Indicators for village-scale trochus management as part of government/community co-management arrangements

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Introduction

Since the establishment of national fisheries services, Pacific Island reef fishery resources have been the subject of scientific monitoring programmes and management measures designed on a national basis with the support of international organisations (Pacific Community, Forum Fisheries Agency, FAO). As discussed in the previous article in relation to the trochus resource, the difference in scale between the geographic decision-making level and the level at which management rules are applied is a major factor in the vulnerability of a fishing system to the risk of overexploitation. This difference means that it is difficult to implement management measures established on the national level at the village level at which the fishing is in fact organised. Villagers want to retain full enjoyment of their local natural resources, while — on the grounds of sovereignty — the national government seeks to exploit these resources for the benefit of the national community under rules that it has established. However, these rules may be ineffective because they are unenforceable when no government representatives are present at the local level.

This realisation has prompted the authorities to devolve some of their responsibilities for fishery management to the provincial or territorial district level, which is closer to the fishers. But the results have not been convincing. Firstly, the decentralisation of decision-making has been incomplete. The province is regarded more as an intermediate level through which decisions taken at the national level are passed on to local communities, rather than as a level for making management decisions. Even when decentralisation has been more effective, as in New Caledonia where each of the three provinces has a fisheries service that is totally independent of the maritime affairs administration in terms of fishery policy, the provincial scale remains too large for villagers to feel ownership and for fishery policies to be effective. This is largely because production is scattered over too many locations and is on too small a scale.

The problem for central government therefore remains unresolved: how to act so that villages with valuable resources such as trochus can exploit these as part of a rational fishing system while avoiding overexploitation. To continue the decentralisation process would mean creating a new level between the province and the villages or indeed devolving resource management to the local level based on the relevance of ancestral management practices, which involve temporary closures of resource access. These practices could be revitalised and combined into a management mode applicable on a national scale based on the principle that good resource management at the local level will provide good overall management (Dahl 1988; Ruddle and Johannes 1990; Sims 1990; Johannes 1994; South et al. 1994; Dalzell and Adams 1994). This article discusses co-management arrangements between central government and local communities for managing reef resources, in particular, trochus. The emphasis is on the conditions that must be met for efficient co-management, particularly with regard to social cohesion, and the indicators required for assessment.

1. Co-management issues and the contemporary relevance of ancestral management practices

The idea of revitalising ancestral practices for managing fishery resources and converting them into a mode of co-management applicable at both local and national levels is a novel one that implies:

a) it is no longer the resource that is managed but the habitat in which the resource lives, which is considered to have heritage value. Good management at the local level will help secure the sustainability of the national heritage, which is made up of numerous such areas.
b) management rules no longer stem from mathematical models but rather from collective decision-making at the village level on periodic opening and closing of the fishery resource. When the closure of a village fishing territory is decided in conjunction or agreement with the national authorities, it is legitimate to refer to it

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as co-management or collaborative management (Barrow et al. 2000; Nurse and Kabamba, 2000). This concept has emerged from research on the management of forests in Asia (Gilmour 1990; Fisher 1995), which in every case presupposes that local communities are closely involved in the management of the resources they exploit; 'anglophone' authors refer to this as community-based management.

The introduction of a co-management arrangement for fishery resources at the local level, using ancestral management practices and giving them fresh relevance, is based on the assumption that, from the perspective of sustainable development, these ancient practices are superior to modern management systems because in the past they have shown their ability to conserve the natural environment and the exploitable resources it contains. The validity of the assumption that traditional methods of managing renewable resources have enduring relevance is subject to two essential preconditions: the permanence of the environmental, social, and economic conditions surrounding the management of the resource, and the permanence of the management objective. These conditions, however, are often not met and it is legitimate to query the efficiency of these management practices in an island setting increasingly influenced by globalisation (David 2003).

Local communities have, of course, changed considerably over the past two centuries. The closed systems that operated autonomously have had to open up. Money has reached even the remotest places and there have been fundamental changes in people's concept of the universe. The external flows to which coastal village communities are exposed have also changed. It would thus be a delusion to think that traditional management methods will operate well in the future solely on the grounds that they worked well in the past. Previously, traditional management methods were applied to subsistence resources, while it is now hoped that village communities will be able to undertake participatory management of commercial resources such as trochus, which attracts high prices on the international market. In addition, village-scale management of this resource before the 1990s was never very successful. Like sea cucumber (bêche-de-mer), trochus have been commercially exploited in the Pacific Islands since the first half of the nineteenth century and, like whales, have contributed to the integration of this region into the global economy to such an extent that the Sabir (lingua franca) languages spoken in Vanuatu, Solomon Islands and Papua New Guinea (i.e. Bislama or Pidgin) emerged to facilitate the trade. This exploitation was conducted as part of a mining-based economy, with beachcombers scouring one area before moving on to the next. This heritage seems to be a likely explanation for spatial variations in the export output of these two commodities with one country leading the market for two to three years before giving way to another after seriously depleting its stocks (Bettencourt 1995). This alternating trend can be seen as a reflection of high demand on the international market (Bour 1990) being relayed to the Pacific Islands by buyers visiting even the most remote islands and offering local communities amounts of money that were sometimes considerable in terms of purchasing power. Communities sometimes accepted these offers, taking the risk of seriously overexploiting their pearl shell stocks. This behaviour might seem illogical given that trochus accounts for a major proportion of the annual income of these villagers and that it is therefore in their interest to manage the fishery resource sustainably to guarantee future income. On the other hand, if it is considered that the village's priority is not to maximise income from a commodity but to enhance the viability of their territory, such behaviour is quite logical.

Territorial viability covers a dual dimension: firstly the ability to meet families' needs, and secondly the provision of community services by the village. For some traditional leaders in islands far from the capital, approaches from trochus buyers can be hard to turn down in the face of financial disengagement by governments that may be increasingly less able to maintain health, education and transport infrastructure. What importance is given to the threat of overexploitation of fishery stocks when the well-being of the community can be improved with money from trochus sales? In contrast to subsistence fishing, commercial harvesting does not generate territorial identity. A fishery territory is an economic resource. This economic territoriality serves the overall viability of the village territory and as such it may be rational to overexploit the fishery stocks that are most in demand on the international market if the resulting income makes it possible to enhance the overall viability of the village territory and its resident communities.[2]

2. Indicators for assessing a community's ability to manage its resources

Various issues surrounding collaborative management, and the current relevance of traditional management practices, mean that the establish-

2. According to Doumenge (1983), viability results from the combination of a static state, 'the creation of the conditions needed and sufficient to exist and endure' and a dynamic state comparable to the conditions 'needed for development, in terms of the most complete possible use of natural resources and for the social and economic advancement of the community'.

ment of a co-management system for trochus resources based on these management practices will probably not be possible everywhere. In a setting marked by the exposure of villages to the global system and the disengagement of government from rural areas, some communities have the ability to resist cash offers that they sometimes receive for the unsustainable exploitation of their reef resources. Others have lost it.

If a fisheries service attempts to establish fishing reserves under a co-management regime where the majority of villages are in the latter category, it is very likely that the programme will fail. The difficulties facing governments wanting to promote this kind of management at the local level relate to spatial variation in situations. Two neighbouring villages may show quite different levels of ability to manage their resources. Therefore, all villages should be assessed before a programme of this kind is undertaken. Technical assistance can then be channelled to communities that are found to be less able to manage their fishery resources. Alternatively, the programme could focus only on villages that offered a high probability of success.

These assessments can take the form of surveys that make it possible to define synoptic indicators of ability to manage reef resources at the local level (Fig. 1). Four synoptic indicators can be developed for this purpose, expressing:

- the value on the world market of marketable fishery commodities; the higher this value, the more the local communities will be approached. For trochus, this value is likely to be at the highest level, presenting a formidable constraint to the establishment of joint management operations;
- the involvement of the national government at the local level, especially in health, education and transport. The lower this level of involvement, the higher the risk that local communities will give way to cash offers for the purchase of fishery commodities as the money thus earned will, to some extent, enable them to offset the lack of government services;
- the social cohesion of the village;
- the authority of traditional leaders.

The latter two indicators both measure the intrinsic ability of the community to withstand external commercial pressures.

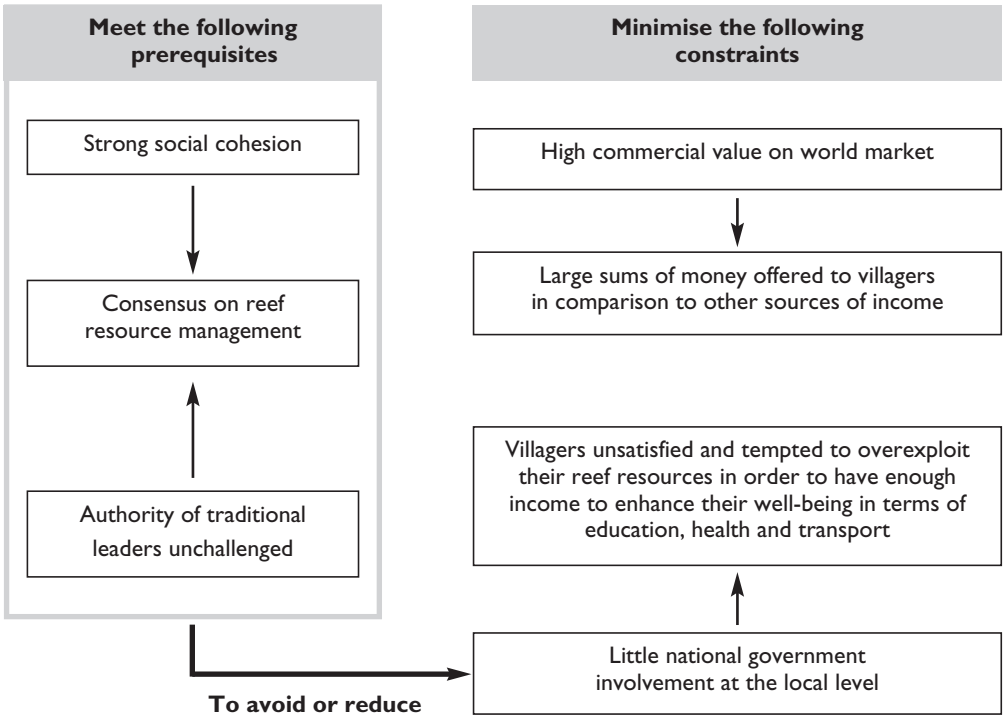

Figure 1. **Conditions required for the sustainable management of reef resources at the village scale**

These indicators can be represented in the form of tables (refer to previous articles) or graphically on four axes presenting two levels of value: low and high. In Figure 2, two maxima are represented: good ability to manage reef resources and poor ability.

Conclusion

Because of the complexity of the reef ecosystem and the associated 'human system', it is difficult to manage fishery resources using conventional rules based on the dynamics of exploited populations and the use of forecasting models. A broader scope is required. The fishery system cannot be considered only in terms of the predator-prey relationship. All the components of the system need to be taken into account, which implies that socio-economic aspects should be dealt with in a more complete and integrated manner rather than simply as non-biological determinants of fishing effort. It should also be recognised that the reasoning of the fishers may vary from that of *Homo oeconomicus*. Coral reefs should be considered as an eco-socio system within which fishing is a major component. Given this background, management of the trochus resource by both the government and local communities within the framework of a co-management system that follows traditional rules for the control of fishing grounds is a worthwhile alternative. However, not all villages have the same ability to succeed using this kind of approach. Fishery services wanting to establish shared management need to have indicators available that enable them to assess the ability of local communities to successfully undertake co-management. The criteria that should be assessed include social cohesion, the authority of local custom chiefs and the involvement of the government in local development.

Generally speaking, sets or control panels of multi-thematic, multi-disciplinary indicators are a worthwhile tool for managing trochus resources. A broad area of research is opening up in this regard. It could ultimately transform the management of fishery resources in the coral environment and elsewhere by offering new concepts and methods.

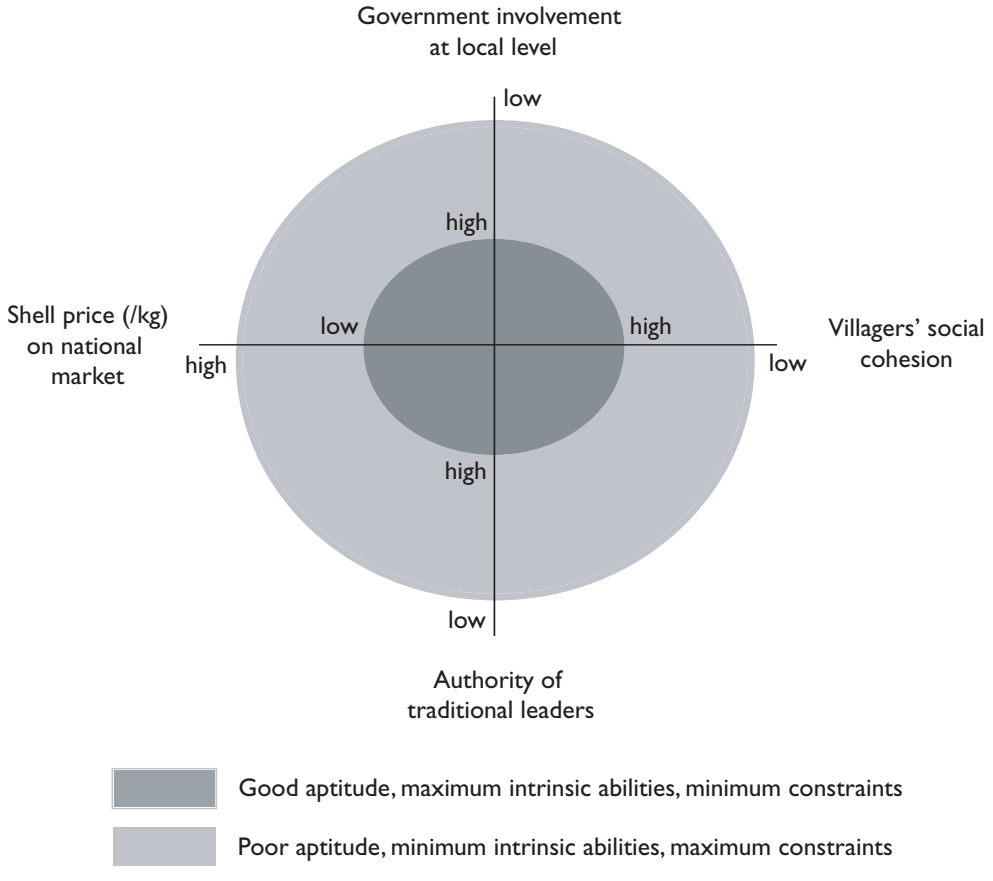

Figure 2. **Indicators of ability to manage reef resources at the local level**

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