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**Community-based fisheries management**

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# Community-based fisheries management

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## 1. Introduction and summary

1. In most, if not all, Pacific Island countries, the total weight of seafood caught in subsistence, or village, fisheries is greater than that from commercial fisheries. And, when a nominal value per kilogram is put on the subsistence catch, it is often found to be of greater value than commercial catches. This is particularly so if one considers the net profits from commercial fisheries, many of which rely on imported boats, equipment, and even bait. Subsistence fisheries on the other hand, are intensive in labour but generally low in other fishing costs.
2. Productive and well-managed subsistence fisheries also decrease a country's reliance on cheap and low quality protein imported from overseas, and therefore result in a corresponding increase in public health and savings in foreign exchange.
3. Yet, in spite of the importance of subsistence fisheries, most fisheries agencies devote the majority of their time to assessing, developing and managing commercial fisheries. Subsistence fisheries are largely ignored. Most countries have national fisheries regulations and, although these may be applied in urban areas, they are rarely enforced in village areas. It would take a brave fisheries enforcement officer to walk into some villages to enforce national laws!
4. In defence of local fisheries agencies, the surveying and management of subsistence fisheries are difficult tasks. Subsistence fisheries are made up of a large number of fishers, using many different fishing methods, making small individual catches of a great variety of species from around the entire country. Commercial fisheries, on the other hand, are usually based in urban areas and target a smaller number of species. No wonder the assessment and management of subsistence fisheries get put in the "too hard" basket (claims of insufficient staff, however, will not do as an excuse as many fisheries agencies in the Pacific have a large number of employees).
5. In view of the above difficulties, fisheries agencies have few options in the conservation and management of subsistence fisheries. Indeed, we believe that the only way forward involves encouraging and supporting fishing communities to manage their own fisheries resources. And, even if this is not the only option, it is likely to be the most effective one.

6. Community involvement results in the ownership of fisheries management actions and regulations. If communities make their own conservation laws, as they have historically done in the past, they are more likely to respect them. Under community ownership, fisheries management measures are enforced by communities themselves.
7. However, in order to establish community-based fisheries management, there are two key considerations:
  - Is the government willing to commit to giving communities control over their fisheries resources? Some governments and fisheries agencies may have concerns (unjustified, we believe) regarding a programme which encourages village communities to take actions for which they see themselves responsible.
  - Do communities have Customary Marine Tenure (CMT) or control over their adjacent fishing areas? Such control, either legal, assumed or *de facto*, is necessary before communities can be expected to manage their marine resources.
8. The key tasks are therefore related to securing government commitment for empowering communities, and a secondary one is to develop a suitable culturally acceptable process for community-based fisheries management - a generalised model is given in the SPC manual "*Fisheries Management by Communities; a manual on promoting the management of subsistence fisheries by Pacific Island communities*". The second task is likely to be easier than the first.

## **2. The settings**

### **2.1. A background of control by communities**

9. People of Pacific Islands have lived in communities for many years. Traditionally, they lived either in extended families, villages, tribes, or in collections of villages under the leadership of traditional chiefs or kings. Community activities included hunting, planting, fishing, and defending themselves from enemies. Activities were largely community driven and controlled for the purpose of survival.
10. Community structures are often hierarchical and sometimes elaborate. For example in Samoa, communal activities of the untitled men (aumaga) are organised by middle-level chiefs (matai). In Kiribati, community decisions are made in the "Kaotibai" (island occasion/gathering). Many communities have traditional methods of protecting natural resources. In the Cook Islands, for example, te koutu nui (traditional chiefs) have used, and now reintroduced, ra'ui, or traditional prohibitions on the taking of natural resources.
11. Fishing is often a communal activity, and very little fishing is done alone. Canoes are used in groups. Fish drives and palm frond sweeps may involve men, women and children. Reef gleaning is carried out by groups of women and children working in together. And, in some cultures, the catch is shared with the whole community as in the inati system in Tokelau (Passfield 1998)..

12. There are many examples, and these community structures, groupings and traditions have to be respected and taken into account when encouraging community-based management.

## **2.2. Customary marine tenure (CMT)**

13. In many Pacific Islands, communities live in coastal areas where there is easy access to near-shore fish stocks that provide a vital source of protein. So important are these fisheries resources, that many communities have claimed ownership of their adjacent waters, even if this is contrary to current national legislation. Some communities claim ownership of their adjacent sea areas and resources that extend from the land to reefs, while others such as the qoliqoli in Fiji may be more extensive.
14. Alternatively, some countries allow open access to all fishing areas – fishers are free to fish anywhere along the coastline. Although superficially attractive on equity grounds, open access systems, where anyone who wishes has the right to exploit a resource, are resulting in severe cases of overexploitation around the world (FAO, 1997). A resource that is for everyone's use, it seems, is no one's responsibility.
15. And relevant to the present context, open access fisheries provide no basis for community-based fisheries management.
16. However, in order to facilitate community-based management some countries without customary marine tenure are assigning property rights to communities. In Tonga, for example, where community-based management is being planned, the government is considering allowing villages to set up "Special Management Areas" over which communities have control.

## **3. The problems**

### **3.1. Overexploitation**

17. Despite a lack of hard data in most Pacific island countries, it is agreed that the coastal inshore and reef areas are heavily exploited and, in many cases, overexploited. This is especially the case in or near the main urban communities. Surveys from some Pacific countries and territories indicate a reduction in landings of inshore species (Horsman & Mulipola, 1995; Saucerman & Kinsolving, 1995; Dalzell et al. 1996).
18. Reductions in total inshore fish landings in a country may be caused by less people going fishing, or by there being less fish to catch. Lifestyle changes may mean that in some areas less people are going fishing, due to loss of traditional culture, increased involvement in the formal employment sector and the availability of cheap, convenient sources of protein such as tinned fish and mutton flaps. However, most fisheries agencies and fishing communities acknowledge that catch rates of fish and shellfish from the lagoons and inshore reefs of many areas have been declining for a number of years.

19. Overexploitation has resulted from a combination of factors including increasing population sizes, the use of overly-efficient or destructive fishing methods, and environmental disturbances.

### **3.2. Destructive fishing practices.**

20. The development of overly-efficient fishing methods has caused some fish stocks to be threatened. The use of modern materials such as chicken-wire for fence traps and monofilament nylon for gill nets, for example, has made fishing effort more effective. In some cases, modest developments such as the availability of underwater torches, which allow the spearing of fish resting under corals at night, have resulted in a dramatic increase in fishing efficiency.
21. In some countries, the use of explosives and poisons to disable and capture fish represents a serious threat to marine ecosystems and the long-term viability of fisheries. These destructive fishing methods include the use of toxic plants, commercially available poisons such as bleaches (sodium hypochlorite), insecticides, and explosives. Poisonous plant material may be derived from the roots of the climbing vine, *Derris elliptica*, and the nut of the coastal tree, *Barringtonia asiatica*, which are ground into a paste. More seriously, commercial poisons, including bleaches, are poured into pools isolated at low tide to capture small coral fish. Explosives are either thrown from a canoe into a school of fish such as mullet, or set on coral where fish have been encouraged to gather by setting bait. Explosives and severe poisons are many times more damaging to small animals, such as fish larvae and coral polyps, than they are to large fish. Destroyed coral reefs result in low fish production, and may not recover for over 20 years.
22. Fish drives and some collecting activities may involve damage to corals, either directly as a result of breaking or overturning coral to catch sheltering fish, or indirectly through the impact of many people moving over the reef. Some traditional destructive fishing practices have only become problematical as a result of increasing population sizes; in the past the marine environment was able to sustain occasional, localised damage because the frequency of the activity was low and fewer people were involved.

### **3.3. Environmental disturbances**

23. Environmental disturbances have resulted from not only natural events such as cyclones and storms but also from human activities. These activities include the destruction of nursery areas (including mangrove areas) by road construction and land reclamation. Corals are collected for sale as souvenirs and coral blocks are used for building. Harbour dredging and coastal building projects often release silt into the water, and this blocks off sunlight or smothers coral. Poor land management practices have resulted in erosion and the siltation of lagoons. Environmental disturbances and habitat destruction have been linked to increasing incidences of ciguatera fish poisoning and outbreaks of the crown-of-thorns starfish.

### **3.4. The failure of centrally based management**

24. In order to manage fisheries, that is, to ensure that fishing is done on a sustainable basis, it is usually necessary to apply one or more regulations. National governments in Pacific Islands have imposed a variety of regulations that either restrict fishing (input controls), restrict the catch (output controls) or protect the marine environment. For a number of reasons these actions are rarely successful.
25. In most cases there is little stakeholder input into the formation of national regulations. The community is given no ownership of either the resource or the problem and therefore feels no responsibility or accountability.
26. National regulations rely on strong government enforcement around the entire country and this is both time consuming and expensive. The enforcement of national regulations is also very difficult in communities that operate under their own traditional governing structure.

## **4. The solution**

### **4.1. Management by communities.**

27. A community-based fisheries management programme involves defining a goal and a strategy. The goal refers to the expected result and the strategy defines the principles or overall plan under which the goal is to be achieved.
28. A goal that would seem to be desirable in all programmes, would be to have a particular number of villages effectively managing their own fisheries resources within a certain time period. One of the possible strategies to achieve this goal would be to encourage each participating village to develop its own fisheries management plan.
29. The key tasks are therefore related to securing government commitment for empowering communities, and a secondary one is to develop a suitable culturally acceptable process for community-based fisheries management - a generalised model is given in the SPC manual "*Fisheries Management by Communities; a manual on promoting the management of subsistence fisheries by Pacific Island communities*". This process encouraging each village to analyse its fishing practices and problems, and suggest solutions. Community undertakings and actions to solve these problems may include introducing fisheries regulations and pursuing other conservation measures. These undertakings and actions would be listed in the community-owned village fisheries management plan.

30. In designing a community-based fisheries management programme, key considerations are given in the following sections.

#### 4.1.1. Maximum community participation.

31. Community ownership will be optimised if as many people as possible are allowed to contribute to the process of developing the village fisheries management plan. This will require involving all groups, including women and untitled men, to ensure the widest community participation and eventual ownership of the plan. The length of the extension process in each village has to be sufficiently extended to allow the community time to establish ownership of their plan and undertakings. Ownership by the community requires sufficient time for people to consider their own problems and causes, and think of their own solutions. It may take many months of facilitated discussions by community groups before the plan can be regarded as owned by the community.

#### 4.1.2. Motivation not education.

32. The knowledge of island and coastal people regarding the marine environment has often been underestimated. Most coastal communities have an awareness of, and concern for, their marine environment. Although public awareness-raising activities are part of the fisheries management programme, the prime need is not for education, but for motivation and support. Part of this motivation depends on the availability of economically viable alternatives to the present unsustainable and destructive fishing practices. The key task is to convince communities that being resource users, they have the primary responsibility to manage their marine environment.

#### 4.1.3. A management system which is demand-based.

33. For reasons of efficiency and sustainability, the management system must focus on villages in which communities have a concern for the marine environment, and are prepared to participate and contribute in finding solutions to problems. Although it is tempting to concentrate on villages where the need is greatest (say a village where destructive fishing methods are known to be used), community-based management will not work unless the community has a strong desire to address its own problems. The strategy involves working selectively with village communities eager to participate in the programme. As the programme progresses more villages may develop the desire to participate.

#### 4.1.4. The development of alternative sources of seafood

34. Whether community-based or not, most fisheries conservation measures, including the prevention of destructive fishing and the imposition of fish size limits, will cause a short-term decrease in catches (King 1995). The same is so for community-owned marine reserves as they reduce the area available for fishing.

35. As most subsistence fishers require seafood for their families on a daily basis, it is unreasonable to expect fishing communities to adopt conservation measures which will initially reduce present catches of seafood even further without offering alternatives. Accordingly, an extension programme should include the promotion and development of alternative sources of seafood to those resulting from the present heavy and destructive exploitation of near-shore reefs and lagoons.
36. The alternatives seafood sources may include the diversion of fishing pressure to areas immediately beyond the reefs through the introduction of other means of fishing, the promotion of community-level aquaculture, and, the judicious introduction of depleted shellfish species.
37. A community-based extension programme which does not provide support by way of promoting alternative means of obtaining seafood is unlikely to be sustainable.

## **5. Results**

### **5.1. *What community-based management can do***

38. Community-based fisheries management programme has the potential to create communities that have set their own fishing regulations and conservation rules and are abiding by them. If communities make their own conservation laws, as they have historically done so in the past, they are more likely to respect them.
39. Because communities are regulating fisheries for which they see themselves responsible there is a considerable saving on enforcement costs which may otherwise fall on government agencies.
40. However, it is unrealistic to expect all communities to do equally well in managing their marine resources and some assessment of individual villages in the programme must be made (Kallie et al. 1999). Some villages will do poorly for a variety of reasons including intra-village disputes and unrealistic expectations. Communities taking stringent management actions will almost certainly suffer a short-term decrease in catches of seafood. The hope of better catches lies some way off in the future, and some communities may become impatient.
41. However, the management and conservation activities of communities, particularly if they include the setting up of community-owned marine protected area (King & Faasili 1998), are likely to eventually result in increased catches in fishable areas.
42. A recent household survey in Samoa (Passfield et al 2001) was designed to estimate fishing effort and catches from subsistence fisheries. The data were collected from 65 villages, of which 17 were in the Fisheries Division's community-based extension programme. A comparison revealed that fishers in villages with community-based fisheries management plans made average catch rates of 2.8 kg per person per hour whereas fishers in villages without such plans made average catch rates of 1.8 kg. Although this difference is highly significant, care must be taken in drawing conclusions as there is the possibility that people in villages joining the community-based extension programme were already better and more aware fishers.



## **5.2. What community-based management cannot do**

43. Community-imposed fisheries rules and regulations must not compromise national fisheries regulations. For example, if a minimum size limit is imposed on a particular species under national regulations, communities may be allowed to locally enforce a higher but not a lower limit.
44. It must be recognised that there are many things that a local community cannot do. Some environmental problems are complex and involve activities and areas beyond the control of a local community. For example, fish catches may be falling in a particular village because silt from a nearby river is killing the corals in its lagoon. Mangroves may be dying because a sea-front road has been built without proper planning. These effects may be caused by decisions and actions taken some distance from the village. Siltation, for example, may be the result of poor farming techniques or the logging of timber in hills many kilometres away from the village.
45. Such problems can only be addressed by an integrated effort by government agencies and community groups working together. Integrated Coastal Zone Management (ICZM) takes into account the inter-dependence of ecosystems, and the involvement of many different agencies (for example, those responsible for agriculture, forestry, fisheries, public works and water supply) and other stake-holders.
46. Although such problems are beyond the power of individual small communities to solve it may be possible for extension staff to provide the necessary link between communities and government to begin to address the issues.

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