SHARING FISHING GROUNDS AND SHARING FOOD – HOW A CULTURAL INSTITUTION HELPS TO PROTECT AN OPEN ACCESS RESOURCE [1]

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Abstract: A long tradition of research has proven that common property resources may be protected by a 'firewall' of regulations. Open access resources, however, seem to be doomed for certain due to their lack of institutions. What happens in between? Can resources be handled in a sustainable manner if a user community maintains cultural institutions which influence only the resource distribution while at the same time access to the resource itself is not restricted?

An island community in the Ha'apai-Group of Tonga has been chosen to illustrate the principle. In Tonga, unlike other Pacific countries, everybody has free access to all marine resources. With a gradual transition from subsistence to more commercial fishery, non-cooperative strategies of resource use are generally arising now as opportunities to sell fish redirect aims towards gain-maximizing. Thus, on the one hand, such non-cooperative strategies are expected to culminate in resource depletion. On the other hand, cooperation (*fetokoni'aki*) has always been a highly cherished value in the traditional culture, and the institution of food-sharing has been particularly strong among community members (including fishermen) due to a tight social net. Therefore, villages still can be found where the cultural institution of food-sharing enhances cooperativeness and sustainable resource use.

The case study took place in Lofanga. Although they have the same opportunities and economic incentives as the commercial fishermen in neighboring 'Uiha, the vast majority of fishermen in Lofanga still harvests on a subsistence basis. The few commercial fishermen hold special positions within the village structure as well as within the social net and try to maintain or improve their position by complying with the sharing rule to an above average degree. Giving all their neighbors access to their yield legitimizes their efforts while at the same time it reduces the efforts of other community members.

Nevertheless, these open access resources are threatened by commercial fishermen from neighboring islands. Some of these have even started to over-exploit their own resources and to compete with other villages for their fishing grounds. It seems plausible that in order to enable traditional institutions in Tonga to work more efficiently, the open access nature of marine resources should be changed to community-based management.

Key Words: Resource Management, Tonga, Fishing, Social Institutions, Cultural Ecology.

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1 Introduction

Since the seminal paper of Hardin in 1968 on the 'Tragedy of the Commons', a whole string of case studies on communal use of renewable yet limited resources has been carried out, most of them coming to a differing conclusion: Jointly used resources are *not* necessarily doomed to be depleted or ruined. On the contrary, if communities of resource users are able to craft institutions regulating the exploitation of the respective resource and to monitor as well as sanction wrongdoers then they can manage these resources sustainably (Ostrom 1992).

In general, these studies focus on rules concerning access to or direct use of resources. Since the conditions for using a resource, however, are not the only incentive for strategies, the question arises whether other institutions may function as a regulation mechanism as well. The next plausible mechanism to access control is distribution of the yields. Among the respective institutions, two types can be distinguished: (1) those which *export* the yields out of the local group (e.g. as taxes or via marketing), and (2) those which *redistribute* them within the user-group (e.g. in the form of food-sharing).

Expecting that the second kind of institutions stabilizes resource exploitation, a case study was chosen that fulfilled all the necessary constraints: In Tonga, marine resources play a significant role in the daily life of the islanders. Granted by the constitution, access to fishing grounds is open for every Tongan, and although the *Fisheries Regulations* aim at the restriction of certain fishing techniques, no real enforcement is possible. Thus, all criteria should be in place for excessive resource use and depletion. At the same time, however, the cultural value of cooperation (*fetokoni'aki*) and the tradition of sharing fish, are still complied with today. Accordingly, two widely disparate expectations may arise:

- Following the importance of fish for cash income and the legal situation of open access, resource depletion seems to be the plausible consequence.
- Given the strong institution of food-sharing and values enhancing cooperation, a sustainable resource use may result as well.

In fact, both developments can be observed in the island group of Ha'apai – examples of mainly subsistence-based fishermen in one island village and commercialized club-fishing in a neighboring village. The goal of this paper is to examine the factors and interactions that stabilize sustainable resource use on one of these islands, namely in Lofanga. It starts with an overview of the relevant theoretical approaches to the problem from different disciplines, followed by a short description of the case studies and the research conducted there. In the third section, some of the interactions between the institution of food-sharing and the strategies of exploitation will be highlighted. Special concern will be given to the point that such indirect regulations as food-sharing bring about practical problems which will be discussed in the last part.

2 Theoretical background: Direct vs indirect regulations of common property

Among the resources typically creating a commons dilemma, living marine resources are a classical one (Berkes 1994; Gordon 1954). In many parts of the world access to them is open, and fish stocks are heavily over-exploited. In most indigenous cultures in the Pacific (as well as in other parts of the world), however, complex and sophisticated systems of managing them either directly or indirectly have been established and proven to be efficient over long periods of time (Campbell, Menz & Waugh 1989; Dyer & McGoodwin 1994; Hviding 1996; Johannes 1981; Ruddle & Johannes 1990).

Most of these systems are able to ensure the sustainable use of limited goods by a common property regime grounded in a set of rights and rules. If accepted by the group of resource users, this regime creates incentives for cooperation and provides sanctions to prevent people from not complying (Pomeroy 1994). Following the Institutional Analysis and Development (IAD) framework (Ostrom 1994; Ostrom, Gardner & Walker 1994), several efficiency criteria for such regimes have been identified, among them clearly defined boundaries and access restrictions, backed by commitment to a responding value system or enforced through mutual monitoring and graded sanctions. Even when complying with these criteria, communal regimes may not work perfectly, though and can break down under certain circumstances, especially when the local management systems are not compatible with the constitutional framework (Feeny 1994; Ostrom 1992; Pinkerton 1994).

Since problem awareness and consensus on viable measures are among the essential efficiency criteria for common property regimes, most studies have focused on tenure systems and other institutions *directly* regulating the access to the resource and the degree of its exploitation (Christy 1982; Cordell & McKean 1992; McCay & Acheson 1987; Ruddle & Akimichi 1984; Ruddle, Hviding & Johannes 1992). Assuming that people's decisions are influenced by a number of different factors, the question arises whether institutions primarily aiming at other activities can set incentives to reduce resource exploitation as well, thus *indirectly* regulating it.

This paper addresses institutions that distribute already attained yields from resource extraction. Whereas three types of such institutions are usually differentiated in anthropology – reciprocal, redistributive and market exchange (Harris 1987) – it seems more appropriate for our purpose to categorize them on the basis of which incentives for exploitation they set:

(1) If institutions cause the yields to flow out of the local user group (i.e. as tribute to an estate holder or through taxes) then they allow for additional pressure on the resource; therefore, they will be called 'extracting institutions'. Selling fish falls in this category as well since it extracts locally used and needed resources out of the local group thus enhancing pressure on the stocks.

(2) The other group of institutions distributing the yields within the group should help to stabilize the degree of exploitation – given that the group itself or its demands do not grow. They will henceforth be referred to as 'sharing institutions'. Among them, solidarity networks (e.g. in the form of kin-relationships, adoptions or remittances) are of special interest since they are widespread and a still strongly held tradition in most indigenous cultures in the Pacific, based on values that enhance cooperation. In Tonga, the most important embodiment is the institution of sharing food, called *fetokoni'aki* (Halapua 1982; Pulu 1981; Morton 1996).

All institutions mentioned above are to be seen in close interaction with the social structure of the user group as well as with their cultural background. While tributes have to be paid to higher-ranking people or in the form of taxes to the government, sharing institutions may be enacted between equally ranking persons or within a kin group. Both institutions can have a significant though not obvious influence on the amount of resource extraction (Bender, Kägi & Mohr 1998). In the case studies analyzed in this paper, *extracting institutions* will be taken into consideration in the context of marketing opportunities and tributes. The focus, however, will be on *sharing institutions*. With the norm of sharing food (*fetokoni'aki*) they create a solidarity network that shelters users from individual shortfalls.

The insurance character of such networks has been extensively analyzed in studies from both economics and anthropology (e.g. Fafchamps 1992; Gould 1982; Newcomb 1990; Platteau 1991). They showed that a solidarity network constitutes a social dilemma where structural incentives theoretically enhance opportunistic behavior. Since insurance is in the long-term interest of all, however, these networks may work efficiently in normal times (Coate & Ravallion 1993; Thomas & Worrall 1994). They are additionally stabilized through norms and sanctions. In order to ensure its efficiency, wealthy members and thus potential contributors have to be identified easily. Accumulation of goods itself is therefore not negatively sanctioned, but secret accumulation is sanctioned. The complementary problem to improper efforts is the lack of adequate effort (moral hazard). A high frequency of moral hazard corroborates the stability of the system since it reflects people's conviction that they can get by anyway. Monitoring can only be guaranteed through a lack of privacy and complex networks which not only distribute the obligation to help on many shoulders but which also personalize mutual obligations and support trust (Fafchamps 1992).

One risk for solidarity networks is change in the availability of those resources that found the basis of the insurance systems: A decline in the resource will consequently threaten the solidarity network as well (Blewett 1995). Even more perilous are social differentiations that finally lead to structural asymmetry or to the formation of coalitions. The first of these differentiations describes how particularly wealthy persons can attain a central position while they accumulate additional wealth, information and clients, rendering the periphery less secure. The latter differentiation resulting in the formation of coalitions will inevitably take place if a subgroup can improve its own welfare by withdrawing from the whole system.

Thereby, they reduce the mutual insurance arrangements to the members of this subgroup (Fafchamps 1992). To preclude processes like this, a group depends heavily on high commitment to shared values and social norms enhancing cooperation and thus on the firm embedding of its institutions in the cultural context (Bataille-Benguigui 1988; Carew-Reid 1990; Ruddle 1994).

Summarizing the results relevant for the proposed argument, solidarity networks are an attempt to secure the right of subsistence by giving all members access to the vital resources. Although their impact arises *after* the process of exploitation, they nevertheless influence its intensity. This argument puts emphasis on a principal problem of indirect regulatory institutions. On the one side, a measure may be the more efficient the less obtrusive it is, as was shown for example in the case of religious taboos (e.g. Johannes 1978; Klee 1980). On the other side, however, the less obtrusive a measure is, the easier it can disappear without substitution. If a user group is not aware of its regulative function, this measure may lose its flexibility to react to changing conditions and even may get lost without being noticed (Hviding & Baines 1994; Johannes & MacFarlane 1991; Ruddle 1994).

Whereas most literature on common property rarely takes such insurance systems into account, the following analysis of the regulatory function of the Tongan institution *fetokoni'aki* in a commons dilemma will integrate them. The hypotheses are derived from the arguments above: Stable networks should stabilize cooperation and enhance sustainable resource use while networks out of balance should weaken its regulatory function. Particularly in cases where better-off members set up a subgroup, increasing commercialization and exploitation will be the result.

3 The setting: The context of fishing in Lofanga and 'Uiha

In order to test the assumed interdependence between solidarity networks and strategies of resource use, the Polynesian Kingdom of Tonga was selected for a case study due to the fact that access to marine resources is free and at the same time the tradition in food-sharing is still strong. Since the first settlement of Austronesian seafarers on the widely scattered islands of Tonga some 3,500 years ago, their inhabitants have had a long tradition in exploiting marine resources. Fishing is still essential today for most inhabitants, particularly of the outer islands, with regard to their subsistence and supply with protein. Apart from that, a good catch enables them to fulfill their social obligations, and in many cases it is their main source of cash income. The high significance of marine resources for their way of living is matched by the extent to which the cultural background influences their strategies.

3.1 The cultural background of users

The Ha‘apai-Group in the center of the Kingdom of Tonga consists of 51 widely scattered islands, a third of them inhabited. Most of these are coral islands not high above sea level with fertile soils, but little freshwater apart from rain. The typical Oceanian spectrum of subsistence products is grown in bush gardens, supplemented by small-scale cattle-raising. The main source of protein is provided by seafood such as fish, shellfish, crabs and lobsters or octopus from coral reefs, reef flats, lagoons and sea-mounds surrounding the islands (Halapua 1982).

Since at least the classic period of Tongan history, a fisher’s social net has a strong influence on his strategies. Basically, fishing is restricted to the male population while women and children engage in reef gleaning. Many economic decisions in a Tongan household are determined by the *fahu*-system, rendering a substantial part of one’s kin group higher ranking and with the right to demand services and material support (*fatongia*). Similar obligations apply towards the chiefs, some of which still strictly call them in today. These obligations sometimes require huge amounts of seafood and especially of prestigious seafood like turtle, lobster or giant clams, most of which are considered to be threatened today. Whether there have been traditional taboos aiming to protect them is not clear (see e.g. Pulu 1981). However, during the time of Christianizing they have been entirely abolished.

With the incorporation of the church into the traditional net of social obligations, the latter has even been strengthened and widened. Since that time, a partly changed code of cultural values and norms enhances cooperation and negatively sanctions all kinds of aggressive interactions (Morton 1996). At the same time, a traditionally strong social hierarchy sets limits for individual initiative or active measures against rivals. Only strictly formalized modes of status rivalry are accepted (Marcus 1978).

Today, an average Tongan household is forced to earn money for a number of reasons: to buy certain types of food and other daily goods, to pay school fees, or to contribute money in the church fund-raisings. Due to population growth and a shortage of land, commercial fishing is one of the most promising (and for many men the only) option to procure money. The degree to which gain-maximizing strategies are socially acceptable depends on that part of the catch that is necessary for individual needs and may vary between villages (Halapua 1982; Perminow 1993). Traditionally, fish has been shared like other food as well, and on most of the outer islands it is considered shameful to sell it to one’s neighbors.

3.2 The fieldwork in Lofanga and ‘Uiha

Two island villages in the Ha‘apai-Group have been visited for an extended fieldwork. The first island, the estate of crown prince Tupouto‘a, with an area of about 1.4 km^2, is inhabited by 250 people living in 44 households. Out of 40 fishermen, only six can be considered as more or less commercially oriented. They work independently and come together for joint

operations on a spontaneous basis. The most popular techniques here are hand-lining (*taumata'u*), fishing with a net (*kupenga*), diving (*uku*) and octopus-luring (*makafeke*). On the neighboring island 'Uiha, approximately 515 people live in 95 households in a village of the same name on the 3.2 km^2 estate of the Honourable Malupo. About one third of their fishermen are commercial divers, organized in fishing clubs, where they are provided with technical support by middlemen to whom they sell their catch in return. The degree of competition in 'Uiha is much higher than it is in Lofanga. Meanwhile, 'Uiha fishermen expand their activities into the traditional fishing grounds of Lofanga and seem to overharvest their resources to a higher degree than their neighbors.

The research conducted here during a period of altogether 15 months (1997/98) involved a variety of methods due to the interdisciplinary context of the research project. Data were collected mainly through participant observation, during which the documentation of resource management and arising conflicts has been one of the main points of interest. In addition, a census of both villages was taken and the ecological situation estimated on the basis of interviews with specialists and members of the local Ha'apai Conservation Area Project, the Ministry of Fisheries and several consultants.

Half-structured interviews with fishermen from both villages were made. In their course, quantitative data had been collected on different domains: (1) on details of their respective resource use strategies, (2) on their social net, and (3) on potential conflicts within and between the communities. The fishermen's answers in these interviews also contained data on their attitudes and opinions on the ecological situation and changes in fish stocks. The final interpretation of these data was based on categorizations of their answers according to content and on frequency calculations. Intensive talks with key informants supported missing information as well as interpretations from inside the cultural background.

4 'Fisheries Regulations': Direct management on the state level

Since the enactment of the constitution in 1875 and the Land Acts of 1882 and 1927, all Tongans have free access to all marine resources in Tongan waters. This legal situation lays the foundation for an increasing potential for conflict. At the same time, traditional management has been abandoned entirely. Most Tongan fishermen nowadays seem to accept this kind of access regulation, and some even consider it a valuable achievement of Tongan culture. While many of them perceive their traditional fishing grounds as a kind of 'territory', only a few express the wish to exclude fishermen from neighboring villages and even fewer show anger about this situation.

An attempt was made in 1994 to compensate for the lack of management with the '*Fisheries Regulations'* which prescribe minimum sizes and closed seasons for various species, such as mullet (*Mugilidae*), turtle (particularly *Dermochelys coriacea*), lobster (*Panulirus sp., Parribacus sp.*), sea cucumber (*Holothuroidea*), and several mollusks as the

winged pearl oyster (*Pteria penquin*), triton (*Charonia tritonis*) or giant clam *(Tridacna sp.)*. Additionally they prohibit such destructive fishing techniques as dynamiting or poisoning and restrict highly efficient techniques as fish fences or scuba diving.

Apart from compliance with these regulations, no signs of conservation measures could be found in the villages. Even the *Fisheries Regulations* themselves are not fully known among villagers. And many answers given in interviews indicate that a majority of fishermen do not recognize the necessity of such regulations:

> There are plenty of fish out there. And you know why? God made them. We believe in God. He gives us enough to eat. He makes the fish, he makes lots of them. He gives it to us – let's eat it! (Subsistence fisherman, 45 years)

Monitoring is difficult, however, and enforcement weak due to the personal and financial limitations of the Ministry of Fisheries (MoF). Meanwhile, various reports of the MoF indicate a growth in competition for fishing grounds between villages and suggest an increasing potential for resource conflicts. For that reason, the MoF is now considering changes concerning access to the fishing grounds and the introduction of community-based resource management (Petelo, Matoto & Gillett 1995).

5 Food-sharing: Indirect management regulations on the community level

More influential than those direct attempts to regulate fishing so far are informal and indirect regulations such as the food-sharing system (*fetokoni'aki*) that reduces incentives to overharvest. By granting the means of livelihood to everybody, it constitutes an informal insurance system. In general, the Tongan institution of *fetokoni'aki* is still strong today. It is grounded on the value *'ofa*, meaning, among others, 'concern, kindness, care, help, generosity, sharing and love' (Morton 1996: 80). Combining old Polynesian traditions and new Christian norms, *'ofa* characterizes the ideal emotional relationship between all people (Kavaliku 1977). With respect to this central idea, the act of sharing is more important than the goods themselves, and no expectation of immediate return is connected to it.

5.1 Strategies of exploitation in both villages – subsistence versus surplus

The comparison of Lofanga and 'Uiha fishing strategies shows that fishermen from both villages have equal equipment, the same alternatives (or rather lack of alternatives) for income generation and the same seasonal requirements for cash. The men from 'Uiha have similar access to land for planting as those in Lofanga. Thus, both could satisfy their basic needs with subsistence farming and fishing. With respect to the extracting institutions of yields distribution, both villages are required to fulfill similar *kavenga* (in the form of taxes and

tributes) and have the same opportunity to market fish, though they do not practice it to the same extent. To the contrary, a significant higher number of fishermen in ‘Uiha work longer and harder in the fishing grounds and sell an amount of fish many times higher than those in Lofanga. But why do Lofangan fishermen not take up the strategies of their economic successful neighbors?

Focusing on social aspects of village life brings out major differences in the position of commercial fishermen within the community structure, in their form of organization and their different responses to the institution of food-sharing. In Lofanga, fishing still can be characterized as rather traditional. Apart from a few exceptions, fish cannot be sold locally. The fishermen more or less autonomously decide on where, when and how long they fish. Only six of them could be identified as commercial. Those hold special positions within the community, as chief, as members of the Mormon church or as newcomers. The town officer had been abroad for long times during the last years, and a low ranking chief represents the estate holder, crown prince Tupouto‘a, who is not insisting on the tributes from his people.

In ‘Uiha, on the other side, the hierarchical structure within the village seems to be tighter. The town officer and the estate holder are present and encourage the inhabitants to enhance their efforts. Fishing has acquired features of a full-time profession beyond subsistence that everybody can take up and that has even attracted people from other parts of the Kingdom to come to the island. One third of the fishermen inhabiting ‘Uiha are engaged in commercial diving. They are organized in fishing clubs with a steadier structure than the rather spontaneous teams in Lofanga have. Their middlemen supply them with equipment they need, particularly boats and ice, and offer to market their yields. Attempts to establish fishing clubs in Lofanga as well have taken place, though they have not been successful so far.

At the same time, competition between fishermen in Lofanga has a strong social character: They try to improve their status in relation to their fellow fishers rather than to attain economic advantages – catching a bit more than one’s neighbor is an often declared goal, not the marketing of a bigger catch. In ‘Uiha, on the other side, the men not only fish longer and more intensively, but to an extent where they even neglect their farming and partly their social obligations, particularly concerning the food-sharing.

5.2 Successful fishermen in Lofanga and ‘Uiha – knots vs holes in the social net

While in Lofanga, the informal insurance system set up by the food-sharing institution *fetokoni‘aki* is still strong and complied with by nearly all members of the village community, this does not apply in ‘Uiha to the same extent. All of the more successful (as well as more conspicuous) fishermen in Lofanga share out of their catch considerably high above average. Their relatives receive portions of the yields as well as neighbors, ministers and particularly old or otherwise weak people.

The successful fishermen in ‘Uiha, on the other hand, share significantly less than those in Lofanga: Just half of them were mentioned as givers of fish, and actually only two gave fish to

people outside their immediate personal net. Here, twice as many semi-commercial fishermen supply others with fish as in Lofanga. Only occasionally would a person in ‘Uiha ask a commercial fisherman for fish as a gift if he was not somehow obliged to him anyway. Instead, people will pay more frequently for fish they receive. What economics (e.g. Fafchamps 1992) identified as the biggest threat for an informal insurance system – the establishing of coalitions – has thus already happened in ‘Uiha. With their partial retreat from the general insurance system, the commercial fishermen here render it weaker. As a consequence, the rest of the village members are forced to higher efforts as well.

A second indicator for a higher stability of the insurance system in Lofanga than in ‘Uiha is the fact that fishermen in Lofanga attribute moral hazard, a lack of effort, several times more often than those of ‘Uiha. Lofangans can rely enough on the *fetokoni‘aki* to be sure that they will get fish even if they do not make a significant effort to avoid shortfalls. This correspondence between insurance stability and intensity of resource exploitation indicates that a stable insurance system will reduce incentives for commercial strategies and thus overexploitation along two dimensions: Since people can get by anyway they don’t have make extensive efforts, and since they always have to share out a considerable portion of their catch they may not feel motivated either (Bender, Kägi & Mohr 1998). In that case, an increasing commercialization should weaken insurance stability and change traditionally social competition towards a rather economic one.

6 Conclusion: Regulation of resource use within the social net

The central place in the fishermen’s daily life as has been shown above is held by their social net with its different functions as giver and receiver of services and goods, as a factor influencing decisions, as an arena for status rivalry and as an instrument for monitoring and control of the compliance to cultural norms. At the same time, with the food-sharing institution *fetokoni‘aki,* this social net functions as insurance system. The mechanisms through which such solidarity networks maintain a security of subsistence within a local user-group are threefold. (1) The *fetokoni‘aki* contributes to social stability because it is based on cultural values of mutual concern and respect and helps strengthen cooperative behavior. (2) Apart from that, the redistribution of essential resources enhances the economic stability as well since goods are shared – though not evenly – to an extent that secures subsistence for everybody. (3) And finally, the *fetokoni‘aki* supports an ecological stability through restraining incentives for reduced efforts and gain-maximizing strategies, thus fostering a more sustainable resource use. Contrary to findings of psychological experiments in Germany (Nerb, Spada & Ernst 1997), depletion of fish-stocks is rather caused by the gain-maximizing strategies in ‘Uiha than the social competition in Lofanga. This indicates the importance of additional mechanisms regulating competition in a broader context. In Tonga, such forms of

social competition are strictly regulated in the setting of status rivalry, as pointed out in chapter 2.

Apart from being very efficient, indirect regulations such as the *fetokoni'aki* nevertheless comprise a great risk for resource management. Management rules have to be flexible in order to be adaptive. Users must be aware of their regulatory function should it be necessary to compensate for declining institutions. Otherwise, alternatives might not available in time as in the case of club fishing in 'Uiha where, the *fetokoni'aki* is weakening.

Other risks such as population growth or technological innovations are less important in the given case: Although the *fetokoni'aki* wouldn't be efficient if the number of its members grew or better techniques made exploitation much easier, this is obviously not happening in Ha'apai. Here, the number of inhabitants is declining and even stabilizing the system through remittances that take pressure from local resources. In addition, there is every reason to believe that in robust networks, particularly in the Pacific, better technologies are not used to increase production, but to decrease the efforts (e.g. Halapua 1982).

As the example of the neighboring village 'Uiha demonstrates, a decline in the sharing institution may result in a decline of the stocks as well. In that case, no alternatives for regulation are ready – and worse, even the idea that such regulation could be necessary seems unacceptable. For the newly proposed implementation of community-based management in Tonga, this has serious consequences. Although it might not be the best solution to the problem, something must be done, however, since Tongan waters are openly accessible for all Tongans and already commercial fishermen can freely enter the fishing grounds of still sustainably fishing communities. And this would eventually ruin their 'commons'.

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