Living in a Lifeless Sea

- How the Ecological Degradation of the Baltic Sea is Affecting People Living in its Coastal Zone on Gotland

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Living in a Lifeless Sea – How the Ecological Degradation of the Baltic Sea is Affecting People Living in its Coastal Zone on Gotland

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Abstract

Facing a number of different environmental problems, such as intense oxygen depletion, overfishing and various forms of marine pollution, the Baltic Sea is one of the most degraded seas on earth. While the aspects of its ecological degradation are well-researched, only few studies have focused on how the Baltic Sea's state is affecting the 85 million people living in its coastal zone. Hence, the purpose of this study is to counteract this research gap with a qualitative approach using semi-structured interviews, that draw on a diverse group of study participants from the island of Gotland. Phenomenological paradigms have been chosen to investigate and understand how people are affected by the Baltic Sea's degradation in their lifeworlds from different perspectives. The findings reveal that interviewees experience the Baltic Sea's degradation in various ways in their everyday lives, with the most common ones being the increase of algae blooms and pollution, as well as the contamination of fish with toxins. How they perceive these challenges is dependent on their background and on the life sphere out of which the interviewee's interpretation takes place. Moreover, it has been found that most study participants do not perceive themselves impacted by the sea's degrading state, while at the same time describing several influences it has on their lifeworlds. Coping strategies that have been developed as a response to the Baltic Sea's state support this unawareness. Those particularly rely on technological advancements and prevent people from needing to make larger changes in their lives.

Keywords: Baltic Sea, ecological degradation, lifeworlds, local coastal perspectives, phenomenology.

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Abbreviations

Baltic	Baltic Sea
HELCOM	Helsinki Commission
SLU	Swedish University of Agricultural Sciences

1. Introduction

Covering 70% of the earth surface, our oceans and seas play a crucial role for the livelihoods on our planet. While they provide important ecosystem services, which are irreplaceable for food supply and the manufacture of medicines (United Nations, 2022), they are also our biggest ally when it comes to combating climate change and global warming (Gruber et al., 2019). However, oceans and seas worldwide are in danger, degrading at an enormous speed, with the pressures continuously increasing (United Nations, 2022; European Environment Agency, 2018). Numerous anthropological activities such as overfishing and increasing pollution lead to direct and indirect effects that threaten marine ecosystems and the access to the seas' benefits (United Nations, 2022). Their degradation particularly impacts people and communities living in coastal areas and depending on their related ocean (c.f. IPCC, 2019; Depledge et al., 2019; Fleming et al., 2019; Bidesi et al., 2011; Kronen et al., 2010), by threatening their health (Landrigan et al., 2020), access to essential supplies and jobs they rely on, for example in fisheries (Scott et al., 2017) or in tourism (González Hernández et al., 2023).

The Baltic Sea is no exception to the worldwide degradation of our seas. It is especially impacted by the input of nutrients that lead to intense oxygen depletion, resulting in the Baltic containing the world's biggest dead zone today (Helcom, 2018a; McCrackin, 2022). Moreover, overfishing and marine pollution through oil spills, litter, and hazardous substances threaten the sea's ecosystems (Helcom, 2018a). Additionally to the anthropogenic pressures, the unique ecological conditions of the Baltic Sea, such as the brackish water, the many shallow areas and the horizontal and vertical salinity gradient, create vulnerable circumstances for species inhabiting its waters (Helcom, 2018a). In combination those unique natural conditions and the anthropogenic pressures lead to complex consequences that not only impact the Baltic Sea's marine environment, but also people living in its coastal zone (Helcom, 2018a; Reckermann et al., 2022).

Research that focuses on how coastal people are affected in their every-day lives is however limited. While there are few studies, that investigate how society is affected economically (cf. Bleckner et al., 2021), the single impact of specific pressures (c.f. Störmer, 2011) or the impacts on a specific sector (c.f. Haapasaari et al., 2019), there are no studies to date that focus on how people are affected by the wide-range of ecological challenges in their every-day lives. Studying every-day

lives in a marine context is however relevant, as it is able to depict the complexity and variety of actual coastal living situations without oversimplifying them (Zoysa & Hornidge, 2016). While it makes findings highly subjective, it also offers a chance to discover through every-day practices, descriptions of feelings and events, knowledge and perceptions that people have embodied and are not aware of and which would otherwise not come to the surface (Zoysa & Hornidge, 2016). Therefore, it can be particularly relevant when implementing local policies and management actions, as it helps to unveil the needs of local people.

Thus, this thesis uses phenomenological paradigms to contribute to minimizing the discovered research gap and create more knowledge around people's lived experiences with the ecological degradation of the Baltic Sea. It investigates how people are affected and cope with it. For that purpose, the study focuses on the Swedish island of Gotland, that is placed in the middle of the Baltic Sea. Through interviews with people from distinct backgrounds who spend a prominent amount of time on the island, the following research questions will be investigated.

1.1 Research Questions

How are local coastal people with distinct backgrounds on Gotland affected by the ecological degradation of the Baltic Sea?

This research problem includes the following three sub-questions:

1. How do people with distinct backgrounds experience and interpret the degraded state of the Baltic Sea?

2. How are the aforementioned people impacted by the ecological problems of the Baltic Sea?

3. How do the local coastal people cope* with the degradation of the Baltic Sea?

*in this thesis the term 'coping' follows a concept provided by Lazarus & Folkman (1984) and can be defined as "cognitive and behavioral efforts to master, reduce, or tolerate the internal and/ or external demands that are created by a stressful transaction" (Folkman, 1984, p. 843). It therefore comprises active, as well as passive responses, adaptations and behaviours consequenting out of the Baltic Sea's degradation.

2. Theoretical Background

To address the introduced research questions phenomenological paradigms, particularly Schutz's phenomenological sociology, are drawn on.

The ethnographic in-depth descriptive character of phenomenology helps to capture and understand the study participants' experiences and perceptions of the degradation of the Baltic Sea out of their perspective. Therefore, phenomenology can be seen as a permanently underlying theoretical lens when conducting the study and analysing the empirical material and represents both, theory and method (also see 4. Methodology). Zoysa and Hornidge (2016) describe phenomenology as a "distinct epistemological philosophy – a style of thinking", that influences the interpretation and analysis of the empirical material, as well as the practice and process of conducting research, meaning the methods. While it has been decided from the beginning that phenomenology serves as a method, it has been chosen inductively as theory with regard to the gained empirical material. In alignment with a constructive worldview (see 4.1 Worldview and Research Design for more), theory is put onto the empirical findings and not empirical findings into theory.

The following chapter elaborates on phenomenology as a theory, while chapter 4. Methodology explains its function as method.

2.1 Phenomenology

Phenomenology was first brought up in the beginning of the 20th century by philosophers such as Edmund Husserl, Martin Heidegger, Maurice Merleau-Ponty and Jean-Paul Sartre (Smith, 2013). It is the study of how individuals or groups experience and perceive the 'phenomena' around them. A phenomenon can be a specific object or circumstance, such as in this case the degrading state of the Baltic Sea. It aims to see and understand the world out of the studied people's perspective and is therefore concerned with people's feelings and emotions, their reactions to and engagement with the phenomenon, as well as how they understand and make sense of it (Inglis, 2012). Thus, it is "centrally concerned with individuals' actions and activities" and an 'actor-centred' approach (Inglis, 2012, p. 86). While the first ideas of phenomenology by Edmund Husserl focused on how individuals perceive the world around them, later developments added the influence of culture and

started to look at groups' shared perspectives (Inglis, 2012). With regard to that, this study aims to understand how people in comparison to each other as individuals and as a group, share perceptions around and reactions towards the degrading state of the Baltic Sea. Compared to other developed strains of phenomenology, Husserl focused on in-depths descriptions of individual's lived experiences (Smith, 2013). It is therefore the most suitable strain, as it complies with the descriptive character of this study.

A key concept that was first brought into discourse by phenomenology is the 'idea of practical consciousness' (Inglis, 2012). Since it focuses on people's everyday life and behaviour, it assumes that most of the time people act rather semi-conscious than fully aware of all their actions all the time. It describes a state in which a person knows what they are doing without needing to think through every step of it. Those semi-conscious actions often happen in everyday life when people function in taken-for-granted, practical ways (Inglis, 2012). We, for example do not need to think through every step, when we go shopping for groceries. We know how we get to the supermarket and know that we need to take a basket to collect everything we want before going to the cashier to pay. And also there, we know how the payment process works, without actively thinking about it, as it is engraved in our practical consciousness.

Another important characteristic of phenomenology, pointed out by the anthropologist Michael Jackson (1996) is that it aims to overcome the distinction between the knowledge of ordinary people and scientists and therefore focuses on the people's lived experiences. While there is a lot of scientifically researched background on the degradation of the Baltic Sea (see 3.1 The Baltic Sea Today), there is little known about how it is "being in the world" (see 3.2 The Social Side of the Ecological State), as referred to phenomenology by Jackson. In that sense, phenomenology distances itself from a distant scientific way of approaching phenomena, but tries to capture the description of people engaging and interacting with the phenomenon (Jackson, 1996). The application of a phenomenological approach in this study therefore helps to shed a light on the lived experiences of people living in the coastal zone of the Baltic Sea.

Over time, the first main ideas of phenomenology were developed further and created more strains and approaches. This thesis will mainly refer to the approach of phenomenological sociology developed by Alfred Schutz. However, ideas from other strains of phenomenology will be adopted to complement Schutz's concepts. In that sense it is important to mention that the different strains of phenomenology are not necessarily contradictory but can naturally complement each other (Inglis, 2012).

2.1.1 Phenomenological Sociology according to Schutz

One of the central concepts in phenomenological sociology is the concept of lifeworlds. The term lifeworld was first mentioned by Husserl and as developed by Schutz, describes the "mundane, everyday world in which people are operating in" (Inglis, 2012, p. 90; Zelic, 2009). His phenomenology therefore aims to investigate the everyday life actions and interactions happening within people's lifeworld. This concept is of high importance for the above formulated research questions, since they aim to study participants 'mundane' everyday life and therefore their lifeworlds. While phenomenological approaches and the study of lifeworlds find frequent application in social-environmental sciences, they have not been adduced in a marine and coastal context (Zoysa & Hornidge, 2016).

The lifeworld of the studied individuum is further coined by the culture that surrounds it (Inglis, 2012). This culture is created by the common-sense of living, of perceiving and experiencing the world around them. This common sense of living is not questioned, but accepted by its people as their reality. Schutz calls it the 'natural attitude', since it describes what seems 'normal' to the people possessing it. It comprises everything that seems to belong to people's everyday life and appears usual to them. Thus, the 'natural attitude' is part of people's lifeworlds. It is only questioned, when people are faced with unusual, extraordinary happenings. As a consequence of the disruption of the 'natural attitude' people feel anxiety and uncertainty (Inglis, 2012).

Schutz divides terms and concepts into first and second-order categories (Inglis, 2012). First-order categories describe everything a person is directly experiencing in their life. It includes their perceptions and how they make sense out of the world around them. Second-order categories are then trying to reconstruct and process first-order categories. In that sense, this whole thesis, in which I try to make sense out of first-order categories (that are the study participant's perceptions) and describe them by putting them into my words, consists out of second-order categories. According to Schutz, I will therefore always be limited in fully grasping the lifeworlds of the study participants, as they are simply too complex and consist out of too many habituated actions, that are perceived 'natural'. However, by analysing a person's lifeworld a researcher can create so-called 'typifications', which are the reconstruction of only a few first-order categories (Inglis, 2012). Those second-order typifications then help to understand a certain lifeworld. However, typifications are also constantly used in first-order categories by all individuals to make interaction and communication possible by simplifying observed phenomena (Inglis, 2012). In our everyday lives we, for example, just assume that a person in a paramedic's uniform actually is a paramedic and attribute all the characteristics, norms and abilities coming along with being a paramedic to this person. Thus, to simplify interactions between individuals, we need to have

some shared typifications, that are anchored in our practical consciousness. Those can occur within groups of various sizes, such as smaller groups like friends and families or bigger groups, e.g. cultures or whole societies. Typifications also link to social categories, since we have certain expectations coming along with different social groups (Inglis, 2012). For example, the typification of an environmental scientist implies the characteristic that they know more about environmental topics than others. That determines how other people think about and act around the environmental scientist. Thus, typifications are not only created through an individual's perspective, but put on a person by others implying certain norms and characteristics belonging to this typification. This especially takes place in shared typifications since multiple people strengthen these processes (Inglis, 2012).

Overall, for phenomenological sociology what makes social life possible are lifeworlds and the practical consciousness. Inglis (2012, p. 92) summarizes is it as follows:

"So the lifeworld is made up of typifications, and is made possible by them. Human life is nothing other than the use of typifications in the practical consciousness of individuals."

In their rework of Schutz's phenomenological sociology Berger and Luckman further added dimensions to the concept of lifeworlds (Inglis 2012). They claimed that people operate in multiple spheres, such as work life, family life and so on. Each of these spheres has a different lifeworld. Those can be even further divided into sub-spheres containing different typifications. Even though that results in a person having multiple lifeworlds, they unite again in the 'bigger lifeworld' (Inglis, 2012). This is relevant for this study as interviewees were asked questions about their personal lives, as well as their work lives. Thus, descriptions of experiences and perceptions of the degrading state of the Baltic Sea may vary depending on whether the interviewee shares it out of the perspective of their work life or their personal life. For example, a fisher can perceive the degradation of the Baltic Sea in much more drastic terms in their work life, compared to when they just visit the beach in their private time, as the absence of fish might threaten the fisher's occupation. Even though the experiences might not be completely different, the intensity of the threat can vary between those two lifeworlds. As mentioned before, it is important to recognize however, that these life spheres do not exist separately, but are intertwined and reunite again in the bigger lifeworld of each interviewee. These multi-layered dimensions of lifeworlds therefore also require that the interviewee's descriptions and statements are always seen against their personal background.

The supplementary implementation of multiple life spheres further counteracts the critique phenomenology is often exposed to. When the approach is criticized for being too subjective and centred only on the studied subject without including outer circumstances or societal structures and powers, the inclusion of people's

personal background and the acknowledgement of them experiencing and perceiving differently in different circumstances, counteracts that critique (Inglis, 2012). This counteraction is further supported by Schutz's ideas of shared typifications and the inclusion of culture, since the "individual consciousness is structured and made possible by intersubjective assumptions held by many individuals" (Inglis, 2012, p. 93). Thus, even though phenomenology is indeed a highly subjective approach, especially compared to other theories, outer forces and people's pre-conditions are not fully neglected (Jackson, 1996). Therefore, it was also important in this thesis to take into consideration the interviewee's background and view their perceptions and experiences made with the degrading state of the Baltic Sea with regard to it. As it can be seen below (see table 1), the interviewees' backgrounds do not differ enough from each other to distinguish between social groups as it is done for example by Bourdieu or Giddens in their structuration theory by focusing on power relations between social groups. Thus, this study solely draws on phenomenological paradigms in that sense.

3. Background

The following sections start by describing the state of the Baltic Sea today, including its ecological characteristics, environmental pressures, and its economic role for society. Hereafter, a demonstration of the research gap focusing on the neglected social consequences of the ecological degradation of the Baltic Sea, is presented. The last part comprises a description of the study site of Gotland.

3.1 The Baltic Sea Today

One of the most threatened seas on earth is the Baltic Sea (Saraiva et al., 2019). It is the largest brackish water in the world and comparably shallow, with 1/3 of it being shallower than 30 meters (Helcom, 2018a). Surrounded by 9 states, Denmark, Germany, Sweden, Finland, Russia, Poland, Latvia, Lithuania and Estonia, it is an inland sea with many unique features (Helcom, 2018a).

Figure 1: Map of the Baltic Sea (Helcom, 2018a).

Therefore, it is mainly isolated and only through the Sound connected to the North Sea. Thus, only little water exchange is possible. Overall,

it takes 30 years until the water in the Baltic is fully exchanged. Marine water inflow happens mainly through the Sound during winter storms, creating a vertical salinity gradient, with salinity being higher in the South and lower in the North. This is further intensified by the freshwater inflow from melting ice in the North (Helcom. 2018a). Additionally, it has a horizontal salinity gradient, meaning that salinity increases with depths, because the density of water increases with salinity (Helcom, 2018a). The various salinity levels allow marine and freshwater species to coexist. This creates a unique, but also very vulnerable food web (Helcom, 2018a). Since only few species are capable to survive under those conditions, the number and variety of species is low. Moreover, the brackish water puts stress on the species, who then as a result often occur modified (Helcom, 2018a). For example, blue mussels in the Baltic are affected by dwarfism, making them comparably small (Riisgård et al., 2014). Another reason for the harsh living conditions in the Baltic Sea are its oxygen depleted and anoxic zones, also called dead zones. Oxygen depletion means, that the oxygen level is lower than the level most species need to survive. Anoxia means, that all oxygen has been consumed by biological processes, which can result in the production of hydrogen sulphide (Helcom, 2018a). In such conditions most life forms, except for some bacteria and fungi, are not able to exist (Hansson et al., 2018). Those anoxic areas occur naturally in the Baltic Sea, mainly in deep waters, however they are triggered and intensified through the input of nutrients and consequently eutrophication (McCrackin, 2017). In shallow waters oxygen depletion is caused by seasonal changes and connected to that eutrophication (Helcom, 2018a). Thus, warm and windless summers increase the probability of oxygen depletion in shallow areas. Oxygen depletion and anoxia can be reduced by the inflow of water, especially through the Sound. However, inflow events decreased and got rarer in recent years, with some exceptions in 2013, 2014 and 2016 (Helcom, 2018a).

During those times oxygen conditions shortly improved, overall however, a declining trend is observable. Today, the Baltic Sea has the largest dead zone in the world (McCrackin, 2017) (see Figure 2: Dead zones in the Baltic Sea). Their expansion especially endangers species, that are unable to move, such as clamps. Even though fish are able to swim through such zones, it weakens them in their reproductivity (McCrackin, 2017). Those effects on marine life then affect fisheries and people's coastal livelihoods (McCrackin, 2017).

The challenging conditions in the Baltic Sea are further intensified by many pressures, mostly originating from human activities. Helcom (2018a) identified several main pressures, namely eutrophication, hazardous substances, marine litter,

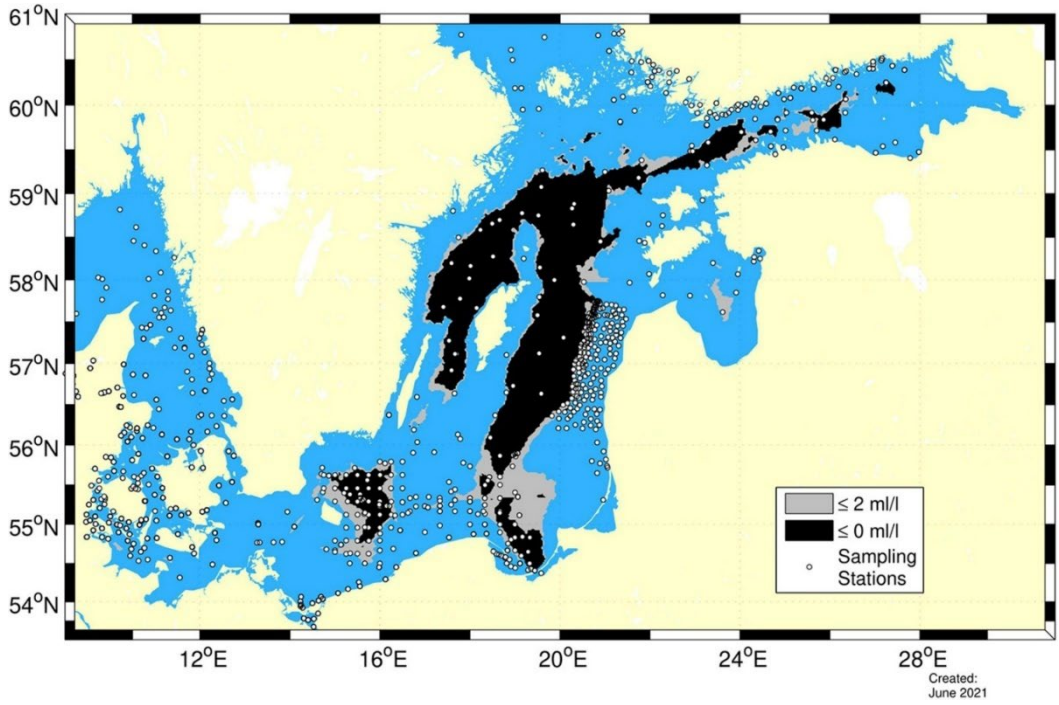

*Figure 2: Dead zones in the Baltic Sea from from Hansson et al. (2020)**:** "Calculated dead zones in the Baltic Sea according to measurements in autumn 2018 (observation points (white dots); anoxic (black) and hypoxic (grey) bottom). The figure is modified by Almroth-Rosell et al. (2021)."*

underwater sound, non-indigenous species, species removal from hunting and fishing and seabed loss and disturbance (Helcom, 2018a).

As mentioned before eutrophication is triggered by the input of nutrients, especially nitrogen and phosphorous, predominantly originating from agricultural activities and waste-water discharge (Rabalais et al., 2010). This enhances the production of opportunistic bethnic algae, as well as overall primary production (Helcom, 2018a). That further leads to bad light conditions, which make it difficult to create enough oxygen through photosynthesis. Moreover, dead algae fall to the ocean floor, where their deposition requires and spends the available oxygen, leaving behind oxygen depleted zones (Helcom, 2018a). Between 2011 and 2016, 97% of the Baltic Sea has been considered eutrophied (Helcom, 2018a). Hypoxia not only increased in the depths, but also in coastal areas, where it could potentially have direct effects on humans (Conley et al., 2011). Eutrophication in coastal areas is caused by multiple drivers, with some originating from conditions in the open-sea and others from land (Vigouroux et al., 2021). Even though the input of nutrients has decreased in recent years after the implementation of management responses, eutrophication is still thriving and only reduced in some small parts of the Baltic Sea (Baltic Sea Center, 2021; Helcom 2018a). This is due to the nutrients already existing in the water and sediments (Helcom, 2018a). Potential improvements connected to the nutrient reduction will therefore take more time to become visible. Additionally, eutrophication is further expected to increase with proceeding climate change (Altieri & Gedan, 2015; Breitburg et al., 2018). In connection with other determining factors, such as the water exchange with the

North Sea, temperature and winds, it is therefore not guaranteed that eutrophication will decrease eventually (Baltic Sea Center, 2021; Rosen, 2021).

Another threat is the entrance of hazardous substances into the Baltics' waters (Helcom, 2018a). Originating from "wastewater treatment plants, leaching from household materials, leaching from water deposits, and atmospheric depositions from industrial plant emissions", just to mention a few, they can harm the ecosystem immensely and enter the food web (Helcom, 2018a). That not only makes them a threat for the life in water, but also for connected life on land and lastly humans (Helcom, 2018a). Even though the Helcom assessment (2018a) showed, that the amount of hazardous substances in the Baltic declined and the prediction for the future also shows a declining trend, it remains a threat, as the sea needs a long time to recover from it. Furthermore, another concern regarding the input of pharmaceuticals through wastewater arises (Helcom, 2018a). Additionally, the Baltic Sea is one of the most trafficked waters on earth and therefore under a constant threat of oil pollution through shipping incidents (UNEP, 2017). Even though marine traffic has increased in recent years, the number of oil spills decreased tremendously, dropping from 763 recorded oil spills in 1989 to 52 in 2021 (Laurila, 2022). While not only having immediate and unknown long-term impacts (Söderström et al., 2015) on the marine environment, oil spills further have negative consequences for fisheries and tourism. Additionally, even though oil spills and the input of hazardous substances shows a decreasing trend, the pressure of contaminants remains high in the whole Baltic Sea (HELCOM, n.d.a).

Another pressure is marine litter, which very visibly affects the Baltic's coast (Helcom, 2018a). This can have obvious consequences on tourism and leisure activities (Helcom, 2018a). However, marine litter also has large invisible effects. Microparticles can enter the food-web, which can harm marine and land animals and through consumption also humans (Helcom, 2018a). Larger litter compartments in deeper waters can threaten animals, when they consume or get entangled in it. Additionally, it enhances the introduction of alien species. It can furthermore have negative consequences for humans, as it potentially damages fishing gear or hinders ships to navigate safely (Helcom, 2018a). Most of the marine litter in the Baltic Sea is plastic, which is only degrading very slowly. Therefore, marine litter is expected to remain a threat in the future, especially considering the uncertainty of its effects, if more and more macro-litter degrades to micro-litter (Helcom, 2018a).

The biodiversity is further threatened by the introduction of non-indigenous species. Between 2011 and 2016 alone, twelve new species have been found (Helcom, 2018a). Overall, about 140 alien species have been discovered in the Baltic Sea (Helcom, 2018a). They often enter through shipping and aquaculture and potentially threaten the Baltics vulnerable food web (Helcom, 2018a). Even though the unique conditions of the Baltic hamper alien species to spread, it remains a threat that not only has consequences for biodiversity, but also for humans, such as

reduced fishing opportunities or the threat for public health, if pathogens or toxic algae enter and spread (Zaiko et al., 2011). Another sign of the marine ecosystem's imbalance, is the increase of seals over the recent years, creating conflicts with local fisheries (Svels et al., 2019).

As in all our oceans, fishing activities also pressure the Baltic Sea. Recreational fishing mainly contributes to fish mortality at the coast. It is however not known how much it contributes to the overall mortality (Helcom, 2018a). Commercial fishing clearly dominates fishing activities with the aim of selling caught fish for human consumption, but to a large part also for industrial uses, such as fish meal, animal fodder or oil (Helcom, 2018a). Main target from commercial and recreational fishing in the Baltic are cod, herring and sprat (Helcom, 2018a). Furthermore, Baltic fisheries still engage in eel fishing, which is considered quite controversial, since eel is on the one hand a widely spread species, on the other hand however, its stocks declined drastically (Helcom, 2018a). Even though regulations and management objectives have been implemented, many fish stocks are in critical conditions (Hamrén, 2020). Overfishing can cause changes in food webs, which result in less productive and less resilient fish stocks (Helcom, 2018a). This therefore calls for further actions, such as catch quotas, that can however also have negative economic impacts for fisheries (Hamrén, 2020).

Such attempts to govern and improve the ecological state of the Baltic Sea from a political side take place through a complex and multi-layered system of international, transnational and European agreements and cooperations, as well as through national legislations and initiatives, including both private and public actors (Kern, 2011). The most prominent actors are the EU, giving different directives (most importantly the Water Framework Directive (WFD), Marine Strategy Framework Directive (MSFD) and the EU Common Fisheries Policy) and policy programmes such as the EU strategy for the Baltic Sea Region (EUSBSR) and the Helsinki Commission (HELCOM), the operating body of the Helsinki Convention (Söderström et al. 2015). HELCOM is a regional, intergovernmental organisation focused on environmental governance in the Baltic Sea area (Helcom, n.d.b). Compared to the EU, HELCOM unifies all bordering states by including Russia into the environmental protection and governance of the Baltic Sea. HELCOM's latest strategy to improve the ecological state of the Baltic, the 'Baltic Sea Action Plan' (BSAP), was adopted in 2007 and has been updated in 2021 (Helcom, n.d.c). It provides an intergovernmental policy strategy based on current scientific knowledge to improve the ecological state of the Baltic Sea.

While HELCOM mainly focuses on the environmental improvement of the Baltic Sea, other policy arrangements, such as the EU, govern the Baltic Sea Region further with regard to economic and geopolitical matters. With nine bordering states and about 85 million people living in its coastal zone, the Baltic Sea has always been a focal point for economic collaborations and power struggles that go beyond the solely ecological importance of the sea (Söderström et al., 2015).

Some economic benefits from the Baltic Sea derive directly from the sea, such as the income generated through fish and shell-fish harvesting or tourism. Alone the income generated through recreational activities totals about 15 billion Euros annually (Helcom, 2018a). Additionally, economic benefits are obtained indirectly e.g. through the transport of goods or energy generation by wind turbine parks. They benefit the national economies, as well as citizens directly, as these activities offer a wide range of employment opportunities (Helcom, 2018a).

Economic trades in the Baltic Sea region are however not always harmonious. The recent leakage of the gas pipeline Nord Stream 2, build through the Baltic Sea between Russia and Germany, was an example of that. While the pipeline itself has been disputed from the beginning (Russell, 2021), the gas leakage (Danish Energy Agency, 2022) fuelled the controversy further and show-cased that geopolitical matters often come to the fore, while the environmental consequences and the sea's status become subordinate in the discussion, when conflicts between bordering countries arise (e.g. Deutsche Welle, 2022). The role of the Baltic Sea as a strategic space between countries has been further in focus since tensions between Russia and Sweden arose, following the Russian invasion of Ukraine (Sliwa et al., 2022). Therefore, not only putting additional pressure on the sea, but also on the people living in its region.

Overall, it is important to recognize that all the afore mentioned pressures do not only consist for themselves, but interact with each other, often creating complex consequences. Moreover, naturally occurring harsh conditions, such as the slow water exchange or the brackish water additionally interplay with anthropogenic pressures and make the Baltic especially vulnerable. Together they have cumulative negative impacts on the biodiversity and ecosystems in the Baltic Sea, but also on life at its coastline (Helcom, 2018a; Reckermann et al., 2022). This is instanced in the Figure 3 below:

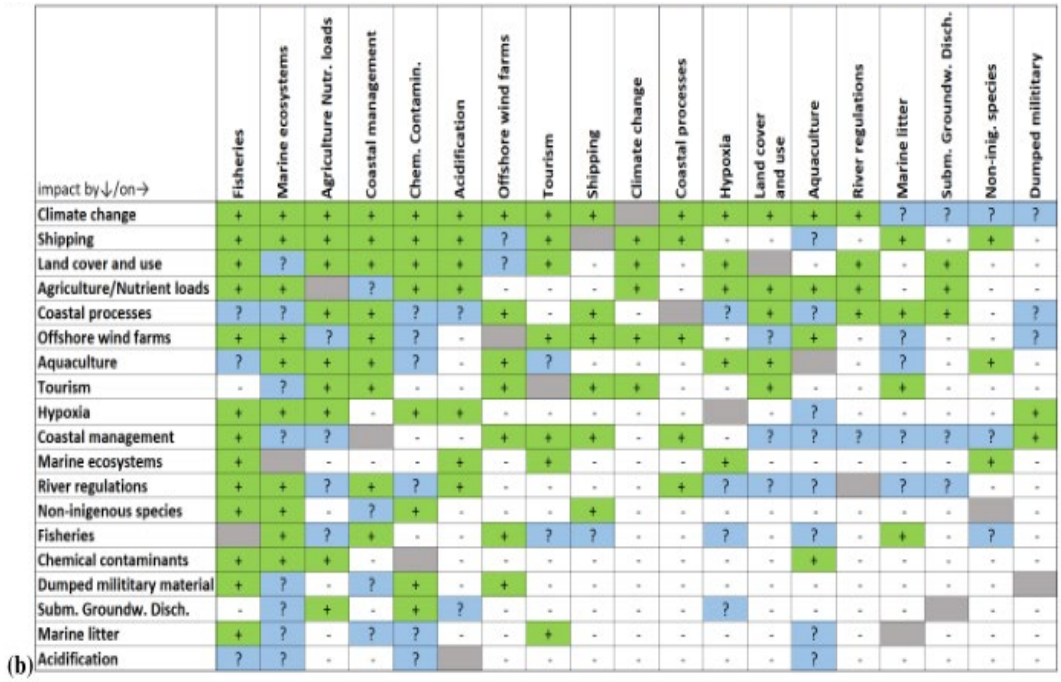

Figure 3: from Reckermann et al. (2022): "The matrix of factors. Natural (but affected by human activity) and entirely human factors are grouped together. Based on the current scientific literature, there is (green) evidence for a connection, (blue) no direct evidence for a connection but a connection is plausible (based on authors' judgement) and (white) no evidence for a connection (these combinations are not discussed in the text)."

The following sub-chapter introduces the current state of research on the consequences of the ecological degrading state of the Baltic Sea has for its surrounding people. It further identifies areas lacking scientific research and where research gaps need to be closed in the future.

3.2 The Social Side of the Ecological State (Supporting the Research Gap)

Even though the Baltic Sea is one of the most studied waters on earth (Swaney, 2011) and there is extensive research on its ecological state, little research focuses on how the ecological state is affecting people living in its coastal zone. Considering the 85 million people living within the coastal zone of the Baltic Sea (Helcom, 2018a), as well as the high employment rates in the marine sector (Blenckner et al. 2021) and at the same time the many ecological struggles the Baltic Sea faces (see chapter 3.1), the social side of this challenge should not be neglected. Helcom formulated the Baltic Sea's relevance for people as follows:

"As long as people have lived here, the Baltic Sea has served as an avenue to connect the bordering countries and as a source of human livelihood." – Helcom (2018b).

Nevertheless, comprehensive research on how coastal livelihoods are affected by the ecological degradation of the Baltic Sea remains largely missing. Often studies focus either on specific pressure (e.g. climate change; dioxin) or on how a specific sector (e.g. tourism; fisheries) is impacted by its state, as it can be seen in the two following examples:

A study by Störmer (2011) focused on the impacts climate change is predicted to have on people living in the Baltic's coastal zone. It claimed that bathing tourism and connected to that human health will be affected, as cyanobacteria and pathogens are expected to increase (Störmer, 2011). Moreover, sea level rise could jeopardize harbours and marine infrastructure. Not least, climate change is expected to affect the Baltic's surrounding land area, which can result in adverse effects, such as an increased need for pesticides (Störmer, 2011). Additionally, fishers are expected to face increasing challenges due to impacts of climate change on fish communities.

The impacts the state of the Baltic Sea has on fisheries and fish communities was also investigated by Haapasaari et al. (2019), who focused on the dioxin levels in caught salmon and herring and its effects for fisheries, which are consequently restrained in benefitting economically and socially from sells. The study calls for a broader perspective on how dioxin levels affect all life, in and at the coastline of the Baltic Sea, to improve management strategies. They state that current research is neglecting food security, socio- economic factors and cultural aspects and thus call for a more overarching approach when investigating such topics (Haapasaari et al., 2019).

The accumulation of such studies contributes to a broader understanding of how society can be impacted by the Baltic's ecological state. However, they do not accomplish to capture how people of various backgrounds, with differing dependencies on the Baltic Sea are affected by its ecological crisis in their everyday lives and therefore do not depict the situation of coastal lives comprehensively.

Moreover, the economic relevance of the Baltic Sea, when investigating the social-ecological interplay is paramount in current studies. That is e.g. reflected by a study by Blenckner et al. (2021), who focus on the marine economy in the sea's bordering countries. The study states that employment rates in the marine sector are generally high, which leads to a thriving marine economy (Blenckner et al., 2021). This is thought to indirectly benefit coastal livelihoods. However, Blenckner et al. (2021) also acknowledge that focusing only on a thriving marine economy can narrow the perspective, since it only represents one aspect of a society's well-being and does not capture the every-day life situation of people living in its coastal zone.

The Helcom Assessment (2018b) makes an attempt to give a broader perspective on how the degradation could affect people. The report is based on the acknowledgement, that human activities, which are based on the sea can lead to economic and social benefits and focusses on "the reduction in human well-being caused by the deterioration of the marine environment" (Helcom, 2018b, p.2). It identified different sectors, that were considered dependent on the sea. Those were

fish and shellfish harvesting, (marine) aquaculture, tourism and recreation. Other sectors, such as the production of energy through the building of offshore wind parks are also dependent on the sea, however not on its ecological state (Helcom, 2018b). The classification of which activity is dependent on the state of the Baltic Sea was done through an "expert assessment within the HOLAS II team" (Helcom, 2018b, p.7). It is unknown which criteria have exactly been used. To then measure how people are affected mainly monetary terms and economical values have been used. The report itself criticizes, that this excludes many non-market values the sea provides (Helcom, 2018b). In some cases, when market prices and statistics have been considered insufficient to show the social importance of the Baltic Sea, other indicators, such as "consumer surplus", which identifies economic benefits people receive, e.g. through recreation, have been added (Helcom, 2018b). Overall, the assessment could provide proof for several links between the Baltic's current state and its surrounding citizens. When measuring the costs of degradation, it has been found, that especially citizens in Sweden and Germany are impacted by the Baltic Sea's degradation. The negative impacts originating from eutrophication are highest in Germany and Sweden and amount 440 – 675 million Euros/ year in Sweden. That means, that every Swedish citizen (between 18 and 80 years) lost 60 – 92 Euros in 2015 through the impacts of eutrophication. It needs to be recognized that the costs per person are comparably high in Sweden, due to its low population and other countries, such as Germany, are facing higher overall costs. A similar observation could be made for the costs of degradation related to recreation, with Germany having the highest costs (385-544 Million Euros/ year) and Sweden secondly losing 297-415 Million Euros/ year in 2015. The same trend has also been found for fish stocks and perennial vegetation. While costs of degradation amount 18-26 Euros/year for each Swedish citizen, it has been found that citizen's welfare could vice versa increase, when fish stocks improve. The assessment also included an investigation on how coastal citizens perceive the Baltic's current environmental state. On a Likert scale from 1 (very bad) to 5 (very good), citizens in 8 out of 9 bordering countries indicate that the sea's state is 'neither bad nor good'. Even though, this assessment sometimes backed up economic values with other indicators, it is heavily focussed on the measurement in monetary values. While one could of course argue that social and economic benefits are strongly interconnected, they are not always the same. Through the focus on monetary values, people's stories are generalised and variables, such as personal experiences are again neglected. Therefore, a huge part of the social side of the Baltic Sea degradation is just ignored. Moreover, the assessment itself notes, that the usage of monetary data as a basis can lead to misdirected interpretations, because e.g. data for tourism did not distinguish between tourism, that is dependent on the sea and tourism that is not (Helcom, 2018b). Thus, findings become somewhat blurry and abstract. This tendency of imprecise statements pulls through the whole report. It

becomes apparent in the following quote, where it is not stated clearly or concretely, in which way people do actually benefit from the knowledge that the marine ecosystem is in good health:

"Although the effects may not be directly observable, people obtain benefits from knowing that the marine ecosystem and its species are thriving. The value for biodiversity is, for the most part, independent of the use of the marine environment, and more related to the knowledge that habitats and species exist and are in good health." – Helcom, 2018b.

The report further states, that research is generally lacking comparable approaches to describe how the economy and society are affected by the Baltic Sea (Helcom, 2018b).

This research gap was also identified by Storie et al. (2021), who in response conducted a literature review to investigate how well-researched the links between the Baltic Sea ecosystem and people's health and well-being in its surrounding areas, are. For that purpose, they drew on the concept of ecosystem services and disservices as a search criteria. They further draw on a concept of 'health and well-being', which includes more aspects beyond "the absence of illness", such as the sea providing resources for people's livelihood and overall enhancing the quality of life (Storie et al., 2021). Similar to the application of the 'costs of degradation' approach in the HELCOM assessment 2018, this study is especially valuable for this thesis since the inclusion of disservices means that potential negative impacts from the degraded state of the Baltic Sea could have been captured. However, Storie et al. (2021) found that there were only little studies pointing out links between people's health and wellbeing and the Baltic Sea ecosystem. If those links were found however, they were considered positive for people's health, especially through the economic benefits they created, e.g. through activities like fishing or tourism. Ecosystem disservices are mentioned rarely at all, which is described as a research gap (Storie et al., 2021). However, they further note that their findings might be biased by the search criteria that focused strictly on the concept of ecosystem services. Storie et al. (2021) add: "Many of the [excluded] articles […] indicate that there are multiple health and well-being risks to human populations." However, this statement shows a similar problematic as discovered in the Helcom (2018b) report; findings are formulated imprecise and do not describe people's actual living circumstances. Additionally, they found that most studies followed observatory methods. Overall, Storie et al. (2021) call for more research on the effects the Baltic Sea ecosystem has on its surrounding people, since there is little research on the topic in general, as well as a more consistent use of concepts and terminology. On that note, they also mention the need for more interdisciplinary research in the topic, since many of the articles they found derived from a single discipline, hampering the overall understanding of how the Baltic Sea affects human's wellbeing. That supports the before identified point of critique, that current research mainly focuses only on one aspect of the Baltic Sea's degradation

when investigating its impact on people living in the coastal zone. Moreover, Storie et al. (2021) call for an inclusion of local people into gaining new information, which "however requires a comprehensive understanding of the values they hold". That is also supported by a study from Ahtiainen et al. (2014), who found that the subjective background, including socio-demographic characteristics, values and engagement with the Baltic Sea plays a significant role in how the Baltic Sea is perceived by individuals and for the willingness to pay contribution to the improvement of its state. Thus, personal backgrounds should not be neglected, when gaining data about people's perception of the Baltic Sea. However, even though Ahtiainen et al. (2014) include the demographics and nationalities of study participants into their study, current research including detailed background information and correlating it with the findings is largely missing and stresses the need for deeper qualitative studies.

A literature review by Heckwolf et al. (2021) came to similar conclusion as Storie et al. (2021). They conducted a systematic review which aimed to find out how coastal ecosystem services deriving from the Baltic Sea lead to socio-economic benefits. They found that out of 657 reviewed studies, only 8 provided "insights to the links and between ecosystems, services and the socio-economic benefit". Additionally, those studies then again tend to focus only on specific part of the connection between an ecosystem service and the created benefit, therefore not providing a broader understanding of socio-economic benefits deriving from the Baltic Sea (Heckwolf, 2021).

It needs to be acknowledged that most of the above-mentioned studies do not aim for detailed, descriptive and qualitative research, but call for more quantitative research and consistent approaches to build a scientific base to improve policy making in the Baltic Sea area. Therefore, these studies are not to be generally criticised in their approaches and conduction, but just exemplify where research is currently insufficient.

Summarising, research that has been done to date contains only little information on how coastal people are affected in their every-day lives by the degrading state of the Baltic Sea, as it did not aim to gain insights into individual experiences and lives. Furthermore, they largely neglect people's different backgrounds and how dependent various individuals are still on the Baltic Sea besides the economic benefits deriving from it. Related thereto, existing research does not use qualitative approaches to include the affected people's perspectives. It therefore fails to understand coastal people's experiences and to describe with their words, how they perceive the ecological degradation of the Baltic Sea and are affected by it. Additionally, none of the before mentioned research has investigated how people cope and respond to impacts, they may face.

This thesis aims to counteract these research gaps by contributing to more knowledge around people's lived experiences with the ecological degradation of the Baltic Sea. Therefore, interviews have been conducted with people living or

spending a prominent amount of their time on Gotland. Thus, the island is introduced in the following section.

3.3 Gotland and its Coastline

Gotland is Sweden's biggest island and also the biggest island in the Baltic Sea (OECD, 2022). It is located 90km off the Swedish main coast and has a size of 3,184 km2 (OECD, 2022). Gotland is mostly covered by forest (39%) or agricultural land (33%) (Regionfakta, n.d.). Its coastline is approximately 950km long, including the outer islands, such as Fårö (Regionfakta, n.d.).

Overall around 60,000 people live on the island all year around (OECD, 2022). The number of inhabitants has increased in recent years due to internal migration, especially during the COVID-19 pandemic. This trend is expected to continue (OECD, 2022; Åberg & Tondelli, 2021). More than 38% of those inhabitants, live in rural areas, which is much higher than the 13% Swedish average (Regionfakta, n.d.). Thus, Gotland can be considered mainly rural (Regionfakta, n.d.). The number of people however increases over summer, as Gotland is Sweden's most popular summer destination (Thanwiset, 2022).

Gotland is rich in nature and has a medieval cultural heritage (Region Gotland, 2017). It holds a unique landscape, that is shaped by its long history of small-scale farmers, that created wide open land through grazing kettle and the circumstance of Gotland being an island in the middle of the Baltic Sea (Region Gotland, 2017). That leads to a multifarious scenery, famous for orchid fields, 'rauks', limestone heaths and sandy beaches (Region Gotland, 2017). Today, 6% percent of the whole land area of Gotland is protected through nature reserves, national parks, habitat protections and conservation areas, such as Natura 2000 (Region Gotland, 2017). This also includes a marine nature reserve, as well as lakes and beaches (Region Gotland, 2017).

Furthermore, the picture of the island is influenced by its long and intense human history. Ancient monuments have been found, showing that Gotland has been inhabited since the Stone Age, when people mainly lived from fishing, hunting and gathering (Region Gotland, 2021a). During the Iron Age, the island started to connect to the outer world, which became increasingly important, when entering the Viking Age. During that time the island became an important trading point due to its position in the middle of the Baltic Sea. This role increased and reached a tipping point when Visby became home to many merchants during the Middle Age and therefore entered the Hanseatic League, showing the importance the Baltic Sea has played throughout Gotland's history (Region Gotland, 2021a). The trade led to increased wealth on the island. As a result, Gotland still has 92 medieval churches today and the medieval town of Visby (Region Gotland, 2021a). In 1995, Visby was declared an UNESCO Word Heritage (Region Gotland, 2017). Today those

places function as meeting points for many cultural activities like concerts, art exhibitions or performances, making the island a cultural hotspot (Region Gotland, 2017). Furthermore, Gotland hosts many historical festivities, such as the annual 'Medieval Week' in August, which consist of over 500 events and has attracted more than 40 000 visitors in the past (Region Gotland, 2017).

Tourism is generally intense and continuously increasing on Gotland, but peaks during the summer months (Regionfakta, n.d.). Consequently, Gotland has compared to the whole of Sweden a higher employment rate in the tourism sector. In 2021 more than 1 000 000 overnight stays were counted, which is the highest number in Gotland's history (Regionfakta, n.d.). The increasing tourism does not only influence the tourism sector itself, but also enhances the expansion of the service sector on Gotland and is therefore of important economic relevance for the whole island (Region Gotland, 2017; Leino, 2018). Its positive influence generates income and make hotels, restaurants, transport services, the food and retail sector, as well as providers of touristic activities, such as tour guiding thrive (Region Gotland, 2017).

Overall, people on Gotland however work in similar sectors as on the mainland. A significant difference is to be found in the hotel and restaurant sector, in which more than 1/3 more people on Gotland work in, compared to the whole of Sweden (Regionfakta, n.d.). Thus, it needs to be mentioned, that even with tourism being comparably big on Gotland, most people work in usual jobs. While fishing has been a very important economic activity in the past, it is mostly considered one of the main leisure activities on Gotland today (Blicharska & Rönnbeck, 2018). The number of professional fishers has decreased immensely, with only 28 professional fishers with a license existing today (Region Gotland, 2017). The most fished species are sprat and herring, while small-scale fishers mainly fish flounder and turbot (Region Gotland, 2017).

In recent years, Gotland has experienced situations of drinking water scarcity (Swedish Environmental Institute, 2017). This is caused by very low groundwater levels, on which Gotland is very dependent, since precipitation has been low in the past years (Region Gotland, 2020; Region Gotland 2017). Additionally, the demand for water increases due to the rising number of tourists, especially in summer, increasing domestic demand and intensified animal keeping and industry (Länsstyrelsen, 2018). Thus, until 2045 the water demand on the island is expected to increase by 40% (Länsstyrelsen, 2018). Even though the demand for irrigation is also expected to increase (Länsstyrelsen, 2018), the region has implemented a watering ban in summer since 2017, to conserve water (Region Gotland, 2020). Furthermore, individuals are invoked to save water during household activities, such as showering, cleaning dishes or flushing the toilet (Region Gotland, 2020). Additionally, in 2016 the first brackish water treatment plant was introduced in the eastern part of Gotland. It produces up to 900m3 of drinking water out of the Baltics seawater (Region Gotland, 2017). However, a recent study (Lindqvist et al., 2022),

investigating how the future climate and socioeconomic factors influence water supply on Fårö, prognoses that groundwater levels will maintain very low in the future and are even likely to drop lower than ever before. That and the general sea level rise, caused by proceeding climate change will increase the risk for saltwater intrusion and limit the availability of drinking water even further (Ebert et al., 2016; Lindqvist et al., 2022).

Water shortage is also further driven by the water intensive business of limestone mining. Limestone mining has long taken place on Gotland and has been an important business on the island, with CEMENTA AB being the 6th biggest employer on whole Gotland (Region Gotland, 2017). However, after environmental concerns have been risen, the Swedish Supreme Court announced in summer 2021 that the company needs to shut down its quarries (Cousins, 2021).

Gotland has developed a regional development strategy 'Our Gotland 2040' to improve living conditions on the island and tackle local challenges, such as the intensified summer droughts and the seasonal-coined economy (OECD, 2022). It's vision for Gotland is to use the islands assets and core values of community, vitality, magical, creativity and transition to become a place were "people and businesses can develop […] and contribute to a better world." (Region Gotland, 2021b). In that sense it also aims to contribute to the UN's Sustainable Development Goals and Agenda 2030 (Region Gotland, 2021b). Gotland is also supported by the EU through the EU's regional and developmental aid (Region Gotland, 2017). Thus, many of the projects and programmes concerning the development of the island are subsidised by the EU (Region Gotland, 2017).

In recent months Gotland also gained increasing attention due to the Russian invasion in the Ukraine. Gotland is seen as a strategic place of security due to its proximity to the Eastern-Baltic States (OECD, 2022).

4. Methodology

In this chapter the methodological approach to answer the before presented research question is described. First, the underlying worldview and the research approach, which shaped this thesis are introduced. Then the qualitative data collection, including the description of how interviews were conducted, as well as recruitment strategies and information about the interviewees, is presented. Afterwards a description of how the collected data is managed and analysed follows. The last section discusses limitations and reflects on potential influences.

4.1 Worldview and Research Design

As the perspective out of which a study is conducted shapes the study itself, it is important to be transparent about the worldview underlying this thesis (Creswell & Creswell, 2017). The worldview describes 'a basic set of beliefs that guide action' (Guba, 1990, p.17). Following a constructivists worldview this thesis aims to understand how people make meaning out of the world they live in by using qualitative methods (Creswell & Creswell, 2017). By means of these, it seeks to understand the subjective experiences people on Gotland made with the phenomenon, that is scientifically described as the ecological degradation of the Baltic Sea. This study aims to shift perspective from a scientific description of ecological factors to a description of how and if people experience and perceive the described circumstances in their everyday lives. In that sense, "reality is not fixed or given" (Ravn, 1991). Nevertheless, it is crucial to recognize that by trying to depict and making sense out of the reality of studied people, the researcher will always influence the study through their own preconceptions and will interfere with that picture, always resulting in a somehow constructed reality (Alvesson & Sköldberg, 2018):

"you partake in its creation and must ensure that reality does not rigidify. Hence, keep the options open and the alternatives fresh, and grant others the freedom you would want – while being considerate of them." - (Ravn, 1991, p.97).

According to Creswell and Creswell (2017), apart from the worldview, a methodological approach within qualitative research is to be decided on. Therefore, as mentioned before, the phenomenological approach extends through the whole study, from the methods of data collection to the interpretation. As introduced

previously, phenomenology aims to investigate a certain phenomenon subjectively through the lived and shared experiences of a certain group of people, which opens the way for it to also be applied as a qualitative research design in this thesis (Padilla-Diaz, 2015). As such, it aims to represent people's reality by firstly describing their experiences in emic term. In a second step it reflects and processes those in such a way to identify the 'essence of the phenomena' and the subjective way of how people un- or subconsciously perceive their realities from different viewpoints, which Padilla-Diaz calls the 'intentionality of conscience' (Padilla-Diaz, 2015 p. 107). It can therefore be defined as an a posteriori approach, meaning it focuses on how a phenomenon is understood based on experiences, rather than solely based on the knowledge that exists around it without experiencing it (Padilla-Diaz, 2015).

4.2 Qualitative Data Collection

As described by Creswell & Creswell (2017, p. 54), in a qualitative research approach "the researcher seeks to establish the meaning of a phenomenon from the views of participants." In order to do so, interviews have been conducted on Gotland. The following three sections reason the choice of Gotland as a study site, describe the interview conduction, the process of recruiting interviewees, as well as the choice of interviewees.

4.2.1 Choosing a Site – Why Gotland?

Gotland has been chosen as a study site, because of its location as an island in the middle of the Baltic Sea, which makes its inhabitants continuously exposed to the sea. The historically important fishing businesses, the proximity to the beach on the island and its intense summer tourism, that is reliant on beach and bathing activities (OECD, 2022), make people more intertwined, connected to and dependent on the Baltic Sea on a daily basis (see 3.3 Gotland and its Coastline). Thus, any effects, changes and adaption strategies people develop are more likely to become visible during the interviews. Additionally, due to the many differing characteristics of the Baltic Sea, the marine environment varies throughout its coast. It was therefore necessary to confine the investigated area in order to make people's experiences comparable to each other.

4.2.2 Semi-structured Interviews

A main method of ethnographic and phenomenological approaches are open-ended and semi-structured life-story interviews as those allow the interviewees to express their experiences most subjectively, detailed and freely, with the description of the investigated phenomenon being in focus (Kyale & Brinkman,

2009; Giorgi, 2009; Marshall & Rossman, 2014). That carries the advantage that interviewees are able to construct their own narratives and choose their own concepts and terms (Alvesson & Sköldberg, 2018). Moreover, interviews can provide information about other circumstances apart from the current situation and present (Creswell & Creswell, 2017). For example are interviewees able to describe situations they have experienced in the past or during another season. Additionally, to other temporal situations, interviewees can also share spatial information, that the researcher is not able to access. For this thesis that means, that e.g. someone living on Gotland can tell me about the experiences they made at various places and beaches on Gotland giving me broader insights into the life on the island.

Due to the little research on the topic, I had several talks with researchers and people who either conducted research on Gotland in the past or work in a related research field. This gave me the opportunity to get an impression on how the situation on Gotland looks like, as I have not been on the island before. Those talks helped me to develop my interview guide (to be found in the Appendix 1). As stated above, the questions were formulated open-ended and clustered into five topics to follow the research questions:

- questions about the interviewee
- job-related questions
- the interviewee's relation to the sea
- interviewee's awareness of the ecological state of the Baltic Sea
- questions about the interviewee's future

Dependent on the interviewee, I asked the most suitable ones out of these clusters and left room to spontaneously react or ask further questions to remain as open as possible. I usually followed the order visible above, as it left most opportunity for the interviewee to mention the state of the Baltic Sea proactively. During the entire process of data collection, I further adapted my interview guide, based on the increased knowledge I gained through each interview. For example, I sometimes asked my interviewee of and how they had experienced a phenomenon articulated in previous interviews.

All participants gave the permission to record the interviews.

I intended to conduct a large part of the interviews during my study visit on Gotland, which took place from 23rd of March 2022 to 31st of March 2022. Unfortunately, the number of interviews on Gotland was limited because of the difficulty of finding interviewees and the limited time I could spend on the island (see 4.5 Reflections and Limitations for further information). Therefore, three out of the ten interviews took place on Gotland, the others were conducted via Zoom. Overall, interviews were conducted from the 24th of March 2022 to the 16th of August 2022. One interview was conducted with two participants at once (Anders

& Maria), as they are married and wished to do so. Apart from one interview, which took place over a shared meal, interviews lasted between 30 minutes and one hour.

4.2.3 Identification, Recruitment and Number of Interviewees

To recruit people the snowball method was applied. Therefore, I draw on the aforementioned talks with researchers and people, that either conducted research on Gotland in the past, work in a related research field or live on Gotland. I asked them about people they have interviewed or other researchers who might have contacts and knowledge on the topic. Moreover, personal contacts, who have connections to people living on Gotland have been resorted to. Several people were approached spontaneously during study visit on Gotland. In the end, ten persons agreed to an interview, aligning with the suggestion of Padilla-Dia (2015) for a study size for a phenomenological research design.

The choice of interviewees followed, as well typical for a phenomenological research design, a purposive sampling (Padilla-Diaz, 2015). Thus, interviewees were chosen according to specific criteria they inhabited when approached, such as their occupational background, demographics and how much time they spend on Gotland, as well as their interaction with the investigated phenomenon (Beyerl et al., 2016). As this thesis aims to gain insights into various viewpoints of perceiving the state of the Baltic Sea, interviewees from different kind of backgrounds were anticipated. Nevertheless, it is important to emphasize that the variety of interviewees only serves as an attempt to depict different perspectives, and not to make this study a statistically representative one, as it is entirely qualitative.

Interviewees cover an age range from 19 to 73 years, with 5 interviewees identifying male and 5 interviewees identifying female. All of them spent a large part of their lives on Gotland, with some of them growing up there. Thus, interviewees were able to provide information that include their experiences with the Baltic Sea over the years, from the past and the present, as well as data about different circumstances, for example about the summer and winter season. Sometimes interviewees also grew up at different places at the Baltic Sea coastline, such as the Stockholm Archipelago. Experiences described from those places are also considered, but marked as such, when presented. A diversity of people working in different sectors was highly important, as their occupation could have a significant influence on how engaged they are with the sea in their everyday lives. Someone working in the fishing sector for example might have a very different view on the sea compared to someone working at university in an unrelated field. Additionally, to their occupational background, a level of diversity was also generated through people's different leisure activities. Some went to the beach nearly daily or followed passions such as bird watching, others did usually not engage with the sea at all. The following Table 1 provides an overview over the interviewees. All interviewees have been anonymized by using pseudonyms, as

agreed on. In one case, the gender of the interviewee was further changed to ensure a higher level of security for their anonymity.

Interviewee	Background & Role in this Thesis
Pia (69)	• lived on Gotland since the 1970s. • grew up in the Stockholm Archipelago. • worked in several EU and local projects, that evolve around food-production, fisheries, tourist offers and product development, as well as with green development on Gotland. • topics of sustainability and local heritage also play a huge role in her private life. ➔ represents the local, highly engaged society on Gotland and can be seen as an expert for local matters & fisheries in the Baltic Sea.
Eva (63)	• researcher at university in marine biology with a particular focus on the Baltic Sea. • has worked as a policy advisor. • grew up on Gotland and returned after her studies. ➔ represents the scientific community engaging with the ecological degradation of the Baltic Sea, and therefore possesses expert knowledge on this topic. Moreover, she is a part of Gotland's society.
Simon (19)	• grew up mainly on Gotland. • at the time of the interviewee just finished school. • works as a waiter at a fish restaurant. ➔ represents the young population on Gotland and people, who do not share a particular interest in the Baltic Sea, but live and grew up being surrounded by it. Due to his occupation in a fish restaurant, he shared some specific insights in the fish business on Gotland, however he does not possess any expert knowledge regarding the Baltic Sea.
Thomas (73)	• lived most of his life on Gotland. • used to be a veterinary on Gotland, is now a pensioneer. ➔ represents the older generation on Gotland and someone who does not have a particular interest in the Baltic Sea, nor possesses expert knowledge on the topic.
Helen (39)	• lives on Gotland for 17 years. • grew up at the Baltic Sea coastline. • works for Gotlandsbesökssnäring AB (Gotland's tourism business association), that represents the interest of the tourism sector on the island as a business developer. ➔ represents the tourism industry, however, it needs to be considered that Helen is not part of a company and therefore not directly dependent on tourism. Since she has lived on the island for several years already, she is part of the Gotlandic society.
Malin (46)	• moved to Gotland more than 20 years ago. • owns a nature-based fishing tourism business that offers guided fishing tours on Gotland. • therefore goes out to the sea regularly. ➔ represents someone owning a tourism company, that is through fishing dependent on the Baltic Sea. Additionally, she is also a representative of the Gotlandic society.
Kerstin (69)	• lives on Gotland for more than 30 years. • grew up in the Stockholm Archipelago. • works and used to work for several nature conservation and environmental protection organizations all around Sweden. • bird watcher in her leisure time.

	➔ represents the scientific community living on Gotland, that engages in environmental topics and thus possesses expert knowledge. Moreover, she can be considered an expert for birds on the island and part of Gotlandic society, as she has been living on the island for several years now.
Patrik (65)	• originally from Canada and mainly lives in Stockholm now. • professor for social sciences. • has a timeshare house on Gotland for many years and therefore visits the island at least once a year. • engages in bird watching. ➔ represents someone who visits Gotland regularly and for many years. He does not possess a particular expert knowledge about the Baltic Sea, but an increased knowledge about bird populations.
Anders (69)	• has moved to Gotland a year ago (into his summerhouse, which has been purchased 20 years ago), because he retired. • has lived in Stockholm throughout his life. • Maria's husband • has visited Gotland throughout all seasons previously. • worked as an academic in social sciences at university. • bird watcher. ➔ represents someone who visited Gotland regularly in the past and even though he lives there fulltime now, distinguishes from other interviewees who are a part of the Gotlandic society for many years. He furthermore does not possess any expert knowledge about the Baltic Sea but has an increased knowledge about bird populations.
Maria (56)	• originally from Norway, but lives in Stockholm for many years. • visits Gotland regularly (about once a month) and throughout all seasons because she has a summerhouse there, which has been purchased 20 years ago. • Anders' wife. • works as an academic in social sciences at university. ➔ represents someone who regularly visits Gotland regularly and for many years, but does not have any expert knowledge about the Baltic Sea.

Table 1: Overview of the Interviewees & their Backgrounds (created by the author, 2023).

4.3 Data Management

To prepare the data for the latter analysis all interviews were first transcribed and in a second step thematically coded (Creswell & Creswell, 2017). Therefore, the online transcription program, otter.io has been used. After that, the transcripts have been red through thoroughly, while at the same time being checked for mistakes and if necessary, corrected. That process also functioned as a way to familiarize with the data (Creswell & Creswell, 2017). Subsequently emerging themes have been identified, which were reshaped and adapted several times, during the engagement with the data, in order to identify those, that are most suitable to answer the research questions and "obtain an interpretation that is faithful to the essence and meanings of the studied phenomenon". Thus, themes can be defined as semi-determined (Creswell & Creswell, 2017). Eventually the

thematical coding has been conducted on all interviews based on the four following themes:

- background of the interviewee, including relation and perception of and to the Baltic Sea
- perceived challenges on Gotland with a focus on the Baltic Sea;
- general impacts & impacts on interviewee's lifeworlds arising from the degradation of the Baltic Sea in connection to the before mentioned problems.
- Responses, actions, adaptations and coping mechanisms to the degradation of the Baltic Sea.

After coding all interviews, identified statements for each theme category were collected in a table. Combined with a summary of the interview and potentially relevant extracted ad verbatim quotes, overview sheets were created to structure the data for the analysis.

4.4 Phenomenological Analysis

The analysis was conducted according to Creswell's (2013) suggestion for the preparation for a phenomenological analysis and formulated into the findings (chapter 5) in this thesis. Thus, the following six steps have been applied:

1. The first step requires to describe the researcher's own experiences with the phenomenon to become aware of the influence they have on the findings (Creswell, 2013). Since I never lived at the Baltic Sea coastline and only visited Gotland shortly once, but have intensely studied the Baltic Sea, as well as environmental sciences, my perception of the state of the Baltic Sea derives from engaging with the scientific literature. Furthermore, the above-mentioned talks with other researchers drew additional focus on knowledge stemming from the scientific community. My perception of the Baltic Sea therefore corresponds with the in chapter 3. Background described circumstances. This perspective is heavily focused on the Baltic's ecological degradation and environmental challenges.
2. In a second step, the interviews are supposed to undergo the process of "horizontalization" (Creswell, 2013). In that they are coded according to what is relevant to answer the research questions. Moreover, quotes and textual descriptions that refer to the in the background described characteristics of the Baltic Sea's degradation, as well as how interviewees consider themselves impacted and relating thereto actions, are extracted. The detailed management of this step has been described in the previous paragraph. It serves as the preparation for the textual analysis.

3. The third step requires to group the extracted information into "units of meaning", which has been described as well more detailed in the previous paragraph, where the themes are also introduced.
4. As the "phenomenological analysis requires describing and analysing the 'text' to interpret the 'context'", textual descriptions have been formulated in the fourth step (Padilla-Diaz, 2015, p.105). This step therefore focuses on what has been said explicitly. To let interviewees speak for themselves "ad verbatim" quotes have been added (see 5. Findings until 5.5). Moreover, interviewees have been distributed into social arenas. This was a primarily practical decision to make findings more comparable between each other and to interpret them against people's background to give them a greater meaning. Social arenas can therefore not be interpreted as social groups, as done e.g. by Giddens or Bourdieu (for more explanation see 2. Theoretical Background) because their backgrounds, especially their access to assets, do not differ enough from each other to make comparisons including power relations between groups. The distinction of interviewees into social arenas took place based on identified similarities, such as the interviewees' occupational background, their level of interaction with the Baltic Sea, their knowledge and dependence on it. To verify the by the researcher identified subjective 'essence' of how a phenomenon is perceived by a specific arena of people, Padilla-Diaz (2015) suggests including more than one interviewee in each arena. Thus, the following four social arenas have crystallized:

    - People who live in Gotland and do not particularly engage with the Baltic Sea: the Gotlandic citizens (Simon & Thomas)
    - People researching and working with the Baltic Sea scientifically: the experts (Pia, Eva and Kerstin)
    - People who work in jobs that are dependent on the state of the Baltic Sea: the job-dependent (Malin & Helen)
    - People who own a summerhouse on Gotland: the summerhouse owners (Patrik, Anders and Maria)

5. The fifth step then stipulates to add the structural descriptions, meaning how and in which way interviewees expressed themselves (Padilla-Diaz, 2015). Those can particularly hint towards shared experiences of a certain phenomenon and are found in the 5. Findings to directly link to the textual description.
6. Based on the textual and structural descriptions, the researcher then captures the "essence of the phenomenon" by identifying common perceptions and experiences among interviewees in the last step (Padilla-Diaz, 2015). Thus,

experiences between social arenas have been compared and the findings have been concluded (see chapter 5.5 Comparison between Social Arenas).

4.5 Reflections and Limitations

The study holds several limitations and circumstances that need to be reflected on. While some are more general and occurred mainly during the data collection, others derive from the application of the theoretical and methodological phenomenological approach in this thesis.

Firstly, the study is impacted by the language barrier existing between the interviewees and me. While all interviews have been conducted in English, it has not been any of the study participants, nor mine, native language. Thus, errors and limitations in communication could have occurred. Moreover, some interviewees felt uncomfortable talking English, potentially hindering them in fully expressing themselves (Ahmad, 2018). Moreover, different circumstances during the interviews could have further affected how comfortable people felt and thus how freely they expressed themselves, with some interviews being conducted over Zoom, while others took place in a café in person and resembled more a 'chat'. Additionally, the wide temporal range through several seasons (from March until August 2022) could have affected which challenges interviewees perceive the most salient, as algae blooms for example mainly occur during summertime. It should further be reflected on the circumstance, that the first interviews have been conducted shortly after the Russian invasion of the Ukraine. Therefore, military forces on Gotland had been intensified and the island had been in focus for a possible Russian attack several times (Ministry for Foreign Affairs, 2022). This might have influenced people's perception of different threatening circumstances. Furthermore, the number of interviews was constrained by the time frame of the thesis, as well as the difficulty to gather study participants. With Gotland still being a big island, it was difficult to reach out to a large group of people at once, additionally people were hesitant of being interviewed ("*He is very Gotlandic, I am not sure he would do that".* – Interview Kerstin, 2022). Thus, while interviewees with different backgrounds were selected, several social arenas are possibly excluded. At this point, it is important to mention again, that even the selected interviewees are by no means representatives of a whole social arena, but only serve to investigate the phenomenon's interpretation out of different worldviews and perspectives. Thus, findings within one arena of interviewees are not applicable to a whole social arena, but merely give a glimpse in how people from different background could perceive the Baltic Sea's ecological degradation. Due to the high subjectivity of phenomenological studies (see chapter 2. Theoretical Background) and the qualitative approach this thesis follows, the study would perhaps lead to different findings with a different set of interviewees. Furthermore, it needs to be

undeceived that even though this thesis aspires to follow a phenomenological methodological approach, it only accomplishes to do so limitedly. As a thorough phenomenological study requires to study people's behaviour and their interactions with their environment (Padilla-Diaz, 2015), but since this thesis only relies on structural interviews, only an understanding for how interviewees perceive and interpret their lifewords themselves can be obtained. What is however missing to study people's behaviour and their interactions with their environment, is an investigation on how people practically interact with the degradation of the Baltic Sea in their every-day lives through other methods such as observations. As mentioned before, the scope of this thesis was limited and thus such investigation could not be carried out. Therefore, the methodological approach in this thesis needs more to be defined as phenomenologically inspired one, rather than a thorough phenomenological study. Moreover, as mentioned before, while this study aims to collect and understand other people's perspectives, the researcher's influence on the study should not be underestimated, as not only the analysis fully depends on me, but I also influence the data collection simply through their existence, constituting a typical disadvantage of conducting interviews. That further becomes a particularly important point with regard to the phenomenological research design. As Zoysa and Hornidge (2016) state: "describing the world through the eyes of others is a paradoxical task". Through processing and interpreting the gained data, categories and boxes are created, that can only lead to already shaped, preset descriptions of that world. Thus, the approach is always limited within itself (Zoysa & Hornidge, 2016). Hence, the least the researcher can do is to acknowledge their own influence (Creswell & Creswell, 2017).

5. Findings

The following section presents the insights and information gained during the interviews in first- and second-order categories. While it contains detailed descriptions of how people perceive and make-sense of their lifeworlds out their perspective, it also reconstructs and processes these descriptions and therefore distinguishes between the consciousness of the interviewees and the consciousness of me as a researcher (for more information see 2.1 Phenomenology). As this thesis further aims to show how people from distinct backgrounds are affected by the ecological degradation of the Baltic Sea, the individual background plays a crucial role for the later analysis and interpretation. As mentioned before, interviewees have been divided into four social arenas, depending on their occupational background, their level of interaction with the Baltic Sea, as well as their knowledge and dependence on it to make findings comparable between different social arenas and reflect on their experiences. This creation of second-order typifications assists to understand these different lifeworlds (see 2.1 Phenomenology). Within the different social arena, the presented data is further structured according to the before mentioned themes to eventually answer the research questions.

5.1 The Gotlandic Citizens (Simon & Thomas)

Simon and Thomas share the perspective and viewpoint of people who live on Gotland full-time, but do not possess any expert knowledge on the Baltic Sea or have a particular interest or dependence on it. Additionally, their insights are especially valuable in comparison to each other, as they represent the oldest (Thomas, 73) and youngest (Simon, 19) interviewee. Both of them grew up on Gotland and thus spent a majority of their lives on the island. While Thomas has worked most of his life as a veterinarian and is retired today, Simon just graduated from high school and works as a waiter in a fish restaurant.

5.1.1 Perceptions of the Baltic Sea

During the interviews it became apparent that both, Simon and Thomas, do perceive and experience most of the above-described ecological challenges in the

Baltic Sea in their everyday lives. The topics being described most intensely were the increase of algae, the reduction of fish stocks, pollution and their perception of the overall water quality.

When describing today's algae situation Simon refers to experiences during the recent years, while Thomas compares it to his past, when he grew up on Gotland:

"You notice it, when we go with the boats, you see down in the water sometimes to see if it is clear to swim. Most of the time it is just filled with algae and stuff. And it's not nice, I don't like to swim [there]. And I don't mind it, because I don't go around swallowing the water, but it feels like you know not that nice. […] I think I know now that I won't swallow, but there's always the possibility so that's what's not nice and the worst part is, that you can get sick from it, you know. So yeah, algae, that's really unlucky that we have it here, otherwise it would be quite perfect in here in the summer at least." – Simon (2022).

"I've seen for example when I was a kid, you know algae, the brown algae connected with a stone, it was a high, maybe half a meter high, with small air bulbs in it. When the waves coming in, they bring down oxygen in the water. When I was snorkeling around 1970 it was still there, but 20 years later it was just like this, the water change, you don't get any oxygen in the water and then you get the problem with a different [algae]." – Thomas (2022).

Additionally, both describe the decline of fish stocks they have observed. Regardless of their age gap and the resulting fact that they experienced the Baltic Sea at different points in time, they describe very similar phenomena: *"The life in the sea is not that lively anymore. Fishermen fish up too much fish."*- (Simon, 2022). He further connects the reduction of fish stocks to the pollution of the water: *"all these bad things have entered the fish, like plastic and stuff."*. Thomas specifically recalls the disappearance of cod in the 1980s and the consequent extinction of most fishers.

Moreover, both bring up the contamination of Baltic Sea fish, due to an increased pollution:

"So I think it also has a lot do with like, you know, the fish is bad now. Because all these bad things have entered the fish, like plastic and stuff. So you can't really eat the fish here anymore. So that's sad. I think, that's why. Everyone knows it. Especially those who purchase our fish, so they always ask if it is from the Baltic Sea, before they buy it. Obviously no, of course not, you can't get it from the Baltic Sea. It's not nice, you know, knowing, that the sea, the fish here are like poisonous, that you cannot eat them, because we humans destroyed the sea and destroyed our fish." – Simon (2022).

Furthermore, both connect the entrance of polluting substances to the dead zones:

"The bottom of the sea is dead, because of fertilizer stuff. It goes into the water like in these different little lakes, but it's happening to our big lake, I guess. That's

why it's dying. I know there is a bunch of bad stuff like oil and stuff in the sea. And it's just on the verge of completely dying." – Simon (2022).

Simon further describes experiencing the oil spills: *"You see those rainbowy-kind-of-ish thingy floating on the surface. We've seen that a lot of times. That's really not nice. So I don't know, what people are doing, but yeah, accidents happened. You hear on the news, a big ship got a big hole in it and a bunch of hundreds of liters of oil get out in the sea. And it's like: What the heck are you doing, guys?"*

Thomas tells how a friend experienced the dead zones, while fishing and taking up some bottom layer of the sea floor: *"It has something to do with pollution and depths. There is just no life and it smells awful."*

Additionally, both share the perception that the sea's overall water quality declined, describing it as 'cloudy' and unclear:

"I really miss to go down to the sea and see clear. […] For example, I could when I was snorkeling before, during maybe April, then you could lie in the surface of the water and you can see 50 meters, see if you had your flounder on the bottom. During summer you can't see, the pollution has made not the clear water as before." – Thomas (2022).

"I really liked it, you know snorkeling, scuba diving and like seeing all the fish and life in the sea. I went to Mallorca one time and it was the first time, I went scuba diving. And it was really nice to see all these fish and life. It was really filled with life. And now, when you do it here, it's like you see some plants, like dead plants and stuff. It was always cloudy in our sea, it's not so nice." – Simon (2022).

Nevertheless, both interviewees bridge various times to past experiences and refer to the Baltic Sea's current state as something that has changed (Thomas: "*I see the change in many things."*), with Simon describing a past impression as follows:

"I don't recall like a specific [memory]. I recall like cleaner, much cleaner beaches and stuff. Like I don't know, the color of the ocean in a way you know? You have this really nice memory of a really nice ocean and a really nice beach, but nowadays it's more grey. A little more depressing, I guess."

The perceptions of the Baltic Sea's current state are regardless of the interviewees' age-gap coined by notions like 'dead', 'destroyed', 'depressing' and 'awful'. Moreover, both interviewees express their anger and frustration throughout the interviews (Simon: "*What the heck are you doing guys?*"; Thomas: "*They don't think about what is happening, they shouldn't accept it, they should go down to the beach be angry if there is pollution.").* Additionally, Simon uses sarcasm to indicate feelings of bitterness related to the Baltic's degraded state, when explaining that he has experienced the increase of seals, but does not perceive them as problematic: *"I think it's nice to have them around, at least a little life".*

However, the Baltic Sea appears to have an additional meaning for Simon and Thomas. Apart from describing their perception of the ecological challenges and how those have changed the sea over the years, both connect the Baltic Sea to personal, joyful memories and a space for bonding experiences with their friends and family:

"In winter it really is something, that is there because you don't do anything with the sea. You see it and it is beautiful, I guess. But in the summer, we own a boat, the family has a boat. So that is really nice. We usually go out to Östergarnsholm, it is an island outside of Östergarn. And that is really nice. And we invite some friends over also and go there and eat some food there and we camp a little. So that is really nice that we have that availability. Just get on the boat and go wherever you want. And you know, go swimming all the time with friends. Wake up in the morning and bike down to the sea and just swim. Yeah, that is really nice." – Simon (2022).

"It had been paradise, when I was a kid!" does Thomas reminisce about fishing with his father and swimming in the sea during his childhood. He further adds: "*It is unique to have an island with the water in all different directions. […] It is unique and the light […] is very special."* His appreciation for the island and thus the sea is additional expressed by his current aim to walk along the coastline with his wife to discover new places.

Moreover, both interviewees seem to identify with the Baltic Sea, using terms such as "our coast" *("At the same time that they don't want to destroy their own coast, they go in here, in the Baltic and destroy our coast."* - Thomas, 2022) and "our sea"; "our fish" (*"[…] the fish here are like poisonous, you cannot eat them, because we humans destroyed the sea and destroyed our fish"*- Simon, 2022), indicating a sense of belonging.

5.1.2 Impacts and Consequences on their Lifeworlds

Both interviewees mention two major consequences the Baltic Sea's ecological degradation had on their lifeworlds. Firstly, both agree on that they cannot swim anymore, when algae blooms come in: *"you can't swim during the summer, if the water starts to bloom, because the cycle is destroyed"*- Thomas (2022).

Secondly, they point out the unavailability of edible fish from Baltic waters. While Thomas notes, that he cannot buy seafood from local fishers anymore, Simon states that the fish restaurant he works in, can sell *"nearly nothing from the Baltic Sea",* which is "*a consequence of us completely destroying the sea".* Simon expresses his sadness about that *("So that's sad."*) and describes how that impacts him psychologically:

"It's not nice, you know, knowing that the sea, the fish here are like poisonous, that you cannot eat them, […]". – Simon, 2022.

Moreover, they both describe that they cannot fish for personal use anymore. For Thomas that further affects his experience of teaching his grandchildren how to fish the same way, that he learned it from his father, indicating a cultural impact the Baltic's degradation has on his lifeworld.

5.1.3 Responses to the Degradation of the Baltic Sea

During the interviews Simon and Thomas describe several practices, they have either developed themselves as a response to the changing circumstances in the Baltic Sea or that they have experienced in other parts of their lifeworlds. While some of these actions represent conscious decisions, others may happen rather semi-conscious and belong to the 'natural attitude' of everyday-life.

In such a sense, both Simon and Thomas check the news and algae radar for incoming algae blooms before going to the beach. Simon additionally asks family members, hinting towards the ubiquity of algae blooms as a phenomenon. Furthermore, he transitioned to visiting touristic beaches, as they are being kept clean by the corresponding companies. Thomas further mentions that people increasingly buy swimming pools or swim in the limestone quarries, instead of going to the beach:

"People buying swimming pools, instead of fighting for a clean Baltic. I will never buy a swimming pool, I want to swim in the Baltic Sea. And in the North of Gotland, where they had some limestone, there is a hole in the rocks and there's nice water and everybody is going there during the summer instead. They don't think about what is happening, they shouldn't accept it, they should go down to the beach be angry if there is pollution."

Another practice described by Simon and Thomas, which ensures the consumption and sell of fresh fish is the import from Norway and the North Sea.

"*They buy the fish from Norway. I'm really angry, because in the north of Norway, they don't fish; just for tourism. They keep the coast nice and clean. And then they go into the Baltic and bring fish for food for salmon. And then they destroy our coast at the same time. At the same time that they don't want to destroy their own coast they go in here in the Baltic and destroy our coast and then someone should work [with] this problem, because soon the Baltic Sea will be dead."* – Thomas (2022).

Additionally to that, Thomas confirms the growing of fish in old barns, which have been retooled to aqua ponds: *"Yes, yes. But then, I asked myself, why have fish in a dairy cow house when you have water on the whole island?"*

Moreover, Thomas mentions several times that he aims to create more awareness for the ecological challenges in the Baltic Sea by talking to other people, which however *"don't seem to care about it."*

Throughout the interview it becomes apparent that Thomas feels enraged about a lot of the adaptations people on Gotland make as a response to the Baltic Sea's degradation, instead of endeavouring for a better environmental state.

5.2 The Experts (Pia, Eva & Kerstin)

Pia, Eva and Kerstin share the perspective on experiencing the Baltic Sea's degradation from the viewpoint of an expert. While Eva is a researcher, Pia and Kerstin work with green development and nature conservation. Through their work, all of them are, or were in the past, engaged in policy making. Additionally, they all grew up at the Baltic Sea coastline (Pia and Kerstin in the Stockholm Archipelago; Eva on Gotland) and today live on Gotland. Thus, they are able to share perceptions and comparisons to the past, as well as perceptions originating from two different life spheres, namely their work-life and their private life. While those are intertwined and come together in the bigger lifeworld, they might have different foci and should therefore be approached distinguished (for more information see 2.1 Phenomenology). Since Kerstin is also a birdwatcher in her leisure time, she can additionally be considered to possess expert knowledge about the Gotlandic bird population.

5.2.1 Perceptions of the Baltic Sea

During all interviews, it became very apparent that the interviewees are extremely well-informed of all the above-mentioned ecological challenges, due to their expertise in this field. Therefore, descriptions of the environmental challenges that did not stem from personal experience were kept short. It indicates that within their work-life spheres the Baltic Sea is rather perceived as an 'object of study' than as something personal. The lack of emotions in those descriptions further supports this interpretation. Eva, for example, summarizes the various problematics in the Baltic Sea relatively unemotional by tracing them back to the "imbalance" of the ecosystem, that drives the eutrophication and overfishing, which "top down" leads to over blooming of algae and bottoms without oxygen and is caused "bottom up" by flushing nutrients into the Baltic from agriculture, forestry factories, humans, boats, etc. That imbalance not only applies to eutrophication, but also to the decline of fish stocks:

"*And then in the 1980s, the Baltic was the place in the world where you could fish most cod. So in the Baltic during that time, there were much more fishing boats from all over the world that came in to fish. And they had a huge amount of catches. So I think the overfishing in the 80s, this is actually the thing that changed the whole, made a whole system go."* – Eva, 2022.

In their personal life spheres, the most prominently perceived phenomena of the Baltic Sea's degradation throughout all three interviews were the increasing algae incomes, the contamination of fish with dioxin, as well as the increase of cormorants and seals. Pia, for example, describes her perception of the algae as follows:

"Yes, it can float in and it's like all manure, in packs and brown. And then it starts to ferment, this smells horrible."- Pia, 2022.

While Pia and Eva categorize the increase of seals and cormorants as a *"big problem"* (Pia, 2022), because *"they are smart enough to be able to use the nets from the fishermen. So there's a conflict between the fishermen and the seals and the cormorants."* (Eva, 2022), Kerstin perceives them as *"neutral"* out of a birdwatchers perspective.

Furthermore, Kerstin describes how she experiences the current water quality and how she considers the occurrence of oil spills 'sad' and 'terrible', however they "*happen less often now"* (Kerstin, 2022):

"Those times, when you see birds with oil stains on them […] that is terrible to see. Because you usually see them far away from the shore, but then they are coming in and they are going to die. And it is very, very sad when that happens" – Kerstin, 2022.

All of the interviewees further describe the change the Baltic Sea underwent, when they compare their childhood memories coined by non-existent critical environmental conditions to today's situation. It needs to be noticed that Pia and Kerstin refer to their memories in the Stockholm Archipelago.

"And I'm not sure if it was; it wasn't as obvious. The algae bloom for instance, I could have forgotten, but I can't remember that it was that much of it. I think that is true. I think it has changed. And I think also that this bottom without oxygen has changed." – Eva, 2022.

"We had; it was a dramatic change. Because when I was a kid, then we went out with a boat, there was no green algae and all the nutrient overload. There was nothing like that. And the water was crystal clear. And then it just turned off, you know, algae soup, and all this green slick stuff on the cliffs. There was nothing like that, when I was a child. It's getting better now everyone says. […] But the water quality definitely changed. And also we were fishing all the time, getting pikes, and there is no pike anymore. And so it was a big change, because it really changed." – Kerstin, 2022.

Even though Pia and Eva share positive memories of the Baltic Sea from the past, their picture of it today is highly connected to its ecological challenges and thus differs from Kerstin, whose perception is, despite her increased expert knowledge, not dominantly influenced by ecological challenges:

"It [living at the Baltic Sea] is brilliant, because I love going into this.[…] I go to the sea probably five times a week, because I am a birdwatcher. […] the water

[condition] is not really influencing the feeling. Maybe- Well, it does if you know- if you find something dead floating around. Yeah, it's not that dramatic, you know, it's not that dramatic. There's a lot of poison in the sediments and there's you know, a lot of dispersion so the ecosystem and wrong species and the cod is gone and blah, blah, blah. But you don't really see it when you take a walk along the shore." – Kerstin, 2022.

This quote, as well as other statements by Kerstin (*"People are extremely afraid of algae and it's silly."*), further show that Kerstin does not perceive all environmental struggles as severe as other people. The same applies for some of Pia's descriptions: *"Oh, it [Baltic Sea fish] is so much poisons, but there are poisons in all kinds of food that is produced."*.

Overall, the interviewees show more emotions when talking about their perceptions of the Baltic Sea from their private life sphere, with Pia also connecting to the Baltic Sea as her "home":

"Q: So do you connect the Baltic Sea with home in a way?

A: Yes, because it connects Gotland and [the place she is from]. Because it does not matter which side, the Baltic connects all countries." – Pia, 2022.

Nevertheless, all interviewees seem detached regarding its ecological state out of their work-life spheres.

5.2.2 Impacts and Consequences on their Lifeworlds

When first being asked if the interviewees perceive themselves as being impacted by the ecological degradation of the Baltic Sea, all of them disagreed. Eva for example stated:

"Not really. I mean, if it's really bad algae bloom that comes in, I do not go swimming as much as I used to. I think I don't go swimming as much as I used to when I was a kid anyway, I think you go much more swimming as a kid in general." – Eva, 2022.

Kerstin positions herself similarly:

"Q: But would you also say, the bird population has been the same or has it been affected in some way?

A: No nothing. […]". – Kerstin, 2022.

She then however described that through the consumption of fish by the birds, they are affected as a part of the ecological system. Nevertheless, this does not affect the "general birdwatcher".

Despite claiming that they are not affected directly, the interviewees describe various ways in which their lifeworlds are impacted, showing how deeply it is rooted in their natural attitude. While Eva mentions that people are not supposed to go to the beach, when algae come in, Pia describes the reduction of fishers which is connected to the avoidance of costumers to consume Baltic Sea fish. She states,

that there currently are only about 13 fishers on Gotland and none to succeed the profession, because *"there is no future"*.

"And then we started to discuss with the inspectors, how the hell can we restore this in a way because we have 600km of shoreline, we have 200 fishing villages, and no fish." – Pia, 2022.

She expresses her anger about the implementation of current regulations that lack a comprehensive understanding for the Gotlandic fisher's situation: *"the law was changed because there was too few fish and the environmental [Pia shakes her head and rolls her eyes]"*.

Furthermore, Eva sees a possibility of current environmental struggles impacting the tourism industry in the future:

"*I think, that if the Baltic continues to have this algae blooms and also one other problem is of course, that there are some poisons in the Baltic, that they think you shouldn't eat all the fish in the Baltic, the fat one. Then, yeah, that could create a situation where people don't want to come."* – Eva, 2022.

5.2.3 Responses to the Degradation of the Baltic Sea

All of the interviewees respond through their work lives to the Baltic Sea's degradation. In that sense, even their current work could be considered a response to the Baltic's degradation, as their jobs would look different without it. Moreover, through their role as researchers they share special insights into the scientific community responding to the Baltic's degradation. Pia for example shares how caught fish from the Baltic Sea is chemically treated in order to lower its dioxin levels. It then gets fed to Norwegian salmon, which later will be sold to costumers, instead of the original Baltic Sea fish. Moreover, farmers on Gotland have started to grow fish in aquaponics in barns to ensure a controlled water environment:

"It's very expensive, they don't make much profit, but they are still in the start-up phase. But it's local, it's possible to do it and you can control it and you can avoid all those dioxins and whatever poison you have in the Baltic Sea". – Pia, 2022.

Additionally, she describes an initiative through which fishers can send their fish to the North of Sweden, where a specific centrifugal machine gets 15% to 20% more meat from the fish than in the usual process. While the initiative can also take care of the leftovers and use it for e.g. dog food, the processed fish comes back as burger patties (Pia, 2022). Also fishers themselves needed to adapt:

"They had to change from being a fisherman to a person who is dealing with food. […]. They are doing practically all the chain, from protecting the sea and surveying the environment, because they are there every day, to having the product on the plate. 50 years ago, they were fishermen, they landed the fish, somebody took care of the fish, they got paid. Now, they have to do everything by themselves, including reporting six times for each time you go to the sea." – Pia, 2022.

Moreover, Pia herself creates different brochures (see Figure 4) to raise awareness and inform people, about the edibility of Baltic Sea fish. *"So it's all about education, education, education, […] and how to communicate",* she stated about the brochures.

Figure 4: Two informational brochures about the edibility of fish from the Baltic Sea. (created by the author, 2023).

Through their work, Pia and Eva further participate in various events, such as 'Fiskens dag', Östersjönsdagarna and the water dialog, as well as projects focusing on blue foods, creating new wetlands and reducing the nutrient inflow into the sea.

However, all of them also observe and carry out responses to the Baltic Sea's degradation in their private life spheres. Pia for example tries out different recipes using unusual fish species and algae. Kerstin describes, how people go swimming in the limestone quarries and lakes to avoid algae incomes at the sea:

"And if you have the wind from the you know, bad direction, you will get it where you want to go swimming, and then people end up swimming in the lakes. And that's a big difference from when we moved here first because now people there, it's packed, you know, lakes, people go into the lakes instead to swim. And also this limestone quarries that are filled with water, a lot of people go there instead to take a swim because they're really afraid of this algae. People are extremely afraid of algae and it's like silly. I mean, if you don't have a dog, you just should not have the dog drink the water. But I mean otherwise, but it doesn't look very nice." – Kerstin, 2022.

Moreover, all of them mention the algae forecast, making it an integral part of their lifeworlds:

"You can't go out in the water because you don't step on those. […]. You must listen to the reports on the radio, which side of the island the algae are. […]. It's the algae report, it's like the pollen report." - Pia, 2022.

While all of the interviewees describe several responses that can be traced back to the Baltic Sea's degradation, Kerstin states she does not believe that anyone would change their behaviour because of the Baltic's state:

"So it's not that I don't want to go because it's so polluted or anything, nothing. I think anyone on Gotland would say they would, you know, change behaviour because of that. Because I mean, it's under the surface, it's always a problem with the sea. It's under the surface, you don't see it."- Kerstin, 2022.

5.3 The Job-Dependent (Malin & Helen)

Malin and Helen are working in different forms in the tourism sector on Gotland. While Helen is employed as a business developer at the Gotlandic Tourism Association AB (Gotland Besöksnäring), which is a nonprofit organization that represents the tourism industry on Gotland, Malin owns a nature-based tourism company, that offers guided fishing tours around the island and in the North of Sweden. Therefore, they depend on the Baltic Sea for a living. Through her job Malin goes out to the sea by boat regularly and possesses insights into the development of fish stocks, while Helen is more focused on beach and bathing tourism. Moreover, both of them live on Gotland, with Helen additionally growing up at the Baltic Sea coastline.

Similar to the before described "experts" their perceptions of the Baltic Sea can vary dependent on the life sphere through which they experience it.

5.3.1 Perceptions of the Baltic Sea

Both of the interviewees again mentioned several ecological challenges, indicating that they do perceive many of the above-described points. The issues mostly addressed were the income of algae, as well as decline of fish stocks by Malin. However, both also, similar to the other social arenas, perceive the Baltic Sea as a place of recreation and identity. Moreover, Helen adds a third perspective originating out of her work-life sphere onto it, in which she describes the sea as a *"unique selling point":*

"It's absolutely one of our unique selling points, it's part of our DNA. Like we're an island so for us being surrounded by the sea, it's part of the whole experience." – Helen, 2022.

However, she perceives the income of algae in her work-life as "*not a nice phenomenon. And it doesn't look nice."*- (Helen, 2022).

The decline of fish stocks is mentioned by both interviewees, however more intensely focused on by Malin, due to the fact that the fish stocks are a fundamental part of her work life. She describes that the decline can on the hand be ascribed to the freshwater shortage on Gotland, leading to dried and "destroyed" spawning areas for fish. As a result, the fry dies and this *"happens more and more frequently because of climate change and how agriculture has been managed for ages, when it has been very efficient in leading freshwater into the Baltic."* On the other hand, fish populations decline because they are overfished, partly by unregulated household fishing. She describes the current decline in herring as follows:

"We are now losing herring, which everybody thought would be impossible. But now it's like on a super decline. And that is a huge problem [because] herring is the staple food for many other predators and salmon and seatrout as well. So it's big, big problems in the Baltic in that sense". – Malin, 2022.

She adds, that the loss of predator species could lead to an increased instability of the marine food web.

5.3.2 Impacts and Consequences on their Lifeworlds

Malin and Helen experience impacts in their lifeworlds caused by the Baltic Sea's degradation in two different ways, with some of the impacts manifesting in their work-life spheres and others in their personal lives.

Especially in the interview with Helen, it becomes apparent that she is aware of the impacts the Baltic's degradation could have on her lifeworld in the future, but at the same time does not perceive any impacts yet.

"Well, I think when this algae […] when this happens, it's a factor that the tourists don't come to the beaches, as much as they did before, because part of the beach experience is to be able to bathe in the sea, which is wonderful. So of course, they're affected by it. […]. So they are aware and affected, a bit worried, but maybe not- It hasn't been an issue for them YET in order to run their businesses." – Helen, 2022.

While she further describes that "*it is not okay to bathe in the sea. […] It's not good for your skin and allergies*.", she also mentions that *"many people go to the beaches anyways"* (Helen, 2022).

The same applies for Malin. While she claims that her company is not directly impacted by not being able to find enough fish to keep the business running, she only perceives the decline of fish stocks as a "danger for the future". However, she also mentions, that sometimes she needs to find new fishing spots, as the water can be too "muddy" in some places. Moreover, Malin describes various other impacts she has perceived in her work-life sphere, such as the need to close down the fisheries in the North, because of the negative effects of the sea's temperature rise. Additionally, commercial fishers are not able to sell their catch on Gotland, because

"*it's not financially working out, like everything else, they have to do it large scale."* As a result, restaurants on Gotland cannot offer local fish anymore (Malin, 2022).

While Helen states on a personal level, that the Baltic Sea's current state does not influence how often she goes to the sea, Malin describes how she considers herself psychologically impacted:

"*there's also the fact that it does something psychologically that you know that the fish that you catch is not very good to eat. Because of the high levels of dioxins and stuff like that. And it's something nice to know that the fish that you catch even if you don't eat it, it's healthy."*- Malin, 2022.

Even though Malin and Helen are aware of some of the impacts the Baltic Sea's degradation has on their lifeworlds and seem to be especially aware of future impacts, they both claim that their work lives are not impacted yet. Contradicting however, both then mention ways in which they are indeed impacted.

5.3.3 Responses to the Degradation of the Baltic Sea

Both interviewees mentioned several adaptions that they themselves and others, especially in their work lives, have made as a response to the current state of the sea.

Helen herself, for example offers workshops and seminars focusing on sustainability in order to increase environmental awareness among tourists. She also describes that tourism companies have developed "good communication systems" for algae incomes, distribute tourists all around the island to minimize the pressure on specific beaches, as they have a "great interest to decrease the effect on both, the sea and the sand" and look for alternatives to bathe:

"And I think that they are thinking about alternatives that if this happens, or that the status of the sea is such that it's not possible to bathe: What can you offer instead? So for example, looking at let's say pools and that sort of stuff, but at the same time, sure, you can have a pool even with sea water in it, but at the same time, it's the same problem that we have very limited access to water."- Helen, 2022.

The same applies for Malin's company, which has implemented a catch and release system, plan their trips to the sea as sustainable as possible with regard to the choice of gear and apprise clients how to handle the fish to not further intensify the pressure on fish stocks and the sea. Moreover, Malin describes, as mentioned before, a more involuntary response, when she needs to find new fishing spots, because the water quality is too bad. She further explains that local authorities try to affect Havsvattenmyndigheten to implement new regulations for the protection of fish stocks.

Additionally, Malin reflects on how the condition of the Baltic Sea will perhaps enforce further adaptions for her business and people in general in the future:

"Humans are always opportunistic. They will find new ways. We will have to eat other species, other fish maybe. And what is happening up North, when the water

temperatures rise: we're going to see more perch and pike. Then we will have to work with that. And we are already increasing the business we do in Lapland with the pike. And when the water gets warmer, that's what is going to happen. So we'll have to adapt of course."- Malin, 2022.

In their private life sphere, Malin and Helen mainly respond to the degradation of the Baltic Sea by avoiding algae incomes and instead going to other beaches and lakes to swim. Moreover, Helen uses the algae and weather forecast to monitor the situation. Recently she further participated in a cleaning campaign on the beach with her kids.

5.4 The Summerhouse Owners (Patrik, Anders & Maria)

The fourth arena of interviewees represents the summerhouse-owners on Gotland: Patrik, Anders and Maria. All of them visit the island several times per year, independent of the season, which distinguishes them from other tourists. All of them have purchased their summerhouses already several years ago. Recently, Anders moved to Gotland full-time, as he has entered his retirement. Before, he worked, just like Patrik and Maria, as social scientists at university. Their topics of research do not connect to the Baltic Sea or other environmental studies. However, Patrik and Anders enjoy birdwatching in their leisure time. Their perspective is specifically valuable with regard to their conscious decision to buy a house and live on Gotland.

5.4.1 Perceptions of the Baltic Sea

The summerhouse-owners' perspectives of the Baltic Sea are coined by two major shared perceptions. One the one hand, all interviewees consider the sea the factor that disconnects Gotland from the mainland and which therefore enables them to "leave reality behind", making it a reason to choose Gotland as their summerhouse destination.

"It [the sea] is important, because it creates the distance, that you are away a bit from everything. Which can be scary sometimes, but it's also something that is nice. You're a bit away from things. So the sea creates a distance to the mainland." – Maria, 2022.

"It [buying a timeshare house on Gotland] had to do with the sea for sure. And the idea of the disconnection from the mainland, taking the ferry over to the island. That feeling of leaving reality behind so to speak". – Patrik, 2022.

On the other hand, they also perceive it as "a reminder of the environmental issues, because […] you often get the problems with the algae" (Maria, 2022). Thus,

their perceptions do additionally align with the before described ecological challenges (see 3.1 The Baltic Sea Today). Patrik for example further states the algae blooms have intensified "a great deal!":

"There is a lot of blooming in the Baltic, that starts in the late spring and goes through summer. There is a lot of other nutrients. I mean, pollution can occur all year around, there is no question about that. We're aware of that, the stagnation of the water and so on and so forth."- Patrik, 2022.

"It's been going on for quite a while, but it didn't exist, when we first started, when I first started there 30 years ago. If it did, it was very rare and came and went very quickly. It was exceptional. If it happened, it was an exception. […] Now, 20 years, I would say that it started to be more regular. And then the last 10/15 years it has become a major problem." – Patrik, 2022.

Moreover, Patrik and Maria observe the increased pollution:

"One thing we should mention […] is the plastic. I shouldn't exaggerate, but that is something we often talk about, plastic or other waste along the beaches. And of course one thing is all the things that you see, but then you think of all the stuff you don't see that's buried."- Maria, 2022.

Furthermore, all of them mention the pollution of the water caused by farming, as well as the toxins in fish:

"For all these poisons, that I've seen in the Baltic, that's sad actually". – Maria, 2022.

Throughout all the interviews it became apparent that the interviewees experience the sea predominantly as a factor providing distance to the mainland, rather than for its marine properties. Moreover, their perception of Gotland is mostly focused on its nature, cultural heritage and social environment, rather than the Baltic Sea, making it a secondary characteristic of the island. Thus, even though they are aware of the ecological challenges, its current state seems subordinate. That is further supported by the little emotions they show, when talking about it, with Maria being the only one of them describing it as "sad".

5.4.2 Impacts and Consequences on their Lifeworlds

Even though, all of the interviewees used to not fully live on Gotland, the ecological degradation of the Baltic Sea had impacts on their lifeworlds, mainly caused by the contamination of fish, as well as algae blooms:

"We don't eat Östersjön [Baltic Sea] fish. Well, it started probably 10 years ago. But now we don't eat any fish out of the Baltic. So that's a big difference." – Patrik, 2022.

Maria explains that before eating fish, she needs to consider "*how much fish can you actually eat? Especially if you have children, you don't want to feed them too much. Which fish from the Baltic? It's awful. We have been fishing with friends*

here […] and that is wonderful, but how much can we actually eat? You can't eat a lot."

Patrik further describes that the algae blooms "*smell horrible. So you don't want to have a picnic in that area or walk really in that area. So there are certain areas we tend to avoid during summer*".

Despite the described impacts, Maria notes, that the degradation of the sea does not *"create a big problem, but that it is a reminder of that the sea isn't doing well.",* indicating a more psychological influence.

5.4.3 Responses to the Degradation of the Baltic Sea

Moreover, they describe that they have experienced several responses to the Baltic's degradation in their everyday-life on the island. Hence, Anders explains, that during summer small fish stores open around the coastline maintaining the impression of selling fresh fish from the Baltic:

"It's kind of absurd that there are small stores, especially during the summer selling fish, giving the impression that this is fish from the Baltic, but it's not. It's fish from the Atlantic. […]. So you go to the little fish village store selling fish, but the fish is not from the Baltic."- Anders, 2022.

As a consequence, smoked shrimp imported from the West coast of Sweden became a "Gotlandic specialty" (Anders, 2022).

All of them further describe that they respond to algae blooms coming to the shore by going to different lakes and beaches:

"Sometimes we need to find another place where we can go swimming. That's often the case, yes, that's sometimes the case."- Patrik, 2022.

"There's a number of inland lakes that we can swim in. And we have a couple of favourite inland lakes that we go to, where there is no algae. That's a change."- Patrik, 2022.

5.5 Comparison between the Social Arenas

This subsection summarizes the most important findings within the social arenas and further points out similarities and differences by comparing them to each other. Thus, shared perceptions that go beyond different social arenas and become apparent.

5.5.1 Perceptions of the Baltic Sea

All interviewees have perceived and described various signs of the Baltic Sea's degradation in their lives. While this on the one hand indicates that they are well-

informed about the Baltic's state, it on the other hand shows that the scientifically described ecological challenges in the background section are part of their lifeworlds. It became apparent that perceptions of the sea often seem to be shared within the social arena of interviewees, however many shared perceptions do also exist among them. Often, descriptions of different challenges then varied in language and words. For example, the "experts" used the term "eutrophication", while the "Gotlandic citizens" describe the same phenomenon with their own words. The most commonly perceived challenges among all social arenas were the increase of algae blooms, the increase of pollution, including the input of nutrients and the connected contamination of fish with dioxin. Furthermore, the social arenas of "Gotlandic citizens", "experts" and "job-dependent" interviewees describe oil spills, the decline of fish stocks connected to overfishing, dead bottoms, as well as a decrease of the overall water quality. While there were some additional challenges mentioned by individual arenas, such as the rise of the water temperature by the "job-dependent" interviewees, a clear distinction between the shared perceptions of "summerhouse-owners" and the other social arenas can be made, as they mention much less challenges perceived in their lifeworlds compared to the others.

Nevertheless, they also share a perception described by all social arenas: the sea's state ecologically declining over the course of time, which is often expressed by describing a change of the overall water quality. What is particularly noteworthy in that regard is that this observation is further independent from the interviewee's age, being mentioned by the youngest as well as the oldest interviewee. While younger interviewees describe it mainly with regard to the decline in water quality and fish stocks, as well as the increase of algae incomes, older interviewees from the "experts", as well as the "Gotlandic citizens"- arena further refer to past events, such as the disappearance of cod in the 1980s (Thomas & Eva). That shows that the sea's degradation is still an ongoing and visible trend that cannot only be assigned to the past but persists even under enhanced management strategies.

While the perceptions generally align with the environmental circumstances described in the background, not all of them were perceived as a problem or coined negatively. The increase of cormorants and seals for example was experienced unproblematic by the "job-dependent"-interviewees, as well as most of "the experts" and even characterized positively by one "Gotlandic citizen". Vice versa, oil spills still seemed to have a significant influence on people's perception of the sea, with many interviewees mentioning and describing them with terms such as "horrible", even though they have drastically declined over the recent years (see 2.1 the Baltic Sea Today).

However, the Baltic Sea is not only perceived as a degraded body of water, but also as a place of recreation, memories and joy, especially by the "Gotlandic citizens", the "experts", as well as the "job-dependent" study participants. Throughout the interviews, a contrasting picture of the sea emerged, which entails

attributions, such as “beautiful”, “paradise” and even a sense of identity and “home”. In that it is also perceived as a place enabling bonding experiences with friends and family. Since this sense of home and identity is not perceived by the “summerhouse owners” it can also be ascribed to the circumstance of the other interviewees having lived on Gotland for a long time.

Moreover, the perception of the Baltic Sea in different life spheres has added several meanings to it. While it represents an object of study to the “experts”, it is seen as a “selling point” by the “job-dependent” interviewees. Additionally, the social arena of “summerhouse owners” construes it mainly as a space that creates distance to the mainland to leave “reality behind”. This showcases how the perception of the Baltic Sea is influenced by people’s individual backgrounds.

Furthermore, the amount and kind of emotions expressed during the interviews vary between the different social arenas. While the “summerhouse owners” show only little emotions overall, the “job-dependent” interviewees express their emotions only sparsely verbally, however seem emotionally involved in the topic, with Helen expressing her concernment for the future and Malin being the only interviewee mentioning that she would take action to improve the state of the Baltic Sea, when being asked if she would like to change anything on Gotland. This is further noteworthy as Malin is the interviewee who could be considered most dependent on the Baltic’s state due to her occupation in the fishing tourism. The “experts” describe several feelings during their interviews, such as sadness and concern over the sea’s degradation. Those were however mainly expressed when talking about their private lives and they seemed rather detached to it out of their work-lives perspectives. This impression was further supported by them indicating the overestimation of some of the ecological challenges’ severeness. The social arena expressing by far the most emotions were the “Gotlandic citizens”. On the one hand, their language was coined by notions such as “dead”, “destroyed” and “horrible”. On the other hand, they show feelings such as frustration, sadness and anger, talking about the Baltic’s current state, but also referring to too little action taken and too much acceptance regarding the environmental struggles.

5.5.2 Impacts and Consequences on People’s Lifeworlds

While all interviewees, independent of their social arena, experience some kind of impacts from the Baltic Sea’s degradation in their lifeworlds, many of them first claim that they are not affected by it directly. This observation especially applies for the social arena of “experts” and “job-dependent” interviewees, with the later considering impacts the Baltic’s ecological state could have in the future, but declaring, that they are neither impacted yet and nor worried. The lack of awareness among all interviewees indicates that these impacts belong to people’s natural attitude (as defined by Schutz) and thus create their common-sense of living, in which they accept impacts stemming from the Baltic’s state as their reality, without

questioning it. The most prominent impacts described by interviewees from all social arenas were the restraint of consuming fish caught in the Baltic Sea due to the high levels of dioxins, as well as the increasing algae incomes hindering people to bathe at affected spots. Moreover, interviewees described specific impacts mainly experienced through their work-life spheres, such as one of the "job-dependent"- interviewees mentioning that she sometimes cannot fish in certain spots anymore because of the decreased water quality. Additionally, two study participants from the arena of "Gotlandic citizens" and "job-dependent" interviewees describe how they are impacted psychologically by knowing that the "*fish that you catch is not very good to eat."* (Malin, 2022) and *"It's not nice, you know, knowing that the sea, the fish here are like poisonous, that you cannot eat them, […]"* (Simon, 2022). Furthermore, Thomas ("Gotlandic citizen") describes that the Baltic Sea's degradation hinders him from teaching his grandchildren how to fish, which can be considered a cultural impact impeding his interaction with the sea.

5.5.3 Responses to the Degradation of the Baltic Sea

Similar to the afore-mentioned impacts caused by the Baltic's degradation, most interviewees claimed that they do not adapt in any way to the sea's environmental conditions. However, all of them describe several actions as a response to it, showing that those practices are carried out within their practical consciousness and are thus further deeply rooted in the natural attitudes, as defined by Schutz (see 2.1.1 Phenomenological Sociology). Responses described by all social arenas were going to different beaches, when an algae income occurs or that they bathe more increasingly in lakes and the limestone quarries on Gotland nowadays. Furthermore, interviewees themselves, but also fish restaurants and shops buy fish from Norway instead of selling Baltic Sea fish, due to its high levels of dioxin. Thus, the most common responses among all interviewees are also connected to the most common impacts and perceived environmental challenges in the Baltic Sea.

While these were the only responses experienced by the "summerhouse owners", the other social arenas ("experts", "job-dependent" and "Gotlandic citizens") further described additional responses, such as the use and reliance on the algae radar. During the interviews it became very clear that people considered it as an integral part of their lifeworlds and culture. Moreover, interviewees in those three social arenas also engaged in actions to improve the Baltic Sea's state or create more awareness around its current degradation. While these responses were mainly carried out in their work-life spheres, such as giving workshops ("job-dependent"), creating brochures ("experts") or participating in different events ("experts") some interviewees also engaged in it in their private lives by talking to others ("Gotlandic citizens"), cooking recipes with unusual fish species ("experts") and participating in beach clean-ups ("job-dependent").

Additionally, more specific responses were experienced in the interviewees' different work-life spheres, such as the chemical treatment of fish caught in the Baltic to lower its dioxin level or the growing of fish in aquaponics on Gotland ("experts").

Overall, the findings show clearly that the interviewees experience the Baltic Sea's degradation in multi-faceted ways in their everyday-lives. How intensely individual interviewees perceive it, depends mainly on their exposure to the sea, particularly creating a distinction between the experiences of the 'summerhouse owners' and the other social arenas. Additionally, interviewees show a different amount of emotions when talking about the Baltic Sea's degradation. These vary between social arenas, but also differ between some of the interviewee's life spheres. As the first research question, focuses on how people experience and interpret the degraded state of the Baltic Sea, it is important to further investigate this aspect to eventually find a sufficient answer.

Moreover, it remains somehow unclear, why interviewees are unaware of the impacts and responses resulting out of the Baltic's degradation. Additionally, many of the responses seem to maintain the illusion of a healthy sea, for example importing fresh fish from Norway or just bathing in different spots in response to occurring algae incomes. These aspects relate to the second and third research question. Therefore, the following unclarities need to be further discussed:

- ➔ Why does the expression of emotions vary between interviewees, when interpreting signs of the Baltic Sea's degradation?
- ➔ Why do interviewees not perceive themselves impacted, even though they describe various ways they are?
- ➔ Why are interviewees not aware that they use adaptations and coping strategies, which imply a healthy state of the Baltic Sea?

6. Disussion & Answering the Research Questions

This section discusses the prior mentioned unclarities against the background of the associated research questions. It starts with focusing on why the interviewees experience and articulate emotions differently, when interpreting signs of the Baltic Sea's degradation. This concern relates to the first research question:

1. **How do people with distinct backgrounds experience and interpret the degraded state of the Baltic Sea?**

As discovered in the findings, the amount and intensity of expressed emotions related to the ongoing degradation of the Baltic Sea differs between the social arenas and the life spheres of interviewees. This observation becomes particularly apparent, when looking at the social arena of "summerhouse owners", who express generally few emotions and the "experts", who show little emotions when talking about the Baltic's degradation out of their work-life sphere.

At this point, it is helpful to draw on ideas proposed by Anthony Giddens (1979). He claims that every person living in a particular society, carries knowledge about that very society, just by being a member of it. This knowledge is based on "practical and discursive" understanding (Giddens, 1979, p.73). Knowledge based on practical understanding describes comprehensions that are built by "embodied" experiences (Giddens, 1979, p. 73). Discursive understanding, in its turn, is a term that embraces all the knowledge people "can talk about" and reflect on (Inglis, 2012). It is therefore more abstract and theoretical (Giddens, 1979). In a similar way to Jackson (1996) (see 2.1.1 Phenomenological Sociology), he sees these presumptions as an opportunity to overcome the distinction of knowledge between ordinary people and scientists (Giddens, 1979; Jackson, 1996). In this study, Giddens distinction serves to better understand, why the emotional responses vary. Whenever interviewees understand the Baltic Sea's degradation practically through actually lived experiences, for example when they encounter algae blooms at the beach or cannot see fish anymore while swimming, they show an increased amount of emotions. In comparison, little to no emotions are expressed when they describe the same circumstances discursively as 'scientific knowledge'. Thus, these two different ways of understanding the Baltic Sea's degradation seem to determine whether and how much emotions are expressed. The following example, in which

one of the "experts" describes her practically encountering birds that suffer from oil spills, underlines this assumption:

"*Those times, when you see birds with oil stains on them […] that is* ***terrible*** *to see. Because you usually see them far away from the shore, but then they are coming in and they are going to die****. And it is very, very sad when that happens."***. – Kerstin, 2022.

This relatively emotional statement opposes the rather detached explanations of the Baltic's ecological challenges out of her work-life sphere, where interpretations happen discursively through a theoretical lens.

The same applies for the "summerhouse owners". While they are aware of the challenges discursively, they do not seem to process them practically, as descriptions are relatively distant:

"There is a lot of blooming in the Baltic, that starts in the late spring and goes through summer. There is a lot of other nutrients. I mean, pollution can occur all year around, there is no question about that. We're aware of that, the stagnation of the water and so on and so forth."- Patrik (2022).

Following Gidden's reasoning, this can be ascribed to the fact, that they only spend limited time on Gotland and therefore experience the Baltic's degradation only constrainedly practically through actual encounters. It contrasts the experiences of the "Gotlandic citizens", who are exposed to the challenges mainly practically and therefore also express the most emotions.

The differentiation between practical and discursive understanding is even verbalized in their own terms by two of the interviewees:

*"Nowadays, everybody is living in town and they don't recognize the change****. They can see it on the television, but then they don't see it by their own eyes.*** *They should react much more. I tried to talk to people about the things like this, but they don't seem to care."* – Thomas (2022).

Thomas connects the missing engagement for a cleaner sea to the missing of practical knowledge. This brings up an interesting point: When pro-active engagement for the Baltic Sea is linked to a practical understanding of its struggles, bridging the gap between practical and discursive knowledge could hold a lot of potential to mobilize people. These considerations could therefore be in focus for subsequent research. Another statement, acknowledging this gap is made by Kerstin, who refers a missing impactedness among people living on Gotland to the Baltic's degradation not being tangible, as all problems occur "underneath the surface":

"So it's not that I don't want to go because it's so polluted or anything, nothing. I think anyone on Gotland would say they would, you know, change behaviour because of that. Because I mean, it's under the surface, it's always a problem with the sea. It's under the surface, you don't see it."- Kerstin, 2022.

Moreover, the expression of emotions seems to be further linked to how much the interviewees identify with and consider the Baltic Sea their home, often called place-attachment (Scannell & Gifford, 2010). The more often they refer to the Baltic with terms such as "our sea" or the more they connect it to personal memories, the more emotions they express.

Thus, how people experience and express their emotions over the degradation of the Baltic Sea is related to how they practically experience and identify with it. This interpretation further indicates that the possession of abstract knowledge about the sea's degradation plays a tangential role in that matter. **To answer the first research question:**

People from distinct backgrounds on Gotland experience the ecological degradation of the Baltic Sea in various ways in their every-day lives. Thus, their perceptions often align with in research scientifically described ecological challenges. How and with which emotions these experiences are interpreted depends mainly on the interviewee's background, as well as the life spheres out of which the interpretation takes place. While all interviewees are discursively well-informed, practical knowledge of the degradation is mainly formed through the direct interaction and encounter with the sea in their private lives and is therefore not obtained to a high degree by the "summerhouse owners".

Furthermore, it needs to be mentioned, that besides bridging the gap between discursive and practical knowledge, the inclusion of emotions and identity does not only matter to answer the first research question, but it also paves the way for future investigations and considerations. As studies, particularly within the field of environmental psychology, state today, emotions, connection, place-attachment and identity can be key drivers for societal change when aiming for a more sustainable future, as they can trigger pro-environmental behaviour (c.f. Clissold et al., 2022; Daryanto & Song, 2021; Westoby & McNamara, 2019; Schwartz & Loewenstein, 2017; Gatersleben et al., 2012). Moreover, people who are connected to the degraded environment and experience it "hands-on" through practical knowledge, as in this case especially done by the "Gotlandic citizens", can function as key factors in contributing to raise awareness and initiate change (Liu et al., 2020). In a broader perspective that underlines again that the inclusion of local people at the sites, is crucial to combat increasing environmental destruction (Hill et al., 2020; Stringer et al., 2007). Additionally, trying to bridge the gap between discursive and practical awareness and anticipate making a broader public "feel" environmental concerns and connect with such, opens the space to creative approaches and innovative fields, such as the implementation of art and music into science communication (c.f. Curtis, 2020; Publicover et al., 2018; Marks et al., 2016).

To answer the second research question:

2. **How are the aforementioned people impacted by the ecological problems of the Baltic Sea?**

there is a need to further analyze and theorize the statements by the interviewees in which they declare that they do not perceive themselves impacted, but at the same time describe several effects the Baltic Sea's degradation has on their lives. The interviews therefore indicate that people are not aware of impacts, such as not being able to bathe in the sea, when algae blooms occur or being restrained from consuming fish from the Baltic Sea. Thus, while they are not affected to an extent that threatens their livelihoods, the consequences of the sea's state still penetrate their lifeworlds. Hence, the following section will focus on several points that possibly contribute to this discrepancy.

At first, it needs to be considered that natural degradations, such as in the Baltic Sea, usually occur over a long period of time. That means, that circumstances do not worsen suddenly, but deteriorate over time, which has been observed by interviewees when, for example describing the decline of the overall water quality. Changes therefore happen rather slowly, allowing them to become integral parts of people's lifeworlds and making them accept them as part of their 'natural attitude'. Thomas described it as follows:

"The change came little by little and when it goes like that, little by little, people don't react." – Thomas, 2022.

Moreover, many aspects of the Baltic Sea's degradation, such as anoxic sea bottoms, can only be limitedly sensorially experienced by humans. While, as discussed in the previous section, most of the interviewees are able to experience some of the aspects practically, those experiences do not match the high severity of the environmental problems.

On a broader perspective these considerations showcase a problematic generally occurring around the nature of environmental problems, not at least around climate change. So called slow-onset processes, in which environmental degradation happens creepingly and changes gradually, can lead to severe impacts for the environment and humans (Schäfer et al., 2021). Those intangible, invisible and slow processes make it difficult to fully grasp and comprehend them, resembling more a "thread that lurks in the background" and fails to pass on "a sense of urgency" among people (Boin et al., 2020). The problematics this nature carries have been marked already in the last section: Where there is missing connection and practical understanding, particularly when people do not even consider themselves impacted, action will remain missing, as there is little motivation to mend something, people are not even considering themselves to suffer from. Considering that implementations need a long time to show positive effects, particularly in the seas, the time delay is fatal (Boin et al., 2020; Varjopuro et al., 2014).

Additionally, the slow nature of the Baltic Sea's degradation is further accentuated in comparison to other critical events that happen more sudden, leading to a strengthened perception of urgency. Such critical events, overshadowing the ecological crises in the Baltic Sea, are the water shortage on Gotland and the Russian invasion of the Ukraine. The water shortage on Gotland is mentioned by eight out of ten interviewees, without ever being a part of the interview questions, indicating the presence of the topic. It is described as a "huge problem", because it is getting "drier and drier" (Eva, 2022). Eva further considers it a more threatening factor for the continuity of tourism on Gotland than the environmental problems in the Baltic Sea:

"*Yes and no. I think, that if the Baltic continues to have this algae blooms and also one other problem is of course, that there are some poisons in the Baltic, that they think you shouldn't eat all the fish in the Baltic, the fat one. Then, yeah, that could create a situation where people don't want to come.* ***But I think actually the situation with the water is even worse. Because when there was this bad situation with lack of water on the island, three years ago, there were people that were worried, that their houses will lose in value (which means, that then it might be a good thing, because the people could afford to buy them; the ones that want to stay on the island). But still, that is kind of a sign, that an island without water would not be as popular.*** *Yeah. And also if there is going to continue with algae bloom on the island, then of course, people coming for the beaches wouldn't be interested in that as well. So yeah."* – Eva, 2022.

Furthermore, three interviewees from the arena of "experts", "Gotlandic citizens" and "summerhouse owners" mention the Russian invasion of the Ukraine as another topic they perceive threatening:

"Also this winter the war has come closer to Gotland, tanks, more military personnel, more aircraft passing the house." - Anders, 2022.

As the Russian invasion of the Ukraine happened just a few weeks before conducting the first interviews, it was very present to the interviewees, creating direct threatening circumstances, which seem to be out of people's control. While also the degrading process of the Baltic Sea is out of people's control, interviewees mention the development of several responses that help them to cope and perhaps suggest a feeling of security, e.g. the algae radar, or swimming in lakes instead of in the sea. In combination with the slow process of the degradation, people are not feeling particularly disrupted, as they get slowly used to these coping mechanisms in their lifeworlds. Those adaptions and responses lead to the third research question. Bringing it in focus, will help to also answer the second research question sufficiently.

3. **How do the local coastal people cope with the degradation of the Baltic Sea?**

As described in the findings (chapter 5) people have responded in various ways to the degradation of the Baltic Sea. While some of these responses manifest as active coping strategies, such as the import of fish from the North Sea, other behaviours, for example participating in conferences around the Baltic Sea's state as part of their work life, can be considered as more general consequences of the sea's deterioration. Similarly, to the before described impacts emerging from the Baltic's degradation, interviewees often do not seem to be aware of the coping strategies they are relying on in their every-day lives. What becomes apparent is, that many of the coping mechanisms are supported or even only made possible by technological advancements. This particularly applies for the algae radar, the use of chemical processes to reduce the amount of toxins in fish and the growing of fish in aquaponics. Additionally, buying fish from the North Sea and selling it freshly on Gotland is made possible by the globalized food system existing today.

To further understand these coping responses and their origin, I again draw on thoughts provided by Giddens (1979). In his explanations on how social systems function and evolve, he describes, that systems have rules and resources based on which, they constantly reproduce themselves:

"To study the structuration of a social system is to study the ways in which that system, via the application of generative rules and resources, and in the context of unintended outcomes, is produced and reproduced in interaction." (Giddens, 1979, p. 66).

According to him a system is made up by and consisting out of the interactions and relations between people and does not exist as something abstract and static outside of those. The people within that system then have the "capacity to make a difference" (called 'agency' by Giddens) and to transform it in the course of its constant reproduction. This process however tends to happen through semi-conscious practices; hence people are not fully aware of the consequences or the process itself (Inglis, 2012).

Referring these considerations to this study, the developed coping strategies, such as the algae radar, can be seen as practices emerging from and being part of the reproduction of the system, which entails the people living on Gotland and their interactions with the Baltic Sea. As stated above, outcomes of the reproduction are "unintended" meaning that it is not consciously induced by people, whether the reproduction leads to transformations or the systems staying the same (Inglis, 2012). However, people produce society based on rules and resources they "inherited from the past" (Inglis, 2012, p. 227). That means, that they are likely to recreate practices in the same manner they have once learned them, which delivers an explanation for coping strategies that at the first glance seem paradoxical: such as importing fish from North Sea to consume as "fresh fish from the Baltic Sea". Considering such practices happen semi-consciously, people do not develop coping strategies intentionally to forcefully remain a status quo. This assumption aligns

with the finding, that interviewees were not aware of the responses they developed to the degradation of the Baltic Sea. Moreover, Giddens claims that people need to draw on resources in order to act: *"An agents' capacity to carry out their practices is very much influenced by what resources they have at their disposal, and how skilled they are at using them."* (Inglis, 2012; p. 228). This assumption can be related to the technical advancements that people on Gotland quite heavily rely on as several ways of coping with the degradation of the Baltic Sea in their every-day lives. Without being able to make use of these technical "resources", people would perhaps not be able to maintain their way of living without making greater adjustments.

This is a particularly important point, when transcending these findings to a more global context. While in many other parts of the world, the degradation of the surrounding sea has much more severe impacts on its people, sometimes even threatening their livelihoods, and forces them to make adjustments at a large scale (c.f. Uddin et al., 2021; Shameen et al. 2014), this is not the case in the Baltic Sea. The access to different kind of resources therefore seems to be crucial to cope with a sea's degradation and to continue living a rather comfortable life.

When referring to Giddens's thoughts in these scenarios it is important to mention, that they are only limitedly suitable for this thesis, as his idea of social systems usually does not include the penetration of such by outer forces and circumstances which are not based on the interaction of people, e.g. environmental problems and conditions. Moreover, he connects knowing the 'rules' and having resources to having the power (Giddens, 1979). The notion of power, however, is not suitable in this context, as people living on Gotland do not act in relation to an antagonist and do not seek dominance in the sense of having 'power over' other people.

Coming back to the second research question, the reliance on coping strategies and adaptations additionally supports the interviewees' unawareness of being impacted. If people can still go swimming, even though not in the sea, but in a lake, if they can still eat fresh fish in summer, even though it is not from the Baltic Sea, etc., it does not come as a surprise that they do not consider themselves impacted so severely that it is a present perception in their every-day lives. Overall, people are still able to live their lives relatively comfortable, without making a lot of large sacrifices or changing their lives drastically. This finding is underlined by the fact that none of the interviewees considers to leave the island in the future, because of any factors related to the sea's degradation.

Thus, to answer the second and third research question:

As described in the findings, people are indeed impacted in various ways by the ecological degradation of the Baltic Sea in their every-day lives. However, the conducted interviews indicate that they do not seem to be aware of these impacts. This can be ascribed to several aspects. To begin with, the nature of

the Baltic's ecological degradation is a slow process, happening through gradual changes, which makes it possible to infiltrate people's lifeworlds without disrupting them. This perception is further accentuated by other crises on Gotland, which seem more pressing and sudden and therefore overshadow the severity of the Baltic Sea's degradation. Moreover, the creeping nature of the degradation allows people to develop a wide range of responses, functioning as adaptations and coping mechanisms. This is made possible by the access to different kind of resources, especially technological advancements. While some of the coping mechanisms seem to be paradoxical, such as importing fish from the North Sea or breeding fish in aquaponics in old barns, it needs to be considered, that people draw on practices that are familiar to them. Thus, responses sometimes resemble those past practices. Overall, these adaptations and coping mechanisms ensure that people can proceed with their lives without making major sacrifices that would force drastic change.

7. Conclusion & Outlook

This study has shown that the Baltic Sea's degradation is a phenomenon which is embedded within people's lifeworlds in various ways. While all interviewees are well-informed about the challenges of the degradation, most of them also experience the deterioration practically in their everyday lives. These lived experiences of the Baltic Sea's degradation seem to be closely connected to many of the emotions the interviewees express. Thus, the social arena of "experts", when describing the challenges out of their work-life sphere theoretically and the "summerhouse owners", who are exposed to the Baltic's degradation only limitedly, show generally less emotion than the "Gotlandic citizens" and the "job-dependent" interviewees. Overall, the most commonly described challenges were the increase of algae blooms, enhanced by the input of nutrients and consequenting eutrophication, as well as various forms of pollution and the contamination of fish. As this thesis aims to portray detailed descriptions of people's complex lifeworlds, it should be mentioned here that this summary does not do justice to the manifold experiences of interviewees and should therefore only be treated as such: a summary of what Schutz calls second-order categories. While it is apparent that the narrative of an ecologically degraded sea is central, it is not the only one: Dependent on the interviewee's background and social arena, additional meanings of the sea are added. It is for example perceived as a "selling point" by the "job-dependent" interviewees or a space to leave "reality behind" by the "summerhouse owners". Moreover, all study participants that live on Gotland full-time associate a sense of identity with it. I thus found that the interviewees' interpretation and perception of the Baltic Sea's state depend on the interviewees' individual backgrounds, including the social arena in which they are embedded, as well as their paramount life sphere.

Furthermore, all interviewees experience some kind of impacts from the Baltic Sea's degradation in their every day lives, such as being restrained from bathing in the sea when algae blooms occur. However, many of them firstly claim that they are not affected by it directly, indicating a lack of awareness. This discrepancy can be linked to three reasons: Firstly, the Baltic Sea's degradation happens gradually. Thus, the impacts of this process slowly infiltrate people's lifeworlds and become part of it without them noticing the gradual deterioriation. Secondly, other crisis on Gotland, such as the water shortage and the Russian invasion of the Ukraine, that

appear more disruptively, overshadow the degrading circumstances in the Baltic Sea. Thirdly, as a response to the degradation interviewees describe the development of several coping strategies (e.g. the algae radar) that they rely on in their everyday lives. While those are on the one hand an affirmation that people are impacted, they on the other hand prevent interviewees from realizing this, as they assist them to maintain their relatively comfortable lives, without feeling the need to change them at large and mitigate the process of the ongoing deterioration.

On a wider perspective, this study demonstrates, that investigating lifeworlds in a marine context is valuable to understand the complex worlds of local coastal people, which cannot be reduced to single aspects. The findings support the claim that descriptions and analysis of people's everyday-lives can enable scholars to capture the nuances which can be of particular imprtance when it comes to the ability to discover local needs and implement coastal management strategies (Zoysa & Hornidge, 2016). While the livelihoods of people on Gotland are not threatened by the sea's degradation in the short run at least, this does not apply to people in coastal zones in other parts of the world (Fleming et al., 2019). Therefore, future research could benefit from utilizing phenomenological paradigms as analytical and methodological tools to lay focus on specific local knowledge and perspectives.

As mentioned in the discussion section, there are several aspects that can be investigated in subsequent studies: Considering the poor state of the Baltic Sea, urgent and comprehensive action is needed. Future research could therefore focus on what needs to be done to encourage pro-environmental behaviour and mobilize people to take action to improve the sea's environmental conditions. For that purpose, a more thorough investigation on the reasons for the discovered discrepancy between people being aware and well-informed about the Baltic Sea's state, but only showing very limited pro-active behaviour, could take place. Such a study could for example focus on the difference between understanding the matter practically and discursively. It should further increase the number of study participants to get more representative findings for people living on Gotland. In a second step, strategies and techniques to enhance an understanding that triggers pro-active behaviour in people, could be identified. Thus, while it is evident that local people living on Gotland cannot improve the severe environmental conditions of the Baltic Sea solely by themselves, they could be key figures in creating more awareness around the topic by sharing their specific and valuable insights. Findings of such research would not only be beneficial for the Baltic Sea context, but for contributing to a more comprehensive understanding of combating intangible, slow-onset environmental problems, which are major challenges of our time.

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Popular science summary

Overfishing, marine pollution and areas without oxygen lead to the Baltic Sea being in a critical environmental state. This is further intensified by its unique conditions, such as brackish water, being an inland sea and having varying salinity gradients. The critical environmental conditions in the Baltic Sea do not only have consequences for marine life, but also for people living in its coastal zone. Previous research has however mostly focused on how society is impacted economically or on impacts that are either caused by a single aspect, such as climate change, or that affect a single sector, e.g. fisheries. It therefore failed to investigate how people living in the Baltic Sea's coastal zone are generally affected by its degradation in their every-day lives. To counteract this research gap, this thesis conducted interviews with a variety of people living on the Swedish island of Gotland.

It has been found that all interviewees experience signs of the Baltic Sea's degradation in various ways in their every-day lives, for example by encountering algae blooms and oil spills when going to the beach or by observing a decline in fish stocks. How these experiences are interpreted, varies mainly dependent on people's different backgrounds. The findings further revealed that interviewees, who only know about the Baltic Sea's degradation theoretically express less emotions, compared to interviewees who understand the challenges through lived experiences.

Moreover, it has been found that interviewees are impacted by the Baltic Sea's degradation, for example when they need to find new places to swim, when algae blooms occur or when they cannot consume fish from Baltic waters anymore, as it contains too many toxins. However, the interviews indicated that study participants were not aware of these impacts, when being asked about it in the first place. This discrepancy can be explained by three major aspects. Firstly, the degradation of the Baltic Sea is a gradual process and therefore impacts slowly infiltrate people's lives without being recognized. Secondly, several other challenges on Gotland occurring more sudden and disruptive, such as the water shortage in summer, overshadow impacts deriving from the Baltic Sea's degradation. Thirdly, as a response to the sea's state, people have developed several adaptations (e.g. going swimming in lakes instead of in the sea when algae blooms occur) and coping mechanisms, for example an algae radar or importing fish from the North Sea. Most of those coping mechanisms are based on technological advancements and ensure that people can

proceed with their lives without making major changes. Therefore, they support that people do not become aware of the impacts the Baltic Sea's degradation has on their every-day lives. On a wider perspective the little awareness of impacts leads to missing active engagement for improving the sea's ecological conditions. How to trigger such pro- environmental behavior could therefore be the subject of a subsequent study.

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so THANK YOU!

Appendix 1

Interviewguide – Semi-structured interviews

Thank you for participating in this interview! First of all, I would like to ask you if it is fine, if I record the interview and assure you, that I will treat the recording confidential. I will also anonymise the data, which means, that I will not use your real name, when referring to you in my master thesis.

To quickly explain again, why I conduct this interview with you: I am currently studying a masters programme, which is called "Rural Development and Natural Resource Management" at SLU in Uppsala and write my master thesis. For that I chose to look at how people living on Gotland relate to the Baltic Sea: that can mean, in their work-life, but also everything else. Therefore, a lot of my questions are personal and regard your life in general. If you feel uncomfortable with answering them, let me know, you don't need to answer anything!

Before we start, do you have questions?

1. **Question about the interviewee: (Tell me a bit about yourself…):**
    a. Who are you? (How old are you?, demographics)
    b. How long do you already live on Gotland?
    c. How do you usually spend your days?
    d. What do you do in your spare time?/ On a day off?
    e. How was it growing up on Gotland?
        i. How did you spend your summers as a kid?
        ii. How was life during the winter?
    f. What did your parents work with?
    g. What did you thought you would become when you were a child?
        i. Why did you change your mind?
        ii. What did your parents work with?
    h. Do you have kids and do you think they grew/ grow up differently from you?
    i. (If people moved to Gotland: Why did you move here?)

2. **Job related questions:**
    a. What are you working with?
        i. Tell me a bit more about your work.
        ii. What are your projects?

iii. How does a typical working day look like for you?
b. How long do you already work in your job?
c. Why did you choose the job you are doing today?
i. Have you been working with anything else before?
d. What is challenging within your job?
e. Would you want to change anything about your job? And if so, what and why?/ If not, what makes you so comfortable with it?
f. Would you recommend other people to do your job? Why?/ Why not?
g. What have your parents/ ancestors worked with?
h. How important would you say is the sea for your work?

3. Interviewees relation to the sea:

a. Are you often visiting the sea?
i. For which reasons? What do you do there?
b. Do you have a favourite place to go to?
i. What is different from that place to other places?
c. Did you often go to the sea in your childhood?
i. Why do you visit more often/ less today?
d. What kind of role does the sea play in your every-day life?
e. What is your favourite memory from being at the sea?
i. Would that situation be still possible like that today?
f. If you could change anything, when going to the sea, what would it be? (tourists, trash, seals, …)

4. Awareness of ecological state of Baltic Sea:

a. Have you heard about that the Baltic Sea is in a critical environmental condition?
i. Yes: What do you know about it?
ii. No: short explanation on the topic.
b. What do you think about that?
c. Have you ever experienced any of this, in your personal or work life?
i. If so, please describe the situation.
ii. Specified questions (dependent on my interview partner):
1. Have you ever had problems with algae when driving the boat?
2. Have you ever been at a polluted beach?
3. Have you ever had problems with toxins in the fish?
4. Have you ever had problems because there are too few fish?
5. …
d. Did this experience had any effects for you? E.g. Did you start going to another beach, did you need to change anything of your usual habits, because of it?

i. Please describe more in detail.

5. **Future Outlook:**
    a. Is there anything you would like to do more or less in the future?
    b. If you could move, would you? Why?/ Why not?
    c. If you could change anything in your life on Gotland what would it be and why?

Thank you very much for helping by doing this interview with me! It was really interesting to hear about your life and your experiences! Is there anything you want to add, when you think back to what I have asked you?

Do you have any questions?

**Depending on how important the interviewees occupation is for my research question, I will focus more or less on questions about the job/ personal life.*

**the questions will be a bit adapted to different people, I will not ask everyone everything.*

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