Faculty of Natural Resources and Agricultural Sciences

The Decline of Small-Scale Fisheries: A Case study in Blekinge, Sweden

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The Decline of Small-Scale Fisheries: A case study in Blekinge, Sweden

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Abstract
Fisheries serve as an essential food source, livelihood, and cultural identity for millions of people around the world. As global fish stocks decline and the world's population grows, the use and management of this resource has become an important issue. Within fisheries, small-scale fisheries (SSF) are of significant importance: they comprise 90 percent of the world's capture fisheries, and are environmentally and socially preferable to large-scale operations. While SSF are increasing in the majority of the world, they are decreasing in Europe. Through a case study in Blekinge, Sweden, this study looks at the decline of SSF in the Baltic Sea in an effort to better understand why SSF are in deteriorating in "developed" countries. In coordination with the Stockholm Resilience Center, data was collected using in-depth semi structured interviews with fishers and other stakeholders. The study found that the predominant use and weight of quantitative and scientific data in policy formation, in combination with a lack of input from fishers, is creating policies that fail to capture crucial environmental, social, and cultural aspects of SSF and are thus ineffective in supporting fishers to maintain their livelihoods and way of life. In assessing the current components used to classify fishers, it can be recommended that increased attention be given to qualitative analysis of fishers, improving the understanding of fishers' motivations, preferences, habits, social needs and norms. Using "fishing styles", which incorporate qualitative data in addition to quantitative data, would give policy makers a better understanding of small-scale fisheries and those working in this realm. Addressing this issue is of crucial importance if the livelihoods, generations of knowledge, culture, and traditions associated with SSF will sustain.

Keywords: *Small-scale fisheries; fishing styles; livelihoods; rural development; Sweden*

1. Introduction

Fisheries serve as an essential a food source, livelihood, and cultural identity for millions of people around the world. Nutritionally, fish provides roughly three billion people with nearly 20 percent of their protein (FAO 2012). According to the FAO (2012), in 2009, fish accounted for 16.6 percent of the world population's intake of animal protein and 6.5 percent of all protein consumed. Furthermore, fish is used for non-food uses, such as the production of fishmeal and fish oil, bait, feed for fish farms and agriculture, as well as in pharmaceutical products (FAO 2012).

In addition to providing sustenance to billions of people throughout the world, fisheries function as a vital form of employment, serving as a livelihood for nearly 55 million people (FAO 2012). When secondary and tertiary sectors, such as processing and transport are included the number jumps to 180 million. Considering that the average job holder in the fisheries industry supports three dependents, the number of people reliant on fisheries worldwide climbs to 660-820 million people: ten to 12 percent of the world's population. Employment in fishing industry is growing faster than employment in traditional agrarian agriculture and at a greater rate than the world's population (FAO 2012).

In recent years it has become common knowledge that the world's fish stocks have been drastically depleted. Current estimates by the FAO (2010) state that over 75 percent of the world's fish stocks are fully exploited, over exploited, or depleted and the global catch has been declining by .7 million tons per year since the 1980s (Pauley et al. 2002). Overfishing is negatively impacting the biodiversity of marine ecosystems, making it more difficult to feed a growing human population, and resulting in adverse political, economic, and social circumstances (Worm et al. 2006; FAO 2012).

Within the fishing industry, small-scale fisheries (SSF) are of extraordinary significance in providing food and job security to millions of people. They comprise 90 percent of global capture fisheries, account for over half the global catch, and employ over 115.5 million people (FAO 2012). Over 95% of small-scale fisheries are found in low-income countries (FAO 2010), and thus the overexploitation of the world's fish stocks is particularly problematic as it depletes a resource on which a much of the world's poor depend for food and nutrition security. In addition to representing a livelihood for a comparatively greater number of fishers (and secondary employees and household dependents) than

large-scale operations, the number of fishers employed per one million dollars of investment in vessels is 100 times higher in SSF than large-scale fisheries (Chuenpagdee et al. 2006).
Moreover, the surpassing of SSF by large-scale operations is problematic as SSF represent a much more environmentally sustainable way of fishing. Industrialized fishing techniques, such as bottom trawling, have led to devastating habitat destruction, ecosystem degradation, and a loss in marine productivity (Pauley et al. 2002; Chuenpagdee et al. 2006). While small-scale fisheries are not exempt from negative fishing techniques (such as blast fishing or cyanide fishing) (Bene 2006; Chuenpagdee et al. 2006) the very nature of the size of the fishing vessels and the absence of particular technologies excludes them from certain environmentally destructive practices. By the same token, small-scale operations use drastically less fossil fuels than large-scale operations, making the catch per ton of fuel consumed in SSF higher than that of large-scale fisheries (Pauly et al. 2006; Chuenpagdee et al. 2006).

On a similar note, by-catch or fish-discard (marine species that are caught while fishing for the target species but not kept) is significantly higher for industrial fishing fleets than small-scale fishing operations (Kelleher 2005). In general, nearly all fish caught by SSF is for human consumption and very little is discarded (Pauly et al. 2006). On the other hand, the large-scale fishing industry catches million tons of fish that is reduced to oils or meals for livestock and farmed fish (Pauley et al. 2006).

FISHERY / BENEFITS	LARGE SCALE	SMALL SCALE
Number of fishers employed	about ½ million	over 12 millions
Annual catch for human consumption	about 30 million t	same: about 30 million t
Capital cost of each job on fishing vessels	$$$$$$$$$$ 30,000 - 300,000	$ 300 - 3,000
Annual catch reduced to meals and oils	20 - 30 million t	Almost none
Annual fuel consumption	About 37 million t	About 5 million t
Catch per tonne of fuel consumed	= 1 – 2 t	= 4-8 t
Fishers employed for each $1 million invested in vessels	5 - 30	500 – 4,000
Fish and other sealife discarded at sea	8-20 million t	Very little

Fgure1. Illustration of the duality between small- and large-scale fisheries (Pauly et al. 2006)

Based on the above comparisons it can be assumed that small-scale fishing is economically, socially, and environmentally preferable to large-scale fishing and for these reasons alone small-scale fisheries should be sustained. Furthermore, SSF provide a sense of cultural identity for the fishers and communities that rely on them for their livelihood. As previously mentioned, SSF support many secondary and tertiary industries such as processing, transportation, marine related services, and even tourism that contribute to the identity of regions. Yet, SSF also contribute assets to communities and individuals in ways that are not monetarily quantifiable. According to Urquhart et al. (2011, p.241), "For many coastal communities, fishing goes deeper than a means to earn a living. It contributes to the identity and sense of place of communities, often based on a rich heritage of fishing". While there appears to be very little written on these relationships, particularly in regards to small-scale fisheries

in high-income countries, in an article discussing the benefits of SSF on low-income countries, Bene (2006, p.35) states that, "the cultures of small-scale fishing communities are usually the result of considerable accumulated adaptive experience which are shaped by many internal and external events and changes affecting these communities over time". He goes further to discuss the positive impacts that this type of amassed knowledge can have on creating or sustaining self-esteem at the individual level, noting that "Among the members of small-scale fishing communities, there is usually a profound pride of their occupational identity as fishers and a correspondingly high devotion to the fishing way of life. Fishing (especially at sea) requires high degrees of independence, self-reliance, autonomy, risk taking, and outdoor work challenging nature" (Bene 2006, p.35).

However, within many of the high-income or "developed" countries, small-scale fisheries are declining (McFadyen et al. 2011). Small-scale fisheries in Europe have declined by 20 percent in the last decade and the relative role that they play in regional economies has dropped 20-30 percent in terms of employment and 30-50 percent in terms of incomes (MacFadyen et al. 2011). In the past 100 years, Sweden has seen a decline in the number of fishers within the small-scale fishing sector. In more recent years, the decline can be attributed to an increase in vessel efficiency and the decline in the fish stocks (OECD 2012).

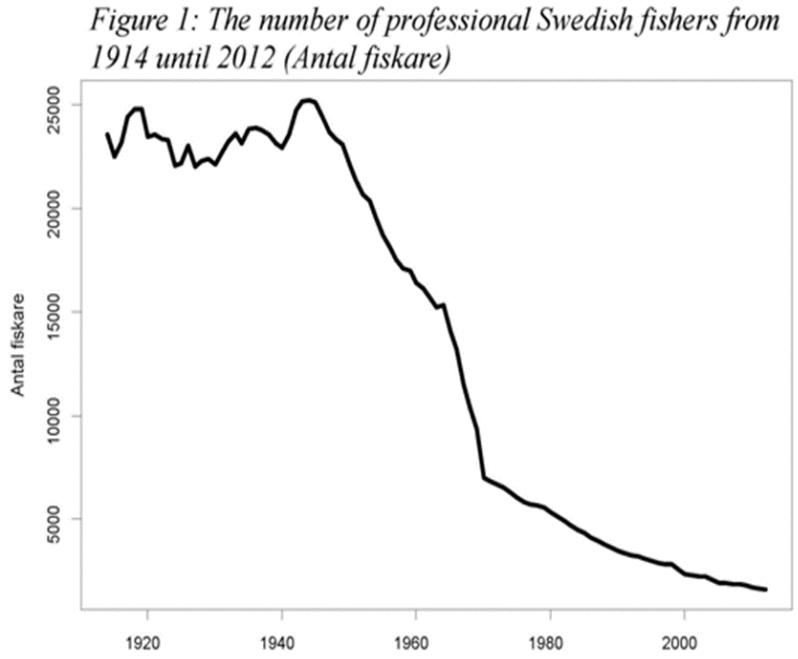

Figure 1. Decline of Swedish fisheries in the last 100 years (Stockholm Resilience Center, 2012)

The objective of this study is to investigate why SSF are declining in high-income countries through a case study of small-scale fishers in Blekinge, Sweden as well as explore how SSF can be sustained through asking the following questions:

1) What are the main drivers of the decline of small-scale fisheries and how are these drivers affecting the development of small-scale fisheries?
2) What effect does the decline of SSF have on rural development?

2. Concepts and Theories

To gain a deeper understanding as to why small-scale fisheries have declined in high-income countries, a closer look needs to be taken at the relationships between small-scale fisheries, rural development, livelihoods, and resilience. Rural development focuses on contexts (policy, economy, civil society) while resilience pertains to certain fisheries and the ways in which they interact with the socio-ecological system they are a part of. Fishers (households) implement various social, economic, and environmental livelihood diversification strategies as a way of increasing their sustainability. The area where these three spheres intercept is the area of interest for this study.

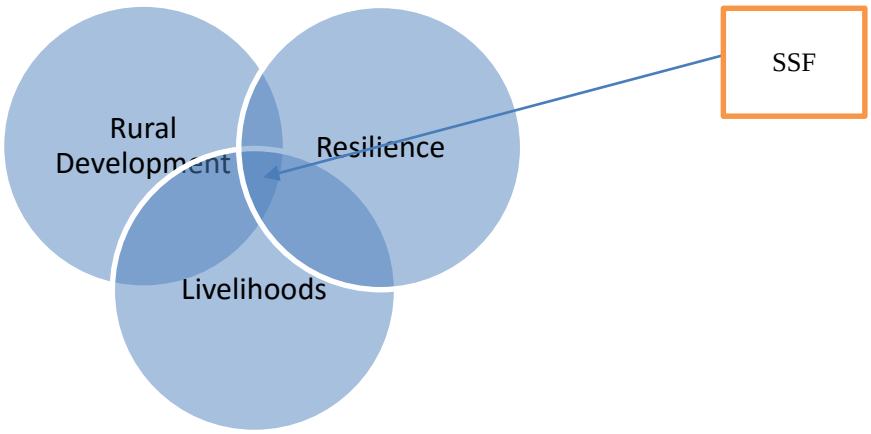

Figure 2. Area of study (Boonstra 2012)

2.1 Rural Development

According to Ellis (2000, p.25) rural development can be seen as "an organizing principle for anti-poverty policies in rural areas of low-income countries". At the heart of Ellis' definition of lies the word "policies". It seems that for fisheries, and especially SSF, this has been the root of many problems and the reason they have failed to reach their full potential (Allison and Ellis 2001; Salmi

2005; Andrew et al. 2007; Perry et al. 2011). While it is true that the majority of SSF are located in low-income countries, SSF play an important role the world over in providing livelihoods in rural areas, utilizing and managing marine resources, as well as contributing to cultural, societal, and personal identities. Regardless of which waters fish, small-scale fishers, their households, and communities are often characterized by poverty and marginalization (Bene 2003; Allison and Ellis 2001). The universality of the open-access nature of fisheries, dependency of fishers on a single resource, the decline of global fish stocks, and the advancement of policies for the industrialization of fisheries (at the neglect of the small-scale sector), means that small-scale fishers throughout the world are subject to the same set of problems, regardless of the income level of their country (Allison and Ellis 2001; Allison 2003). Therefore, for the purpose of this study, rural development will not be limited to low-income countries but focus on rural areas, regardless of the income level of the country.

For many decades the primary objective of the rural development sector has been increasing the output of small-scale farmers through increased and improved technology (Ellis 2000; Rigg 2006; Ashley and Maxwell 2001; Ellis and Biggs 2001). According to Ellis (2000), the research, literature, policies, and funding are evidence of such, and for those that lie outside of the small-scale rural farmer categorization there has been little attention from the rural development mainstream. Within rural development literature there is much written about the relationship between livelihood diversification and resiliency, especially in regards to low-income countries. However there is dramatically less that looks at this relationship within small-scale fisheries and their communities. There is less still that looks at the diversification and resiliency relationship of small-scale fisheries in high-income countries. Of the little that is written about the subject in high-income countries, most research has focused primarily on in land-based agriculture or includes fishing as a subset of the agriculture sector (Salmi 2005).

One reason for this may be the trajectory that rural development in fisheries has taken during the last half century in the "developed" world. Since the 1950s, fisheries policy in Europe and North America has tended to concentrate on the industrialization of fisheries (Pauly 2006; Allison 2003; McConney and Charles 2008). During the 1950s the FAO began to collect and record annual global fisheries landings and it is this data that has been used (primarily by biologists and fisheries scientists) to formulate the majority of current fisheries policies, which focus on sustainable yields and the total allowable catch (TAC). TACs for each fishery are set annually and based on the scientific

recommendations of International Council for the Exploration of the Sea (ICES) and then divided into national quotas (Pauly 2006; Andrew et al. 2007). Until very recently, modernization and efficiency, in the form of increased catches, has been central to many national fisheries policies, and key to the EU Common Fisheries Policy (CFP) (Allison 2003). According to Eggert and Ellegård (2003, p.525) "The problems in Swedish fisheries are due to the same reasons as in other EU countries, i.e. total allowable catches (TACs) set above scientific advice, over-fishing, over-capacity of the fleet, discards and illegal or black landings".

Current fisheries management is generally based on science that looks at the maximum sustainable yield in relation to fish stocks and does not take into account the role of fishers in the wider rural economy (Allison and Ellis 2001; Allison 2003; Boonstra and Hentati-Sundberg 2014). Thus, policy is often ineffective because it is based on maximum yield, despite the fact that scientists have not been able to accurately identify a "stable biological yield function" (Allison and Ellis 2001, p.380). As Pauly (2006, p.9) states, "Whatever the route that 'development' took, the goals of fisheries development were generally 'biological' (high catches, utilization of all resources, etc.), to the near complete neglect of social goals such as employment, community-wellbeing, food security, etc." To this end, small-scale fishers were seen as "an inefficient use of capital resources, as well as being difficult to regulate" (Allison 2003, p.19). Consequently, in most of northern Europe's inshore fisheries, small-scale and part-time fishers have been replaced by specialized, full-time, larger operations (Allison 2003).

2.2 Rural Livelihoods and Strategies

According to Ellis (2000, p.10), "a livelihood comprises the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household". Within Rural Development literature, livelihood diversification has been widely acknowledged as a strategy employed by rural residents throughout the world, regardless of size, level of income, or wealth (Ellis 2000). It has been shown to mitigate risks and reduce vulnerability by decreasing households' reliance on a single resource or occupation, as well as a way to increase one's means (Ellis 2000; Allison and Ellis 2001). Within this paper, livelihood diversification refers to households or individuals having a diverse portfolio of activities and income sources amongst one of which is fishing.

Looking at SSF, there is an assumed relationship between livelihood diversification and resilience and/or adaptive capacity. Within the body of literature that focuses on SSF and their contribution to rural development, it is widely accepted that fishers with a diversified livelihood portfolio have higher adaptive capacity or level of resilience, than those who rely solely on fishing for their survival or those that fish for a single species (Daw et al. 2012; Bene 2009; Allison and Ellis 2001; Salmi 2005; Allison 2003). Fishers that have greater adaptive capacity (higher levels of resilience), are less vulnerable to economic shocks and environmental disasters (Bene 2009; Allison and Ellis 2001; Allison 2003). For instance, it has been documented that small-scale fishers in low-income countries who pair fishing with farming are less vulnerable than those that rely solely on fishing (or farming) for their livelihood (Bene 2009; Allison and Ellis 2001; Zacharias 2009 (unpublished)). On the other side of the coin, resource users who are reliant on a single resource or who target only one species are severely limited in their ability to be flexible and adapt to changes (Marshall et al. 2007). These specialized fishers are often typical of environments in which resources are predictable and the socio-ecological system is "stable" (Marshall et al. 2007). Resources can be naturally more "stable" and dependable in their availability or they can be supplemented by government or social institutions. For example, in northern Norway where fishers are protected by a strong welfare state, as well as have the benefit of more job options in rural areas, small-scale fishers often use the diversification strategy of fishing income, paid employment, social welfare payments, and occasionally farming to maintain their fishing lifestyle (Salmi 2005). Allison's review of literature regarding diversification and SSF in European countries concluded that "diversified livelihoods are also a feature of household strategies, with members of fishing households often being involved in different economic sectors to smooth the effects of resource variations" (2003, p.19). Such strategies include allocation of family labor, managing income variation, and consumption patterns (Allison 2003). The ability of small-scale fishers in certain regions in Europe to adapt to reduced employment/income from fisheries, depends on diversification and creating alternative and appropriate work opportunities. However, in most instances, these alternative employment opportunities are not suitably matched to the skill sets or desires of small-scale fishers (MacFadyen, et. al 2011).

2.3 Resilience

Broadly, resilience is the ability of a system or individual to recover from an interruption. Diversity is an important contributing factor to resilience both in natural and human systems (Ellis 2000). Within the field of ecology and the social sciences, it is generally accepted that there is a direct relationship between diversity and resiliency: the greater diversity present in an individual/system,

the more resilient it is to shocks and disturbances (Folke 2006; Folke et al. 2010; Adger 2000; Allison and Ellis 2001; Buzzanell 2010; Coutu 2002). Within the body of literature on SSF in low-income countries, it is has been frequently documented that it is the diversity of fisheries that helps them to maintain their livelihood (Allison and Ellis 2001; Bene 2006; Allison 2003). While the diversity-resiliency relationship of small-scale fisheries in low-income countries is rather well documented, there is very little written on this subject in high-income countries resulting in a consequent blind spot in the literature.

Depending upon the discipline, the theory of resilience has varied definitions. Within the field of ecology, where resilience theory has its roots, the term generally refers to an ecosystem's ability to absorb changes and return to a balanced state (Folke 2006). More recent thinking recognizes the indistinguishable boundary between nature and human society and looks at resilience in terms of interdependent systems or socio-ecological systems (SES) (Folke 2006; Folk et al. 2010). However, concepts such as equilibrium(s), scale, time, and system are all contentious factors which make resilience the subject of much debate within the scientific community (Folke 2006; Folke et al. 2010; Adger 2000). Within the arena of social science, the term is often applied to collective groupings and referred to as "social resilience". Adger (2000, p.347) defines social resilience as "the ability of groups or communities to cope with external stresses and disturbances as a result of social, political and environmental change". In addition to ecological and social systems, resilience can also be applied to individuals and institutions with varying definitions and degrees (Coutu 2002; Adger 2000). Adaptive capacity, is often used interchangeably with resilience and refers to a "the necessary preconditions for adapting to change" (Marshall 2010, p.37). For the purpose of the discussion of small-scale fisheries in this paper, resilience will be understood in general terms, as the ability of an individual, community, or system to persist, adapt to change, and transform after and throughout a disturbance or difficult experience.

Resilience is relative to SSF on a number of levels. As Marshall and Marshall (2010, p.36) summarize, "the basis of resilience theory is that social and ecological (socio-ecological) systems are intrinsically coupled and constantly face change; the outcomes of which are inherently unpredictable". As fisheries are a resource-dependent industry, they are especially vulnerable to environmental, social, and political shocks and disturbances (Marshall 2010). Small-scale fisheries are prone to uncertainty and risks both within the fishery (size and availability of fish stocks, excess capacity, and overfishing) and external factors (weather, climate change, market fluxes) (Allison and

Ellis 2001; Andrew et al. 2007; Marshall 2010; Allison 2003). Yet they are also prone to the uncertainty of changing regulations. As Marshall et al. (2007, p.363), elaborate "resource users that are socially and economically dependent on the resource are vulnerable to institutional change because they lack the necessary skills, attitude, and opportunities to successfully navigate through a policy change period. Resource dependency acts to reduce the flexibility with which resource users can approach, and adapt to change. Many fishers have developed a niche within society, which for most of their lives, has provided stability and security. Faced with the changing institutional, social, and environmental conditions, however, many have become vulnerable".

Policies are formal institutions that dictate how sectors of society are able to utilize natural resources. As the population increases and creates a greater demand for natural resources, policies have become progressively more restrictive on natural resource users (Marshall and Marshall 2007). A study by Marshall and Marshall (2007) on the resilience of small scale fishers, found that "Natural resource policies that take into account the resilience of resource users are likely to be much more effective at achieving resource sustainability, while also minimizing the social and economic impacts of these changes".

2.4 Scale and policy

Due to the fact that fishers' techniques and characteristics are infinitely varied and continuously changing to adapt to fluctuating environmental, political, and technological climates in order to maintain equilibrium, it has proven difficult to standardize categories that encompass small-scale fishers' generalized behavior (Pauly 2006; Cheunpagdee et al. 2006; Salmi 2005; Therkildsen 2007; Johnson 2006; Carvalho et al. 2011; Salas and Gaertner 2004; Boonstra and Hentati-Sundberg 2014). A deeper understanding of fishers' characteristics (activities, behavior, etc.) is essential to policies that are effective in sustaining fish stocks and supporting fishers' resilience.

The conventional definitions of small-scale fisheries are varied, almost exclusively based on quantitative information, and often site-specific. Some examples of terms used to describe small-scale fisheries are: artisanal, small-scale, in-shore, subsistence, or traditional. However, what is a "small-scale" fishery in one part of the world may be considered a large-scale fishery in another (Pauly 2006; Carvalho et al. 2011; Johnson 2006; Therkildsen 2007). Berkes (2003, p.8) states that small-scale fisheries "include traditional, artisanal, and subsistence fisheries…" and states that they "may be mechanized but tend to use traditional fishing gears such as small nets, traps lines and

spears". Bene (2006) finds that small-scale fishers share the characteristics of fishing in-shore, targeting multiple species and using a range of gear and technologies. Allison and Ellis (2001) define small-scale fishers simply as "those that work from shore or from small boats in coastal and inland waters". The European Union (2011, p.19) states that "there is no single definition of small-scale fisheries in European legislation that is applicable across all Member States. The most specific description is of 'small-scale coastal fisheries' which is 'vessels under 12 meters in length, not using towed gear". This small sampling of definitions illustrate that within fisheries literature, there is no singular or uniform definition for small-scale fishery (FAO 2012; Pauly 2006; EU Parliament 2011). In addition to varied means of classifying fishers, there are different ways to interpret the data that the classifications are based upon: at the most basic level, quantitative or qualitative. Quantitative is by far the most common and uses data based on the effects of fishing (e.g. catches, landings, fishing trips and means used: gear, vessel types, and technologies). Qualitative analysis considers the social and psychological characteristics of fishers. Nearly all of the research that goes into the formation of current fisheries policy and management uses quantitative data to inform policy and management (Boonstra and Hentati-Sundberg 2014; Ulrich and Andersson 2004; Salas and Gaertner 2004). Surprisingly little is known about the forms of social organization and the processes of social representation of recent small-scale fisheries (Symes and Frangoudes 2001).

The failures of conventional classification of fishers through science may be related to two interconnected features: 1) the use of scale as a means for summarizing the many varied characteristics of a fishery and 2) the lack of consideration given to social issues when forming policy and making management decisions. The majority of fisheries policies classify fisheries as small-scale or large-scale, based on vessel size and/or motor size (horsepower). Such classifications are significant in that they dictate which policies and regulations a fisher must comply with (COM (2010), final; McFadyen, et al. 2011). However, they do not provide an adequate or robust description of the fishery. Just as the use of single species stock analysis is inadequate in describing the ecological and social system of fisheries, the use of a single characteristic is inadequate to capture the complexity of fisheries and fishers (Boonstra and Hentati-Sundberg 2014). Size is only one aspect of a fisher's composition: There are numerous factors which characterize fishers and contribute to distinguishing how they fish, such as technologies, size, modernization, access to markets, habits, etc. (Boonstra and Hentati-Sundberg 2014). However, it is rare that these multiple traits are considered when determining how to classify fishers. While fishers may have one trait in common, such as vessel size, it is rare that other characteristics such as household size, motivation for fishing, perceptions of risks,

and other behaviors will also be in line with one another. Crude classifications (such as fleet) make fishers a homogenous group which is not representative of the empirical reality, and risk turning fishers into "virtual fishers" (Boonstra and Hentati-Sundberg 2014).

Part of the problem may lie in government policies' heavy focus on science and biology as the guiding and only credible principle for proof in fisheries policies. It would therefore make sense to incorporate more social science insights into fisheries management (Boonstra and Hentati-Sundberg 2014). In order for formal institutions to be effective in managing fisheries, they must recognize the varied and complex nature of small-scale fisheries. Rather than relying primarily on quantitative science-based data, policies would address fishers' needs more thoroughly if they were to consider the varied hard and soft characteristics of fishers as well as their motivations. One suggestion is to consider fishing "styles" as opposed to rigid classifications (Boonstra and Hentati-Sundberg 2014).

2.5 Styles and Structuration

Large-scale and small-scale fisheries have both played a role in depleting the world's fish stocks (Pauly 2006). Yet the resiliency of the two scales of fishery and their influence on the trajectory of rural development are quite different. Referring back to the table from Pauly et al. 2006, (See figure 1) it can be assumed that small-scale fisheries are preferential to large-scale operations, in both environmental and social regards particularly for rural areas.

According to Marshall et al. (2007, p.366), "The business size and approach that resource users adopt can influence their level of dependency on the resource". In agriculture, larger farms/businesses can protect themselves from shocks or disturbances such as mechanical breakdowns, weather, or workers issues. They can also afford to invest in more efficient technologies or take bigger risks or experiment with new techniques (Marshall et al. 2007). The same can somewhat be said for fisheries. Large-scale industrial fisheries may be more resilient than small-scale operations because they have more assets to serve as a safety net. However, when regulations permit, SSF can be less specialized than large-scale operations, as they can more easily switch gear and technologies and techniques based on their small scale. Such adaptability and financial freedom makes them more flexible and better able to adapt to changing situations (Carvalho et al. 2011).

Large-scale fisheries tend to re-invest the capital into more advanced technologies and/or fleet expansion, enabling them to increase the size of their catch. Such overcapitalization is a primary

contributor to the overfishing of the world's fish stocks and the cause of increased competition between large and small-scale fisheries (Greboval and Munro 1999; Pauly 2006). In low-income countries, small-scale fisheries tend to re-invest financial capital gained from fishing into their farms stimulating the agricultural and non-farm sector of the economy and increasing their resilience by spreading out their assets (Bene 2006). While fishing profits may not comprise a substantial portion of the household budget, the earnings may provide important cash income that can be used to buy goods and services that cannot be provided through household resources and may also generate income at a crucial time of the year (low agricultural time, or crucial time for buying seeds, etc.) (Bene 2006). According to Symes and Philipson (2009), the focus of developed countries has been on wealth creation, with the assumption that benefits would trickle down to the entire community. Where this did not happen, social welfare safety nets were put in place.

The concept of "style" in social sciences is based on how natural resource users use primary resources and how their use affects their environment. Anthony Giddens believed that agency and structure are dualities that cannot be separated (Giddens 1984). Through their activities, individuals create both the perception and the structural conditions that make their activities plausible. As individuals naturally observe the continuous flow of activities and structural conditions, they adapt their actions to their ever changing understandings (Ritzer and Goodman 2004). As a result, social scientific knowledge of society will actually change human activities.

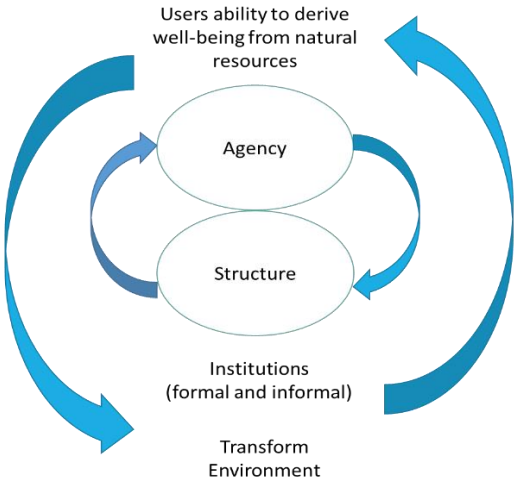

Figure 3. Structuration in relation to natural resource users (Krogseng 2015)

According to Harrington (2005, p.218), "Structuration theory is designed to explain the reproduction of institutional orders through the knowledgeable agency of individuals." Thus, the environment provides a background for the social actions of natural resource users, but it is also a product of their actions (Scoones 1999). For example, while the sea, social norms, and the political environment influence the motivations, habits, and patterns of fishers, the fishers' behavior also influences and shapes this landscape (fish stocks, industry, the marine environment, etc.). Different institutions, both formal and informal, and often working in combination, affect different users' access, use, and ability to derive well-being from natural resources, and in doing so influence the ecological system (Scoones 1999). Users' actions and practices performed within institutional contexts may also serve to preserve ecological features or processes (e.g. quotas may limit the amount of a certain species caught or when fishers are allowed to fish may protect breeding stocks). However, people may also act as agents to transform the environment (e.g. fishers will not fish a certain species if their catches are low). According to Leach et al. (1999, p.239), "such agency may involve precipitating transitions of ecological state that push ecological processes in new directions or along new pathways". While some actions may be intentional and the result of direct management aimed at particular goals, others may be unintentional but still have significant effects (Scoones 2009). Thus "style" considers how patterns of use are influenced by sociological context, as well as individual choice.

According to Boonstra and Hentati-Sundberg (2014, p.9) "fishing styles can be defined as collectively shared and enacted, durable, habitual patterns of systematic and coherent which aim to create congruence between their normative notions about how fishing should be practiced, and fishers' dependence on different social and ecological contexts". Additionally, styles develop from the need for self-preservation, social needs (such as dignity, pride, and respect), and even further from existential needs (such as fishing as a lifestyle), as opposed to solely a means for income (Boonstra and Hentati-Sundberg 2014). They are often the result of solving repetitive problems, and can be influenced by culture, norms, motivation, life histories and personality (Boonstra and Hentati-Sundberg 2014).

3. Methods

To answer the research questions, the study was conducted in the following phases:

- Partnership with the Stockholm Resilience Center (SRC) was formed and research question(s) were formulated that complimented an existing SRC project on small-scale fisheries in the Baltic.

- A preliminary interview was conducted with the County Administrative Board (*Länsstyrelsen*) to gain information on SSF in Blekinge. Desktop research was conducted to further understand the fishing situation in Blekinge, Sweden, and the EU.
- Based on the information gathered from the above sources, potential fishers to interview were selected and contacted.
- Information was gathered using semi-structured interviews with personnel at the Blekinge County Administrative Board, Institute of Marine Research (*Havsfiskelaboratoriet*) run by the Swedish University of Agricultural Sciences (SLU), and current and retired fishers.
- All interviews were translated from Swedish to English, then transcribed.
- Interviews were coded using fishing "styles" concept.

3.1 Partnership/Coordination with Stockholm Resilience Center

As part of a larger project that aims to better understand small-scale fisheries in the Baltic Sea, SRC was involved in some aspects of this research project. Researchers from SRC that were gathering data on characteristics of small-scale fisheries, created the questionnaire that was used in interviewing all fishers in this study. Additionally, the researcher (student) and advisor, who is a research fellow with SRC, conducted a preliminary interview with the head fisheries at the County Administrative Board in Karlskrona, Blekinge. Data from the interviews collected throughout this thesis have been added to data collected by the SRC and will be used to strengthen rationale behind fishing style concept.

3.2.1 Study area

The following is a description of the physical attributes of Blekinge in southern Sweden, as well as the governance of fisheries in the region.

3.2.1 Physical description of Blekinge County

Blekinge County (*Blekinge Län*), sits in the southeastern region of Sweden (56 ° 20'N 15 ° 20'E) bordered by Skåne County to the west, Småland County to the northeast, and the Baltic Sea to the south. The county has 4,204 kilometers of coastline and beaches and an archipelago that runs the entire length of the coastline, of which 156,000 hectares is water and 54,000 hectares is terrestrial (UN Educational, Scientific and Cultural Organization (UNESCO) 2009). The geology of the area combined with the mild coastal climate, and variant fresh and brackish water, have created distinctive circumstances for rich biological diversity. According to UNESCO (2009) "the coast and archipelago

are important for research and education within several areas, such as tourism, outdoor and recreation, and marine biology".

The fishing industry in Blekinge consists of commercial fishing, the processing industry, aquaculture, and sport and tourist fishing (County Administrative Board, 2012). The primary species fished commercially in the region are salmon (S*almo salar*), eastern cod (*Gadus morhua*), and European eel (*Anguilla anguilla*) (Lundahl 2012). As of 2003, the fishing fleet in Blekinge consisted of 26 boats less than 10 meters long, and 26 boats 10-11.99 meters long, 26 boats 12-17.99 meters long, 19 boats 18-23.99 meters long, and 34 boats greater than 24 meters long (County Administrative Board, 2005).

3.2.2 Governance and fisheries management

With Sweden's accession into the European Union (EU) in 1995, fisheries governance shifted from national policy to the jurisdiction of the EU Common Fisheries Policy (CFP). The CFP was introduced in 1983, and presently governs 28 member states (European Commission 2010). The exclusive economic zone (EEZ) for EU countries extends 200 kilometers (108 nautical miles) out from the coastline and is the largest in the world. Sweden has its own regulations 12 nautical miles (22.22 kilometers) off its coast (European Commission 2010). Within Sweden, the Baltic Sea is the most important fishing area, responsible for 72% of the total national catches (European Commission 2010). The Swedish Board of Fisheries operates under the rules of the CFP and is the national governing body responsible for managing fisheries in Sweden. Fisheries management is based on TACs and quota system which sets upper limits for the total amount of fish which can be landed from particular areas. In tandem with TACs other measures are employed such as effort regulation, technical conservation measures, gear guidelines, closed seasons and areas, minimum allowable sizes for individual species, management/recovery plans, and stock enhancement operations (EU Commission 2010). The CFP attempts to further limit fishing by controlling the capacity of fleets (structural measures) and time spent at sea (Daw and Gray 2005). Commercial fishing normally requires an individual license which is granted based on the availability of fish, the need for regional development, and regeneration of the fishing sector. Sweden also has a number of rights-based management systems in place including Individual Quotas and Individual Transferable Quotas, territorial use rights, and restricted non-transferable permits and licenses (European Commission 2010).

3.3 Case selection

In order to provide a general understanding of the state of SSF in Blekinge, it was desired that one fisher from each primary species fished in the region be sourced to interview for a case study. A preliminary semi-structured interview was conducted with Lars Lundahl from the Blekinge County Administrative Board in order to learn about small-scale fisheries in Blekinge. The interview was conducted at the County Administrative Board office with Lundahl, his colleague, the student, and supervisor from SRC. A second interview was conducted between the student and Lundahl to further grasp the state of SSF in Blekinge, in relation to the context of this thesis. As the head of the branch of government in charge of fishing permits, Lundahl was able to provide information on the primary species that are fished in the region (salmon, herring, cod, and eel) as well as the different methods and gear used. A list of corresponding names of fishers currently fishing for each species was provided and Lundahl indicated those fishers which were still active and may serve as potential interview contacts. A translator called the fishermen, briefly explained the thesis project, and arranged for interviews.

3.4 Interviews

Semi-structured interviews were conducted with all fishers using questions provided by SRC. Each interview lasted roughly one to three hours and was conducted in the harbor where the fisher kept his boat and gear. Additionally, semi-structured interviews were conducted with representatives from the County Administrative Board and the Institute of Marine Research and lasted one to two hours.

For all interviews, except with the retired fisherman, the researcher and a translator were present. The interview with the retired fisherman was conducted solely by the translator. All fishermen were given a one page document from SRC written in Swedish outlining and describing the project and the role that the information collected in their interviews would play. Their permission was received for providing information for the project, as well as recording the interview.

All interviews with fishermen were conducted in Swedish and recorded using a digital voice recorder and translated at a later date by the translator who conducted the original interview into English. In all instances it was possible to see the boats and gear, and photos were taken. The interview with the retired fisherman was conducted at his home. Interviews done with organizations were held at the offices of the organization were conducted in English with only the student present.

3.4.1 Portraits of fishers

Salmon fisher, (48), Karlshamn and Sandshamn

Years in as a fisherman: 15 years with own license
Collaboration: Alone and with partners
Full time/part-time: "At the moment fishing is so bad, that I needed to take another job on land part-time to survive."
Target species: Salmon, cod, turbot. "Earlier I was fishing for cod, salmon, and turbot. Now I am just doing the small-scale fishing because the seal are taking all the cod and salmon fishing is prohibited. I can combine the small-scale fishing I do now with my regular job, so that's why I just fish for flounder, perch, and pike."
Gear: Boat(s): 4.8 meters long, 2 meters wide and 10.8 meters long, 4 meters wide. Fishes with "yarn" for cod and herring, hooks for salmon, sometimes hooks for cod (but most of the time it's yarn for cod and turbot and hooks for salmon).
Labor organization: Member of the Swedish Fishermen's Federation
Normative opinions about fishing: "The lifestyle to be a fisherman, that's what I like. I like to go out and fish and not care what week it is or what month it is. It's the freedom that I really enjoy."
Dependence on social, economic, and political context: "Fishermen, in general, that have been using the passive methods have needed to change their minds and their ways of fishing to fish for other types of fish. And also to try to have land jobs at the same time, because it's impossible to live off the [income from] fishing like it used to be." "I've never wanted to give up fishing, but I have to give up some part now because it's not financially feasible to live off the fishing one hundred percent."
Diversity in fishing policies: "Today I have to try different angles of and different techniques of fishing because the whole fishing industry is so insecure: maybe today you can fish and maybe tomorrow you can fish, but the day after that, with the regulation they decide that 'No, you are not allowed to anymore'. That has been happening to me many times. I have a lot of equipment that is just sitting there, worth several hundred thousands of kronor, because one day the nets were fine and the next day the nets have to be a smaller size. So today there are not really any more long-term investments; you just have to be clever and survive on what you already have."

Herring fisher, (36), Sturkö
Years in as a fisherman: 18 years independently, but fishing on his father's boat since he was three or four years old, 13th generation fisherman in his family
Collaboration: With his father and other fishermen
Full-time/part-time: Currently fishing full time

Target species: Cod and herring
Gear: Boat(s): "*Tammerfors"* 11.5 meters long, purse seine; "*Porju"* (father's boat) 18 meters long, trawling.
Labor organization: Member of the Swedish Fishermen's Federation
Normative opinions about fishing: "It's nice to be out on the water fishing and the freedom. It's enjoyable when you don't have inspectors coming up on you. But it's like all jobs: sometimes you really hate it and sometimes you really love it."
"I think it's better to take a smaller amount of fish if it's better quality. For example, if you're fishing for cod there are a lot of fishermen that go to areas where there are a lot of small cod. Then you have to throw back a lot of fish in the water. I think the reverse is better: to have the right net so that you get the fish that you want and it's of better quality."
Dependence on social, economic, and political context:
"If you follow your quotas and regulations that's what maintains the stocks. And to use equipment that sorts out the right size of the fish. I think it's wrong if you take up fish that you shouldn't be fishing for, that you have to throw back. I think it's better to land all fish. And I think all the fish that you land should be included in your quota."
Diversity in fishing policies: "Quotas and old habits are important in deciding on the type of fishing to undertake. Thinks about long-term investments all the time: "The question is about if I dare to do such a big investment in nets and stuff like that. The risk is that the government could come with new regulations tomorrow, and you just spent a lot of money, and then you're screwed. So I don't dare to do any investments like that."

Eel fisher, (64), Hörvik
Years in as a fisherman: 35 years independently, 5th generation fisherman in his family
Collaboration: With other fishermen
Full-time/part-time: Currently fishing full-time (90 days/year)
Target species: Eel (with quotas)
Gear: Boat(s): Eight meters; seven meters using "bottom yarn" (nets that sit on the bottom) and nets
Labor organization: Not a member
Normative opinions about fishing: "It's a struggle." "I had a positive feeling about the fishing until ten years ago; very, very positive. And the negative is that it's the regulations".
Dependence on social, economic, and political context: "The fisher today is all pessimistic and it's been like that for quite a while. There is not future in this what-so-ever. There is nothing that has

become better today. There are too many regulations and the government has been voting in and telling too much what we should and what we shouldn't do. And we down here know much better what to do and what not to do [than the government]. If there is a fisherman who cannot survive or get around on his fishing, he sells his gear and quits. And the reason is that the government is looking in on everything."

Diversity in fishing policies: "A fisherman needs to have the choice of what kind of fish he wants to catch. If he's a cod fisher he needs to be able to fish other species to compliment his business. For me as an eel fisher, I'm only allowed to fish eel. For example, if there suddenly starts to be a lot of herring out here, I'm still not allowed to fish for that. I can't get a license for that, I only have my eel fishing license. When I started as a fisherman, it was never any problem to do complimentary fishing. Sometimes I went out for cod or herring if there wasn't so much eel. But these days it's impossible."

Retired fisher, (73), Saltö

Years in as a fisherman: 35 years independently, 5th generation fisherman in his family

Collaboration: With other fishermen

Full-time/part-time: Retired, but still fishes. Was full-time until 1991

Target species: "Pigvar", salmon, eel, and flounder.

Gear: Boat(s): Has owned five boats in his career, the largest was 31.6 meters long and the smallest was 5.7 meters. All were trawlers except the last two. Salmon, yarn (net); and founder yarn (net), and pigvar yarn (net).

Labor organization: Member of the Swedish Fishermen's Federation

Normative opinions about fishing: "We try new gear or new water; now it's more difficult because if you have a license for cod and you see a lot of herring, you can't just change; you have to stick to the fish you have a license for. In fishing that's the kind of flexibility you need to have. You need a lot of different gear; you can't just stick to one, you need a lot of different kinds. You can't stick to just one kind of gear, in fishing you need to be flexible. That's how it works."

Dependence on external factors: "The most important thing is that the government is listening to the fishermen, and that they don't just sit with calculations; because the fishermen understand more about the fishing industry than can be reflected in numbers."

Diversity in fishing policies: "It changed radically with the fishing zones. When they divided the sea into different economic zones, then that was the start of fishing systematically. At any price, you just had to vacuum the sea for the quota that was yours. And it was both with the floating trawl

and the bottom trawl. It was too much systematically, and there was no one listening to the old [people]. We shouldn't bring more to land than we could deliver, and we had a quota. It's exactly the same today: We have to do our quota as fast as we can."

3.4.2 Portraits of organizations interviewed

Blekinge County Administrative Board (Länsstyrelsen)

At the local level, the County Administrative Board (*Länsstyrelsen*) is responsible for development of the fishing industry, including ensuring that fishing policy is implemented, developing the industry and acting as a liaison between the fishers and government with regards to issues and opportunities in the county. They provide their opinion to the Swedish Board of Fisheries in regards to fishing licenses and permits and provide EU support for investment in commercial fishing, development projects, training, etc. (County Administrative Board 2012). "The County Administrative Board coordinates and conducts exploratory fisheries to monitor the development of the fishery resources. In addition, we use the opportunities provided by legislation to protect the natural fish habitat" (County Administrative Board 2012).

Institute of Marine Research (Havsfiskelaboratoriet)

The Institute of Marine Research (*Havsfiskelaboratoriet*) is a part of the Swedish University of Agricultural Sciences (SLU) and is concerned with the collection of biological data, population and ecosystem analysis and provides scientific advice used to guide both national and international management decisions. The office works in cooperation with ICES, EU expert groups, and universities in Sweden and other EU countries. Another aspect of their work is to "scientifically evaluate if management regulations have had the desired effect or if there is a need for changes to achieve the objectives". Yvonne Walther leads the Swedish national monitoring program for Baltic Cod, conducts fish stock assessment, and studies ageing and quality assurance of the ageing process.

3.5 Transcribing and translating interviews

All interviews were translated from Swedish to English by the translator who was present at the original interview, except for the last interview with the retired fisherman. The last interview with the retired fisherman was translated by two separate translators, due to difficulty in understanding him. After all the interviews were translated, they were then transcribed in their entirety by the student.

3.6 Data validity

The following steps were taken in attempt to ensure the validity of the results:

- Several methods for data collection including exploratory interviews, interviews with current and a retired fishers, as well as desk research were used. Further expanding the depth of the research, experts holding different standpoints and positions from various organizations were targeted for interviews in order to improve the quality of data collected;
- Conducting a preliminary interview with and a clarifying, secondary interview with Lundahl, ensured that he was familiar with the project and able to aptly recommend fishers that would be able to deliver reliable and reputable answers relevant to the student's research project.
- Feedback by experts at SRC, as well as the thesis advisor was incorporated into interview questions in order to reduce possible leading questions;
- All interviews were recorded to enhance accuracy of our data collection process;
- Translating interviews was done by the translator that was present at the interviews in order to deliver reliable and consistent results;
- Results were compared to other research projects (e. g. academic articles and previous thesis in Rural Development and Natural Resource Management).

4. Results

4.1 Rural Development-policy legitimacy and effectiveness

All fishermen interviewed for this project believe that present day fisheries policy has too many restrictive regulations and is excessively complicated. They cite these regulations as the primary factor hindering their livelihood, both in their ability to earn a consistent income and sustain the industry. The numerous and complicated regulations are affecting not only their personal way of life as fishers but also their communities and the regional landscape.

The numerous and often frequently changing regulations make it difficult for fishers to maintain a stable and sustainable financial situation. Fishers worry about substantial fines, which cut into financial profits, for what they feel are generally unintentional and insignificant offences. Some of the fishermen complained that the laws and policies change frequently, often with little warning. Changing regulations frequently require the purchase of new gear or licenses, which may become obsolete with the next policy change, making it difficult for fishers to make investments and increasing their sense of financial insecurity. Such intuitional instability makes fishers insecure about the sustainability of their livelihood and way of life. This uncertainty makes fishermen

hesitant or unwilling to invest in new gear or boats, often feeling that the financial risk of purchasing new equipment is too great.

"For example, if somebody catches a little bit more cod, it's just a very small percentage that are doing this and it's difficult to meet the exact quota of what you are allowed to take up or not. If a cod fisher, for example is coming in to land his fish and he is off by a few percent of the weight, he will be punished and I don't think that is right. If there is a few percent below of what you are allowed to catch then there is no problem. But as soon as you are a few percent over, then you are punished. If you are a lone fisherman and you are out in bad weather fishing, it's not very easy to know exactly how much you are catching. And when you come and land the fish, if you are a little bit over the limit, you are punished directly. I don't think this is ok. It's difficult. It's the same for me: if I get an eel up, I need to decide within two seconds if the eel is bigger or smaller than 70 centimeters. And when I get to land my fish and I did wrong, I am punished directly. And then the fishing regulator is there with his stick to measure my fish as soon as I land them. For me it's my vision. Sometimes it's better, sometimes it's worse" (Eel fisher 2012).

"The things that have been becoming worse today are other types of regulations and all the fines they give you and controls. You don't have so much space to make it right. It's very easy to be wrong according to the law and bureaucracy" (Salmon fisher 2012).

"You still need a license and if the government comes to tell you after ten years not you need this kind of license, then maybe I haven't had time to pay off the loan from the first license, if there's been bad fishing and stuff like that. And my license has been for a thousand tons per year, they can suddenly tell me that my quota will be smaller by 20 percent, then its suddenly really bad business, as I haven't paid off my loan from the first license and then I have to take a loan for the new license with a new quota….To go in and buy a license like that is like buying a piece of air. It doesn't' matter; it's not useful. And it's not only the fishermen who own the fish…it is the whole Swedish population. We should have the right to fish the fish, and to eat the fish" (Herring fisher 2012).

"When I was stared as a fisherman, the job itself was pretty free not so much laws and regulations as there are now. Now when we want to land fish we need to call ahead to an inspector; four hours before we land. And if you don't do that they will be at the harbor waiting for you and give you a fine. I have no understanding for this kind of behavior and it's the same when we do the purse

seining. If you have less than 5 tons landed on your boat, then you can just go to the harbor and land your fish without calling the inspector. But if you get six tons, then you need to call the inspector, and then you have to wait for four hours before you can actually get in the harbor. And if you have to sit out there and wait, maybe the fish starts to go bad. But so far they have been pretty nice about it and help us out" (Herring fisher 2012).

"Today it's not really a good idea to make a long-term investment because you don't know what will happen in the future" (Salmon fisher 2012).

"I look into scientific reports because these are the reports that decide my quota. And there's not so much I can do about it. The salmon fishing used to account for 70% of my yearly income, but now that it won't be legal to fish for them any longer that just disappeared overnight" (Salmon fisher 2012).

"The question is about if I dare to do such a big investments in net and stuff like that. The risk is that the government could come with new regulations tomorrow, and you just spent a lot of money, and then you're screwed. So I don't dare to do any investment like that. I'm thinking about it and it's just a very difficult decision to make. I don't really know" (Herring fisher 2012).
Furthermore, a couple of the fishers expressed frustration with the fines and regulations imposed on Swedish fishermen, who are only one portion of the fishers in the Baltic. They felt that it was useless to impose so many regulations on one country, when other fishers in the Baltic fishing the same stocks have little or no regulations governing the way they fish. The effectiveness of such narrow and solitary policy is validly questioned regarding common pool resources.

"Swedish fishermen are too regulated today. The Swedish government is professional at making more and more regulations for fishing, making it harder and harder for fishermen. Meanwhile, the other countries around the Baltic do not have these kinds of regulations at all. This makes it really difficult. They are fishing for the same species which make the Swedish fishing industry go bad and that makes the fishing really bad for us" (Salmon fisher 2012).

"I do not think that the regulations are helping increase the species or stocks in Sweden. No I don't think the regulations are helping at all. If it was the same for the entire Baltic then, yes, then it

would be different. I don't think at all that the Swedish regulations are helping at all" (Salmon fisher 2012).

The numerous and complicated regulations are seen as responsible for the die out of the small scale fishing industry, constraining current fishers and deterring new fishers from entering the profession. In addition to causing financial strain, the regulations are seen as eroding personal identity. While levels of frustration with regulations varied, all fishers stated that there is a need for regulations. However, they all expressed sadness/regret/frustration with the effect that regulations are having on their way of life, their households, the industry, and their communities.

"The fisher today is all pessimistic and it's been like that for quite a while. There is no future in this what-so-ever. There is nothing that has become better today. To the worse, there are too many regulations and the government has been voting in and telling too much what we should do and what we shouldn't do. And we down here know much better than what to do and what not to do. If there is a fisherman who cannot survive or get around on his fishing he sells his gear and quit. And the reason is, is that the government is looking in on everything" (Eel fisher 2012).

"The equipment of today (the nets etc.) is the same as it was years ago. They've been improved a little, but it's the same technique. The regulations have been increasing over the years, and there is a lot more bureaucracy than there was in the past. There are a lot more controls today in general. Back in the day, you were just a fisherman, and you went out to fish and that was it. Today it's become worse and worse, and that's because of the regulations. When the government decides that you are only allowed to fish four or five months out of the year then the whole business is just falling apart. It's become a little bit better in the last year or two with the regulations, but still there are too much regulations and too much bureaucracy" (Salmon fisherman 2012).

All the fishermen interviewed felt frustration with how policies have changed over their career and the amount of control legislation has over the fishing industry. They believe the numerous regulations decrease the feeling of freedom, which they believe is central to the fishing lifestyle. All of the fishers interviewed stated feelings of freedom as the most important aspect of fishing. On the same side of the coin, they all talked about the difficulty that they face in working in regular nine to five job situations.

"*It's the freedom and to be out on the ocean; that's what you're looking forward to" (Eel fisher 2012).*

"The lifestyle to be a fisherman, the freedom: that's what I like. I like to go out and fish and not care what week it is or what month it is the freedom that I really enjoy to be a fisherman. I worked two years in a professional industry and I will never do that again. I promised myself that I would never again work in a place with four walls and a roof. I did that from 1991 to 1993 and it's after that that I became a professional, independent fisherman" (Salmon fisher 2012).

The numerous and complicated regulations are not only a source of frustration for current fishers they believe that they are a barrier deterring new fishers from entering the profession. With no new generation joining the profession, the present fishers have no one to pass the knowledge of the trade down to. Furthermore, the loss of fishers will influence the character of the landscape and communities where fishing has been an industry for many generations.

"The regulations in Sweden, make it difficult for younger people to become fisherman. I am one of the youngest fishermen in Blekinge and I am 48. I feel like I'm getting to be an old man! There's not so many left out there who want a career as a fisherman. With the regulations, there are too many laws and they are too difficult to understand and know and to learn: So it's dying out" (Salmon fisher 2012).

"I can promise almost 99 percent that when I'm done fishing next year when I turn 65, no one will continue fishing for eel in this water" (Eel fisher 2012).

"Now I'm the only one here. And it's another gang, but they are mostly in Karlskrona or in Simrishamn. It's all 'finito'*" (Retired fisher 2012).*

"The whole society around here would die out. This area is really famous for salmon and eel. And now when it's forbidden with fishing salmon, and soon it will be prohibited to fish eel. Hörvik is world famous for their fishing and when it disappears, everything else will disappear. There won't be any more tourists around here" (Eel fisher 2012).

All fishers interviewed struggled with the legitimacy and effectiveness of fisheries policy. They perceive too many discrepancies between what they see in their nets and what the scientific reports that influence quotas and policy are showing. Although science provides the quantitative data that is the basis for most policies, fishers have a different view of how science is relative to their daily observations. They felt that the "science" that the organizations use is contradictory to what they experience and encounter when at sea, often causing feelings of frustration and nullification of their experience and input. A lack of informed understanding about the knowledge and effort involved in their work, lack of communication between fishers and those formulating policy, and the fact that policy is based on data and reports which contradict what fishers see in their daily work lives, are all factors that lead fishers to question the legitimacy of policies' impacts. This misunderstanding is reflected in policies that fishers believe do not benefit the industry, their livelihood, and are a hindrance to their way of life. They expressed distrust of the reports compiled by research organizations, which form the foundation for current fisheries policy.

"Back in the '80s when it was really bad with cod, (I was too young to fish cod at that time), but a few years ago when we could see in the nets there was a lot of cod, the Ministry of Fisheries said, 'There is no cod and you are not allowed to fish'. But now, the Ministry of Fisheries says that there is quite a few cod out there and you are allowed to fish for them. But I don't agree with that. I think it's worse now because the seals are taking so much of the cod. If the quota is getting bigger, of course I will start to fish more. Obviously. It's what I do for a living. I really hope that the politicians realize how the problems were back in the past so they don't make the same mistakes again with setting wrong quotas… For those of us that are out there fishing every day, we see what happens in the water and we are pretty good on regulating. If there is less fish, then we fish less. And if there's more fish, well then we are happy and we are fishing more" (Herring fisher 2012).

"But from my point of view, I don't really think that the eel is in danger. I see how much we catch" (Eel fisher 2012).

"Without a doubt, cod gave the best results; and even herring. It depends on the season. And that's what the government doesn't understand: you have to do everything just at the right season, and at the right time" (Retired fisher 2012).

"I can't affect the laws. I only fish what I'm allowed to fish. Whatever is legal in the yarn is in the yarn. I only save what I want, the rest I throw back. So I say this is sustainable fishing. The majority of what we throw back is surviving" (Eel fisherman 2012).

"No I don't trust researching. I only trust what comes in my nets" (Eel fisher 2012).

"The most important thing is that the government is listening to the fishermen, and that they don't just sit with calculations; because the fishermen understand more about the fishing industry than can be reflected in numbers. There can be streams or algae for example…the fish are flexible, the water temperature: it's too cold or it's too warm. But it's me as a professional fisherman who understands these things in order to be able to catch a lot of fish. When you go through these systems [EU, bureaucratic, etc.) there's no real relevance in real life. The decisions that the decision-makers are making are not from the fishermen. They come from somewhere else" (Retired fisher 2012).

"Everything you do, if you don't do it right will threaten the species. The biggest threat was the intensive fishing for cod. Then the government said you could fish more than you were allowed; and we here in Blekinge said many times that we have to stop all the fishing for cod. It's the same now with the herring. They say there's a lot of herring but what do you do with the fish that are up on the surface? Because salmon eat the herring and the salmon population has gone down and it's both the human and the seals that are hunting for salmon. When you come into one of the islands with 500 tons of fish, you don't count how many salmon it is….if it's one or ten. If you want to do a study, you have to do like the Spanish….you can't sit on your ass on land, you have to go out and be on board (a boat). And it affects the fishermen, because no one believes them" (Retired fisher 2012).

"With the fish that are close to becoming extinct, with the salmon for example, I don't really believe these reports because the last few years I've been seeing a lot of salmon. And with other fish that I've been reading reports on, I sometimes believe these reports but sometimes I don't; especially with the salmon. My experience tells me that it's not as bad as the government and the Department of Fisheries says it is. Plus, Sweden is the best country in the world on prohibiting everything" (Salmon fisher 2012).

"From the experience I have, some parts of the science are very good. But most of it is just blah. If they are going to do science, they have to be on the boat all the time, not just for small parts" (Retired fisher 2012).

All the fishermen interviewed expressed frustration at not being included more in the decision making process. They often felt that their experience, knowledge, and opinions were either not sought or ignored in policy formation. The fishers interviewed felt that those in charge of making policy and setting regulations do not have an understanding of fishers' way of life or the challenges that they face in their livelihood. They felt that their voices are not being heard and their opinions and expertise are not recognized or considered when formulating or amending fishing policy.

"A few years ago the government was happy to say that the cod population was back, and they increase the quotas by 15 percent a year. But in 2007/2008, I could see a big difference in the coastal fishing that I was doing. There was a decrease in the cod population. I had to go further and further out and take bigger turns, just to survive financially. And from 2010, I can't survive just on cod fishing financially because I can't chase the fish that far. And still the government says that the cod population today is much better than it used to be. Today its "green listed" and it's free to fish from every different angle; even if there are quotas" (Salmon fisher 2012).

"I don't even think that the claims that we've been filing get read by people in that department; because the following law that comes out or gets passed is the same as the report that they read, and we didn't even have time to answer the questionnaires. We feel like they don't even listen to us (fishermen) at all" (Salomon fisher 2012).
"Well, I think that we fishermen, if we had more of a part in the decision making process, that would be more useful for us. And I really think that the fishing would be working well if we got to say what we know" (Eel fisher 2012).

"I would like to have better connection with the Department of Fisheries and more meetings so that people up in the office actually understand what is going on, which is how we see the problem now: There is a lack of understanding. I hope that they would come out on a boat and see how it is one day in the real world. They say they will do it, but so far we've never seen anyone coming out here and joining us" (Herring fisher 2012).

"It's without a doubt when Sweden became part of the EU: all of the laws and regulations. We had all of these people who were new to fishing and they went down to Brussels and they didn't know anything and they didn't have a vision of the future. They didn't know what to expect, because they didn't have the knowledge. There were no kind people in Brussels. They were old criminals. That part got worse for us. They took away our credibility" (Retired fisher 2012).

"And more participation in the decision making process. Absolutely, and more credibility for the people that are actually working" (Retired fisher 2012).
"Now what I really dislike is, just before Christmas, came a new regulation that you are not allowed to fish more for salmon. They told us we were no longer allowed to fish for salmon. I think there is a lot of salmon; but we are not allowed to use hooks and long-lines any longer" (Salmon fisher 2012).

"How they divide the quotas between the fishermen. Sometimes I feel it's not even among the fishermen. That's something that bothers me that I get angry about. The government says, this is the new regulation and the new law and you just have to follow it. If there's something that you disagree with then you have to file a complaint, then it goes all the way up to the high court, it gets expensive, you have to higher attorneys, and it takes a long time to process. It can take up to two or three years before you get an answer. Then you can't go on with this and think that you will be reimbursed because that's not going to happen. Sometimes it feels really hopeless" (Herring fisherman 2012).

"It kind of summarizes up in the fisheries policy and in the end if you have a fisheries policy where the end user, which is the fisherman, is not involved and understand(s) the fishery policy, they would naturally not be interested in following the fisheries policy. If you're involved in deciding the fishery policy you feel a part of it and you don't break a system which you're part of. It's a natural human interest. So you need to enroll them. And I speak to a lot of…I take a lot of information, mostly soft information, but also hard knowledge form the fishermen from discussing with them and getting ideas" (Biologist 2012).

"Do you think fishers should be considered more? Absolutely. Absolutely" (Biologist 2012).
The fishers also felt that current fisheries policy is favoring large-scale industrial fishing to the detriment of the small-scale fishing sector and the marine environment and fish stocks in the Baltic.

"I believe that small-scale coastal fishing is sustainable fishing. It's the big trawlers that aren't good for the fishery. The small-scale coastal fishery uses very selective nets so that it catches only the target species. So I think this is a very sustainable way of fishing" (Salmon fisher 2012).

"There should be rations (quotas) that are reasonable, and some kind of engine regulations. They should reduce the horsepower on the big boats to minimize on these big trawlers. And then there should be a system so that you can see which fish you land, so that you don't have to take up all the fish in the system" (Retired fisher 2012).

4.2 Livelihoods

Under the CFP, commercial fishers fishing salmon, cod, eel, and herring are only allowed to fish one species. For example, fishers that have a permit for salmon fishing, are only permitted to fish for and catch salmon. According to the fishers interviewed as well as Lundahl (2012), this is not good for the sustainability of the fish stocks or the fishing industry. If fishers were permitted to fish multiple species, this would diversify their portfolio and bring about less financial risk and more stability. Not only would decreased risk benefit current fishers, it would be beneficial in attracting new fishers to the industry. Additionally, some believe that allowing fishers to fish multiple species would take pressure off of species whose stocks are in decline and allow suppressed stocks to recover.

"If he's a cod fisher he needs to be able to fish other species to compliment his business. For me as an eel fisher, I'm only allowed to fish eel. For example, if there suddenly starts to be a lot of herring out here, I'm still not allowed to fish for that. I can't get a license for that, I only have my eel fishing license. When I started as a fisherman, it was never a problem to do complimentary fishing. Sometimes I went out for cod or herring if there wasn't so much eel. But these days it's impossible. Today it totally forbidden/prohibited" (Eel fisher 2012).

"Yes, I think it's possible to have a sustainable way of fishing. For us, because we have the opportunity to fish both herring and cod. So for example, if the cod fishing is bad we switch over to herring and if there's a lot of herring, well that's good and that's how it is. Especially with herring, there's been a lot of fish lately in the last few years" (Herring fisher 2012) *It should be noted here that he fishes cod with his father on his boat, and then herring under his license on his smaller boat.

"Fishermen, in general, that have been using the passive methods have needed to change their minds and their ways of fishing to fish for other types of fish, and also to try to have land jobs at the same time, because it's impossible to live of fishing like it used to be" (Salmon fisher 2012).

The following descriptions fishers gave of their "typical" day illustrate the variance in fishers' lifestyles, schedules, motivations, methods, gear, habits, etc.

"The last time I went out fishing was small-scale very close to the coast type of fishing. I set the nets, came home and then went out again at 4am to bring them in. I just brought a couple of empty boxes to put the fish in and I just brought a couple of empty boxes to put the fish in. I was fishing for pike and perch. I stayed out until 9am. After 9 I kept working, repairing the nets, cleaning the fish, I didn't get back home until 6pm. The fishing that day was ok: not good, but not bad either. Nothing spectacular happened and nothing unexpected happened as well. When I came back I just cleaned the boat and then there was the other kind of work as well: cleaning the nets and repairing stuff and maintenance" (Salmon fisher 2012).

"During the year it can vary a lot: from staying out for three or four hours or staying out for up to a week or ten days" (Salmon fisher 2012).

"When they go for herring they go out normally around 9 o'clock in the evening, they fish the whole night and then go back to land the fish early, around 6 am in the morning. There is not so much preparation and they decide on the trip back when they should go out in the evening again, but normally it's around 9 o'clock. Last time they went out fishing for herring it was outside Verkö where the big Poland ferry is going and they mostly went around Verkö, but they could go all the way from the bridge over to Möcklö all the way over to Hasslö. And the last time they went out fishing it was a very good fishing, a big catch. When he came back home from that trip, he went to sleep for a couple of hours and then he spent some time with his family. During this period the fisher is really intensive: they are out six nights a week so I mean it's affecting the family as well. But it's during such a short period, about two to two and a half months, so they can handle it all" (Herring fisher 2012).

"Well you know, I'm only allowed to fish 90 days per year and that is from July to September. And the rest of the year it's about repairing: A lot of repairing. Many, many months I spend repairing my nets" (Eel fisherman 2012).

Fishers' beliefs as to what characteristics are essential for successful fisher were also varied.

"A good characteristic for a fisherman to have is to be stubborn. Fishing is like one day you get fish and the next day you don't get any fish. That's just the way that it is: sometimes it's better and sometimes it's worse. You just need to be stubborn and keep on doing it. The last few years it's been going downhill and so you need to be smart enough to ask yourself when you should leave it and go do other stuff; because you do need to pay your bills" (Cod fisher 2012).

"Stubborn and patience are the most important characteristic traits in a fisherman" (Salmon fisher 2012).

"Stubborn and positive" (Herring fisher 2012).

"Good character. Independence. That you make your own decisions. No one else will make decisions except you. Whether you are going to go out to fish or not fish is up to you. How motivated you are" (Eel fisher 2012).

"Patience. A real sailor: He has to be able to fry an egg, peel potatoes, fix the engine, tune the valves and fix the electric system; you have to be able to do everything." (Retired fisher 2012).

Fishers had varying motivations that determined their fishing. They all used different gear, used different methods to determine where to fish, and held different personal values that influenced the way they went about their livelihood.

"I decide where I am going to fish from other fishermen, rumors, and of course my past experience; where I've been fishing before. I know a lot about the seasons. For example, when it's becoming fall, more or less from November first, I know there is good salmon fishing for about a month or so" (Salmon fisher 2012).

"It's a lot about asking other fisherman and colleagues. We talk to each other. Someone says 'we've been down at a certain spot and it's been good fishing, or it's been really bad fishing'. Everybody knows each other and everyone talks to each other and that's how we find out where to go. And of course, it's experience as well" (Salmon fisher 2012).

The decline of small-scale fisheries in Blekinge is resulting in the loss of livelihoods as well as the loss of industry related to fishing, such as transportation, processing, smokeries, etc. All fishers interviewed noticed that the landscape of their communities has changed since the deterioration of the fishing industry. In interviewing the fishers, and witnessing the deep understanding that they possess of the trade, (gear, weather, natural environment, fish species, migration patterns, boat and equipment mechanics, etc.) it was hard not to be concerned that this cache of knowledge will be lost once many of them stop fishing.

"[If fishing disappeared from the area] the whole society around here would die. This area is really famous for salmon and eel. And now when it's forbidden with fishing salmon, and soon it will be prohibited to fish eel. Hörvik is world famous for their fishing and when it disappears, everything else will disappear. There won't be any more tourists around here" (Eel fisher 2012).

"Fishing should be important for the local community because it's a profession that is dying out and it is a rich cultural thing for Blekinge. This is a thing that is dying. Without fishing in Karlshamn, the harbor would be dead for nine or 10 months out of the year, with only two or three months in the summer for tourism" (Salmon fisher 2012).

"Fishing is really important for the area and if the fishery dies out it will not be good for local business. Especially in Saltö, where they land most of their catch. The factory will disappear, the small local business that comes and picks up the fish won't exist anymore. So I think it's bad if we can't continue fishing" (Herring fisher 2012).

How important is fishing to the community? *"Very important. Most people on Hasslö were fishermen…now I'm the only one here. And it's another gang, but they are mostly in Karlskrona or in Simrishamn. It's all* finito*" (Retired fisher 2012).*

4.3 Resilience

Fishers often spoke about their ability to be flexible with gear, ways of fishing, schedule, etc. but complained that the regulations are prohibitive. Such adaptive capacity is necessary for SSF to weather environmental, social, and political shocks. Flexibility is a cornerstone of resilience, the ability of an individual or system to adapt and move forward. It could be seen speaking with small-scale fishers in Blekinge, that they felt institutions should be less rigid in their policies in order to preserve fish stocks and support fishers' livelihoods and way of life.

"I think that today the cod population has come back, but I blame the seal population as it is too big and coming further and further south and growing and growing because they have no natural predators here in the Baltic. And the government is not doing anything about it; they don't want to shoot them. In 2002 when the Swedish government wanted to pass a law to prohibit all fishing in the Baltic Sea, then on the coastal fishing that I did, I could survive as a professional fisherman completely, at that time. I only went out a couple of hours out, and I didn't have any other job besides fishing. And I could make money with this kind of fishing of the cod at that time" (Salmon fisher 2012).

"Well, yesterday I had a really negative experience: Now they come up with this regulation that you need a special type of scale when you weigh your fish. And when you are weighing your fish, the control inspector can just tell me what to do and I can't say anything about it. And I won't do that because I just want to be an independent fisherman" (Herring fisher 2012).

"Yes, I think that fishing must have some regulations, but it should be very actual/current/concrete. Fast decisions and if you have taken a negative decision and if that decision is wrong, you should be able to change it. But there should be regulations, that's important" (Retired fisher 2012).

"There are too many regulations. It was as I said: a fisherman today is getting breathing through a regulator [with assistance]. When it was with the cod for example they had to use this kind of stamp system. If we didn't need to use this system we wouldn't need to breathe through these regulators. And also they put fishermen on unemployment [money]. If they would just be able to work the way they always have been, without regulations, it would be better" (Eel fisher 2012).

"In fishing that's the kind of flexibility you need to have. You need a lot of different gear; you can't just stick to one, you need a lot of different kinds. You can't stick to just one kind of gear, in fishing you need to be flexible. That's how it works" (Retired fisher 2012).

"Today I have to try different angles and different techniques of fishing because the whole fishing industry is so insecure: Maybe today you can fish and maybe tomorrow you can fish, but the day after that, with the regulation they decide that, 'No you are not allowed to fish anymore'. That has been happening to me many times. I have a lot of equipment that is just sitting there, worth several of hundred thousands of kronor, because one day the nets were fine and the next day the nets have to be a smaller size. So today there is not really any more long-term investments; you just have to be clever and survive on what you already have" (Salmon fisher 2012).

"And the government says, 'This is the new regulation and the new law and you just have to follow it.' If there's something that you disagree with then you have to file a complaint. And then it goes all the way up to the high court, it gets expensive, you have to higher attorneys, and it takes a long time to process. It can take up to two or three years before you get an answer. And then you can't go on with this and think that you will be reimbursed because that's not going to happen. Sometimes it feels really hopeless" (Herring fisher 2012).

The risk and insecurity brought about by changing regulations and policy, and the consequent inability of fishers to rely on formal institutions to maintain stability and their best interests, has led the fishers interviewed to believe that the current system is not sustainable. They expressed concern that the regulations, as they currently exist, are serving as a crutch and the small-scale fishing industry is not a self-sustaining occupation for those involved. Additionally, they fear that the complex regulations are hinder the recruitment of a new younger generation of fishers.

"For us older fishermen that are so negative, (and this is why the younger population doesn't want to fish), because there is so much pessimism around the fishing industry here. That's the effects of regulations. If it was positive, then I would have a younger man here, for example my son, to teach him the profession" (Eel fisher 2012).

5. Discussion

5.1 Main findings

The main findings of this study indicate that the small-scale commercial fishing industry in Blekinge, Sweden is at risk of extinction, and with it will come a loss of livelihoods, immense knowledge, and culture for the communities and larger society. Fishers interviewed stated that the immense amount of bureaucracy, regulations, and fines make it difficult for them to sustain their livelihoods and their way of life. All the fishers interviewed stated that what they love most about being a professional fisher is the freedom and lifestyle that it affords them. The myriad of regulations that they must adhere to are contradictory to this sense of autonomy and detract from their enjoyment of their profession as well as their ability to earn a living. The fines that they are often issued for not following regulations (even when they intend to) are placing additional financial strain on an occupation that is inherently subject to economic risk. Furthermore, changing regulations, which render existing gear or permits obsolete and mandate that new gear or permits be purchased, add additional financial risk to the profession. Fishermen also see the abundant and complicated regulations around small-scale fisheries as an obstacle which prevents new fishers from joining. They expressed regret that when they stopped fishing, it was unlikely that a younger generation would carry on the profession and the tradition as well as an immense knowledge base would be lost. When they leave the profession, they will take with them vast amounts of knowledge of gear, weather patterns, the natural environment, fish species, and much more that has been accumulated and passed down for generations.

The loss of small-scale fisheries will mean a change in the economic and cultural landscape of rural Sweden and throughout the world. Small-scale fisheries support secondary industries such as processing, transportation, maintenance, and even tourism. Their decline or demise will result in the loss of these businesses as well. Additionally, the absence of the small-scale fishing fleets and their supporting industry will change the cultural landscape of the region. Communities that once included fishing as part of their cultural identity—the presence of fishermen and their families, marine related industry, harbors bustling with fishing boats, etc.—will lose a piece of their traditional character. It can be assumed that this loss will be felt across Europe and in other developed countries where SSF are also in decline.

The small-scale fishers interviewed in this region stated that another obstacle they face in sustaining their livelihood is the policy which prohibits them from fishing for multiple species. Before Sweden joined the EU and was mandated to comply with the CFP, fishers were allowed to fish for multiple species and thus diversify their risk. If the salmon stocks were low, they could fish for cod, etc. Now

when they are tied to a single species, fishers are financially dependent on that species, making them more vulnerable to environmental, economic, and political changes. This results in fishers fishing that species as much as the quota will allow. As the planet faces such environmental challenges brought about by increased population, climate change, and economic uncertainty, the risk to fish stocks will naturally increase and with it a corresponding risk to fishers. All fishermen interviewed for this study felt that this was not the best system, for the fishery or the fish stocks.

The inability to accurately understand and therefore classify small-scale fishers as well as the shift in scale in regards governance from local to international and of time from the immediate to the future, has left the needs of the individual small-scale fisher neglected and thus their livelihoods threatened. There has also been another shift in scale in regards to time and policy. Symes and Phillipson (2009, p.2) state that, "In general, the focus of political attention has shifted from the needs of the individual to the viability of coastal communities and the wishes of society as a whole".

In regards to governance and management decisions a shift from the local level to the EU has had negative consequences for small-scale fishers. According to Urquhart et al. (2011, p.14), "Under the European CFP, decommissioning of the fleet, quota restrictions and technical measures have contributed to increasing numbers leaving the industry or, at best, struggling to make a living". The fishers interviewed for this project certainly substantiated this finding. Additionally, most current fishing policy tends to favor large-scale fisheries over small-scale (McConney and Charles 2008). According to Symes and Phillipson (2009, p.3) "Mainstream policies have tended to marginalize small scale fishermen and especially those who engage in fishing as a seasonal or part time occupation as part of a pluriactive existence. Moreover, there are increasing signs of a toughening up of licensing restrictions and quota allocations which will inevitably undermine the sector's resilience and threaten the viability of traditional survival strategies and adaptive responses". Though if we consider structuration theory, the issue becomes less about scale and more about the informal and formal institutions that govern fishers' livelihoods. As Bene (2006, p.38) writes, "the key factor is therefore not the scale of the fishery (small versus large; artisanal versus industrial) but the effectiveness of the management setting to ensure the sustainability of the fisheries. This effectiveness has more to do with the institutional arrangements of the fisheries and the collective capacity of the stakeholders to control individual fishing effort and investment, rather than the level of capitalization of the fleet itself". The fishers interviewed for this study all agreed that Swedish policy makers and consequently

the CFP favor large scale fishing operations to the detriment of their ability to sustain their livelihoods.

"The frequent failure to acknowledge and examine the diversity, complexity, and dynamics of small-scale fisheries can exacerbate problems for fisheries governance as policies designed on assumptions of homogeneity or on outdated conditions founder on the reality of complex, globalized, and changing fisheries" (Johnson 2006). As pointed out by Boonstra and Hentati-Sundberg (2014), SSF may best be defined by considering fishing *style* which is a combination of the species that is being fished, the gear that is being used, and the length of the boat being used, and includes intention, the short-term tactics and long-term strategies of fishers. More inclusive categorization may result in more effective policy.

"At the same time, critiques of fisheries development policy based on idealizations of small-scale fisheries are equally suspect if they also fail to recognize the social and ecological impacts of these fisheries" (Johnson 2006). Considering again structuration theory, institutions--formal and informal--influence fishers' ability to derive well-being from the marine environment. In other words, fisheries policies (formal institutions) and fishers' behavior, habits, motivations, etc. (informal institutions) influence fishers' ability to maintain their livelihoods. Further, the way in which, and their ability to utilize the resource transforms the environment. It can be seen through the case study in Blekinge, that the formal institutions are excessively affecting fishers' use of the resource. The fact that these policies and laws are almost exclusively based on quantitative data and are void of qualitative analysis is evident in the misalignment of policies and fishers beliefs. The fishers interviewed in this study felt that the policies governing their resource use were based on data that was not in line with what they were seeing at sea. Even the biologist from the Institute for Marine Research felt that the lack of fishers input into policies created an environment in which fishers would be unlikely to adhere to rules and regulations and that successful policy should consider fishers' "soft" attributes in order to be most effective.

5.2.1 Strengths and limitations of the study

The case studies and interview style for this research project allowed for an intimate and personal sharing of information. Having individual conversations that were relatively unstructured in their design and nature, meeting the fishers in their work environment, getting hands-on view of harbors, boats, and gear gave the researcher (and hopefully the reader) a rich understanding of small scale

fishing in Blekinge. According to Flyvberg (2003) the use of case studies takes research from a beginning level of understanding to an expert level of understanding. Case study knowledge is central to human learning and essential to theory formation. “First, it is important for the development of a nuanced view of reality, including the view that human behavior cannot be meaningfully understood as simply the rule-governed acts found at the lowest levels of the learning process, and in much theory. Second, cases are important for researchers’ own learning processes in developing the skills needed to do good research. If researchers wish to develop their own skills to a high level, then concrete, context-dependent experience is just as central for them as to professionals learning any other specific skills. Concrete experiences can be achieved via continued proximity to the studied reality and via feedback from those under study” (Flyvberg 2003, p422). In staying true to the findings regarding the importance of qualitative data and “soft” facts in relation to fisheries policy, such personal and subjective look into this profession provided a deeper understanding of the situation than purely quantitative or scientific data could deliver and provided support and weight to theory of fishing “styles”.

However, it is the researcher’s opinion that using such a small sample size was a limitation for the study. Using only one fisher per species may not be an accurate representation or adequate sampling of the population of small-scale fisheries in Blekinge to capture general perspectives, opinions, and experiences. Additionally, the language barrier between the researcher and the fishers may have also resulted in some inaccuracies in data. There may have been some difficulties for fishers understanding the questions posed in the interviews. On a similar note, while all but one of the interviews were translated by the same individual, some understanding may have been lost in translation.

5.3 Comparisons with other studies

There exists a great deal of research around small-scale fisheries in low-income countries, particularly regarding livelihood diversification and resilience. However, when this project was initiated there was little information available on SSF in high-income countries. Much of this was due to the great amount of diversity between fishers in “developed” countries, (for example comparing salmon fishers in Alaska to cod fishers in the Baltic to anchovy fishers in Portugal). While all fisheries are in “developed” countries, they are drastically different in fishing style. Thus, this study is in agreement with much of the work done by Johnson (2006) as well as Boonstra and Hentati-Sundberg (2014) regarding the importance of considering the social aspects of fisheries the importance of *how* primary resource users use primary resources. Particularly employing qualitative analysis to compliment

quantitative data that has generally been the foundation for fisheries policy. Huges et al. recognizes the importance of social sciences in the formation of fisheries policy, yet focuses on the significance of scale and resilience in relation to marine ecosystems (Hughes et al. 2005).

5.4 Opportunities for further research

In looking into the concept of fishing styles that provide a comprehensive and holistic of SSF, this study could be built upon to in many ways. One idea is a comparative study that uses fishing styles methodology to evaluate in SSF in other high-income countries. For example, comparing fishing styles of salmon fishers in Alaska to fishing styles of fishers in the Mediterranean. This methodology could be applied further to look at fishing styles of SSF in low-income countries.

6. Conclusion

As we look towards the future, with a growing population that must be supported by a declining resource base, it is essential that SSF are supported. Sustainable fisheries are not only desirable for the health of marine environments, but for meeting society's nutritional needs and providing livelihoods and cultural identity to millions of people around the world. In comparison to large-scale industrial fishing, small-scale fisheries are better for the environment in that they use less fuel per fish caught and have less by-catch. They support more individuals per capita, more of the fish caught is used for human consumption, and they employ more people per investment in vessels.

Yet in high-income countries small-scale fisheries are at risk of going extinct. Policies based almost exclusively on quantitative data are failing to accurately capture the complex and varied nature of fishers and the industry and are thus proving frustrating for fishers and ultimately ineffective. Using data on stock sizes and mortality to formulate fisheries policy is like trying to paint a picture of a sunset using only blue and yellow. Quantitative data is useful for representing certain aspects of the state of marine resources, but fails to capture the motivations, psychological characteristics, habits, social structures, and knowledge that fishers use in their profession. The present system used to classify fisheries does not take this qualitative or "soft" data into consideration and is thus only partially complete and effective. The fishers interviewed for this research project voiced great frustration with present day fisheries policy and it can only be concluded that this is due to its partiality to numbers which they do not see reflected in their nets and its failure to consider their knowledge and input.

Fishers need to play a more significant role in the decision-making process. There needs to be more interaction between researchers, governing bodies, and those working on the sea. Increased and improved opportunities for exchanging knowledge on environmental conditions and fish stocks should be improved. Fishers often stated that if those making the laws could spend some time on the boats, out in the weather and waves and looking into the nets, they would have a much better understanding of the profession and be able to formulate more effective and fair policies. In addition to wanting more input, fishers need more accessible avenues for contesting issues they feel are unjust or inappropriate.

Regarding scale, policy needs to account for contextual variations, striking a balance between enforcing regulations and considering the changing environmental, economic, and social contexts that comprise fishers' lives. There needs to be a middle ground between blanket rules and individual circumstances. Furthermore, policies need to be dynamic enough to address present issues, while still taking into consideration the distant future.

For the sake of the small-scale fishers in Blekinge, their communities, the character of the country, and other countries that find themselves in a similar situation, it is imperative this way of life be preserved. Should small-scale fishers be allowed to slip into extinction, society at large will lose vast quantities of knowledge, a unique part of their cultural identity, and a way of life that cherishes characteristics such as freedom, patience, determination, and bravery. In his article, "Resilience: The emergence of a perspective for social-ecological systems analysis", Carl Folke raises the point that disturbances have "the potential to create opportunity for doing new things, for innovation and development". Let us hope that such regime shifts that are affecting the small-scale fishers of Blekinge might result in opportunities that will enhance small-scale fishers' way of life in Sweden and beyond.

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