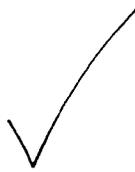


**Closing the Commons - Opening the "Tragedy":
Regulating North-Norwegian Small-Scale Fishing**

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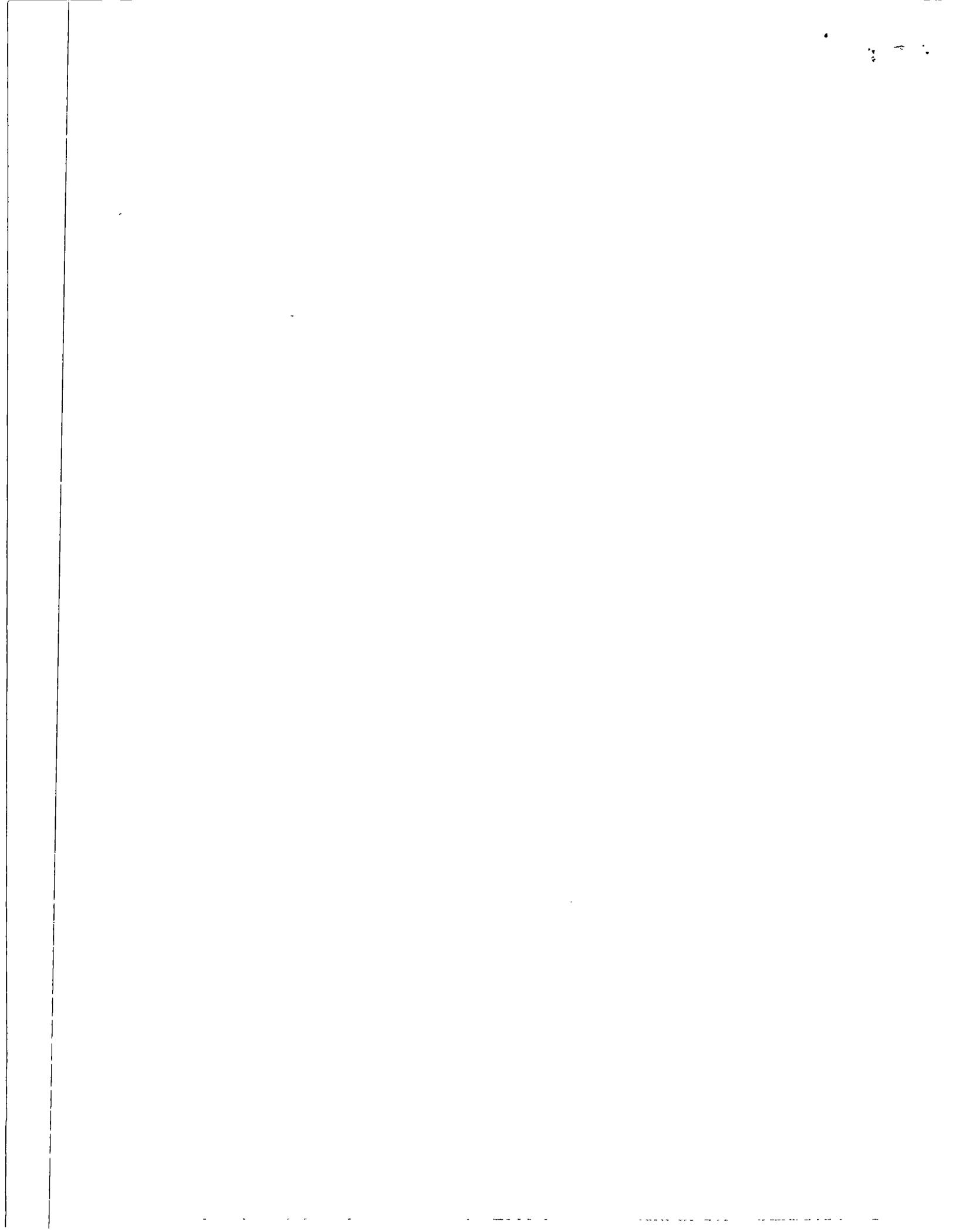
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Abstract:

The North-Norwegian small scale fishing fleet has faced radically changing conditions in the last years. Due to scientific reconsiderations about the size of the cod-stock, fishing has been severely reduced. From partaking in an open access/communal property context, fishermen now face a private fishery since the introduction of boat quotas in 1990.

Organizational framework influence the productive strategies in exploitation of resources. My studies of the North-Norwegian small-scale fleet, indicate that the strategies change in relation to the new framework. Formerly, exploitation and expansion inherent in the small-scale production were curtailed. The levelling of productive effort can be seen as an outcome of the organizational features of this particular type of production. After the introduction of boat quotas the same organizational features have a totally new and reversed significance for fishermen's economic strategies; instead of limiting economic expansion, they provide incentives to expand.

My paper will discuss how the organizational context and strategies of fishermen are changing. And how state regulations can have unintended implications; how the suppositions for entering a tragic situation are more present now than before.



THEORETICAL INTRODUCTION

"Freedom in a commons brings ruin to all," stated Garrett Hardin in a paper in "Science" in 1968. This sets off a large discussion about human ecology. Hardin used a theoretically constructed example of herdsmen considering how many cows to put on a pasture open to all. Each herder enjoys the benefits of putting one extra cow into the pasture. The cost this extra cow introduces, by grazing, and eventually overgrazing, since every herdsman acts this way, is shared among all the participants in the area. The fact that herdsmen are part of a social community, sharing and obeying social rules of behaviour, is not discussed by Hardin.

Hardin's tragic situation has met a lot of criticism, especially for being a tautology. Berkes (1987) draws upon the works of Stillman (1975) and points to the "hidden assumptions" in the model of the tragedy:

- 1) The resource must be freely open to any user (open access).
- 2) The users must be selfish and pursue self-interest as opposed to the collective good. They maximize shortsighted motives of profit without regard for any long-term effects.
- 3) The exploitation must exceed the sustainable yields.

Berkes says that given these premises, there is no logically consistent solution to the tragedy. The "challenge of the tragedy is that the solution has to be sought beyond the three premises".

Since Hardin's article was published, a great anthropological body of literature on the study of the commons has evolved. Both empirical studies and theoretical exploration show that the main points of Hardin, that man is maximizing his own individual benefit, disregarding the collective costs of individual strategies, and that resources are open to any user, are not the case in many production systems. Empirical studies show ways in which the fishery is embedded in a web of social institutions restricting behaviour and in this way regulating the fishery. (See f.ex.: Berkes 1989, McCay and Acheson 1987, Ostrom 1990, Pinkerton 1989, Ruddle and Akimichi 1984, Ruddle and Johannes 1989).

Norwegian fishery could be seen as a tragic situation. The cod stock is low, which means that the fishery faces severe problems of overcapacity. In recent years the TAC¹ for cod has been highly reduced: In the beginning of 1988 the TAC was set at 590 000 tons. Later that year, the quota was reduced due to scientific reconsiderations of the growth in the stock. The quota was set at 450 000 tons. Next year the TAC was set at 300 000 tons. In 1990 it was as low as 160 000 tons. For the following years the quota has been increased, but it is still low (215 000 tons in 1991 and 300 000 in 1992). Thus, within a few years, the extremely high prognoses from the early 1980's were revealed as faulty. This is one part of the story of Norwegian overcapacity: Since the early 1980's fishermen had been reassured by highly optimistic scientific prognoses for very large catches at the end of the decade. Many fishermen had invested on the basis of those prognoses.

Scientists, fishermen and politicians are still debating the causes for the decline in the cod-stock: Natural variations, failure in governmental regime, and/or overfishing. However, with a fishery fleet out of proportion with the reduced TAC, the immediate solution of the authorities was to restrict the fishery severely in order to save the cod stock which now was seen to be at a minimal level. Formerly, only the largest boat groups were regulated by quotas². Now, quota restrictions were applied to all boats. Individual quotas were also cut, relative to earlier years.

The sudden reductions brought the fishery into serious trouble. Reductions in harvesting were implemented as a means to save the cod stock. To the fishermen however, the new regulations also imply a new regime and a new framework for them to operate within.

Hardin's model possesses assumptions about a regime in which expansion is unlimited. The Norwegian fleet is a heterogeneous group, consisting of large scale enterprises fishing 2000 tons, and small scale boats fishing 20 tons, or lesser, a year. The catches of the former boat group are restricted by formal regulations, the latter are not. However, my

¹Total Allowable Catch, from which Norway catches a little more than one half.

²In fact, the small scale fishery ~~was~~ regulated by quotas, but they were set at a very high level. Thus, in practice it was unregulated.

studies of the small-scale fleet³, have shown that catches, and expansion, in some ways are curtailed. Thus, introducing a quota system to prevent expansion may be the same as solving problems that do not exist within the small scale coastal fishery. It might even create problems of expansion, as I will show.

Brox (1990) discusses the tendency in social science and economics to regard Hardin's model as a theory about the world. The debate on the use of common property resources would gain more if the model was regarded for its "possible utility as an analytic tool". In this way it would be of relevance for understanding the tragedies in collective interests: The problem is not that the commons are open, but to find under which conditions there are restrictions on use and under which there are incentives to overuse.

In this paper I will use Hardin's model " as an analytic tool": I will try to highlight the "hidden assumptions" of the model, by focusing on restrictions and incentives to harvesting in the North Norwegian small scale fishing. I will try to show how the introduction of new regulations, in a paradoxical manner, seem to create incentives to overuse, while former restrictions are discontinued⁴.

THE SMALL SCALE FLEET

The enterprises are small with boat-size varying from 8 to 13 meters, commonly employing one person, but also two and three on the larger boats. In 1987 the number of small-scale boats accounted for 60 % of the Norwegian fleet above the size of 8 meters (Anon 1988a, 1988b). The number employed in the fleet is hard to tell, since no officially published statistics relate fishermen to boat-size.

³As a crew participant in 1984/85 and fieldwork for my Masters degree 1989.

⁴The effects of the new regulations have not been thoroughly studied yet. The full outcome, that is the stable new strategies resulting from the new framework, is hard to tell at this moment, since the situation is new and still turbulent. In this paper I present my impressions so far. I base the presentation on recent interviews with fishermen in Troms and Finnmark.

The small scale catches of cod have averaged 24 % of the total catch in the period 1977-1990 (Hersoug and Hoel 1991). Average catches for boats vary according to the boat-size. For the year of 1989 an average catch of cod for a boat at 9 m, a common one-man enterprise, was 12 tons (Bergland 1991). Cod fishing, together with various amounts of other species make up the yearly income. Average yearly income for the same boat, was 107 000 kroner⁵ in the period of 1980-1988 (measured in 1988-kroners).

A special feature within this boat group is that the production strategies are many. The narrow confines of this paper only allows me to cover the most common of these strategies. There are many different marine species along the North-Norwegian coast, but not all are harvested in the same manner. North Atlantic cod is the most important species, due to great quantities, good price and availability. It is the catching of spawning cod in the Winter season which is said to "make the year". Cod-fishing is located all along the coast, though the mainstream of spawning cod comes in at Lofoten. The winter cod-fishing ends in April/May. However, codfishing can still continue, fishing the nutritional migratory cod. This fishery takes place in Finnmark, the northernmost part of Norway. Except for the people living in these areas, fishermen have to leave home ports to participate. Besides, many fiords contain species like Norway haddock, Wolf-fish, coalfish, herring, octopoda, halibut and haddock.

Before the quotas were set, a small scale enterprise which would give a high income would be to fish cod from January till August, interrupted by a period of nonfishing in June/July. In late Autumn, the fisherman could go for octopoda, herring, coalfish or haddock. He could chose one or more of the resources, all of them being highly paid and available in quantities large enough to give a good income. A small scale enterprise giving a lesser income would be codfishing in Spring, then Wolf-fish or Norway haddock in Summer, and then, in the months before Christmas halibut fishing. According to my studies few fishermen participate in either the high income or the low income enterprises.

⁵A man-labour year in the small boats is less than one in most other professions. When discussing profitability with regard to effort in fishing, I find daily income a more accurate measure. This figure was 630 kroner for the same period (Maurstad 1990).

More common is cod fishing together with one of the better paid resources.

However, the new regulation system, restricting catches of cod by quotas, as opposed to the formerly unrestricted catches, may be seen to impose changes in fishing strategies. Fishermen's opportunities and restrictions are different within the new regime. As a result, the curtailments inherent in the former way of production are discontinued. One can view these changes as the creation of the assumptions for "the Tragedy" to be fulfilled. In the following I will highlight this view by addressing the creation of each of the three assumptions of Hardin's model.

- Creating the first assumption: Changing the property state of the resource

The various fishing strategies just mentioned are partly connected to territoriality. The study of social organization of small scale work indicates that fish resources are a sort of communal property⁶. The use-rights vary in respect to resource, fishing gears and sea territory⁷.

Gill-nets, especially important in the winter cod-fishing, take up a great deal of space. The amount of fishermen who can be sited in a special sea area is thereby limited. However, the amount of fishermen is not only limited by number, but also by use-rights; since the Norwegian coast is inhabited, most sites are located nearby someones home or village. This feature is important when discussing exploitation of resources.

⁶Common property resources may be held within four idealized types of property rights: Open access, communal property, state property or private property. Communal property use-rights for the resource are controlled by an identifiable group, not privately owned nor managed by governments (Berkes 1989). In Norway fish resources are state property and formally governed by the government. When I use the definition communal property I refer to an informal system of use-rights.

⁷Exploitation of common property resources in Norway has not, with few exceptions (Dikkanen 1965), been addressed on the research agenda until recently (Jentoft 1987, Jentoft and Kristoffersen 1989, Bjørklund 1990, Eythorsson 1991). However, earlier ethnographic studies indicate that local ownership has been a part of the social organization of work for a long time (Gerrard 1975).

The story of Otto, a newcomer in a local area, elaborates this. Otto was respectful towards the local fishermen when he first started using the area. He did not enter the best fishing sites; he knew well of them, but they were occupied by locals.

One morning there was a great conflict reported on the boat-radio: Another non-local fisherman had set his gillnets at the site of one of the locals. Harsh words were used. Otto was surprised: "He (the local man) is really mad, one does not use such a language on the radio".

The sanctions used within this informal system of communal property-rights regime are not physical means. The non-local was only subjected to harsh words. However, the story continues: This fisherman did not stay in the area, he soon left. Otto stayed. By and by he got more acquainted with the area and with the local fishermen, and cooperation began. They shared of their knowledge about fishing sites, Otto helped, among other things, in repairing machinery, in which he was especially talented.

The sanctions against this non-local, who was using the same fishing gears as the other fishermen in the area, were not strong. The situation is different for coalfishers, using purse seiners: Their gears are sometimes being cut and destroyed and their catches lost. The reasons fishermen give for doing this, are that purse seiners destroy the fiord by taking a lot of other resources as well as coalfish, and that leaving fish to stand locked for weeks is a waste of resources.

From this I conjecture that "**knowledge**", in addition to being an important topic in understanding what small scale fishery is in general, is particularly important in discussing exploitation and overexploitation. Knowledge of fishing sites is exclusive to fishermen. It is a fisherman's property. He might have reasons for sharing it, in this way knowledge becomes exclusive to groups of fishermen. This knowledge, together with membership in a local community, give exclusive use-rights to members of the community. As Otto's story illustrates, there are ways to become members. The point is that the community controls who is allowed to fish; there exist social and cultural regulations on the matter of exploitation of resources in local areas. Curtailments in the harvest are thereby connected

with informal rules of fishing. Such rules are especially true when the fishing is taking place in someone's home fiord as is the case in Winter cod fishing in sites other than Lofoten, and in fishing for other resources than cod. Fisheries which for a long time have been open to all fishermen, like the Lofoton fishery and the Finnmark fishery, do not seem to be restrictive in these senses. The impact of these use-rights, and the degree to which they are valid, should be studied further.

The new quota system gives a new framework to operate within. For various reasons the pressure on other species than cod has increased. Common enterprises are no longer fishing cod and then **perhaps** participating in one or two of the other fisheries. It is rather codfishing **and** most other fisheries. Some of these other resources are located in fiords, that is; near someone's home. This means that the informal system of use-rights is put under pressure. Locals from one area are in need of using other locals' area. They get access to the area by taking the role of "members": They use their "knowledge to people", that is their acquaintances, to get into the area. Fishermen express for example that it will not be hard to obtain access to a new fishery, because they know the brother of someone partaking in it. The brother then helps the fisherman to gain "permission" to fish in the area. At the same time as they, in this way, depend upon the system to get into the new fishery, they argue against the rules of use-rights, using words like "old fashioned system" about such rules. "No, the sea must be open to everyone", they say. From this it seems as if renegotiations about the local use-rights are taking place.

The fact that people are taking action by destroying the fishing gears of coalfishers, could be seen as a way of protecting their user rights. If so, then this stands opposed to the opening of rights just discussed. However, the renegotiations I speak of concern resources that are used by local fishermen, and within the same boatgroup. Preventing the coalfishing is an action towards a different boatgroup, the big purse seiners. On the other hand, these happenings highlight the tensions and conflicts on use-rights which are emerging. The question regarding the outcome is open.

Use-rights then, seem to be dependent upon the pressure for entering the locals' area. Now, since people within the same boat group renegotiate their use-rights, the obvious

question is whether this means that the sea is no longer communal property, but instead is really open access.

It is hard to tell whether these changes would have occurred even if the new system of regulations had not been introduced. One could have a hypothesis about fishermen viewing this as old-fashioned and wanting to get rid of it for a long time. The important thing though is that it was the introduction of the formal system that made it necessary to renegotiate. The new system creates a need for other resources than cod. This creates the pressure that leads to renegotiations and perhaps a change in the property state of the resources.

- Creating the second assumption: The short-sighted, egoistic, maximizing individual

Small scale fishing is labour intensive. The owner himself is responsible for all tasks attached to the fishing; maintaining the boat and other equipment, administration, and accounting, to mention some. Spending time with the family is also a preferred activity. The social organization of work in small scale, makes this way of production to something quite different from most large scale productions. In small scale, earning money is an actual decision which must be made. The decision is of a more active character in small scale enterprises than in large scale. In large scale fishing the boat is at sea and you work. Taking resources then, is not an actual decision, but it follows as an implicit action. It is also implicit to fish a great deal while at sea to shorten the time spent at sea. In the small scale fleet these matters are different. You actually have to take the boat to sea to earn money. This applies whether fishing at home or not, for both decrease the amount of time spent on other tasks attached to the fishery, spent with family or enjoying leisure ashore. This means that earning money, that is taking resources, becomes an actual means in itself. It is not as implicit as it is in large scale technology⁸.

⁸This is supported by statistical figures showing that a man-labour year in the small scale fleet was about 170 days in the period of 1977-1988, whilst one in the large scale trawler fleet was about 250 (Maurstad 1990).

Both quantitative and qualitative studies, prior to the quota introduction, show that some fish large quantities and some fish small (Maurstad 1990). The fact that small scale fishermen do not fish, even though there are fish to catch, is often used to discredit these fishermen as a lazy, fair weather, low income group of fishermen. What I question is why they do not catch fish, and I raise a hypothesis about a limited use of resources based on **needs** (Chayanov 1966, Sahlins 1972).

There are various resources to harvest in the North-Norwegian fiords. Some fishermen can exploit resources from home ports whilst others must leave. The amount of resources at home does not seem to be the most important basis for decisions about fishing. Fishermen with the possibility of joining a homebased fishery did not participate. Take for example Jørgen and Villy, - fishermen from the same village, but with different fishing strategies. Villy was busy all year round. He said he had to be in order to make ends meet. At the time when I visited the village, he was occupied in the haddock fishery, while Jørgen was "doing nothing". Why these different fishing strategies? Jørgen expressed that for him it was important to spend time ashore, staying and doing things together with friends. The opportunity of doing this was in fact the main reason for him entering the small-scale fishery. Villy also expressed that spending time ashore was important; he was married and had children. One of his reasons for entering the small scale fleet was the opportunity of spending time with the family, an opportunity he considered as better in small scale rather than large scale boats. However, he had to use a large effort in the fisheries. He had high debts, - his boat was fairly new as was his house. Jørgen had inherited the boat and lived with his parents.

The financial aspects in the two enterprises provide explanations for the different strategies. The economics relating to small scale enterprises is interesting. It is not something that exists, but it certainly is something fishermen deal with and act upon; they manage their finances by minimizing their costs. One thing is that variable costs in small scale are low. Fishing without catching fish, is not expensive. A more important feature is that fishermen actually take actions to keep costs low. Many fishermen do not buy a boat and equipment until they can raise a high amount of own-capital. This has been a necessary strategy, since public financial support in the form of subsidized loans has been

scarce ever since these important financial-political means were introduced. However, fishermen also minimalize costs in other ways: Most fishermen develop knowledge about how to do common repairs, either by learning from others, and/or simply trying themselves. In this way they avoid expensive stays at the shipyards.

Another issue, important when discussing small scale finances, is that the paid work of fishermen's wives are important contributions to the household economy, not to mention their unsalaried work (Gerrard 1983, 1990). Thus, it is necessary to consider the household economy to find the reasons for different fishing strategies. They are often connected to the various contributions and strategies of the women.

Effort depends on debts in many professions. The interesting thing though is that small scale enterprises constitute a production system where effort in exploiting natural resources depends on debts, where debts are low and where strategies of not contracting debts and minimizing costs exist. Due to the managing of finances, it is possible to decide not to go fishing.

The strategies of Jens and Johan, prior to the new regulations, is another example of how debts influence fishing strategies: Jens has high debts, and in the Autumn he leaves his home port to go herring fishing. Johan stays at home and does not start fishing until the herring comes swimming into the fiord at home. He uses herring for bait in the halibut fishery. Johan is debtless. By fishing the bait himself, he minimalizes the costs in the halibut fishery. In this way he makes a sufficient income without large effort. He is also able to work from the home port. Jens' high debts makes him dependent upon the extra income from the herring fishery. He can even participate in the halibut fishery when he comes home.

So far I have tried to show that small scale fishing strategies vary. The fact that fishermen have disparate needs means that the pressure each fisherman puts upon the resources varies. The example of Jørgen and Villy illustrates different use of haddock. One takes none, the other takes the whole of the quota. The example of Jens and Johan illustrates different ways of using the herring resource. One takes the quota and the other takes a

few. Since the group of fishermen have disparate needs for extra payments, one could view resources other than cod, as being "buffers". As long as there is a balance between fishermen in need of high amounts of fish and the actual amount of "buffer" resources, then this special feature is an important backbone in maintaining this way of production. It allows people to buy boats, fish hard for a while to pay down the debts, and slow down their effort in the fisheries as time goes on. Whether or not this balance existed before the quota system was introduced we do not know. Neither figures of catches, nor amounts of fishermen partaking, nor biological estimates of these resources exist.

Now, since fishermen experience a restricted codfishery, this fishery is no longer a means to secure enough income for the year. Many more fishermen have to partake in the fishing of other resources. By this "activating" of a group of fishermen who formerly did not exploit these resources, like Jørgen and Johan, they have now ceased being "buffers". Instead they are sought by all fishermen.

I have discussed how this provides possibilities for a change in the property state of the resource, the first assumption of the model of Hardin. As important is that it provides possibilities for a change in the second assumption; the one concerning the individual actions. Fishermen's behaviour has now become more similar in the sense that they all act the same way as only those with high debts did earlier. Now needs do not mean less effort, it means increased effort. Regulations in this way incite the egoistic short-sighted fishermen. The maximizing individuals, always searching for catches are stimulated.

The new regulations even lead to higher effort in cod-fishing, the fishery that was to be severely restricted. Fishermen who formerly fished small quantities, now strive to fish the quota. The various regulations which were introduced in 1989, and have changed from one year to the next, have created a situation of insecurity. Fishermen are afraid of being excluded from the fishery, or losing parts of the quota if they do not fish it all.

The new framework also means that former ecologically important aspects of this way of production are changing. Fishing small fish was formerly said to be "more work than money" and leaving to another site, or not fishing at all, was an ordinary strategy when

only small fish was available. Now, the earlier code of practice is violated. Now, the reasonable way of acting is to bring as much fish as possible on board the vessel while the prices are high. If the fish is large one takes it, if it is small it is thrown, since small fish reduce the overall net income in the quota. Such actions obviously is of a different character than the former. Individuals acting this new way can be characterized as being short-sighted, egoistic individuals, paying no attention to collective interests, as in the second assumption for "the Tragedy" to be fulfilled.

- Creating the third assumption: The overuse of resources

The productivity of the Norwegian fleet is out of proportion with the size of the cod stock. Due to the Norwegian fleet being so heterogeneous, I find it important to question whether the size of the small scale fleet is any real threat to the cod-stock. We do not have accurate quantitative measures for the expansion over a period of years. In my opinion, this means that their assumed overuse is more of a hypothesis than a fact. The territorial and social restrictions I have focused upon in this paper, put the question of overuse in a special light.

An objection, often raised in discussions about expansion in the Norwegian small scale fleet, is that these boats are well equipped and effectivity is high; they are capable of emptying the sea. A matter usually ignored in this debate, however, is the fact that investments in improved effort does not equal increased effort. The boats of the fishermen I have been referring to in this paper, are all equipped in a similar manner. When good income is achieved one year, fishermen buy new equipment, improving their working place, and thereby the effectivity of the boat. This improved effectivity, however, does not always lead to higher catches. Many small scale enterprises, capable of catching 70 tons of cod a year, only catch some 30-40, and even less. We find reasons for such strategies when turning our focus to the social organization of work. The owner might prefer working alone, which means keeping fewer gill-nets than optimal and having a shorter working day. Reasons for such preferences might be that he is getting old and wants to take things easier. Or he might have small children, or other kinds of social obligations,

and want to spend more time at home. Being responsible for a crew gives less opportunities to stay ashore one day than operating alone. At the same time as well-equipped boats might fish small amounts of fish, old boats not so well equipped might fish several tons. Thus, catch capability does not coincide with actual catches.

In other words: The boats have a high capacity for emptying the sea, technologically. Their capability in social terms is different.

Having discussed the issue of social organization restricting the harvest, I will now consider a few technological restrictions. One concerns the fishing gears, - small scale technology operates so-called passive tools, which means that the fish seek the equipment, as opposed to active tools, - a feature that curtails the amount of resources harvested. Amounts of resources are also restricted because operating the tools are dependent upon the weather. Nature and technology in this way put certain restrictions upon the harvest.

As already discussed, the new regulations lead to new ways of using resources. Resources which formerly were exploited by some fishermen are now exposed to a higher pressure. I have discussed how this may provide possibilities for a change both in the property state of the resource and in the individual actions, assumptions number one and two for "the Tragedy" to be fulfilled. However, it also provides possibilities for assumption number three, the actual overuse, to be realized. We have no knowledge of the biological base for these species. Increased effort in this way increases the chance of "the Tragedy" occurring in these species as well as the cod.

As well as increasing the effort on specific fish resources, the introduction of the quota system creates incentives for expansion in labour and capital. Since the owner gets the quota, it has become important to be an owner. Many crew have been put ashore, since the owner manages to take the small quota themselves. Crew are the great losers in the new system (Bergland 1991). They have good reasons for buying their own boat, returning to the fishery. The tragic situation in this is that such strategies increase the amount of capital in the fisheries. Formerly two fishermen (and their families) could make a living out of one boat. Now they each work on their own boat. Regulations in this way lead to

increases in capital effort.

The quota system also creates other incentives to increase capital effort. The boat you are stimulated to buy, should be large. Formerly a cost-minimalizing strategy was an ordinary way into the small scale fishing. Recruits bought small boats to begin with. Now big boats are important since quotas are given according to boat size. So far, people have bought old and cheap boats. However, if the incentives continue, an important criterion for fishing effort has changed. The amount of boats with high debts would probably increase under such conditions with dependence upon debts leading to a high level of effort.

Reducing the overall effort in the fishery by setting quota restrictions, means that the quota becomes a benefit. Reasons for staying in are created along with the introduction of a quota system. As such, quotas work more as an incentive, than as a restriction to expansion in the fishery. This is also seen in the small scale fleet. The fear of the fishery being formally closed, means that people, although having alternative income sources, do not leave the fishery for fear of not being allowed in again. An ordinary strategy when income is low in fishing used to be to work ashore. Some fishermen, who did this in the years before the quota system was introduced, have experienced that working ashore give them the official status of non-fishermen. By this status they do not receive quotas. Without such options some fishermen would have left for a while, and come back when the cod-stock had increased. With such a reduction of effort, people's resources would maybe have increased when out of fishing. Now they stay in and earn scarce money. This drains their resources heavily, both their human and their material capital.

Entering and leaving the fishery in rich and scarce periods may have had a regulatory impact upon the crowding of the small scale sector. The fact that those with the better possibility of income from other sources left the fishery, might have led to conditions improving for others. We do not know how important, in quantitative terms, this effect was. What we do know, is that the introduction of a quota system, creates reasons for not leaving. A probable mechanism of regulating amounts of people partaking in the fishery, is violated.

Finally, the important question is what kind of reduction the quota system, restricting overall catches of cod, has led to. The increased effort I have pointed to; the increased effort on the "buffer" resources, the stimulants to increase capital effort, and the incentives to fish the whole quota, might lead to reduction in overall effort being a sort of zero-sum situation. The only thing achieved might be structural and organizational changes within the small scale fishing sector; some fishing more than they used to, be it cod or overall effort, and some fishing with higher capital costs than they used to.

CONCLUSION

The small scale coastal fishery of Northern Norway have been characterized by an informal system of restriction, a system still unknown to governmental bodies and, until recently, largely ignored by fishery scientists. Since our knowledge of it is vague, we know nothing about the regulatory impacts it may have upon the fishing, which is an important issue in the discussion of new regimes.

So far this debate is highly influenced by ideas generated from viewing Hardin's model as a theory about the world. However, small scale fishermen are not characterized by an **egoistic** and **maximizing** behaviour. Rather than maximizing profit, they are regulating their production to optimize different values. Small scale fishermen may be oriented towards maximizing profit, but this is dependent upon situational factors, like the demand for catch to pay down loans on fishing gears, boat, a new home, etc. Fishermen with different needs tend to have different productive strategies.

Neither is small scale fishery characterized by open access. The sea is more of a communal property, with social and cultural rules defining who is allowed to fish where. This puts the question of overuse of resources within the framework of a small scale technology in a special light.

New regulations for the regeneration of depleted fish stocks, have changed the strategic situation **for all** small scale fishermen. Today fishermen must produce to ensure their

future quotas, and hence tend to produce more than previously.

Thus the new quota system which were designed to counter over-production, and the assumed tendency of fishermen to be egoistic; maximizing individual profit on the expense of the common resources, are in the process of undermining the older informal restrictions in the small scale fishery. It has created incentives for higher productivity and lessened fishermen's former tendency to produce according to needs. Thus, the new regulations can also be seen as transforming the small scale fishermen into the role of egoistic, profit-maximizing individuals. And it can be seen as transforming the communal property to one of open access.

In other words, the tragedy of the present situation, is not the one Hardin speaks of. The tragedy is that there was not any tragedy until the solutions to counteract it were introduced. At least we do not know this for sure. What we do know is that now the conditions for Hardin's tragedy are being created. In fact, the regulation of the small scale fishery in Norway can be seen as a case where Hardin's model function as a self-fulfilling prophecy.

REFERENCES:

- Anon. (1988 a): Register over Merkepliktige Norske Fiskefarkoster. Fiskeridirektøren.
- Anon. (1988 b): Aktivitets- og strukturanalyse. Fiskefartøy 8,0 - 12,9 m.l.l. 1987. Rapporter og meldinger nr.5/1988. Fiskeridirektoratet.
- Bergland, H. (1991): Kvotereguleringer. s.42-73 i Torskefiskets økonomi og regulering. C. Armstrong, H. Bergland, A. Eide, O. Flåten, N.J. Larsen. FORUT, Tromsø.
- Berkes, F. (1987): Common-Property Resource Management and Cree Indian Fisheries in Subarctic Canada. pp.66-92 in (second edition) McCay B. and Acheson J. (eds.); The Question of the Commons. The Culture and Ecology of Communal Resources. The University of Arizona Press, Tucson.
- Berkes, F. (ed.) (1989): Common Property Resources: Ecology and Community-based Sustainable Development. London, Belhaven Press.
- Bjørklund, I. (1990): Property in Common, Common Property or Private Property: Norwegian Fishery Management in a Sami Coastal Area. ISV-Stensil, Tromsø 1990.
- Brox, O. (1990): The Common Property Theory: Epistemological Status and Analytical Utility. *Human Organisation*, Vol.49, 3:227-235.
- Chayanov, A.V. (1966): The Theory of Peasant Economy. Irwin, Inc., Homewood, Illinois.
- Dikkanen, S. Lavik (1965): Sirma, Residence and Work Organization in a Lappish-speaking Community. Bind VIII av samiske samlinger, red. A.Nesheim. Norsk folkemuseum, Universitetsforlaget.
- Eythorsson, E. (1991): Ressurser, livsform og lokal kunnskap. Studie av en fjordbygd i Finnmark. Hovedfagsoppgave i samfunnsvitenskap, Institutt for Samfunnsvitenskap, Universitetet i Tromsø.
- Gerrard, S. (1975): Arbeidsliv og lokalsamfunn - samarbeid og skille mellom yrkesgrupper i et nord-norsk fiskevær. Magistergradsavhandling, Institutt for samfunnsvitenskap, Universitetet i Tromsø.
- Gerrard, S. (1983): Kvinner i fiskeridistrikter: Fiskerinæringas "bakkemannskap"? s. 217-241 i Hersoug B. (red.): Kan fiskerinæringa styres? Novus Forlag A/S, Oslo.
- Gerrard, S. (1990): Fiskerkona som begrep og institusjon i samfunnsvitenskapelige fiskeristudier. Notat.
- Hardin, G. (1968): The Tragedy of The Commons. *Science*, 162:1243-1248.

Hersoug, B. Og A. H. Hoel (1991): Rammebetingelser for fartøystrukturen. Utredning for fylkesfiskarlagene i Norges Råfisklags distrikt. Tromsø.

Jentoft, S. (1987): Almenningens tragedie - statens ansvar? Tidsskrift for samfunnsforskning, bd.28:369-390.

Jentoft, S. og K. Kristoffersen (1989): Fishermen's Co-management: The Case of the Lofoten Fishery. *Human Organization*, vol. 48 nr. 4.

F/E

Maurstad, A. (1990): Sjarcken; et eksempel på at "smått er godt" - også i fiskerinæringa? Fiskerikandidatoppgave. Norges Fiskerihøgskole. Tromsø.

McCay B. J. og J. M. Acheson (eds.) (1987); *The Question of the Commons. The Culture and Ecology of Communal Resources.* University of Arizona Press, Tucson.

Ostrom, E. (1990): *Governing the Commons. The Evolution of Institutions for Collective Action.* Cambridge University Press. Cambridge.

Pinkerton, E. (ed.) (1989): *Co-operative Management of Local-Fisheries: New Directions for Improved Management and Community Development.* Vancouver: University of British Columbia Press.

Ruddle, K. and T. Akimichi (1984): *Maritime Institutions in the Western Pacific.* Senri Ethnological Studies No.17, Osaka.

Ruddle, K. and R.E. Johannes (eds.) (1989): *Traditional Marine Resource Management in the Pacific Basin: An Anthology.* UNESCO/ROSTSEA. Jln. M.H. Thamrin No.14 Jakarta.

Sahlins, M. (1972): *Stone Age Economics.* Routledge, Chicago.

Stillman, P.G. (1975): *The Tragedy of the Commons: A Re-Analysis. Alternatives,* 4:12-15.