers and balances the three pillars from a microeconomic point of view. The triple bottom line concept states that firms

have to engage in responsible social and environmental behaviour and simultaneously ensure the process provides positive financial gains (Gimenez et al., 2012).

Even further, Ergene et al. (2021) add a fourth dimension to sustainability, the political aspect. They present that the world needs these sustainable changes because it is a product of former political and economic practices exploiting the environment to benefit a few. Also, the current political economy is an obstacle when implementing sustainable development or innovation. Hence, politics is based on competition, shareholder wealth, and consumption-based economic growth (Ergene et al., 2021).

Although the worst effect may be more than 50 years away, time is central to the sustainability concept. Experts believe there is an urgent need for society and corporations to act quickly to avoid potentially damaging long-term effects. Climate change, therefore, requires a multifaceted view of time, which is challenging for companies that are pressured to think short-term. Researchers claim that the long lag between climate action and its effects has prevented companies from dealing with climate change (Slawinski & Bansal, 2012).

Regardless of the uncertainty associated with climate change, corporations that connect the past, present, and future are more willing to make long-term investments, which means that making connections in time can alleviate some of the uncertainty associated with long-term problems (Slawinski & Bansal, 2012). Williams et al. (2017) suggest that managers can benefit from an enhanced understanding of the dynamic interaction within and across interconnected systems to address societal issues such as climate change adequately.

2.2.1 CSR - Corporate Social Responsibility

The difference between CSR and business sustainability may be confusing, given that society's time scales are longer than those of business. Acts of CSR,

such as philanthropy or community volunteering, create value for both business and society in the short run but do not necessarily sustain the viability of micro- and macro-systems in the long run (Bansal & DesJardine, 2014).

However, some activities are either responsible or sustainable, but not both. Short-termism can be defined as "*decisions and outcomes that pursue a course of action that is best for the short term but suboptimal over the long run*" (Lavery, 1996, p. 826; Bansal & DesJardine, 2014). However, scholars argue that CSR represents the set of organisational activities good for society *and* the firm (McWilliams and Siegel, 2001; Bansal & DesJardine, 2014).

2.2.3 SDG - Sustainable Development Goals

The United Nations (UN) uses sustainable development in its sustainable development goals (SDGs) plan. The SDGs consist of 17 specific goals and 169 targets that should be reached by 2030 (Archived Data, UnFoundation, 2015). The SDGs are supposed to be guidelines for problem-oriented research to create a better future for the next generations (Howard-Grenville et al., 2017). Since these goals were presented, companies in all industries have begun to incorporate one or more goals in their sustainability reports. Companies utilise SDGs to show other companies, media and the general public how they work with sustainability and want to continue sustainable development in the future.

However, it is crucial to take a step back and consider the definition of sustainability to cultivate the relevant connections between business activities and the large ecosystem organisations are a part of (Jarzabkowski, 2021). In addition, Howard-Grenville et al. (2017) question how realistic the bold agenda of the 17 goals are, given that it requires a bold transformation from the current state (Howard-Grenville et al., 2017). When a firm focuses on only a few goals, they often target goals they are already strong at in order to improve the company's image and develop public trust. Other goals which could be more urgent for that company to work with can be overlooked.

2.3 Sustainability Work in the Salmon Farming Industry

Sustainability within the aquaculture industry is an emerging field of research, reasoned in the predicted rapid growth of the world's population, and its increasing need for protein. In order to meet the growing protein demand, aquaculture is an attractive solution because currently, only 3% of the food consumed in the world comes from the ocean, and the potential is significantly higher (Boyd et al., 2020; Gentry et al., 2017; Olesen et al., 2010; Archived Data, Tveterås et al., n.d.).

Aquaculture does not only present an enormous potential in production capacity but also concerns sustainability. Protein from the ocean has the competitive advantage of using fewer resources than protein produced on land (Boyd et al., 2020; Gentry et al., 2017). The carbon footprint from farmed fish is already 7,3 times lower than beef and 2,9 times lower than lamb. Also, area usage for farmed fish is 44 times less than lamb and 39 times less than beef (Ritchie & Roser, 2020). Therefore, aquaculture is already an industry preferred to develop further than protein sources from land.

In the last two decades, global aquaculture enterprises have shown a booming increase in production while simultaneously achieving the three pillars of sustainability; environmental, economic, and societal (Boyd et al., 2020). Specifically, the aquaculture industry in Norway has shown to continue reducing carbon footprint, use of freshwater and land resources, and improve feed, species, and the development of new technology and farming practices (Tveterås, 2002). In contrast, Taranger et al. (2014) state the opposite, that the rapid growth of the aquaculture industry has *not* developed in the right direction considering sustainability, and that there is a need for a deeper understanding of the ecological effects such that more precise predictions can be developed.

Tarangers statements, alongside the aquaculture industry's rapid growth, have raised other environmental concerns. The concerns that are repeated in the literature are impact on the wild stock, pollution, fish welfare, diseases, use of

medicines, habitat destruction, interbreeding, and even scrutiny from media (Gentry et al., 2016; Olesen et al., 2010; Tveterås, 2002; Sætre & Østlie, 2021). This has further led to a growing number of national and regional authorities engaging in spatial planning processes and encouraging researchers to give more comprehensive scientific guidance (Gentry et al., 2016).

Furthermore, Sætre and Østlie (2021) illustrate in their science-based book how poor fish welfare has historically been and continues to be. The book is sensational and sheds light on the backside of the seemingly fairytale of the industry. They highlight how humanity tried to tame a muscular fish, fit to swim long distances, combat arising issues with salmon lice, getting salmon into new markets and customising the nutrients. How farmers have attempted several solutions to combat salmon lice, including chemicals, lasers, and rinsing the fish in boiling water, to the point that the salmon were deformed, infertile, and many died. How a different breed of fish, lumpfish, was brought inside the cages with salmon to eat salmon lice, but the lumpfish death rate was close to 100%. They also include fish feed and how they present colour charts to breeders, ensuring the farmed salmon got the same colour as wild stocks, just to be more desirable in the market (Sætre & Østlie, 2021). Therefore, you could claim that the industry's rapid expansion has many dark sides. If the industry continues at the same pace, stricter regulations and measures must be in place to be sustainable.

A successful aquaculture system should only have by-products as positive contributors to the surrounding ecosystems and the economy (Folke & Kautsky, 1992). In order to continue and ensure sustainable growth in the aquaculture industry, it is necessary to understand how aquaculture interacts and affects the value, health, and productivity of the surrounding ecosystem. It will also necessitate quantifying and reducing impacts through scientifically proved spatial design. Gentry et al. (2016) argue that limited direct guidance is available in the present literature. Olesen et al. (2010) state that new approaches to guide research are necessary to identify ethical issues and engage stakeholders to resolve the current challenges.

Norway is currently the largest exporter of farmed Atlantic salmon in the world. It all started with wild salmon capturing in 1970 and has been at the forefront of farmed salmon's rapid growth. Now 90% of salmon produced in Norway is farmed (Vormedal & Skjærseth, 2019). Reports from the Norwegian government and numerous salmon farming companies show that the industry is working purposefully towards an even steeper growth in the near future, highlighting that it is possible in a sustainable manner (Archived Data, Regjeringen, 2021).

The industry is ready, but the lack and need for clear regulations is a major problem in developing new ways and technology within the aquaculture industry. The ministry of Fisheries and coastal affairs has demanded further scientific research and coastal monitoring efforts to develop the industry's environmental impact at an acceptable level (Taranger et al., 2014).

However, the need for these strict regulations is necessary. It will most likely only benefit the larger actors in the Norwegian aquaculture industry because they already have a stable high profit and resources to adopt new regulations quickly without harming the business. Smaller actors are essential in serving jobs and economic growth in remote areas, but they do not have the competitive advantages compared to the larger actors (Vormedal & Skjærseth, 2019). Larger actors have dynamic capability scale economies, flexibility in production, and technology frontrunners, making them qualified in the competition for government permits.

In 2017 a significant regulation system was implemented in Norway, called “*the traffic light system*.” This system divides the Norwegian sea into 13 production areas, where infection pressure of sea lice on wild salmon stocks is measured on a biannual basis. If an area gets a “*green light*,” it can be awarded a capacity increase. If “*yellow light*” the area can maintain production capacity, and “*red light*” areas get punished and must reduce capacity (Vormedal & Skjærseth, 2019).

Regarding the future of salmon farming, many projects of entirely new

types of salmon farms are currently under development. These new farms are developed due to solve problems traditional cages have shown with production capacity, influencing wild stocks, salmon lice and how it affects the ecosystem inside the fjords (Archived Data, Regjeringen, 2021).

Salmon farming offshore is one potential future solution to salmon farming that is currently being tested. Offshore farming of salmon appears to have advantages such as fewer spatial conflicts, a higher nutrient assimilation capacity, lower biological risk, and a larger production area (S. Malterudbakken et al., personal communication, February 2022; Gentry et al., 2017). Malterudbakken et al. (2022) claim that within 2040 there could be more than one hundred offshore salmon farms in Norway.

Another potential type of salmon farming is moving the farms on land. Land-based salmon farming presents the advantages of eliminating water pollution, improving freshness and safety and the issue with sea lice. Introducing a factory on land can also reduce shipping costs, as the farms could be placed anywhere in the world, not dependent on perfect conditions in the sea for salmon to grow (Archived Data, Summerfelt & Christianson, 2013).

The last new type of salmon farming under development and testing is closed cages close to shore. A study conducted by Nilsen et al. (2020) concluded that closed cages provide improved growth rates and welfare alongside having a low mortality rate and being easier to prevent infestation of salmon lice. The issue with these farms is that they compete directly with traditional production. The reason for still developing closed cages is an expectation that new regulations and licences will benefit this type of development (S. Malterudbakken et al., personal communication, February 2022).

Furthermore, the Norwegian government has started evaluating areas and frameworks for salmon farming, now also off-shore and on-shore. However, these large-scale farms are relatively new with significant risks. Careful research is needed to succeed in this seemingly ample opportunity (Gentry et al., 2017).

2.4 Innovation and Learning for Sustainability Change

The term *sustainable development* relates highly to sustainability, but some differences can be found. The fundamental base is identical to sustainability. However, sustainable development is a concept where humans are the main reason for concern and need to make sure their life and everything within it is healthy, productive, and, most importantly, in harmony with the environment (Moldan et al., 2012). It is a concept that, in short, represents a diversity of everything from local to global efforts based on human needs and not destroying or degrading the environment (Robert et al., 2005; Elleuch et al., 2018).

The triple bottom line: economic, environmental, and social sustainability, can also be continued for sustainable development. When it comes to sustainable economic development, a firm needs to operationalise production- or manufacturing costs. Environmental sustainable development includes using resources and companies' footprint on the environment their operations leave behind. Within this development, companies work with waste, pollution, and emission reduction and use energy more efficiently or switch to other types of energy. The last of the three, is socially sustainable development, which promotes the development of companies to provide equitable opportunities, encourage diversity, and for countries to develop accountable governments providing democratic processes (Gimenez et al., 2012).

Given the definition of Anthropocene, “*a geological period characterised by a dominant human influence on the function of the ecosystem. A direct result of a political economy that privileges wealth accumulation at the expense of environmental destruction*” (Ergene et al., 2021, p.3). We have never faced an environmental problem such as the Anthropocene in the past. The field of sustainability has a forward-looking focus, only looking at the solutions instead of looking back and paying attention to the origin of the issues that produced the crisis. Ergene et al. (2021) state that sustainability is practised in a highly political and economical manner, limiting thinking, or acting outside existing approaches.

The world is limited in raw material extraction, energy use, consumption, and waste release. Furthermore, the current economy is dominated by capitalism, profit, and economic growth, which cannot deliver a liveable world in the future (Ergene et al., 2021).

Therefore, we are desperate to address the real concerns of the Anthropocene and create new ways of thinking and living, asking different questions, and going beyond market-based interests. In the future, collaborations across stakeholders and disciplines and a real worry about the world's health should be the solution (Ergene et al., 2021).

Ergene et al. (2021) claim that the sustainability challenge is fundamentally political, and if we do not find new ways to relate to the natural world, *“We will run the risk of becoming the only species on the planet that is sufficiently intelligent to recognize our own imminent demise, but too foolish to prevent it”* (Ergene et al., 2021, p. 22).

2.4.2 SOI - Sustainability Oriented Innovation

Sustainability is an increasing term used by researchers, companies, and media. Business models have therefore seen the need for change. Traditionally, businesses have been mostly concerned with value creation. However, with the world rapidly changing, firms now need to find new ways of creating and capturing value for stakeholders (Spieth et al., 2014). The importance for firms to create, redesign, adapt and diffuse environmentally sound technologies is already pointed out (Klewitz & Hansen, 2014). Using innovation ensures sustainable development since it poses questions concerning sustainability and structural reconfigurations of firms. It is also important to note that innovation is only positive regarding sustainability if the needs of society, economy, and environment are met (Burget et al., 2016).

SOI is about changing philosophy and values, products, processes, and practices to realise the social- and environmental value and economic returns

(Adams et al., 2016). Furthermore, SOI is a part of a larger innovation of the system. It is influenced by technological progress, market forces, government regulations and non-governmental organisations (NGOs), societal initiatives, and the media (Buhl et al., 2019). SOI differentiates from other types of innovation when it comes to direction and purpose (Adams et al., 2016).

For businesses to foster SOI, two approaches can be used, either “*doing what we do, but better*” or “*doing what we do, but differently*” (Adams et al., 2016). The value proposition, value creation, and distribution of costs and benefits are three aspects Boons et al. (2013) stated vital for a business model to include when creating SOI. Further, outside actors like governments, civic society, and NGOs must be involved to achieve sustainability. It is, therefore, necessary for management to have good networking skills (Wu et al., 2015). Involving other stakeholders in an innovation complicates the process since different stakeholders may have different objectives and needs for sustainability (Cillo et al., 2019).

The goal of SOI is to create a win-win situation, making sure there is possible economic growth and sustainable development simultaneously. We also need to focus on values and behavioural change in society. This goes beyond creating new technology by changing markets, user practices, policy, culture, and governing institutions (Geels et al., 2008). Because SOI should be characterised as a society pull, where society decides the goals of economy, ecology, and society and how they will be met (Vollenbroek, 2002). It is important to note that SOI is supposed to be innovations that are sustainable for decades, and not short-term solutions (Geels et al., 2008).

Lubberink et al. (2017) state that private industry has the greatest basis for finding and developing innovations and solutions for this problem. In the last decade, research has also generated knowledge of how important contributors to small and medium-sized enterprises are to SOI (Klewitz & Hansen, 2014). Moreover, the Norwegian government stated that research, knowledge- and technology development are crucial to increasing overall production in a sustainable manner (Archived Data, Regjeringen, 2021).

To ensure further development of SOI will require massive efforts and significant investments. The reason for needing large investments is that sustainable technologies tend to be more expensive, have lower performance, low legitimacy, insufficient competencies, and lack political clout compared to other types of innovation. This creates the problem of SOI being what the collective good needs, but costs affect individual enterprises (Geels et al., 2008).

2.4.3 DT - Design Thinking

Design Thinking, DT, is defined by Elsbach & Stigliani as “*an approach to problem-solving that uses tools traditionally utilized by designers of commercial products, processes, and environments*” (Elsbach & Stigliani, 2018, p.2274). DT addresses human needs, including concerns about social sustainability and a possible approach that could help create such solutions and contribute to the SSD - *Strategic Sustainable Development* (Shapira et al., 2017).

Brown & Wyatt (2010) claims that DT gets beyond assumptions that block effective solutions by getting consumers' insights and rapid prototyping. Businesses embrace DT because it enhances innovation, differentiates brands, and introduces products and services faster to the market (Brown & Wyatt 2010). By crossing traditional boundaries between public, non-, and for-profit sectors, DT works closely with clients and consumers, allowing high-impact solutions from the bottom-up rather than the top-bottom approach (Brown & Wyatt, 2010).

DT focuses on human-centeredness, meaning that human needs, practices, and preferences are at the centre of the design process. Although sustainability's popularity has recently increased, DT does not include sustainability unless it is the user's preference (Shapira et al., 2017, p. 278). However, Shapira et al. (2017) believe that by including purposeful innovations that move the DT process in a more sustainable path, anyone can be a part of developing a sustainable future and possibly become a leverage point for participation and transformation (Shapira et

al., 2017, p. 286).

Additionally, design thinkers' characteristics are abductive reasoning, meaning "wondering how something might be done differently or made better" (Berger, 2009; Lefebvre & Kotler, 2011). Furthermore, Lefebvre & Kotler (2011) states that DT has become a "force" for bringing forward practical solutions for new social and organisational systems. This is similar to the approach Adams et al. (2016) claim that businesses need to foster SOI. DT helps foster SOI in firms by helping to reduce the risk of innovation failure because of its human and stakeholder focus on meeting actual needs. This is relevant for firms because innovations that do not meet the actual needs of consumers and stakeholders lead to a waste of energy, material, and financial resources. Nevertheless, DT is often overlooked and not used by firms when addressing sustainability challenges (Buhl et al., 2019).

2.4.4 Sustainability Maturity Model

Kane (2011) defines sustainability maturity practices in organisations using five stages. The model is a framework organisations can use to figure out where they currently are, and how to further develop in a sustainable direction, where the goal should be to reach full integration in every part of the organisation.

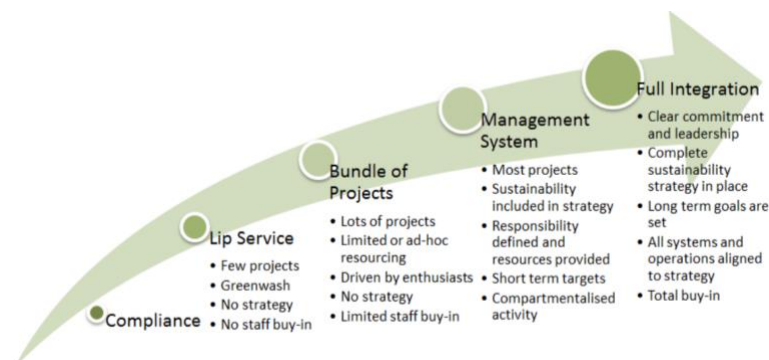


Figure 1: Sustainability Maturity Model Based on: (Kane, 2011)

Compliance is the lowest stage of sustainability maturity, where organisations that fit in this stage do not proactively work with sustainability. Organisations in this stage will suffer financially trying to keep up with new green regulations, laws and taxation, also falling further behind when customers demand and choose greener products.

The next stage, lip service, is where organisations have taken a small step in the right direction. They usually have some green projects they are working on, but are usually called “greenwashing”. According to Delmas & Burbano (2011), "greenwashing" occurs when businesses mislead consumers about their products or services by claiming that they are more sustainable than they truly are. This stage could be viewed as worse than compliance, since employees are cynical and unaware that they are deceiving themselves into believing they are doing the right thing for the environment.

Third stage, a bundle of projects, is where some of the employees of a firm start green projects, usually without a strategy. In the short term, this is a step in the right direction toward full integration. Continuing at this stage in the long term may work for smaller firms; however, improvements will be minimal for larger firms and might not cover key issues.

The fourth stage, management systems, is when an organisation has a framework, clear objectives, action plans and monitoring results. This creates an understanding of sustainable work for employees, and responsibility is divided within the firm. The issue at this stage is how employees perceive these changes with new systems, documentation, and meetings because they still believe it is only formality and someone else's job to care about sustainability within the firm.

The last stage, full integration, is where sustainability is integrated through the whole organisation. This implies full integration in core functions and processes and simultaneously having all staff and stakeholders on the same page. At this stage sustainability is a norm, not an exception.

An important note is that this model is just a simplification of reality. It is not necessary that an organisation will fit precisely into one of the five stages, one

could have traits from different stages. It is also possible for organisations to skip stages when improving their sustainability work, and do not have to follow the stages in order. Hence, the model serves as a tool for organisations to evaluate where they now are and how they may progress to achieve full integration.

2.4.5 Organisational Learning and Sustainability

According to the literature, an organisation's ability to learn successfully is crucial to foster a culture of sustainability (Nattrass & Altomare, 1999; Senge et al., 1999; Senge&Carstedt, 2001; Jamali, 2006, Crews, 2010, Dess et al., 2019). Kane (2011) states that to be at the forefront of sustainability, the company must keep trying, learning, and going (p. 241). Therefore, we turn to organisational learning theory to better understand the characteristics that enable organisations to implement sustainability initiatives.

Argyris (1977) defines organisational learning as *“a process of detecting and correcting errors. Error is for our purposes any feature of knowledge or knowing that inhibits learning”* (p.116). Furthermore, Argyris and Schön (1996) highlight the action aspect of organisational learning and define it as a process that contributes to improved actions through increased knowledge and understanding (Argyris & Schön, 1996).

Argyris and Schön (1996) also emphasise the importance of learning in organisations, stating that since the mid-1990s, there has been a considerable increase in understanding about the relevance of learning and competitiveness. *“(..) business firms, governments, nongovernmental organizations, schools, health care systems, regions, even whole nations and supranational institutions need to adapt to changing environments, draw lessons from past successes and failures, detect and correct the errors of the past, anticipate and respond to impending threats, conduct experiments, engage in continuing innovation, build and realize images of a desirable future.”* (Argyris & Schön, 1996, p. xvii). Due to the

increased focus on sustainability, organisational learning is an essential aspect in achieving sustainable organisational performance in a rapidly changing business environment.

Argyris & Schön (1996) distinguishes between two different levels to learn; single-loop learning (SLL) and double-loop-learning (DLL), and emphasises that DLL is necessary to be a learning organisation. SLL addresses the visible problems in an organisation but does not necessarily address the underlying factors that lead to the problem in the first place. In contrast, DLL goes deeper and looks at the governing values for the actions (Argyris, 1977, Argyris & Schön, 1996).

When the focus is goal achievement, SLL is commonly used in organisations. However, by first learning, the theory of DLL introduces a certain level of openness into organisations. As changing the governing values is necessary to correct an action, learning a new theory of use is required. When the result of the action does not correspond to the expectation, the process of thinking and acting in a new way begins. Attempts to solve a problematic situation often generate new sources of surprise (Argyris & Schön, 1996).

As organisational learning enhances knowledge and understanding, the intention is to highlight the need of establishing a sustainable loop of learning within the organisation itself.

III Research Methodology

3.1 Introduction

This section of the paper covers the approach utilised when outlining our empirical process, which is essential for providing quality and an understanding of the choices we made. During the research process, several decisions had to be made to eventually find a suitable way to explore our chosen topic of interest. First, we will start by describing the process of our research setting and the choice of abductive reasoning and explanatory qualitative research method. Second, we will present the approach of data collection, which is tightly interwoven with our data analysis. Third, we will utilise the choice of snowball-sampling technique, present our participants and the quality of our research, followed by ethical considerations.

3.2 Research Setting

The Salmon Industry in Norway is divided into three sectors; sea- and river fishing for wild salmon, salmon farming, and aquaculture (Liu et al., 2011). The sectors have different traditions, interests, practices, and administration. Either way, they all have identical product supply, income, and employment creation (Liu et al., 2011). Our research has been limited to Atlantic Salmon farming in Norway.

Our original plan for the master thesis was to deep dive into the motivation for sustainable actions and impulses within the Atlantic Salmon farming industry in Norway, and how this had changed over time. Looking at two companies; one company developing technology for aquaculture and one well-established salmon farm, which had partnered up on a large sustainable project. Unfortunately, they decided to end the partnership a few weeks before we started with the interviews.

However, we had already begun to analyse archival data, which aroused our curiosity about the mystery of sustainability in the salmon industry. As a result, we sought to examine the industry as a whole, including the reasoning, stimuli, and responses to sustainability.

Therefore, we preferred to include a wider variety in our sample in order to address our research question properly. The purpose was to examine if there are any similarities across different stakeholders. Therefore, we chose to use our network and further broaden our research question to “*how do major actors in the Atlantic Salmon farming industry reason around stimuli to organisational sustainability work and possible responses?*”

3.3 Abductive Reasoning

Traditionally, researchers are facing a dilemma between two types of reasoning, inductive or deductive, before proceeding with the appropriate approach to continue with. Deductive reasoning refers to research that takes a specific topic and generalises it. It explores known theories in given circumstances for validity. Meanwhile, inductive reasoning is when researchers observe or generate meanings from a dataset and identify patterns to create a theory (Dudovskiy, 2016).

However, inductive and deductive reasoning have weaknesses, which are addressed by the third way of reasoning, namely abductive reasoning. Abductive reasoning is similar to inductive and deductive reasoning, in which all three types aim to make and construct theories but differ by adopting a pragmatist perspective. Abductive reasoning is choosing the most suitable explanation among different alternatives to describe what researchers have found on the topic at the beginning of the research process. Results from abductive reasoning do not claim to be the final truth about the researched topic (Dudovskiy, 2016).

In order to investigate the Atlantic salmon farming industry and how different stakeholders reason around stimuli to organisational sustainability work

and responses, we will use abductive reasoning. We choose abductive reasoning as the most appropriate way of exploring this topic because it allows us to move back and forth between theory and the current time and also allows us to create interpretations of the data gathered. We aim to present the “best” understanding of our observations.

3.4 Research Design and Data Collection

In this thesis, we focus on exploring and understanding real-life situations rather than confirming and quantifying them. We conducted qualitative research as part of our search strategy to study underlying reasoning, stimuli, and possible responses around sustainable work (Bell et al., 2019).

According to Yin (2014), there are three research design approaches: exploratory, explanatory, and descriptive. The aim is to investigate how major actors in the Atlantic salmon industry reason around sustainability changes and the most important impulses for sustainability work. Hence, we recognize this to be explanatory research.

The data collection and analysis started simultaneously, due to the circumstances of the companies that opted to quit collaborating. Also, we started with data collection and analysis until a research question emerged and enabled our theoretical contribution (Sacks, 1992; LeBaron et al., 2016).

We divided the data collection into two categories: interviews and archival data collected by others. We collected data by switching back and forth between interviews and archival material, which allowed us to create interpretations of the data gathered and the flexibility to gain a deeper understanding of our observations and enrich the research (Cowton, 1998). We closely examined the participants' reasoning and explanation instead of focusing on what was expected (ten Have 2004; LeBaron et al., 2016).

3.4.1 Interviews

The research design included semi-structured interviews, where we asked open-ended questions that led to a discussion rather than formal questions. We created an interview guide to ensure that particular topics were covered throughout the interviews without interrupting the natural conversation and connecting (see Appendix 3). Allowing the participants latitude in responding (Bell et al., 2019). Following Bell et al. (2019)'s recommendations, the interview guide has constantly evolved and developed throughout the interviews. The interview example inspires the interview guide from the lecture about interviews in GRA2243 Research Methodology for Organizational Behavior with Arne Carlsen, February 24th, 2021 (Spradley, 1979; Mishler, 1986; Holstein & Gubrium, 1995; Kvale, 1996; Kohler Riessman, 2008; Czarniawska, 2014; Rhodes & Carlsen, 2018).

Because of the Covid-19 situation, the interviews were conducted online. We used the platform Zoom or Microsoft Teams, depending on the participant's preference, to make them as comfortable as possible. Zoom and Microsoft Teams include a video function that lets us see each other during the interviews.

Instead of focusing on taking notes, we recorded the interviews with the participants' consent, allowing us to be fully present in the conversations and guide the discussion toward the major topics. After the interviews, we transcribed them to ensure we did not miss any content. Furthermore, reviewing the video recordings afterwards improved the quality of the interviews by identifying areas for improvement for the next interview.

We conducted 13 interviews and one follow-up conversation with one of the participants to expand and confirm the findings. The duration of the interviews ranged from 30 to 60 minutes, depending on the respondent's relevance and availability.

3.4.2 Archived Data

We also included archived data to examine the responses and reasons around sustainability work in the Atlantic salmon farming industry. Since we gathered data in a limited period, looking at previously collected data for other purposes and reusing it for our research enabled us to go back and forth between interviews and archived data to enrich our knowledge (Hox & Boeije, 2005). This gave us a more holistic understanding of the industry, which we could subsequently categorise and apply in our thesis.

When collecting archived data regarding the research, we viewed public interviews, industry analysis, public articles, books, and public documents from major companies in the industry, such as sustainability reports.

In addition, the references are separated into two sections, with archived data on a separate reference list to distinguish between interviews conducted by us, and archived data collected by others. The in-text citation will specify if the reference is on the archived data reference list.

3.5 Sampling

When selecting participants, we applied the *snowball sampling technique*, which is a purposive sampling strategy (Patton, 2002), where we initially sampled a small group of people, we found relevant to the research. The aim was to get hands-on thoughts from people working in the Atlantic salmon farming industry, as well as relevant stakeholders. We already had contacts within a firm working with aquaculture technology development, which ended up being our “first group” to interview. Further, we asked them to propose other participants with relevant experience or characteristics for the research. Then these participants suggested other people they found relevant, and the “snowball” began to roll. Names that were mentioned repeatedly by several participants took on particular importance (Patton, 2002). However, even though the Atlantic salmon farming industry is

large in Norway, with many employees, we struggled to get in touch with salmon farmers. Even when we contacted people in our close network or the people our participants suggested, they did not respond when we mentioned "sustainability in the salmon industry."

In addition to interviewing salmon farmers, it is also essential to consider the operation and valid economic answers to all involved parts in the system (Vassallo et al., 2007). Therefore, we wanted to include how various stakeholders, such as politicians, salmon feed producers, and industry technology developers, reason around stimuli to organisational sustainability work and possible responses.

3.5.1 Participants

13 people participated in this study, and consisted of a variety of positions and connections to the Atlantic salmon farming industry which we categorised into four groups: salmon farmers, politicians, fish feed and technology developers. Whereas five employees were from salmon farms, two from fish feed companies, three politicians and three technology developers. All of them are from different companies, except for two within technology development, namely Sophie and Eric, whereas Sophie is newly retired.

To make the assignment more personal and provide a more comprehensive overview of the results, all names are fictitious to disguise the identity of the participants. Likewise, we have divided them into groups rather than company names. Furthermore, we kept the gender in case of replicability in future research. We also included the participant's role to provide an impression of the sample distribution. Unfortunately, despite our plan to interview several people within the same organisation, we were unable to do so due to a lack of responses. However, we are pleased with the mix of regular employees and sustainability employees, as well as interviews with major actors. Also,

stakeholders within technology, feed and politics, due to the political aspect of sustainability and the focus on SOI.

Table 3 Participants

Name	Role	Group
Adam	Board Member	Salmon Farm
Karen	Sustainability Coordinator	Salmon Farm
Jack	Head of Feed and Sustainability	Salmon Farm
Philip	Process Operator, Aquaculture	Salmon Farm
Sara	Former Aquatic Technician	Salmon Farm
Lucas	Subject Specialist	Fish Feed
Michael	Manager of Sustainability and Public Affairs	Fish Feed
Fredrik	Former County Group Leader	Politics
Thomas	Senior Consultant within Aquaculture	Politics
Peter	CEO in a Inter-Municipal Council	Politics

adhered to the same topics during each interview, even though the conversations varied (Bell et al., 2019).

As a result, we conducted interviews, read theories, and found relevant archived data as part of our data collection and analysis processes. As our knowledge grew, we were able to alter the course of the interviews. Even though our interview guide was modified, the adjustments were minor and were made solely to improve the questions' clarity and relevance to our research subject.

When coding, Bell et al. (2019) recommends that you code as rapidly as possible in order to obtain a thorough comprehension of the data material and avoid being overwhelmed by the volume of data. We transcribed the interviews together to ensure that we got everything before moving on to archival data and other theories. We were better able to comprehend the interviews since they were written down, and we could read them repeatedly and get the most important information and comprehend contexts.

Furthermore, some sections of the data material may fall into many categories (Bell et al., 2019). Coding is a term used to describe and compare the actions that constitute the continuous comparative (Dey, 2007, p. 169; Locke, 2001, p. 47). We classified the citations from the interviews and discovered five major patterns. Bell et al. (2019) claim that coding is helpful in getting an overview and dividing the data with common features into categories. Additionally, coding should not be confused with analysis because coding is simply one component of the analysis (Bell et al., 2019). Therefore, we discovered more archived data to strengthen and validate our conclusions.

We worked through the various data analysis in cycles, filling in gaps and changing theories based on interviews and archived data, until a research question emerged, allowing us to make a theoretical contribution (Sacks, 1992; LeBaron et al., 2016).

3.7 Quality of the Data

3.7.1 Validity

Here we want to explain the validity of our research, because in every study one is concerned with the integrity of the generated conclusion (Bell et al., 2019, p. 46). We placed a high value on internal validity when conducting the study. According to Creswell and Miller (2000), validity should also be examined in terms of whether the study remains true to how the respondents believe reality to be.

We chose to conduct the interviews in Norwegian as all the participants had Norwegian as their first language, ensuring that no information or observations were lost in translation, as well as making the setting more comfortable. Our responsibility was to promote honest and clear answers (Arifin, 2018), therefore, the recordings made us able to confirm the tone of voice, as well as listen to it repeatedly. In case of uncertainties, we asked the participant for confirmation.

Furthermore, validity emphasises whether there is a connection between what we seek to measure and what we believe we are measuring (Roberts & Pries, 2006). Given that we used semi-structured open-ended interviews, we were able to structure the interview to some extent. We knew what topics to look for even though the research question emerged after data collection. Similarly, creating an interview guide in advance of the interviews allowed us to deliberate on what and how we should ask the questions to ensure that we truly measured what we intended to measure.

3.7.2 Reliability

Reliability regards whether the results of a particular study are repeatable, or more precisely; if there is a consistency of measures (Bell et al., 2019, p. 46).

When more than one observer participates in data collection, internal reliability refers to whether the researchers agree on what they see and hear (Bell et al., 2019, p. 362-363). We stressed the need to do the interviews jointly so that we could observe. Only two of the interviews were conducted with only one of us present. However, the interviews were recorded, transcribed, and interpreted together to make sure we agreed on what we saw and heard. Thus, a collaborative decision was taken in all assessments, ensuring broad agreement at all levels. As for now, we have focused on the research's strengths; nevertheless, limitations will be addressed later in this thesis.

3.8 Ethical Considerations

We will now present some ethical considerations, which are an integrated part of our business research. Our purpose is to learn from the participants in this study, indicating reflexive research, which means we must consider their ethical vulnerability (Rhodes & Carlsen, 2018).

Our project was submitted and approved to the Norwegian Centre for Research Data (NSD - [see Appendix 1](#)). Participation in the study was voluntary, and we ensured confidentiality in terms of changing names and job titles and not mentioning organisation names. When obtaining consent, it is essential that the consent is freely provided and that the participant understands what is being requested (Arifin, 2018). Before the interview, a consent form was sent out, ensuring anonymity and that the recording of the given interview would be erased once the transcribing process was over ([see Appendix 2](#)). The consent form also stated that the participant had the right to withdraw at any time without giving a reason or triggering adverse consequences for them (Crow et al., 2006). In the beginning of each interview, we assured the participant understood her or his rights from the consent form, and the aim of the study. The transcriptions of the interviews were only seen by our supervisor and us and deleted when the paper

was handed in.

In addition, verbal noises such as "uh..." were deleted from the interviews throughout the transcription process. The citations are also originally in Norwegian but were carefully translated to English. Apart from this, the quotes that will be published later in the study are direct citations.

IV Findings

4.1 Introduction

After conducting interviews, we discovered patterns of defence mechanisms that may be barriers to not moving forward with sustainable work. From literature, we have found that the industry is working on a number of sustainable projects whilst participants give excuses as to why they have not come further in the development process. Despite the fact that salmon farming is a profitable industry and Norway is a leading supplier of technology and development, the industry seems to be stuck and not moving forward. However, some of the excuses may be valid and understandable, but these also inhibit learning, preventing investigation or elimination of the underlying sustainability problem (Argyris, 1986).

We have categorised the patterns for not taking responsibility when it comes to environmental sustainability into five defence mechanisms: (1) Avoiding Financial Risk, (2) Questioning the Needs and Forms of Regulations and Measures, (3) Waiting for Technology Development, (4) Complaining about Media Misinformation and (5) Blaming Others.

The defence mechanisms are stronger in some groups than in others. The technology developer group showed an overall positive attitude towards sustainable development. In contrast, politicians had an overall negative attitude toward the expansions of the industry. Salmon farmer- and fish feed-group mentioned the most barriers and hindrances in implementing sustainable projects.

A strong overall pattern running across all five defence mechanisms is profit and costs.

In our empirical analysis, the pattern exhibited is the most common defence mechanism for some actors within the industry. We make no claim that this is an exhaustive list of defence mechanisms, nor that the findings are uniform for the whole industry. However, we have data to point out certain actors' defence mechanisms in a clear pattern of excuses, which is a hindrance to further development and being at the forefront of sustainability.

Table 1 lists and describes the five patterns of defence mechanisms revealed.

Table 2 Five patterns of defence mechanisms described

Patterns	Definition
<p><i>“Cost and risk are too high”</i> Avoiding Financial Risk</p>	<p>Choosing sustainability often has a high cost which also makes the risk high in order to stay competitive since most customers are not willing to pay a higher price. It is difficult for companies to take the cost and the risk of sustainable large projects proposed because of uncertainty.</p>
<p><i>“Environmental regulations are hindering the companies from using resources on sustainability”</i> Questioning the Needs and Forms of Regulations and Measures</p>	<p>The government is either being too strict, too feeble or lacking knowledge when drawing regulations and laws considering sustainability in the industry. These regulations are hindering competitiveness and the opportunity to develop sustainable solutions.</p>
<p><i>“The technology is not well developed”</i> Waiting for Technology Development</p>	<p>Sustainable solutions are underdeveloped within the industry. The current technology of cages in fjords is cheap and well functioning for its purpose makes it challenging to choose a new, uncertain technology.</p>

“The media lacks knowledge”

Complaining about Media Misinformation

The industry often gets undeserved negativity in all types of media from large newspapers to individuals on social media. Lack of knowledge about the industry within the general population and the industry itself not being able to reach a response makes the truth rarely come out.

“Claims that they are more sustainable than other protein producers”

Blaming Others

Salmon farmers do believe they already have a decent production when it comes to sustainability and that the salmon itself is sustainable. Comparing area usage, carbon footprint and feed used per kg sold for common protein produced on land.

4.2 Defence Mechanisms 1: Avoiding Financial Risk

A solid pattern in our data is that profit and competition is the biggest concern when it comes to sustainable development in the industry. Salmon farmers themselves claim that going green is expensive and may go at the expense of their competitiveness. The politicians in our dataset are also concerned about the cost of technology in the future, and all three believe that the industry can never be sustainable and profitable at the same time. As Fredrik puts it:

The salmon industry will by definition never become sustainable, and if so, they have to reduce their production by 50% for the fish to thrive and get more space to take up nutrients, but this will only lead to loss. [Fredrik, Politics].

Thomas believes there is no cheaper way than the current method with open cages. In his own words:

The best way to do that is undoubtedly the way one does it today. With open cages, where you have a simple and cheap technology with a plastic ring. You can

not get the cost lower than doing it that way. All other technology will increase production costs. That is obvious [Thomas, Politics].

Fredrik focuses on the definition of sustainability throughout the interview, along with an opinion that the industry will never achieve true sustainability while also being profitable.

Both participants within fish feed claim that the most significant hindrance is the cost, and who will take the cost:

For now, I feel that the biggest obstacle when it comes to sustainability is that no one wants to take the cost [Lucas, Fish Feed].

One has to clarify who will pay more for this. Because we are complaining about electricity prices, we are very afraid of the climate crisis, but honestly of course we have to pay more for electricity, you have to pay more for everything! Everything is going to be damn much more expensive [Michael, Fish Feed].

In addition, Michael claims that they are already at the maximum limit for what they can pay for soy in order to stay competitive. Nonetheless, profitability numbers demonstrate that both the fish feed- and salmon farming industry is still profitable, despite a decrease in financial results due to increased costs and reduced sales price (Archived Data, Fiskeridirektoratet, 2020).

Every year, the newspaper Kapital publishes a list of Norway's wealthiest, and in 2021, four billionaires from the salmon farming industry were listed, whereas all of them increased their fortune in 2020 (Archived Data, Kapital, 2020).

The international magazine Business Insider wrote an article in 2018 about “*The insane life of Norwegian salmon heir*”, referring to the heir of SalMar, Gustav Magnar Witsøe. (Archived Data, Fitzmaurice, 2018; Sætre & Østlie, 2021,

p. 260). He is also listed on the Forbes list: The world's youngest billionaires, whereas 12 people under 30 years are listed (Archived Data, Horton, 2022).

However, the technology developer, John, argues that many of the salmon farming companies are family businesses and that the second or third generation has taken over and is not pumping assets back into the company, but instead takes out dividends. Further, he claims that they do no longer have contact with the "roots" of the company, nor understand the importance of development. In an interview with Gustav Witsøe, on the Norwegian TV-show Skavlan, he says that he has nothing to do with the day-to-day operations, even though he owns shares in the company worth billions (Archived Data, Witsøe, 2021, 25:52). Further, in his own words about the daily operations of the salmon farm:

...Eventually, I have felt that the motivation one must have to be properly in the operation. I grew up looking at Dad and how much motivation it takes to make it happen, so I do not think I am the right man, in the right place, right now to do it (Archived Data, Witsøe, 2021, 25:52).

Moreover, our three technology developers claim that the industry sees innovation and development as loss, instead of looking at it as an investment for further green growth. The salmon farmer, Karen, states that sustainability is expensive and time consuming, and that they want to use the money on research. In her own words:

Sustainability is time consuming and expensive, we must take the bill even without guarantee to continue the production, and would rather spend money on research. [Karen, Salmon Farmer].

Sophie, the technology developer, adds that changing customer demands, and preferences play a significant role in sustainability work. She is also concerned about how colonials promote low prices in their marketing, resulting in

cheap products rather than sustainable products on the market.

In addition, the salmon farmer Sara claims that the customer's demands are crucial for profit.

The industry only wants to make money, when people do want to buy "sustainable fish", then they have to change [Sara, Salmon Farmer].

Similarly, Adam admits that they sell organic salmon because of the customers' demands, as well as receiving support and DEBIO certification for it. DEBIO is a certification that, according to their website, sets a standard for managing natural resources without harming the environment, nor the organisms (Archived Data, Debio, 2022).

All of the salmon farmers who participated in the study agreed that large firms must act because the risk for smaller firms is too high. However, who should go first does not seem like something they agree on. All the companies we have interviewed claim that they have a strong focus on sustainability, referring to certificates, SDGs and changes they have made.

It seems like everyone is just sitting and waiting for something to happen. They are waiting for it to get cheaper or something. So, it really depends on who is first in line [Lucas, Fish Feed].

When asked explicitly what motivates salmon farmers to operate sustainably, they agree on economic growth, future regulation, and taxation. In Jack's words:

We see which way it goes and are afraid of being taxed in the future. We would rather spend time and resources on it now [Jack, Salmon Farmer].

According to all the participants, the motivation to operate sustainably is

mostly about profit and which restrictions, measures, and certificates the authorities have and will enforce in the future.

If no one had earned money from it, no one would have done it [Lucas, Fish Feed].

4.3 Defence Mechanisms 2: Questioning the Needs and Forms of Regulations and Measures

The second central defence mechanism revealed is the pressure from external stimuli, such as laws and regulations from authorities. Participants mentioned regulations as a primary reason for working with sustainability when asked about impulses that foster sustainability within the firms. Firms do not feel they have a choice whether to go in a sustainable direction or not because they know that demands for sustainable production and punishment for not choosing sustainability will come sooner or later.

I think we need to be forced to do it (choosing sustainability), and someone must force us. [Lucas, Fish Feed].

It is facilitated with, first and foremost, politicians and a framework that should be in place, such that we do not have hindering laws that make it hard to develop further. [Jack, Salmon Farmer].

Even though participants agreed that regulations from externalities are essential to foster sustainability work, there were significant differences in personal opinions. For example, Eric from technology development thought current regulations have significant gaps that need to be filled by authorities, and municipal and state regulations to move forward in the right direction.

Further, three participants (Thomas, Fredrik and Adam) talked about the traffic light system presented in 2017, which we described in the chapter about Sustainability Work in the Salmon Farming Industry. Thomas, who works in politics, said he does not think the classification system is strict enough. Our other politician, Fredrik, said this about the traffic light system:

I mean, the traffic light system, where you get the green light as long as the fish farm does not impact the wild population of salmon by less than 30%, that means if anything up to 30% of the wild population dies, it is completely fine. (...) You see how horrible the threshold is? [Fredrik, Politics].

On another note, salmon farmer Adam did not mention the classification being the main issue about the traffic light system. However, his opinion was that it should include more factors than only salmon lice because only having one factor in a system like that is too narrow compared to all the current issues salmon farms have.

It is excellent that authorities are doing something, but in general, the whole setup should have been done differently [Karen, Salmon Farmer].

Karen further claims to be internally motivated and wants to make sustainable changes in the firm she works in, but in her opinion, regulations are presented too rapidly. They barely have time to adopt new regulations and laws, which becomes an unnecessary annoyance.

John additionally mentioned annoyance regarding how the authorities regulate sustainability. He told two different stories about how the firm he works at wanted to include green energy and carbon-neutral solutions to their new technology but did not get any goodwill from the ministry or priorities regarding getting concessions. This made him reflect on how easy it is for not choosing sustainable solutions if they do not have to and lack internal motivation to do so.

An interview published in Nettavisen, interviewing Gunhild Stordalen, a Norwegian doctor and environmentalist, stated the salmon farming industry in Norway has a “home alone party” in the sea that needs to be put on hold. In this interview mortality rates, fish welfare, usage of soy, and export were highlighted as significant problems that authorities need to combat with stricter regulations. Making sure it is profitable to implement sustainable development is something Gunhild sees as a necessity to fix the industry (Archived data, Svendsen, 2022). In her own words:

Because it pays to choose the bad alternative for climate and environment, you do it. The regulations around the aquaculture industry need an overhaul. We need incentives and regulations where it pays to produce what is nature positive, and with good fish health and welfare (Archived Data, Svendsen, 2022).

The technology developer Sophie also states that:

The salmon farming industry in Norway is an industry which has grown to be so large so fast that the government has not had the time to make quality regulations [Sophie, Technology Development].

Backing up the statement from Sophie, Fredrik from politics also said that the whole industry needs to pause expansion and work with the issues already existing before being allowed to expand further.

John also criticises how the government and authorities use extensive amounts of time to implement new regulations and laws. Authorities are restrictive and talk about sustainable objectives but do not offer solid tools for the industry to work with. Lucas from fish feed agrees, discussing a lack of knowledge and understanding about the industry within politics and government institutions. This was further highlighted when Karen revealed that she had experienced discrimination or was told different laws apply to different advisors in different

counties, which she believed was reasoned to personal interests of advisers in the different counties.

One of the participants said something fundamental through these negative statements about regulations being too strict, lacking structure, and having too many.

The way I experience it, should there be no need for restrictions in the industry to choose sustainability, if they have the right mindset, they will do it automatically
[Thomas, Politics]

This statement shows an internal motivation and a deeper understanding of sustainability beyond cost and change in the traditional production. For the future of the industry, this should be the primary mindset of the employees.

Our participants clearly knew what they wanted and demanded from authorities in the future. The salmon farmer, Jack, highlights the need for stimuli and support from outside the industry when it comes to developing and creating new technology, because of the high risk and cost. The industry has already seen this functioning, when authorities presented an incentive for changing the source of electricity from diesel aggregates to electricity from land on the cages, and now forcing salmon farmers to use only electric boats in the near future. Further, Jack hopes for a reward scheme where salmon farmers choosing sustainable solutions first get rewarded, and the ones hesitating and waiting until authorities give them no other choice, need to be punished.

When it comes to the already existing cages, Philip the salmon farmer wishes for stricter regulations to lower carbon footprint. He desires a system of laws that allows collaboration between companies having cages in the same area. Reasons in how the cages from different companies affect each other and should therefore have closer communication and collaboration for the better good for all firms in the same area. Politician Peter sees the need for easing some of the already existing restrictions before continuing with new regulations because

currently, there is a spider web of regulations that makes it difficult for firms to navigate. It should be clearer such that misunderstandings and finding ways around the regulations can be stopped. The other politician, Fredrik, expresses no faith in the industry, and wants severe strict regulations for the future. He sees this as the only way of making sure the industry is developing in a sustainable manner, which means that he does not believe the people working in the industry are capable of changing attitudes from profit-centred thinking to sustainable-centred thinking. John adds:

This industry is only concerned about profit and will not stop until someone stops them [John, Technology Development].

From what our participants want from authorities in the future, we can see a pattern of dissatisfaction in how authorities regulate the industry. At the same time the desperate need to have a decent regulative system in place to expand the industry and make it more sustainable. This takes us further to the following defence mechanism.

4.4 Defence Mechanisms 3: Waiting for Technology Development

Another potent defence mechanism revealed is that technology is not well developed. Currently, nearly all salmon farms found in Norway are open cages close to shore and inside fjords, a technology that has been used for a long time in the industry and has shown to be trustworthy and well-functioning. However, facing new challenges with environmental sustainability and production capacity, the industry sees the need for further innovation development. John from technology said:

I do not believe there will be any salmon production in open cages left in the Norwegian fjords in 15 years. It ruins the wild population of salmon, it ruins the

seabed, and it ruins the whole ecosystem inside the fjords [John, Technology Development].

All of the participants mentioned the three new types of salmon farms for the future, closed cages, off-shore farming and land-based farming, but the beliefs in which ones are possible and believed to be successful are somewhat scattered.

Lucas from fish feed argued heavily about land-based salmon farms being the leading solution. Because it allows the possibility of building salmon farms directly in the markets, eliminating issues with logistics, and how these farms can customise their surroundings, creating the perfect environment for salmon to thrive. Sophie from technology development also mentioned how land-based farming might reduce the carbon footprint when exporting fresh salmon to Asia by air. In contrast, Fredrik and Peter from politics have no faith in land-based farms:

With the knowledge I have, indicates that the energy consumption you need to have enough water in circulation is absurd [Fredrik, Politics].

If you were supposed to close the cages, you would need giant pumps and filters to get water in and filtrate the sludge, which is very resource-intensive [Peter, Politics].

Eric from technology development agrees with a land-based farm's high energy demand but compares it to potato chips factories, which also need extreme amounts of energy and water.

John states that moving salmon farms offshore, on the other hand, provides the benefits of a natural drift from the gulf stream. In addition, one has barely any gathering of sediments on the seabed and the possibility of larger production capacity, Eric agrees, and both are from technology development. Philip also sees potential in offshore farming and is optimistic that the industry needs to develop

this technology further. Meanwhile, Thomas from politics said this about offshore farms:

These planned offshore installations are gigantic installations, and you have great forces of nature to fight out there. So, I do not think it is a quick fix to make it work [Thomas, Politics].

The high cost of developing technology and enormous installations to fit the environment offshore is something Peter is worried about even being possible. Mainly, he proclaims to be highly pressured due to recent year's industry development.

The third new type of salmon farm is closed cages. Karen thinks this will be the solution in areas where the natural habitat is vulnerable, and open cages are no longer allowed because of their impact on the surroundings. Fredrik from politics also supports the idea of closed cages:

I think that with closed cages, you can solve problems with sea lice and fish escape, so that is something I can imagine [Fredrik, Politics].

Realistically, the future will consist of a mixture of new types of salmon farms, depending on what the major actors believe in and prioritise spending money on development further.

We will have the existing cages we see today, which will give us fantastic advantages. We need to get the mortality rate down. We are going to have offshore farms. We will have closed cages because it allows us to use sea areas that cannot be used today. And we are going to have a few land-based farms. So therefore, a wide range of production [Eric, Technology Development].

Sophie considers the industry's future even further, discussing the prospect of developing technology and exporting it to other countries. This would allow other countries to produce salmon and other species using Norwegian technology, thereby eliminating the environmental problem associated with export.

New types of farms are not the only option to ensure the sustainability of the salmon farming sector in the future. A significant part of our participants brings up fish feed as one of the biggest issues when it comes to sustainability. Currently, salmon feed is based on 40,5% vegetable protein sources and 20,1% vegetable oils, most of which are from imported soy (Archived Data, Strøm et al., 2022). However, Thomas from politics wants fish feed to be produced locally in the future, or at least closer to Norway, where soy may not be the solution. Therefore, finding new ingredients that work as fish feed is necessary. Lucas tells a similar story, but includes his views on genetically modified ingredients:

I do believe we need to use something other than soy in fish feed, but we should not use too much animal protein either. It is stupid to use species to produce another species [Sara, Salmon Farmer].

Saras' statement was corroborated by Eric from technology, who stated:

Is it sustainable to use low-value fish to produce high-value fish? Economically sustainable, yes, but environmentally sustainable? It depends on what the fish used for feed can be used for in other ways [Eric, Technology Development].

The millennial salmon project, a project led by Nofima, is currently working towards finding a solution for a feed based on circular sources with a low carbon footprint (Archived Data, Kraugerud, 2022). However, the problem is how to commercialise it and produce the required quantity at a competitive pricing level.

Suppose we can find new ways to produce sustainable fish feed, better utilisation, raw materials from insects, or other things. In that case, it could be very thrilling to see what will happen and the possibility of becoming even more sustainable [Adam, Salmon Farmer].

Further, these significant changes in the whole industry are not the only technological challenges the industry currently works with. Through the years, more minor sustainable technological changes have been made to the existing cages. For example, all five participants working in salmon farming proudly tell about the change from getting energy from diesel aggregate to using power from shore and how this positively affected employees' daily operations, fish welfare and a lower carbon footprint. However, one must know that this was a highly founded and encouraged change by Enova, which is owned by the Ministry of Climate and the Environment (Archived Data, Enova, 2021).

All participants are talking about technological plans, but everyone also includes the need for rules, restrictions, and governments to tell them what to change and how to do it. For instance, Adam from salmon farming states that innovation and technology development would have gone faster if the incentive schemes were better. Similarly, Jack from salmon farming believes that a solid framework and significant investments in new technology need to be stimulated before development can arise.

4.5 Defence Mechanisms 4: Complaining about Media Misinformation

The fourth defence mechanism identified is that the sector claims that they are under a lot of pressure from the media and that the posts are frequently inaccurate. People in the salmon farmers- and feed - groups agree that the industry gets unfairly criticised in the media and that a general lack of knowledge means that the truth rarely emerges.

Michael in the fish feed group tells a story about when a big, famous newspaper in Norway published an article criticising the company for destroying

nature. Therefore, the company engaged consultants to investigate whether this was true and publish a summary of the results. The report revealed that the company was not involved in the criticism and that it could not have been tied to their company, yet the newspaper refused to publish this information. Michael emphasises the following:

Remember that the newspaper is concerned with the conflict because then it is a news story [Michael, Fish Feed].

However, the company used resources on hiring consultants proving they did not have a direct relation to that case. That said, two newspapers published the report after the interview we had with the participant. John from technology development also claims that the salmon industry often gets the criticism to “go away” by hiring expensive consultants to write reports in their favour.

Furthermore, Sætre and Østli (2021) spoke with David O. Carpenter, the researcher who led a study on environmental toxins in Atlantic salmon. The study included salmon from 16 different countries and the aim was to examine the salmon for 14 different environmental toxins. Including the “cocktail effect”, meaning the different toxins combined and how harmful this might be. The researchers used the EPA’s (American Environmental Protection) calculations model which is unaffected by the industry, is strictly health-based and able to calculate the “cocktail effect” (Sætre & Østli, 2021, p. 78). The tests were conducted in a laboratory in Canada, which at that time was classified as one of the world’s best (Sætre & Østli, 2021, p. 75). They received funding for much larger and more comprehensive analyses, and the study was so thorough that it was ultimately approved by Science, one of the world's most prominent publications (Sætre & Østli, 2021, p. 76).

The result of the study was clear: The levels were extraordinarily high, and farmed salmon had far more environmental toxins than the wild salmon (Sætre & Østli, 2021, p. 76). The article was published in Science in January 2004, and this

is where it all began. The media headlines concentrated on the fact that salmon is carcinogenic, although the report focused little on cancer and was hardly addressed.

The information manager for the export committee for fish in Norway, today the seafood council (Sjømatrådet) contacted Carpenter several times the same day. Norway had press releases on Norwegian Broadcasting Corporation (NRK) where The Norwegian Food Safety Authority claimed that Norway has the broader experience and more thorough material to build on than researchers in the US. In addition, the National Institute for Nutrition and Seafood Research (NIFES) claimed that the environmental toxins are within limits set by the EU and WHO and that it is safe to eat salmon (Sætre & Østli, 2021, p. 76).

The article was interpreted as a threat to the global salmon industry, and curious reporters were constantly contacting Carpenter. He noticed that the questions changed over time and went from curious questions about the results to critical questions about the motives and methods (Sætre & Østli, 2021, p. 77). The model was called controversial, the article hysteria and the risk assessment had gone extremely far. Some even called it “junk science”.

Likewise, Carpenter and his research team became aware of the objections from Norway before the research even started, when they were unable to obtain salmon from Norway. A Gothenburg student had to drive to Oslo to buy farmed salmon from a grocery store (Sætre & Østli, 2021, p. 77).

Moreover, Carpenter claims that the people who attack you often have ties to the industry and that it is severe what people are doing to discredit a study that may have implications for human health. In Carpenter's own words:

Many academics have become afraid to speak out in public. They are intimidated by labels such as "activist" or "controversial" and do not want to talk to the press. I understand them. But if you want to prevent diseases and fight against financial constraints in research, you must talk to more people than your colleagues at the university (Sætre & Østlie, 2021, p. 82 & p. 83).

In addition, he said:

Attempts to discredit evidence-based findings are only continuing, and today it is worse than before. When misinformation is spread on social media and online, and almost no one sees the correction afterwards (Sætre & Østlie, 2021, p. 83).

According to Sara, people within the industry should be better at responding to the media's statements and focusing on their repetition. In her own words:

Companies have a far way to go when it comes to building a reputation. I feel that they say nothing, while instead, one should speak out when there are statements in the media [Sara, Salmon Farm].

Sætre & Østli (2021) explain in their book how salmon farmers pay authors to write about "the fantastic salmon adventure" to build reparations and control the narrative. It is presented as an industry that has contact with its roots, has soreness, and fights a battle for history (Sætre & Østli, 2021). The truth is that "we exterminate species, pollute, change the geochemical cycle, and the climate, the acidity of the ocean and the temperature of the planet" (Sætre & Østli, 2021, p. 91). Yet, none of this is mentioned in the paid books about the salmon adventure.

Furthermore, Adam, the salmon farmer, claims it is a profitable industry, making it easy to point fingers at what the media frequently portrays as "Salmon Kings." Looking at Gustav Witsøe's glamorous Instagram profile, *guswitzoe*, where he posts pictures of his lavish lifestyle from all over the world, does little to alleviate the "Salmon King" stereotype (Sætre & Østli, 2021).

Jack, another salmon farmer, also states that it is not necessarily the people with the most knowledge that speaks the loudest. Again, in the words of Jack:

I have experienced this many times, now I am in the business, and then I hear things about the industry, then I understand that the person who speaks does not have a clue as to what is going on, but still gets speaking time [Jack, Salmon Farmer].

However, Michael in the feed group, points out that individuals in social media have a strong voice, bringing forward the example of palm oil, about a big influencer that pointed out the downside of using palm oil in food.

It is the pressure from individuals that becomes too big. It takes some time before you go to the store and do something about it. Who bothered to go and read the biscuit package to look at the contents with 3-point font whether it contained palm oil or not? But as soon as Rema 100 started printing "does not contain palm oil", THEN people noticed. Because then you stand as a customer in the store and think " yes, I take that one". Rema 1000 felt pressured and wanted to be in a different position, so the others had to follow. And for example, after this, it was a large fish farmer who went out and said that they should not use soy in their feed because they would not be associated with this [Michael, Fish Feed].

The Rainforest Fund produced a list of all the foods that contain palm oil, concealed behind labels like "vegetable oil," to promote public awareness. The grocery shop Rema 1000, which accounts for over 25% of the grocery trade in Norway, declared that all its own products will be palm oil-free from 2014 (Archived Data, Regnskog, 2015). Sophie Elise, a big influencer in Norway, posted a blog article about a giant chocolate company, Freia, in 2015. The 20-year-old published a post about how they used palm oil in their Easter eggs and encouraged people not to buy them. The blog posts were shared over 20.000 times, raising awareness of the issue (Archived Data, Isachsen, 2015, 32:38).

Furthermore, the three participants in technology development think that the pressure from the media should not be an issue since the importance is that the

company knows the truth and acts in a sustainable way. However, the technology developer, Sophie, also believes that it is crucial that stories that are not controlled by the industry are shared, allowing people to form their own opinions and decisions. In addition, she states that consumer power has a huge influence on sustainable work. In her own words:

It is good that most people use their consumer power and say that "we only buy what is sustainable" and set requirements for the industry (Archived Data, Isachsen, 2015,3 2:38).

We have seen what the media and consumer power did to palm oil, and how pressure from newspapers and individuals on social media compelled producers to act in a more sustainable manner.

4.6 Defence Mechanisms 5: Blaming Others

The fifth and last defence mechanism found when interviewing our participants is the tendency to blame others for being the reason the salmon farming industry is not sustainable or unable to move in a sustainable direction. Because of the term's complexity, it can be difficult for anybody to comprehend what it genuinely means to be sustainable. What we have observed in the salmon farming sector is that they focus on what they are already strong at and compare themselves with others that are worse.

We looked at three sustainability reports from 2020 and 2021 and chose Norwegian salmon farmers from the list in Vormedal & Særseth's article (2019). Namely, SalMar, Cermaq Group, and Lerøy Seafood Group. All of them had various goals in focus, but goal number 2 - zero hunger, 3-Good health and Well Being, 12- Responsible Consumption and Production, and 13- Climate Actions were mentioned in all reports (Archived data, Cermaq, 2021; Lerøy, 2020; SalMar, 2021). The UN developed and presented these goals because they saw the need for creating universal and specific targets to make it easier for companies to

adapt and work with sustainability. They knew that the media and the public would get interested in these goals, because of the simple design, and they would put pressure on the companies.

The companies themselves can choose which SDGs they focus on, creating the possibility to only show and talk about goals they are already good at, a phenomenon called cherry-picking. Thereby, making “greenwash” more accessible, meaning misleading the general public into believing it is a sustainable company. Sophie also highlights goal number 2 - “zero hunger”, and states:

“It is also an attitude that salmon can save the world from hunger, but it is not about exporting Norwegian salmon to wealthy people around the world”
[Sophie, Technology Developer].

According to the Nasdaq Salmon Index, a panel of Norwegian salmon exporters and producers, the current export price for salmon this week (week 24 in 2022) is 106,80 NOK/kg (Archived Data, NASDAQ, 2022).

Salmon farmer Adam states his opinion that the Salmon farms are already sustainable, justified with a comparison to the production of meat and feed utilisation. A chart from 2016 shows that one kilogram of beef requires 6,6 kilograms of feed, 1,7 kilograms for poultry, whilst for farmed salmon, it only requires 1,2 kilograms (Archived Data, Skretting, 2015). Adam's statement seems accurate, and Philip also expressed his meaning that the industry is sustainable compared to others. However, sustainability is such a complex term that no industry will ever be truly sustainable considering every aspect.

The growth is almost one gram on one gram feed, so it is yes... I am glad that people do not grow so fast [Adam, Salmon Feed].

As people who eat things, we destroy things, whether it is carrots or cows or whether it is salmon, we destroy something when we eat. We are a large species

that eats a lot [Michael, Fish Feed].

Through our interviews, a pattern was found where participants not only viewed themselves as sustainable but blamed other parts of the supply chain or generations for being less sustainable than themselves.

The salmon farmer, Karen, and Sophie from technology development blamed research. Karen discusses the difficulty of conducting proper research at a decent pace. She considers hiring an impartial third party to conduct research but getting this done is very time-consuming. However, conducting it themselves could be viewed as biased because it is paid for. Sophie agrees to some extent, emphasising the necessity for further research into the context of the impact of salmon farms on the ecosystem.

Participants working in feed and salmon farms tend to blame each other for being the non-sustainable part of the supply chain of farmed salmon. According to Michael and Lucas from fish feed, the key concerns that need to be tackled are the mortality rate and salmon welfare, as seen by the salmon lice issue. The salmon producers, Adam, Karen, Jack, Philip, and Sara, all identify feed as a significant issue to address to become more sustainable, due to transportation and ingredients used. The politicians, Peter, and Fredrik, also support the salmon farmers, blaming feed as the most critical part of the supply chain to make improvements. Highlighting that wild salmon naturally consume marine feed but is fed with plant-based feed, which is unnatural.

Salmon is supposed to eat other types of fish, not plant-based. I am in doubt if the end product is as health-promoting as they want it to be [Fredrik, Politics].

Karen from the salmon farmer group also addresses the topic of export's potential for improvement. She also stated that this applies to a wide range of foods from many nations, demonstrating that this is not a problem exclusive to the salmon farming industry. Eric and Sophie, from technology development, blame

both export and consumers. Claiming that Norway can export fresh salmon within 48 hours to any country, particularly Asia. According to export statistics, 70% of Atlantic salmon is consumed raw, and Norwegian salmon is preferred in Asia (Archived Data, Aandahl, 2021). Karen from the salmon farmer group also addresses the topic of export's potential for improvement. In addition, she mentioned that this applies to all kinds of foods from many different countries to justify that this is not an issue only applying to the salmon farming industry.

It is a relevant theme to accept shipping salmon by air, with all of the environmentally sustainable challenges it entails [Eric, Technology Development].

Furthermore, several participants discussed how different generations perceive sustainability and how this might damage future sustainable development. In Sara's words, the older generations are to blame:

I notice differences between myself and my older colleagues. To me, small sustainable choices in the daily operations comes just as natural as being polite to others, it's kind of implemented in my attitude. Whilst for my older colleagues it's more of a "It's not a big deal" [Sara, Salmon Farmer].

The politician, Peter, supports this argument by stating that sustainability is a relatively new term. Older generations may not realise how vital it is. Sustainability is considered a minor threat. Sophie and Eric from technology claim that it is reasonable to blame attitudes fostered within the organisations that are not making sustainable changes and that governing values need to change.

In 30 years is the kids that's now in kindergarten who is farmers, fish farmers and industrial leaders, and then, maybe then, have we come a little further [Eric, Technology Development].

V Discussion and Conclusion

5.1 Summary of Findings

We have presented the findings from a qualitative study investigating how major actors and stakeholders in the Atlantic salmon farming industry reason around stimuli to organisational sustainability work and responses. Based on 13 interviews, we revealed five patterns of defence mechanisms for not taking responsibility for environmental sustainability. The five most common defence mechanisms were (1) Avoiding Financial Risk, (2) Questioning the Need and Forms of Regulations and Measures, (3) Waiting for Technology Development, (4) Complaining about Media Misinformation and (5) Blaming others, as presented in table 2. Moreover, even though we recognise five major patterns, our overall findings are that these defence mechanisms help the businesses to moral non-sustainable actions.

The central defence mechanism identified is avoiding financial risk, which is concerned that sustainability may come at the expense of profitability and competitiveness. The groups within salmon farmers and fish feed claim that being sustainable is expensive, and no one wants to take the cost due to the uncertainty.

It seems like everyone is just sitting and waiting for something to happen. They are waiting for it to get cheaper or something. So, it really depends on who is first in line [Lucas, Fish Feed]

However, profitability numbers demonstrate that the industry is profitable, and a published list of wealthy people shows that the "Salmon Kings" are still among the world's richest. A summary from all the groups is that the motivation for acting sustainable is the high profit. Meaning that they act sustainable if it increases the profit.

If no one had earned money from it, no one would have done it [Lucas, Fish Feed].

The second defence mechanism revealed is questioning the need and forms of regulations and measures, which means that the government is too strict in some areas and too feeble in others. From what our participants want from authorities in the future, we can see a pattern of dissatisfaction in how authorities regulate the industry. Some claim that the government lacks knowledge and that the laws and regulations hinder competitiveness and the opportunity to develop sustainable innovation rather than using resources to follow regulations. At the same time, there is a desperate need to have a decent regulative system in place to expand the industry and make it more sustainable.

This industry is only concerned about profit and will not stop until someone stops them [John, Technology Development].

The third defence mechanism observed is that they are waiting for technology development, making it challenging to choose an expensive, uncertain technology. However, the industry sees the need for new technology to be more sustainable. Most participants claim that the incentive for choosing sustainability and technology development would have gone faster if the financial support had been better.

If you were supposed to close the cages, you would need giant pumps and filters to get water in and filtrate the sludge, which is very resource-intensive [Peter, Politics].

The fourth defence mechanism identified is that they are complaining about media misinformation and claim that they are under much pressure from the media and that the posts are frequently inaccurate. Except for the politicians who did not mention the media, everyone agrees that the salmon industry is under

much pressure. Nevertheless, some claim that it might be necessary to bring forward a narrative that is not controlled by the industry and shed light on the issue. In addition, consumer power has a massive influence on sustainable work.

I have experienced this many times, now I am in the business, and then I hear things about the industry, then I understand that the person who speaks does not have a clue as to what is going on, but still gets speaking time [Jack, Salmon Farmer].

Finally, the last mechanism relieved is the tendency of blaming others for not moving in a sustainable direction. Participants working in feed and salmon farms tend to blame each other for being the non-sustainable part of the supply chain of salmon. All the salmon farmers who participated believe that they already have a decent production compared to the protein produced on land, feed efficiency, carbon footprint and a healthy product. In addition, working towards the SDGs is highlighted and how the industry works towards feeding the growing world population. Some claim that the industry will never be truly sustainable and that we are a large species that eat a lot and therefore destroy things we eat. Further, some participants claim we need a generation shift, blaming the older generations.

The growth is almost one gram on one gram feed, so it is yes... I am glad that people do not grow so fast [Adam, Salmon Feed].

The five defence mechanisms and patterns identified may overlap in some areas. However, high profit is a common factor across all the revealed defence mechanisms.

5.2 Linking it Back Theory

This section will integrate the theory with our findings to reach a conclusion. We identified five major defence mechanisms based on interviews and archival data patterns. The patterns help the business moralise non-sustainable actions (Kvalnes, 2019), which inhibit further sustainable development and being at the forefront of sustainability (Argyris, 1986). According to Kvalnes (2019), this is defined as moral neutralisation, which initial moral dissonance and gives way to acceptance (Kvalnes, 2019, p. 117).

In addition, organisational defence routines are the most effective strategy to deal with possible embarrassment, defined as “*any action or policy designed to avoid surprise, embarrassment, or threat*” (Argyris, 1986, p.75). One may argue that the way Norwegian experts and the media supported the salmon industry regarding the US study on environmental toxins in Atlantic salmon was an organisational/ industrial defensive routine. As well as the industry’s method for making the critique “go away”. Furthermore, these processes inhibit learning, preventing investigation or elimination of the underlying problem (Argyris, 1986, p.76), which is crucial to fostering a culture of sustainability (Nattrass & Altomare, 1999; Senge et al., 1999; Senge & Carstedt, 2001; Jamali, 2006, Crews, 2010, Dess et al., 2019). Kane (2011) states that to be at the forefront of sustainability, the company must keep trying, learning, and going (p. 241).

According to Argyris and Schön (1996), organisational learning is a process that contributes to improved actions through increased knowledge and understanding. The defence mechanisms and moral neutralisation techniques hinder further sustainable development. Instead of changing the governing values to correct or improve their non-sustainable actions, i.e., double-loop-learning (DLL), they are pointing out what they see as barriers to sustainability. How the industry questions the authorities regarding regulations and measures indicates that they only address the visible and short-term problems, such as satisfying the consumers, and not the underlying factors that lead to the problem in the first place, i.e., single-loop-learning (SLL).

This can further be connected to the Sustainability Maturity Model from Kane (2011), which organisations can use to assess how sustainable they are and how to proceed toward full integration. This requires all employees and stakeholders to agree that sustainability is a norm, not an exception. One pattern in our analysis was the industry's tendency to place blame elsewhere, especially on stakeholders in the same supply chain, disrupting the need for agreement.

Our analysis shows that certifications and green projects are often used as a sales argument. In addition, we saw that the industry's major actors have SDGs listed in their sustainability reports, which were mentioned during our interviews. This could be a form of cherry-picking, where an organisation carefully selects a small number of goals from a list that are advantageous to them and does not necessarily select the goals that require change. SDG number two, "zero hunger", was mentioned in the interviews but did not emphasise that salmon is an expensive product. As Sophie states:

“It is also an attitude that salmon can save the world from hunger, but it is not about exporting Norwegian salmon to wealthy people around the world” [Sophie, Technology Developer].

“Greenwashing”, or “bluwashing”, as Sophie called it, has been mentioned in numerous Norwegian articles regarding the sector. According to Delmas & Burbano (2011), "greenwashing" occurs when businesses mislead consumers about their products or services by claiming that they are more sustainable than they truly are. However, the companies hire consultants and lawyers to help get out of trouble by deleting evidence or writing new reports in their favour (Sætre & Østlie, 2021). Bluwashing is effective in moral dissonance and ignorance, and the participants fool themselves into thinking they are doing the right thing for the environment.

The connection to Kane's (2011) Sustainability Maturity Model is strengthened due to how the participants discuss authorities. The participants

talked about how regulations need to be stricter in some areas, looser in others, the need for more and less, and how restrictions are the main reason for moving forward in a sustainable manner. This implies that the industry is far from fully integrated with sustainability, as Kane (2011) proposes to be the highest level of sustainable maturity. Therefore, we have found clear patterns where the salmon farming industry fits at the “lip service” stage of the Sustainability Maturity Model (Kane, 2011).

Furthermore, one could argue that the industry does not include design thinking (DT) in its innovation processes. The industry uses resources on “blue washing” techniques instead of truly listening to the criticism and identifying the underlying problem. The pattern found is complaining about misinformation in the media and blaming others instead of addressing human needs and addressing social sustainability concerns (Shapira et al., 2017). This also strengthens the argument that this is an industry that does not prioritise organisational learning, or at the very least SLL, which addresses visible and short-term sustainability challenges, such as being exposed in the media for doing non-sustainable actions that reduce sales and thus profit.

On the other hand, because profit and sales are strongly prioritised, one could argue that the industry is focusing on human-centeredness to some extent. For example, they emphasise certificates and support schemes as a sales pitch to increase profits.

In DT is, human needs, practices, and preferences at the centre of the design process (Shapira et al., 2017). Here it is essential to distinguish between customers and private individuals, as customers still buy the salmon. Although sustainability's popularity has recently increased, DT does not include sustainability unless it is the user's preference (Shapira et al., 2017, p. 278). We saw from the palm oil case that consumer power greatly influences sustainable work. Younger generations are becoming older, and these consumers will most likely demand truly sustainable products. This presents the opportunity to use consumers in the development of new technology in order to make sure

consumers desire the product more, which will be a competitive advantage.

The industry itself can move DT in a more sustainable direction by including DLL and changing the governing values to truly focus on human-centeredness instead of “bluewashing” and fixing the visible short-term problem. However, the problem is that they claim that the cost and risks are too high. However, innovations that do not meet the actual needs of consumers and stakeholders lead to a waste of energy, material, and financial resources (Buhl et al., 2019).

Additionally, design thinkers' characteristics are abductive reasoning, meaning *“wondering how something might be done differently or made better”* (Berger, 2009; Lefebvre & Kotler, 2011). Using DT in the innovation process might turn the defence mechanisms into strengths and open up for DLL, which forces to bring forward practical solutions for new social and organisational systems (Lefebvre & Kotler 2011).

Our analysis identified three innovative methods of salmon farming as a viable approach for future salmon farming; initiatives like these are undoubtedly taking SOI into account because each one offers a workaround for the sustainability problems that conventional salmon farms currently experience as well as economic returns (Adams et al., 2016). However, salmon producers continue to use financial risk as an excuse for their lack of urgency in developing these farms. This is a known issue with SOI because it often implies to be the solution for the collective good but has a negative economic impact on individual firms (Geels et al., 2008).

However, we know from profitability numbers and Kapital list of Norway's wealthiest people (Archived Data, Kapital, 2020), that major salmon farming corporations have abnormally large profits. Therefore, funding for SOI should not be constrained by price. This might be because the current leaders are the second or third generation in family businesses. They are not included in the daily operations nor have the same passion and drive for Salmon farming as their ancestors.

The main goal of SOI is to create a win-win situation, making sure there is possible economic growth and sustainable development simultaneously. Considering that the private industry has the greatest basis for finding and developing innovation and solutions for this problem (Lubberink et al., 2017), alongside a rapidly changing world, firms should see the necessity to find new ways of creating and capturing value for stakeholders. However, based on our research, we have observed a tendency to blame other stakeholders in the supply chain for the industry's stagnation and lack of sustainable growth. Needing to wait for directions from authorities before doing anything shows a lack of internal motivation to perform sustainable changes. Stakeholder involvement, blame, waiting for directions, and avoiding financial risk make the process more complicated because they have different understandings of sustainability and motivations (Cillo et al., 2019).

It seems like everyone is just sitting and waiting for something to happen. They are waiting for it to get cheaper or something. So, it really depends on who is first in line [Lucas, Fish Feed].

The defence mechanism is also connected to CSR. Despite the lack of current government constraints, some participants appreciated the importance of making sustainable decisions. Hence, it was often followed by thinking there will be restrictions coming in the future and possibly taxes will be imposed for failing to choose sustainability. There is also a perception that they seek an incentive to be first, as sustainability does not appear to be a motivation in the industry. However, enlightening the non-sustainable actions in the media and pressure from the consumers is forcing the industry to choose sustainability and show acts of CSR to stay competitive and profitable. One can argue whether this is "bluewashing" or not, given the focus on short-termism, which is opposed to the CSR concept.

Our findings show that our participants have an overall understanding of the sustainability term, mentioning the definition from the Brundtland report, Elkington's (1998) "triple bottom line" - financial, social, and ecological, emphasising the financial pillars, and argues that staying profitable and competitive is crucial. However, the financial pillar should not be at the expense of the two other pillars; social and environmental. This argument is more reminiscent of the Financial Bottom-line approach, which prioritises profit above all else and has a negative impact on the social and ecological pillars (Moosmayer et al., 2019; Waddock, 2016; Dyck & Caza, 2021).

There is an urgent need to fully integrate sustainability in every organisation (Kane, 2011; Ergene et al., 2021), and Norway, with its great profit and technological foresight, has the potential to be at the forefront of sustainability. However, because increased profit is the most powerful incentive for sustainability and the main defence mechanism for acting sustainable, we are stuck in a rut where no one wants to go first and uses defence mechanisms to avoid the underlying problems and moral non-sustainable actions.

5.3 Contribution to the Literature

We consider our research to contribute to the current literature on sustainability work in the salmon farming industry. This research revealed five major patterns of defence mechanisms that have not previously been identified. One would argue that these patterns make it easier to recognise and be aware of neutralisation techniques in the Atlantic salmon farming industry, allowing us to challenge and question them (Kvalnes, 2019). Hopefully, someone will investigate these further and discover ways to deal with these defence mechanisms to move the industry on a more sustainable path.

Additionally, these defence mechanisms may help organisations become aware of their non-sustainable activities and moral neutralisation techniques,

which can contribute to mapping out where they are currently positioned in Kane's Maturity Model (2011) to work towards full integration.

Furthermore, the five defence mechanisms are presented as a tool to identify moral neutralisation techniques for challenging organisations' sustainable work and a guide to organisational learning in the complexity of sustainability.

5.4 Limitations and Future Research

Our study aimed to delve deeper into reasoning around stimuli to organisational sustainability work and possible responses in the Atlantic salmon farming industry. The research resulted in five patterns of defence mechanisms. However, despite all the precautions we took regarding our research method, the study had certain limitations. A limitation of the study is that the data was primarily gathered through digital interviews, with no physical observations of the salmon farms' daily operations. This is partially due to the pandemic, but it is also because we have spent most of our time on different continents.

A second limitation is that it might be challenging to build trust between interviewers and participants. As all the participants were working, except for one, trust was especially vital to minimise scepticism in information sharing for fear of appearing unprofessional. However, we focused on creating a comfortable environment which led to the establishment of a great connection and interesting conversations with all our participants. Further studies might be conducted on recently resigned employees. In that way, one may obtain answers related to contemporary practice. At the same time, there might be a lower threshold to withhold information for fear of appearing unprofessional.

A third limitation is the number of salmon farmers participating in the study and salmon farmers within the same firm. We found it hard to get in touch with salmon farmers, even though the people we interviewed recommended that we contact them. We mainly talked to the managers/employees with sustainability responsibility. As a result, commenting on whether the findings and defence mechanisms are representative of the entire industry is insufficient.

Therefore, we recommend more research on responses and reasoning around stimuli to organisational sustainability in the Atlantic salmon industry to generalise the thesis' findings. In addition, we recommend further research to engage in a quantitative study of the five defence mechanisms on all levels and roles in the companies to strengthen our theory, as well as compare small-, middle- and major-sized companies. Further research should also investigate the counterparts in each defence mechanism, such as the media, paid authors, the regulative authorities, financial support schemes, certification bodies and consumers' willingness to pay. This allows for more research on prevention strategies. We hope that someone finds our findings intriguing and is interested in exploring them further.

5.5 Conclusion

This thesis has investigated how the major actors in the Atlantic salmon farming industry reason around stimuli to organisational sustainability work and possible responses. Our findings presented five defence mechanisms that delay organisational learning and further development to reach the final stage (fully integrated) in Kane's sustainability maturity model. Even when considering the limitations of this research, interesting findings in theory and practice have been found.

This study contributes to the current literature by providing a list of five defence mechanisms; (1) Avoiding Financial Risk, (2) Questioning the Need and Forms of Regulations and Measures, (3) Waiting for Technology Development, (4) Complaining about Media Misinformation and (5) Blaming Others, which was found by interviewing people working in and around the Atlantic salmon farming industry in Norway, as well as archived data. The five defence mechanisms make it easier for researchers to conceptualise how the Atlantic salmon farming industry works with sustainability and recognise the patterns of moral neutralisation techniques. Previous research and literature about the salmon farming industry

have not mentioned defence mechanisms for the stagnation in sustainable development. It is a profitable industry, complaining about high costs. Having restrictions and laws made for them, while simultaneously claiming that they are wrong. Complaining about costs and restrictions hinders sustainable progress in a country that is a global frontrunner in technological innovation. Being negatively talked about in the media, not wanting to respond or enlighten the general public. Finding themselves already sustainable, blaming others is an easy solution to moral neutralisation.

This research yielded meaningful findings, yet some questions remain unsolved. Norway is Brundtland's country, with a high profit and a leading supplier within technology and development. Everyone is just sitting and waiting. Why are we not at the forefront of sustainability? The mystery remains.

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Appendix

Appendix 1

Legal and Ethical Regulations - NSD

08.01.2022, 16:57

Meldeskjema for behandling av personopplysninger



Assessment

Reference number

401148

Project title

Bærekraft i fiskeindustrien

Data controller (institution responsible for the project)

Handelshøyskolen BI / BI Oslo / Institutt for ledelse og organisasjon

Project leader (academic employee/supervisor or PhD candidate)

Arne Carlsen , arne.carlsen@bi.no, tlf: 93087712

Type of project

Student project, Master's thesis

Contact information, student

Jenni Marie Bjørnstad Johannessen, jennibjornstad@gmail.com, tlf: 90721290

Project period

01.11.2021 - 01.07.2022

Assessment (1)

18.10.2021 - Assessed with conditions

NSD har vurdert at personvernulempen i denne studien er lav. Du har derfor fått en forenklet vurdering med vilkår.

HVA MÅ DU GJØRE VIDERE?

Du har et selvstendig ansvar for å følge vilkårene under og sette deg inn i veiledningen i denne vurderingen. Når du har gjort dette, kan du gå i gang med datainnsamlingen din.

HVORFOR LAV PERSONVERNULEMPE?

NSD vurderer at studien har lav personvernulempe fordi det ikke behandles særlige (sensitive) kategorier eller personopplysninger om straffedommer og lovovertrедelser, eller inkluderer sårbare grupper. Prosjektet har rimelig varighet og er basert på samtykke. Dette har vi vurdert basert på de opplysningene du har gitt i meldeskjemaet og i dokumentene vedlagt meldeskjemaet.

VILKÅR

Vår vurdering forutsetter:

At du gjennomfører datainnsamlingen i tråd med opplysningene gitt i meldeskjemaet

At du følger kravene til informert samtykke (se mer om dette under)

At du laster opp oppdatert(e) informasjonsskriv i meldeskjemaet og sender inn meldeskjemaet på nytt.

At du ikke innhenter særlige kategorier eller personopplysninger om straffedommer og lovovertrедelser
At du følger retningslinjene for informasjonssikkerhet ved den institusjonen du studerer/forsker ved (behandlingsansvarlig institusjon)
At du deler meldeskjema med prosjektansvarlig/veileder. Det gjør du ved å trykke «Del prosjekt» i meldeskjema. Prosjektansvarlig bes akseptere invitasjonen innen en uke. Dersom invitasjonen utløper, må du invitere på nytt.
Utvalget ditt har taushetsplikt. Det er viktig at datainnsamlingen gjennomføres slik at det ikke samles inn opplysninger som kan identifisere enkelt personer eller avsløre annen taushetsbelagt informasjon.

KRAV TIL INFORMERT SAMTYKKE

De registrerte (utvalget ditt) skal få informasjon om behandlingen og samtykke til deltakelse. Informasjonen du gir må minst inneholde:

Studiens formål (din problemstilling) og hva opplysningene skal brukes til

Hvilken institusjon som er behandlingsansvarlig

Hvilke opplysninger som innhentes og hvordan opplysningene innhentes

At det er frivillig å delta og at man kan trekke seg så lenge studien pågår uten at man må oppgi grunn

Når behandlingen av personopplysninger skal avsluttes og hva som skal skje med personopplysningene da: sletting, anonymisering eller videre lagring

At du behandler opplysninger om den registrerte (utvalget ditt) basert på deres samtykke / At du behandler opplysningene om dine deltagere basert på deres samtykke

At utvalget ditt har rett til innsyn, retting, sletting, begrensning og dataportabilitet (kopi)

At utvalget ditt har rett til å klage til Datatilsynet

Kontaktopplysninger til prosjektleder (evt. student og veileder)

Kontaktopplysninger til institusjonens personvernombud

Ta gjerne en titt på våre nettsider og vår mal for informasjonsskriv for hjelp til formuleringer:

<https://www.nsd.no/personverntjenester/fylle-ut-meldeskjema-for-personopplysninger/sjekkliste-for-informasjon-til-deltakerne>

Når du har oppdatert informasjonsskrivet med alle punktene over laster du det opp i meldeskjemaet og trykker på «Bekreft innsending» på siden «Send inn» i meldeskjemaet.

TYPE OPPLYSNINGER OG VARIGHET

Prosjektet vil behandle alminnelige kategorier av personopplysninger frem til 1.7.2022.

FØLG DIN INSTITUSJONS RETNINGSLINJER

NSD legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

Dersom du benytter en databehandler i prosjektet, må behandlingen oppfylle kravene til bruk av databehandler, jf. art 28 og 29.

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og/eller rådføre dere med behandlingsansvarlig institusjon.

NSD SIN VURDERING

NSDs vurdering av lovlig grunnlag, personvernprinsipper og de registrertes rettigheter følger under, men forutsetter at vilkårene nevnt over følges.

LOVLIG GRUNNLAG

Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Forutsatt at vilkårene følges, er det NSD sin vurdering at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse som kan dokumenteres og som den registrerte kan trekke tilbake. Lovlig grunnlag for behandlingen vil dermed være den registrertes samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a.

PERSONVERNPRINSIPPER

Forutsatt at vilkårene følges, vurderer NSD at den planlagte behandlingen av personopplysninger vil følge

prinsippene i personvernforordningen om:
lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke behandles til nye, uforenlige formål
dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER

NSD vurderer at informasjonen om behandlingen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13.

Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18) og dataportabilitet (art. 20).

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

MELD VESENTLIGE ENDRINGER

Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til NSD ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilken type endringer det er nødvendig å melde:

<https://www.nsd.no/personverntjenester/fylle-ut-meldeskjema-for-personopplysninger/melde-endringer-i-meldeskjema>

Du må vente på svar fra NSD før endringen gjennomføres.

OPPFØLGING AV PROSJEKTET

NSD vil følge opp ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet.

Kontaktperson hos NSD: Lisa Lie Bjordal

Lykke til med prosjektet!

Appendix 2

Consent Form Standardised

Request for participation in the research project ***“Sustainability impulses within the Atlantic Salmon Farming Industry”***

Background and aim of the study

This project aims to investigate sustainability impulses within the Salmon Farming industry.

The *research question* of the study is: *Where do the most important impulses for sustainability work come from, and how has this changed over time?*

The project is part of a master thesis at BI Norwegian Business School (Handelshøyskolen BI, Campus Oslo). The participants of the project come from different departments in your organisation, as well as other organisations within the industry. The participants have been selected based on their position in the Salmon Farming industry.

What does participation involve?

Participation in the project involves an interview with a maximum length of 45/60 minutes. The interview will cover topics such as your experience with sustainability activities and stakeholders. The interview will be recorded.

What happens to the information from the interview?

All information collected in the interview will remain confidential. The individuals who will have access to the information are the Project Leads Serina Veen Gilje and Jenni Marie Bjørnstad Johannessen, and no identifiable information about the participant will be connected to the audio recording. The recordings will be marked according to a coding system that will be stored separately from the audio files. No participant will be recognizable in a potential future publication using the data.

Generalised summations may be made based on interviews, but no information that cannot be de-identified will be made available outside the research team without explicit approval of participants.

The project will end on July 1st, 2022, and all recordings will be deleted after being transcribed and anonymized.

Voluntary participation

It is voluntary to participate in the study, and you can withdraw your consent at any time without providing a reason. In the case that you withdraw from the study, all information about you will be anonymized.

If you have any questions regarding the study, please contact jennibjornstad@gmail.com or serina.gilje@outlook.com

The project is supervised by Arne Carlsen, who can be reached at arne.carlsen@bi.no

This study has been reported to NSD - Norwegian Centre for Research Data (Norsk senter for forskningsdata).

If you have questions related to NSD's assessment of the project, you can contact:

- NSD - Norwegian Center for Research Data AS by email (personvertjenester@nsd.no) or by phone: 55 58 21 17.

Consent to Participate in the Study

I have received information about the study and consent to participate.

participant, date) (Signed by

Appendix 3

Interview Guide

1. Initiation and Warm Up
<ul style="list-style-type: none">● Introduce ourselves (Name, what we study, where we live and work) to make it casual.● Remind them that we are recording and that the recording is just for our eyes.● The interview forms part of our master thesis and will be used in research to find out how you work with sustainability and challenges. We will not identify individuals, and your identity will only be for our eyes.● This interview will last for about 40-50 minutes and will be very casual. Our intention is to get to know you and get an understanding of how the industry works. (Shoulders down)● Can you start by telling us about your career and your position in the organisation you work for?
2. Sustainability in Practice and Challenges
<ul style="list-style-type: none">● What challenges in terms of sustainability do your organisation work with right now and how do you work with it? What are your role and responsibilities?● Talk about sustainability and how you would define it, what does sustainability mean for you?
Remember: Small talk, looking for common ground, demonstrating that you listen

3. Eliciting Extended Storytelling on Predefined Themes

- Grand tour: Could you tell a story of a successful sustainable work project that you have been involved with – what happened? How were you involved? Why was it successful? Was it easy, stressful, complex?
Could you tell us what this project looked like to you? How were you involved in it? What happened? Similarly, do you have any challenging sustainable project experience?
- Directed tour: Could you tell of an episode where you were part of bringing a sustainable idea/a set of ideas significantly forward? Who did you cooperate with and how? Talk about an external relationship that has been valuable and how this behaved and what was valuable. Impulses (stakeholders).

4. Directed Questions, Comparative

- Prompting comparisons: What are the main stimuli for sustainability and how has this changed over time? How is this part of your strategy?
- How do you (the actors) perceive measures and regulations for sustainability, where are they strongest, and where are they lacking?
- What is your motivation for working with sustainability?
- Future perfect: How does a sustainable salmon industry look like to you?
- Future of the industry: Realistically, is the salmon industry moving from or towards a sustainable direction? What is necessary to move in (or from) this direction?

5. Closure and Sharing

- Share interpretations: Deeper understanding of the stories he/she just told us, ask to tell us more about something.
- Recommend persons: Considering the topic, whom do you recommend us to talk to?
- Repeat context of use
- Thank you for an interesting talk! – If necessary, are you open for a brief revisit later in our thesis process?