

Self-Governance in the Commons

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Self-Governance in the Commons

**A study of social control in Swedish
recreational lobster fisheries**

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Abstract

Most of the natural resources we rely on for our existence on this planet could in one way or another be a subject to overexploitation through *tragedy of the commons*. *Tragedy of the commons* occurs when rational individuals all acting in their own self-interest creates a situation that is suboptimal for everyone involved (Hardin, 1968). For long privatization or government control over a common were seen as the only two options to avoid this tragedy. Through empirical studies Elinor Ostrom described a third alternative based on local self-governance where individuals themselves managed to collaborate around a scarce resource and create long-term sustainability (Ostrom, 1999).

In this study the appropriateness of a self-governance system in small coastal societies and in the city of Gothenburg was assessed through a case study of recreational lobster fishers. Further on some factors to get acceptance for regulations in a common were highlighted. One of these factors was the development of social norms regarding regulations in lobster fishing. The norm development seemed to have followed a perceived crisis in the fishery. This visible decline of the stock made the fishers realize the importance of the regulations and thus internalizing them, creating a norm. Another important factor is that the stationary nature of the lobster. Lobsters live most of their life within the same area this can be expected to increase the incentives for fishers to treat the resource sustainably since a growth in the local stock will likely benefit the same fishers in the years to come.

Based on the existence of social punishment for violators in the small coastal communities, it can be assumed that the social control in Grundsund and on Stora Kornö is much greater than in Gothenburg. Social control is one very important factor for the success of a self-governance system; therefore it could be assumed to be easier to implement a self-governance system in the small coastal societies of Grundsund and Stora Kornö than in the city of Gothenburg.

Popular Science Summery

Self-Governance in the Commons

Many of our most precious natural resources are commons meaning that they are not owned privately nor completely controlled by the state. In 1968 Garret Hardin described in a soon famous article how these resources would be overexploited if not privatized or fully controlled by the government, he called this phenomenon “the tragedy of the commons”. In the 1990s Nobel Laureate Elinor Ostrom described a third way to govern the commons through collaboration between the resource users themselves in a system based on local self-governance.

In self-governance the resource users themselves establish and enforce regulations to protect a common resource. To find out whether a self-governance system would be suitable in Swedish fisheries a case study of the recreational lobster fishery in Sweden was conducted. Fishers from the small coastal towns Stora Kornö and Grundsund as well as the from the city of Gothenburg were asked to answer questions about why they follow established regulations and what they would do if they caught another fisher with illegal harvest.



Through the interviews it became clear that it was not socially acceptable to harvest illegal lobster. This social norm seemed to have developed as a response to a decline in the lobster stock. The fishers in the small coastal communities would to a much greater extent use social punishment (e.g. ostracism, spreading the word etc.) if someone violated the regulations than the fishers in Gothenburg. The stronger social control in the small coastal towns indicated that they already have a structure that could facilitate a self-governance system. This points to the fundamental conclusion that it would be easier to implement a self-governance system in contexts

where the feeling of local connection and common social norms are strong.

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Introduction

Many of the resources we rely on for our existence on planet earth are commons. In 1968 Garret Hardin published an article that came to be of great importance in how we understand the incentives behind the overexploitation of common resources. Hardin explains that the only way of preventing a common resource to become overexploited is for the government to take full control over it or for the resource to become subject to privatization (Hardin, 1968). For long these two options were the only ones considered when governing the commons but in the 1990s Elinor Ostrom, later a Nobel Laureate, drew attention to a third option for managing a common pool resource based on local self-governance (Ostrom, 1990). Systems of self-governance exist in many parts of the world and are usually developed as a response to the necessity of managing scarce resources. In a self-governance system the users themselves are developing and enforcing regulations concerning the common resource. This paper explores to what extent the need for external control over a common pool resource correlates with a high social capital and local connection. Further on it examines some important factors to get acceptance of regulations to avoid *tragedy of the commons*. The study is conducted through interviews with Swedish recreational lobster fishers.

Purpose and Issues

The purpose of this study is to create an understanding of the underlying rationale behind law-abidingness of those using a common. Further on it examines if members of different communities differ in their reasoning and how this correlates to a strong sense of community and local connection. The surveyed locations are analyzed through Ostrom's framework for a successful self-governance system in the commons. With the assembled information the aim is to evaluate if local self-governance in fisheries would be easier to implement in small coastal towns in Bohuslän rather than in a big city in the same coastal part.

Research Questions

- ❖ *What are the important factors to get acceptance and compliance for regulations in order to avoid “tragedy of the commons” in a common pool resource?*
- ❖ *Will high social capital and strong local connection decrease the importance of external control in a common resource?*

Definition of Key Terms

In this study the normative terms used will be largely based on Elinor Ostrom's definitions in her work on local self-governance.

When evaluating the existence of high social capital three factors commonly used by Ostrom have been included. These factors are; (1) the presence of social networks and (2) trust amongst the resource users and (3) the existence of formal and informal rules (Ostrom and Ahn,

2009). Further on, social control is here referred to as the promotion of altruistic behavior and the discouragement of selfish behavior by making altruistic behavior the dominant social strategy within the community (Wilson et al. 2013).

The definition of social norms is taken from Ellikson's (2001) and refers to "a rule governing an individual's behavior that third parties other than state agents diffusely enforce by means of social sanction".

Background

Tragedy of the Commons

Tragedy of the commons occurs when rational individuals all acting in their own best interest creates a situation that is suboptimal for all involved as well as for society in the long-term perspective. The phenomena was first described by Garret Hardin as a way of understanding why the earth's human population will grow beyond the optimum level if left unregulated. The welfare state, according to Hardin, creates incentives for having more children by giving them all equal rights to the commons. The benefit of having one extra child will thus go exclusively to you while the cost of overpopulation will be borne by society. Overexploitation of common resources is an issue related to population rates only in specific contexts. This means that an action that today leads to a suboptimal outcome would not be a tragedy of the commons situation with a very small population. Today, however, it is obvious that economic growth together with population cause increasing tragedy of the commons problems on our planet.

Common Pool Resource (CPR)

The types of resources most susceptible to tragedy of the commons are Common Pool Resources (CPR). The first criterion of a common pool resource is that it is non-excludable meaning that it is open for everyone to use. The second criterion is that one person's usage of the resource decreases the ability of another person to use it, so-called subtractability

(Sarker et.al. 2015). The classic example of a CPR is fish. There is no way to exclude people from catching fish in the ocean and if a fisher catches one fish it means that there is one less for the rest of us to enjoy. The benefit of catching one extra fish will go solely to you and the cost of a depleted stock will be divided between everyone. Further on there is no incentive for the individual fisher to restrain from catching fish in order to increase the fish stock for next year. This is a sad reality because it is impossible to make sure that other fishers won't catch the fish you refrain from catching. "Freedom in commons brings ruin to all" stated Garret Hardin (1968).

This scenario is an example of what neo-classic economist would call *the prisoners dilemma*. A prisoners dilemma occurs when the optimal choice for each individual by themselves leads to a worse outcome for everyone than if they could agree on each taking less for the benefit of both. The conclusion of this theoretical example is that if we are all rational individuals and we cannot collaborate, a commons will be ruined if left un-managed. For long this suboptimal scenario was said to be the destiny for all common resources if they were not either privatized or controlled by the government through regulations. But one important aspect of the prisoner's dilemma was not fully acknowledged: the fact that the prisoners were coerced into not collaborating (Ostrom, 1990). In the real world there are many empirical examples of when human beings have collaborated and sustained a resource over time despite the lack of private ownership or government control. Examples where a rational individual would benefit from taking more from a resource than optimal for the group but chooses not to because of the existence of strong social norms (Ostrom, 1990).

Overcoming Tragedy of the Commons in Fisheries

The fishing industry has for long been a subject to tragedy of the commons, which have lead to both reduced profitability and declining stocks. A quarter of the world's fish populations are at this present day overexploited and within the European Union 75 % of all the major fisheries are considered overfished (European Commission, n.d.). It is not only the commercial fishery that suffers from poor management, the recreational fishery is also considered unsustainable in many parts of the world (Johnston et.al. 2010). With this background massive research has been conducted to overcome these issues and create sustainability in the industry. Below follows a description of three different management strategies in fisheries to overcome tragedy of the commons: state ownership, privatization and self-governance.

State ownership

Regulation heavy, top-down, command and control management characterizes state controlled commons. Through massive external control and monitoring these regulations are supposed to deal with issues of non-excludability and subtractability. In fisheries they often focus on controlling fishing effort through input and output regulations. Examples of input regulations are requirements to use specific tools, limit the number of days allowed at sea and so on. Output regulations revolve around setting up quotas limiting the total allowable catch (TAC), forbidding fishers to throw away bycatch etc. (Squires & Bull, 2014 and Prellezo et.al. 2012).

The Swedish fishery has long been characterized by a top-down government control and is today dependent upon the EU's common fisheries policy (CFP) (Hav och Vatten, 2015). Command and

control management has been criticized for being inflexible and decreasing the resilience of a system as well as leading to high monitoring costs (Holling & Meffe, 1996 and Sarker et.al. 2015). Some Swedish fishers criticize the current management strategy for involving too much bureaucracy and making it difficult to have more than one target species (Häggström et.al. 2014). Further on, command and control strategies in general have been criticized for not being able to create ecologically and economically sustainable fishery and for handling the relationship with the fishers poorly, creating a destructive incentive structure (Yagi et al. 2011 and Townsend, 1995).

Privatization

Privatization of a common resource can overcome *tragedy of the commons* and decrease the need for external control by changing the incentives of the users. Privatization is built on the premises that we are all rational individuals driven by our own self-interest and therefore we need to create situations where each person's own self-interest aligns with society's best interest. The theory is that by creating the right incentives it is not necessary to monitor and control the resource as much as in a state controlled system. With other words you internalize the negative externalities produced from overharvesting. On the other hand this narrow definition of human behavior as strictly rational and self-interested has been criticized for over simplifying the complex processes underlying decision-making (Sethi & Somanathan, 1996).

In 2009 the open sea pelagic fishery in Sweden got managed in a new way. A system of individual transferable quotas (ITQ) was implemented in order to create the same incentives as under a pure privatization (Paulrud & Waldo, 2011). The ITQs are rights that

fishermen own or lease and have the right to sell. The theory is that the ownership will create incentives for the fishers to treat the resource more sustainably in order to increase the value of the fishing right (Costello et.al 2008). The system has been successfully implemented in many fisheries for example in New Zealand and Iceland (Mace et al 2013 and Yagi et al 2012). One issue that many critics as well as Swedish in-shore fishermen have stressed is that privatization in fisheries can lead to a decrease of the small scale fishery and tend to lead to a bigger concentration of fishing rights to a small number of big firms (Pálsson & Helgason, 1995, Chuenpagdee, 2011 and Eggert & Ulmestrand, 2008). This situation is created when it is more profitable for small-scale fishers to sell their rights to the bigger companies and leave the business. In one way this is a win-win situation where fishers who want change job, retire etc. can leave the fishing business, with a profit while companies who are more efficient and want to expand can increase their part of the quota. On the other hand one of the 16 environmental goals in Sweden (Miljömål, 2015) is to preserve the cultural values on the coast and in this aspect the ITQs leads to another type of *tragedy of the commons*. If all the fishers would act in their own self-interest many of the small-scale fishers would sell their right to bigger companies to make some money. This would lead to the disappearance of job opportunities on the coast, which in the long run will likely ruin the culture and the communities.

Self-governance

Self-governance is a system in between private and state ownership where the appropriators themselves manage the resource. Self-governance overcomes *tragedy of the commons* by maintaining a high level of social control and creating social norms to sustain the resource (Sethi

and Somanathan, 1996). Elinor Ostrom developed the theory behind this type of management through empirical studies of existing self-governance systems. In many of the examples of self-governance Ostrom studied the locals have themselves organized a system to share a scarce resource. Other scholars' show that the evolution of self-governance usually occurs as a response to some sort of crises in resource supply, for example a rapid decline in the abundance (Olsson & Folke, 2001). Traditionally self-governance is thought of as a system with little or no government involvement but there are cases where the government plays an important role. In Japan the state used laws in order to encourage the development of self-governance in the early 1900s (Sarker et al., 2015).

In successful self-governance systems Ostrom showed that even if the penalty for breaking established rules is lower than the benefit from unlawful harvest, people tend to follow the rules (Ostrom, 1990). Through careful examination of small-scale (50 - 15 000 people) successful and unsuccessful cases of self-governing management she came up with 8 design principles that indicate a successful system. A successful self-governance system should have:

1. A clear definition of who has the right to use the resource, who is in or who is out of the collaboration.
2. Clear rules of allowed inputs and outputs e.g. gear, time, amount etc.
3. Possibilities of the appropriators to design the regulations themselves.
4. Hold users who do not follow the regulations accountable to the other users.
5. Sanctions for rule breakers.

6. Existing arenas for conflict resolution.
7. The ability for users to change regulations over time.
8. Nested institutions (mostly important for larger self-governance systems).

(Ostrom E. 2014)

So why does Ostrom promote self-governance as an alternative system to government control and privatization? First of all she states that the earth consists of heterogeneous systems and is therefore in need of heterogeneous solutions. Self-governance will not be suitable for all commons but well for some (Ostrom, 1990). One of the advantages of self-governance is that by engaging the local population in the decision making process the need for external control can in some cases decrease. Examples from the Japanese coastal fishery show that by managing a resource within a group of people that are dependent on the resource and held accountable to each other instead of an external regulator it is possible to lower the monitoring costs (Makino, 2010). The Japanese example also shows that the state can play an important role in creating a sustainable fishery through a self-governance system by setting up regulations that the fishers must follow and then give them freedom to govern the resource within this framework (Sarker et.al. 2015).

Since 2000 a type of informal self-governance also exists in Sweden in the waters around Koster on the Swedish west coast. The management is a collaboration between professional fishers, scientists, the county administrative board (Länsstyrelsen) in Västra Götaland, the agency for Water and Sea (HaV) and the municipalities (kommunerna) in Tanum and Strömstad. Through the collaboration fishers get the chance

to take classes in marine ecology at the local field station and decision makers can participate in a course lead by professional fishers in the area on the history and present practice of being a small-scale fisher. By letting the appropriators themselves participate in the decision making process it is easier to access the local ecological knowledge (LEK) existing within the community (Olsson & Folke, 2001). Even if the cooperation has no legal mandate it has been able to affect the regulatory framework by bringing forward solutions and bridging the gap of distrust between fishers, scientists and decision makers (Samförvaltningen Norra Bohuslän, n.d.).

Methodology

This study examines how strong local connection and social capital affects the importance of external control in a common pool resource. The study is qualitative and was conducted through interviews with recreational lobster fishers preparing for the 2015 years premier. The questions were asked in person with the purpose of figuring out whether it is fear of getting caught by the coast guard (external control) or other fishers (internal control) that has the biggest impact on the legality of the fishers in the small coastal towns Stora Kornö and Grundsund and the fishers in the city of Gothenburg. Grundsund and Stora Kornö were chosen because they are both towns characterized by a strong community affinity and would therefore be expected to have a strong social control and high social capital. The marinas in Gothenburg on the other hand are big and close to the city and are thus expected to be more anonymous, potentially leading to less social control and social capital.

To further evaluate the appropriateness of a self-governance system on Stora Kornö, Grundsund and Gothenburg the locations were assessed through Elinor Ostrom's 8 design principles for a successful self-governance system.

Case Study

Lobster fishing

Lobster is a common pool resource regulated by the government. The lobster fishery in Sweden is non-excludable meaning that it is open to all citizens and if you restrain from catching too many lobsters there is no guarantee that other fishers will do the same. Further, if a fisher catches one lobster there is one less left for the rest the resource is subtractible. Lobster fishing is a popular activity on the Swedish west coast and every year around 9000 people fish for lobster using almost 100 000 lobster pots. Despite the fact that we use 70 000 *more* lobster pots today than in the 19th century the amount of lobster caught is less than half (Sundelöf, et al. 2013).

To stop the negative trend in lobster fisheries the government has implemented several regulations. Today one person is allowed a maximum of 14 lobster pots if they are not a licensed fisher. Further on it is not allowed to harvest lobsters with a carapax length shorter than 80 mm and it is prohibited to keep females with visible spawn. The fishing season is limited to the 3rd Monday in September until the end of April. Despite these regulations a study from the Swedish University of Agricultural Sciences shows that it is not enough to sustain a viable lobster population (Sundelöf et al. 2013).

The Swedish coast guard together with the county administrative board (Länsstyrelsen) in Västra Götaland and the agency for sea and water (HaV) are responsible for monitoring the lobster fishery outside Gothenburg and Bohuslän. Most of the violations of the law concerns incorrect labeling of lobster pots but there are also cases of illegal harvesting. The penalty for illegal harvesting of small lobsters and

egg bearing females is so called “day fines”. This type of fine is based on the detainee’s income (Vesterlund, 2015).

Surveyed Sites

The locations Stora Kornö, Grundsund and Gothenburg were chosen for this study due to expected differences in local connection and social capital amongst the fishers on the specific sites. On Stora Kornö and in Grundsund the social interactions between the fishers are expected to be more frequent than in Gothenburg, thus allowing the development of trustworthiness and informal rules.



Picture 1 Map over Southern Bohuslän; Fiskebäck, Hinsholmen, Grundsund and Stora Kornö.

Stora Kornö

Stora Kornö is an island located West of Lysekil on the West coast of Sweden. On the island there are 52 houses but as of 1970 there is no year round population. A strong community characterizes the island and the rates of people moving in and out is relatively low. Many of the people living on the island today are ancestors to the population living there in the 18th century. Its inhabitants privately own the island since 1743. This ownership makes the population responsible for taking care of the roads, streetlights and other types of infrastructure. Maintaining the island’s infrastructure is made through workdays where all the community members contribute to the up keeping. The island also has a

community organization that organizes for example new plumbing systems on the island (Stora Kornö, 2015).

Grundsund

Grundsund is a small coastal town located on the island Skaftö in Lysekil's municipality. The town has around 600 inhabitants year round and many of these have lived there for generations. In the summer on the other hand the population increase substantially (Lysekil, 2015). It is an old fishing town that used to be the biggest in Bohuslän in the 1920s. Today, only four fishing boats are left in Grundsund but the culture revolving fishing activities is still present in the town (Grundsund n.d.).

Gothenburg –Hinsholmen and Fiskebäck

Gothenburg is Sweden's second largest city with its 530 000 inhabitants (Vårt Göteborg, 2014). The city is located on the West coast and is surrounded by big ports. Although the biggest ports in Gothenburg are commercial shipping ports there are also a number of marinas where people engage in recreational lobster fishing.

The two marinas where fishers were interviewed were Hinsholmen and Fiskebäck. These are both big marinas relatively close to the city center of Gothenburg. Hinsholmen marina with its 1500 berths is the second largest marina for pleasure boats in Gothenburg and Fiskebäck 930 berths is located next to Gothenburg's biggest commercial fishing port (Hinsholmens båtförening, 2015 and Grefab, 2015).

Results

Stora Kornö – Interviews with fishers

Local connection and social capital amongst the fishers

All the fishers on Stora Kornö answered that they knew everyone fishing lobster on the island. Five of the seven fishers I talked to were ancestors to the people who first bought the island in 1752 and the other two had more recently purchased a summer house on the island, one in the 1960s and one just four years ago. In the interviews it was revealed that lobster fishing was closely connected to social interactions and celebrations together with the community.

Why do you follow the regulations in lobster fishing?

When asked why the fishers on Stora Kornö follow the regulations regarding lobster fishing 3 out of 7 answered that they cared most about keeping the lobster population at a viable level. The other 4 were most concerned about following the law regardless of any sanctions. All of these 4 fishers put a viable lobster population as the 2nd most important aspect.

If you broke the regulations – whom would you least want to get caught by: the coastguard, family and friends or other fishers?

The fishers on Stora Kornö varied in their answers of whom it would be worst to get caught by. Three people said family and friends would be most embarrassing whereas four answered that they would be most worried about the coast guard. On the other hand all fishers agreed that

all three would be very embarrassing. All of them were almost appalled by the question and said things like: one would never do so or it is morally wrong.

What would you do if you caught someone cheating?

All but one of the lobster fishers on Stora Kornö would not initially report a violation to the coastguard but rather talk directly to the person in question. If the person wouldn't listen some said they would report it whereas most said that they would spread the word in the community. It is clear that it is not socially acceptable to cheat and if it came out you would risk ostracism and nasty nicknames. One story many people told was about one man in Lysekil who harvested small lobsters, he was called Calle-tena (Calle lobster pot) all his life and even his son had to suffer from his father's mistake by being called Calle-Tena's son.

One of the oldest fishers on the island, Ernst-Gunnar Gunnarsson, says that even if it nowadays is considered wrong to keep small lobsters and egg bearing females it didn't use to be that way. Back when the regulations were first implemented the women on the island used to hide small lobsters in their skirts it was something everyone did. Ernst-Gunnar said that there was no acceptance of the regulations back then cause there was still so much lobster in the sea.

Do you think the fishers on Stora Kornö would change their behavior if they knew that the coastguard would not monitor the fishery for a whole season?

All but one of the surveyed fishers answered that they *didn't* think anyone on Kornö would change their behavior. Some said that the social control is too high and that you would have to lie other fishers straight in their face to be able to cheat. Others said that it is ingrained in lobster

fishers that it is morally wrong to harvest small lobsters and females with visible spawn.

Grundsund - Interview with fishers

Local connection and social capital amongst the fishers

One of the fishers did not live in Grundsund at the moment but was born and raised there. The other had a vacation home in Grundsund but said that he felt like a part of the community and that it was important for him to maintain his good reputation. Both of them said that they knew most of the fishers in the area.

Why do you follow the regulations in lobster fishing?

Both of the surveyed lobster fishers in Grundsund answer that their main objective when following the regulations in lobster fishing was to keep the population of lobster viable.

If you broke the regulations – whom would you least want to get caught by: the coastguard, family and friends or other fishers?

Family and friends and other fishers were the two fishers in Grundsund's answer to this question. Both of them were least concerned about the coast guard.

What would you do if you caught someone cheating?

One of the interviewed fishers said he would tell everyone in the community unless it is really serious cause then he would press charges. The other fisher said he would talk to the affected fisher and threaten to spread the word.

Do you think the fishers in Grundsund would change their behavior if they knew that the coastguard would not monitor the fishery for a whole season?

One of the fishers thought some might start harvesting illegal lobster but probably very few. The other didn't think anyone would change their behavior because the regulations are accepted within the community.

Gothenburg - Interviews with fishers

Local connection and social capital amongst the fishers

None of the fishers in Gothenburg lived in the district where they had their fishing boats but lived in other parts of the city year round. Two of them said that they didn't know many in the area that fished lobster recreationally whereas the other two said they knew basically everyone.

Why do you follow the regulations in lobster fishing?

Three of the fishers answered that the most important factor was to follow the law, regardless of sanction. The fourth one cared most about the lobster population.

If you broke the regulations– whom would you least want to get caught by: the coastguard, family and friends or other fishers?

All of the fishers answered that it would be worst to get caught by the coastguard and least by family and friends. One of the fishers expressed that family and friends wouldn't care at all.

What would you do if you caught someone cheating?

All of the surveyed fishers answered that they wouldn't do anything if they saw someone cheat. They said that each one should mind their own business even if they also stated that it was wrong to break the law. One of them answered that he would be annoyed with the person but still do nothing. Another fisher told a story about a professional fisher on Vrångö, an island just outside Gothenburg, who fished lobster in an area

closed for lobster fishing. According to the interviewed fisher he made 70 000 SEK and only had to pay a 30 000 SEK fine when he got caught. When asked how other fishers responded to this behavior he said that they mostly just laughed.

Do you think the fishers in Gothenburg would change their behavior if they knew that the coastguard would not monitor the fishery for a whole season?

In general the fishers thought that the behavior wouldn't change but one said he thought that some people probably would catch a few more illegal lobsters. Another mentioned that the reason why it wouldn't change was that it is not socially accepted in Fiskebäck to break the regulations.

Stora Kornö, Grundsund and Gothenburg analyzed through Ostrom's 8 design principles

Here follows an assessment of the study sites through Ostrom's framework for a successful self-governance system. The rankings are based on how well the locations matched Ostrom's criteria. The evaluation was made through reflections from the interviews and background information on the locations. For a full assessment see Appendix 1.

Table 1. The study sites assessed through Ostrom's framework for a successful self-governance system. (+++ = Principle fully complied, ++ = Principle partly complied, + = Principle not complied n.a. = not applicable). For full assessment see appendix 1.

Criteria	Stora Kornö	Grundsund	Gothenburg
1. Clear definition of who has the right to use the resource	++(+)	++	+
2. Clear rules of allowed input and output	+++	+++	+++
3. Ability of appropriators to design their own rules.	n.a.	n.a.	n.a.
4. The ability to hold violators responsible to other users	+++	+++	+
5. Sanctions for violators	+++	+++	+++
6. Existing arenas for conflict resolution	+	+	+
7. Ability to change regulations over time.	n.a.	n.a.	n.a.
8. Nested institutions	n.a.	n.a.	n.a.
Sum of compliance	13	12	9

Discussion

The necessity of external control in Gothenburg, Grundsund and Stora Kornö

Through the interviews it appears as though the internal, social, control is stronger in the small coastal communities than in Gothenburg (see criteria 4; Table 1). In Grundsund and Stora Kornö social punishment (e.g. ostracism, spreading the word in town) would be used rather than legal punishment if someone got caught with illegal harvest. The fishers on Stora Kornö and in Grundsund described vividly how they would treat a cheater, everything from throwing the lobster back into the sea to telling everyone in the community about it before considering going to the authorities. In Gothenburg the fishers would neither tell on a cheater in town nor go to the authorities, indicating that the need for external control is higher.

Potential for Self-governance in Swedish Coastal Fisheries

Through my studies of the lobster fishing community on Stora Kornö, Grundsund and Gothenburg I would say that the potential of fulfilling the 8 design principles set up by Ostrom for a successful self-governance system is greater in the small coastal communities than in Gothenburg. The already existing social control can be used as a tool to monitor regulations set up by the community.

Ostrom et al. (1999) further shows that strong social connections such as those present on Stora Kornö can facilitate the

development of social norms by increasing the number of interactions between people using the CPR. Playing the game of prisoner's dilemma many times will give the players opportunities to gain trustworthiness, increasing their social capital and thus overcome *tragedy of the commons* (Ostrom, 1999). The probability of the game to be played many times is higher in small contexts, with a limited number of persistent members. In such locations the government can implement a self-governance system just by defining who has the right to use the resource (Townsend & Shotton, 2008). The looser social context in Gothenburg will probably make the fishery there more suitable for the establishment of an individual rights based system, such as ITQ.

Adding to this the relatively high geographic seclusion and low population fluxes of primarily Stora Kornö but also Grundsund compared to Gothenburg creates a natural limitation of the number of members in the community. Drawing from an example of the Danish matjes herring fishery changing community members can turn a successful self-governance system into an unsuccessful one. The voluntary agreement between Swedish, Norwegian and Danish fishers was successfully maintained through the 90s but as the members of the agreement changed and the fleet became more heterogeneous, the system collapsed (Raakjär Nielsen & Olesen, 2008).

Even though the small coastal towns show potential for self-governance through a strong social control there are other issues that might be more prevalent if we look at professional rather than recreational fishers. One of these issues is the lack of trust between scientists and fishers. In my study all of the interviewed fishers were of the opinion that the regulations in the lobster fishery were reasonable and essential for keeping a viable stock. This might not be the case in

other types of fisheries, a study from 2014 shows that even after several years of meetings and discussions between fishers and other stakeholders there is still many important questions where a consensus cannot be reached (Lundholm & Stöhr, 2014). On the other hand the collaboration in the waters around Koster shows that through meetings and knowledge exchange a mutual understanding is possible (Samförvaltning Norra Bohuslän, n.d.). Associate professor Mattias Sköld working on the project says in an interview that even though some fishers still violate the regulations, a number of more law-abiding individuals tell on their colleagues, creating a sort of social monitoring as a complement to the external control (Sköld, 2015). The co-management has created a culture much like the one on Stora Kornö and in Grundsund where social control is used as one mechanism to enforce regulations.

Drawing conclusions on the appropriateness of implementing self-governance in Swedish coastal fishery through this particular study can further be problematic due to of the nature of the lobster. Unlike many commercial fish species lobsters live most their life in the same area creating stronger incentives for fishers to maintain a viable stock. This incentive might not exist in the same way when a fisher doesn't know if it is them who will benefit from increasing stock or someone else.

The Creation of Norms

Even though the Swedish lobster fishery is governed by the state through a command and control system the regulations regarding harvesting small lobsters and egg bearing females seems so largely accepted that the control part is almost unnecessary. Many fishers

mentioned how it today is considered immoral to harvest illegal lobster and that the fishers wouldn't change their behavior even if the monitoring stopped for one season. Sethi and Somanathan (1996) argued that this type of internalization of regulations making them into norms is one of the most important factors to facilitate self-governance. In a wider perspective creation of social norms could be a very strong tool to fight big environmental challenges of today, many which are characterized by *tragedy of the commons*. The way we think of contributing to a tragedy of the commons situation differs largely from case to case. Some contributing actions are considered immoral whereas others are not connected to any moral obligations. One example of a tragedy of the commons situation that is not *yet* connected to any moral obligations is the emission of greenhouse gases. Emission of greenhouse gases could be seen as a reversed tragedy of the common situation where more of a resource is negative. It is very hard to stop anyone from emitting greenhouse gases, it is not excludable, and for every molecule one person emits there is one less for the rest of us to emit before the whole system collapse. Slowly, big companies are starting to be held responsible for some of their emissions but for common people it is not yet a norm. Today almost no one will look askance at you for taking your fossil fueled car to pick mushrooms in fall or for driving your child to soccer practice. In lobster fishing the norm building seems to have followed as a response to the regulations when people started to realize the importance of them. When the regulations were first implemented people did not understand why they existed because they didn't see the effects of a diminishing stock. Many of the fishers I spoke to talked about how they get far fewer lobsters today and was concerned over the viability of the population. Drawing from the conclusions of norm

building in lobster fisheries an important tool for creating a norm, in regard to climate change, is that the regulations set up by the international community as well as the nation states must become real to people through some sort of crises or visible change. The regulations in lobster fisheries were not accepted until people started seeing the effects of an overexploited resource. People must understand why they shouldn't contribute to a tragedy of the commons before a social norm is created. Much like the example of some professional fishers distrust towards scientists, if there is no common understanding, the immorality of breaking a regulation does not exist. In climate change as we start seeing the effects of a warming climate the common ground grows, the skeptics become fewer and the probability of norm creation higher.

What are the important factors to get acceptance for regulations in order to avoid “tragedy of the commons” in using a common pool resource?

Two underlying factors observed in the case study that I would like to emphasize as important for the success of Ostrom's 8 principles are the nature of the good and the importance of a crisis to catalyze the development of social norms. These two factors stand out when listening to the fishers elaborate on why they follow the regulations in the common pool resource. Even in Gothenburg where the fishers wouldn't tell on a violator and where you could likely avoid being caught with illegal harvest the regulations seemed socially accepted and self-evident. Something that according to some fishers wasn't the case before the lobster population started to decline.

The nature of the good, as mentioned above, is important when it comes to the incentives for fishers to sustain a resource. With a

migrating resource overcoming *tragedy of the commons* would possibly be much more difficult. In economic theory this importance is observed many times over. One example is the establishment of agreements between different Native American families in the 17th century concerning the right to hunt beaver. These agreements were established as a response to a decline in the beaver population and managed to avoid a tragedy. When it comes to the Buffalo population defining hunting rights did not have the same success. Beavers are sedentary animals, meaning that they stay in the same area most their life whereas buffalos migrate over the Great Plains making it impossible to defend rights establish by the community (Stroup, n.d.). Today we can communicate easier between larger groups of people, something that could facilitate the development of social norms regarding less stationary resources but the process will probably be much harder.

Reflections on the Chosen Method

In this study recreational lobster fishing was used to analyze whether high social capital and local connection affects the users behavior when operating in a common pool resource. One issue with choosing recreational lobster fishing for a case study is that the fishers are not economically dependent on the resource and the incentives to keep illegal harvest could therefore be less tangible. Ostrom had 3 criteria for cases that she studied: that the resource is renewable, that it exists in scarcity rather than abundance and that the users can harm each other (Ostrom, 1990). The first two criteria suit well to lobster fishing while the third can be discussed. Since the lobster fishers in the study had little economic interest with their fishing and fished merely for fun, the risk to harm each other is a lot less prevalent than in professional fishing were

the appropriators depend on the resource for their living. All of the interviewed fishers claimed that there was almost never any conflict regarding the fishery, something that would be expected if fishers were economically dependent on the resource.

Another issue with the study is the small sample size. To randomize the fishers interviewed they were all sought out in person at the marinas. This process was time consuming and did not always lead to results but since there is no record of recreational lobster fishers another strategy was hard to find. A general issue with in person interviews, part from being time consuming, is that the respondents might have answered differently due to the fact that I was present (Esaiasson, 2007). Some of the questions asked were fairly personal and even if they were designed to avoid dishonesties there is always the risk that the fishers portrayed themselves as more moral than they actually are.

Conclusion

In some situations it is possible to overcome *tragedy of the commons* without government control or privatization. However there are important conditions that have to be fulfilled to attain such a situation. In Swedish recreational lobster fisheries the development of social norms through a perceived crisis was one important factor behind changing the acceptance of existing regulations and ensure compliance. This was highlighted in the two small towns Grundsund and on Stora Kornö where the fishers stated that social rather than legal punishment would be used if someone violated the law. This type of social control is important to facilitate self-governance and only seem to exist in the small coastal communities. This leads to the conclusion that it would be easier to implement a self-governance system in contexts where the feeling of local connection and common social norms are strong, such as on Stora Kornö and in Grundsund.

Suggestions for Future Research

Future research on this topic could be to compare a non-migrating species such as lobster to a migrating species and see if the reasoning behind law-abidingness of the resource users would be the same. Further on it would be interesting to see if a dramatic decline in stock abundance is essential for developing a social norm or if norms can develop even though the change is incremental.

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Appendix

Appendix 1

Stora Kornö, Grundsund and Gothenburg analyzed through Ostrom's 8 design principles – Full assessment

The *first* principle in Ostrom's framework for a successful self-governing system is to have a clear definition of who is in and who is out of the collaboration. In my evaluation Stora Kornö acquired the highest score in regards to this principle. Stora Kornö is a small island only reachable by boat and it is thus easy to identify the members of the community. All interviewed stated that they knew all the other lobster fishers on the island. The parenthesis on the third star was added because the fishers on Kornö do not have exclusive right to the waters around the island. Several fishers interviewed expressed some level of distrust towards the law abidingness of these "outsiders" especially concerning fishery off-season.

Grundsund was given a lower score than Stora Kornö in this aspect due to fact that the town is accessible by car and thus less isolated. This means that in Grundsund it possible to have your fishing boat in the marina without owning a property there. One can assume that this will make it more difficult to control who fish lobster in the area.

Gothenburg scored the lowest in this category. The closeness to a big city for the marinas in Gothenburg makes it hard to know who is in and who is out of the lobster fishing community. Some of the fishers in Gothenburg didn't know any of the other fishers in the marina, which indicates a lack of social control of the fishers in the area.

The *second* principle regards clear rules of allowed inputs and outputs e.g. gear, time etc. All locations scored the same in this category as the government sets up the regulations and the fishers seemed well, and equally, aware of existing rules.

The *third* principle is the possibility of the appropriators (the lobster fishers) to design the rules regarding the resource themselves. Since lobster fishing in Sweden today is not managed by a self-governance system this option does not exist in any of the locations. On the other hand, this principle can almost be considered fulfilled due to the wide acceptance of the regulations amongst the fishers. All the fishers in the study answered that the established regulations were good and should stay the same; some even said they should be stricter. Further on almost all the fishers believed that no one would change their behavior if the coast guard stopped monitoring for a season assuming that the fishers are right it clearly illustrates how well accepted the regulations are.

Design principle *four* is the ability to hold users who do not follow the regulations accountable to the other users. Grundsund and Stora Kornö were given the highest compliance in this category and Gothenburg got the lowest. Most of the fishers in Grundsund and on Stora Kornö said that rather than reporting a violator to the authorities

they would tell everyone in the community as punishment. In Gothenburg on the other hand the fishers said they wouldn't do anything if they caught someone harvesting illegal lobster. This indicates that social control doesn't exist as strongly in Gothenburg and the fishers ability or maybe more accurate their desire to hold someone accountable is less prevalent.

Principle *five*, sanctions for rule breakers, exists through government control. Daily fine or prison for serious offenses. The material sanctions are same in all locations.

Number *six* - existing arenas for conflict resolution. Neither of the fishers surveyed mentioned any conflicts occurring in the lobster fishery part from pots getting stolen (in Gothenburg). Since people unknown by the community always made the thefts a conflict resolution was not possible.

The *seventh* principle is the ability for users to change regulations over time. Such ability does not exist since there is no self-governance in the lobster fishery.

Number *eight* is nested institutions, which is mostly important for larger self-governance systems and does not apply to the lobster fishery (Ostrom E. 2014).

Appendix 2

Interview Questions – lobster fishers

Bakgrund (Background):

Ålder (Age):

Kön (Sex):

Bostadort (Hometown):

Yrke (Profession):

Äger/disponerar familjen fastighet på hummerfiske orten? (Does the family own or have access to property on the lobster fishing location?)

Om JA hur länge har fastigheten funnits i familjen? (If YES how long has this property been in the family?)

Bor du året runt? (Do you live permanently where you fish lobster?)

Hummerfiske:

- I. *Hur många år har du fiskat hummer?* (For how long have you engaged in lobster fishing?)
- II. *Varför fiskar du hummer?* (Why do you fish lobster?)

- III. *Fiskar du ensam?* (Do you fish lobster alone?)
- a. *Om INTE vem/vilka fiskar du med?* (If NOT who do you fish with?)
- IV. *Känner du många av de andra som fiskar hummer här i området?* (Do you know many of the other lobster fishers in the area?)
- V. *Ponera att du skulle ta upp en rom-hona; vem skulle det vara värst att bli påkommen av?* (Ranka 1-3 där 1 är värst och 3 minst) *(Imagine that you would keep a female with visible spawn; who would it be most embarrassing to get caught by? Rank 1-3 where 1 is most embarrassing and 3 least).*
- a. *Myndigheter (Kustbevakningen, HaV)* (The officials; the Coast Guard or HaV)
- b. *Andra fiskare* (Other fishers)
- c. *Familj och vänner* – (Family and friends)
- VI. *Är nummer 1 mycket eller lite viktigare än nummer 2?* (Is your first choice a lot more embarrassing than your second?)
- VII. *Vad får dig att följa de bestämmelser som finns kring hummerfiske?* *Ranka följande orsaker efter fråga 1 - viktigast till 4 - Mindre viktigt* (What makes you follow the regulations regarding lobster fishing? Rank following options 1-4 where 1 is most important and 4 least).
- a. *Hummerbestånd (hållbarhet)* (Sustainability of the lobster stock)
- b. *Andra fiskares åsikter om mitt hummerfiske* (Other fishers opinion of my behavior).
- c. *Böter eller fängelse* (Fees or prison).
- d. *Vilja att följa lagen (oavsett eventuella sanktioner)* (Willingness to follow the law regardless of sanctions)
- VIII. *Om du upptäcker att någon annan inte följer reglerna, hur reagerar du då?* (If you catch someone violating the law what do you do?)

- IX. *Råder det god kännedom kring vilka regler som gäller inom hummerfiske? (Do you believe that fishers are well aware of existing regulations within the lobster fishery?)*
- X. *Tycker du att restriktionerna på hummerfiske är rimliga? (Do you think the regulations in lobster fishing are good?)*
- a. *Om INTE skulle de vara striktare eller lösare? (If NOT should they be stricter or looser?)*
- XI. *Om ytterligare restriktioner skulle införas vad skulle du då vilja se att de innefattade? (If more regulations would be implemented, which type would you prefer?)*
- a. *Ökat minimimått (*
 - b. *Maximimått*
 - c. *minskad säsong, -*
 - d. *minskat antal tinor -*
 - e. *fredade områden*
- XII. *Tror du hummerfiskarnas beteende på den lokala orten skulle ändras om de visste att kustbevakningen inte skulle kontrollera fisket under en tid? (Do you think the behavior of the lobster fishers in the local area would change if they knew that there would be no external control one season?)*
- a. *Om JA på vilket sätt? (If YES, how?)*
- XIII. *Skulle det kunna bli konflikter inom hummerfisket på den lokala orten? (Does conflicts ever occur regarding lobster fishing in the local area?)*
- a. *Om JA hur löses dessa konflikter?*
- XIV. *Finns det andra riktlinjer som du följer utöver de lagstadgade bestämmelserna? Ställen du inte lägger tinor på för att det är "någon annans plats" eller dylikt. (Are there other guidelines you follow in addition to government regulations? E.g. some spots where you wouldn't put your pots cause it is "someone else's" etc.*

XV. *Är du personligen orolig för hummerbeståndet?* (Are you personally worried about the lobster population?)



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