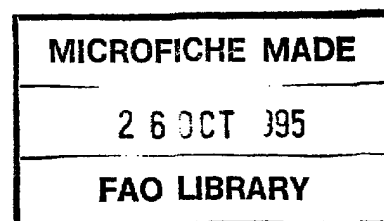
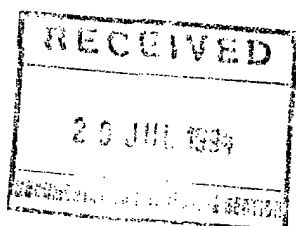


**A GUIDE TO THE LITERATURE ON TRADITIONAL  
COMMUNITY-BASED FISHERY MANAGEMENT IN  
THE ASIA-PACIFIC TROPICS**



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

**A GUIDE TO THE LITERATURE ON TRADITIONAL  
COMMUNITY-BASED FISHERY MANAGEMENT IN  
THE ASIA-PACIFIC TROPICS**

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS  
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## PREPARATION OF THIS CIRCULAR

During the last 15 years there has been a surge of interest in traditional community-based systems of marine resource management. Judging from requests for information and "reading lists", there has also been a noticeable increase in the number of university theses and dissertations on the subject in the Asia-Pacific Region.

It is largely in response to those frequent requests that this guide to *some* of the published and unpublished literature has been written. No pretence is made at completeness; the author has included only some of the materials that he has collected.

Supplementary materials from the Pacific Islands will be published occasionally in the *Information Bulletin of the Special Interest Group on Traditional Resource Management and Knowledge*, of the South Pacific Commission.

Ruddle, K.,  
**A guide to the literature on traditional community-  
based fishery management in the Asia-Pacific tropics.**  
FAO Fisheries Circular. No. 869. Rome, FAO. 1994. 114 p.

### ABSTRACT

This Circular is a guide to the literature on traditional fisheries management systems in the Asia-Pacific tropics. The introductory section discusses the geographical distributions of such systems, their principal characteristics including authority, rights, rules, and monitoring, accountability and enforcement. It notes that information on these systems is fragmentary and much remains anecdotal and unsynthesized. It calls for greater research efforts on these systems and highlights some major research issues including the nature of management boundaries and the traditional ecological knowledge base. The main body of the Circular provides, on a country by country basis, a summary of the present knowledge on traditional management systems of marine and estuarine fisheries in the Asia-Pacific tropics based on the literature available to the author.

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The FAO Fisheries Circular is a vehicle for distribution of short or ephemeral notes, lists, etc., including provisional versions of documents to be issued later in other series.

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## INTRODUCTION: DISTRIBUTION, CHARACTERISTICS AND RESEARCH NEEDS

A scattered and fragmented literature reveals that traditional community-based systems of marine resource management are or were utilized widely throughout the Asia-Pacific Region to manage coastal fisheries. Such systems are particularly widespread in the Pacific Islands. Existing examples in Asia have been documented over a wide yet discontinuous geographical range, extending from Japan to Sri Lanka.

But, for most localities, the tenurial relationship of small-scale fishermen to resource areas and resources is not well known.<sup>1</sup> There are few comprehensive accounts of the structure and functioning of community-based fisheries management systems and their institutional arrangements. The problem is compounded by the fragmentary and commonly anecdotal nature of, and confusion of tenses in, the existing literature, the lack of recent fieldwork in most places, and the rapid decay and disappearance of such systems since Western contact (Ruddle, 1988a). Thus the remaining inshore fisheries management systems are commonly hybrids of traditional and modern components, with the former decaying rapidly (Ruddle and Johannes, 1985; 1990).

Most fishermen in the Asia-Pacific Region, as elsewhere in the tropics, are predominantly part-timers, combining fishing and farming, and other activities. It is typical of this region that land and sea and their associated occupations are seen as economically and nutritionally complementary domains, and not dichotomized along Western lines into "ownable land" and "unownable sea" (Ruddle and Akimichi, 1984a; Ruddle, 1988a).

This is often expressed in the concept of "corporate estate", a territory held jointly by a kinship-based group and embracing a connected range of terrestrial and marine resource zones, which is widespread in the South Pacific (Ruddle and Akimichi, 1984a). Examples include the Hawaiian *ahupua'a* (Meller and Horowitz, 1987), the Yap *tabinau* (Lingenfelter, 1975; Schneider, 1984), the Fijian *vanua* (Ravuvu, 1983), the Marovo (Solomon Islands) *puava* (Hviding, 1990), the Cook Islands *tapere* (Crocombe, 1967), and the estate of the Yolngu aboriginals of North Australia (Davis, 1984; 1985). Such estates provide a collection of rights and implied duties to the social communities (the "corporate group") which possess them (Radcliffe-Brown, 1952). On high islands in the Pacific "estates" are usually wedge-shaped, extending from a central watershed, along lateral ridges into inshore marine waters. These were self-contained units that included a complete set of the resource areas and habitats required to provision the society which inhabited them.

### The Geographical Distribution of Systems

Recent documentation has revealed the widespread existence of often time-honoured, community-based fisheries management systems throughout the world. While the Asia-Pacific Region is especially rich in such systems (Ruddle and Akimichi, 1984b; Ruddle and Johannes, 1985; 1990), they also occur in the Caribbean, South America, Africa, and the Middle East. They are not restricted to developing countries. Similar systems are used by both aboriginal populations and communities of European ancestry in North America, Australia and New Zealand, as well as in several countries of Europe and Japan (Ruddle, 1994).

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<sup>1</sup> Partly this is because only in the last two decades has it been realized that "sea tenure", or the way in which fishermen perceive, define, delimit, "own", and defend their rights to inshore fishing grounds exists at all (Emmerson, 1980; Acheson, 1981; Ruddle and Akimichi, 1984a; Durrenberger and Palsson, 1987).

Although the Asia-Pacific Region is particularly rich in such systems, even there they are far from having been well-documented. They are poorly studied in Asia, and knowledge of systems in the Pacific Basin is patchy.

In both continental and insular Southeast Asia only vestiges of what probably were more widespread systems remain. Conspicuous by their absence are either historical or contemporary reports of systems from continental Southeast and East Asia. Field research and archival study of the records of former colonial administrations is likely to prove profitable in filling these gaps.

There is scant documentation of traditional marine resources management systems in the Philippines, an archipelagic nation with a diversity of cultures and rich local fishing traditions, and where such systems are to be expected. More detailed field research is likely to reveal the widespread existence of traditional community-based systems in the Philippines, since they appear to have been commonplace historically (Ruddle, 1994). Further, although today the coastal or "municipal fisheries" of the Philippines are operated under an open-access regime, several examples of traditional community-based systems of coastal fisheries management have been documented for different parts of the country.

Similarly, contrary to what might be supposed for a massive archipelagic nation like Indonesia, with its diversity of local fisheries traditions, there are surprisingly few documented examples of traditional marine resource management systems in the country (Polunin, 1984; 1986). However, more recent research demonstrates that traditional, community-based fisheries management systems have a long and effective history in many scattered parts of Indonesia, and that in some places they have been implemented in recent decades as fishing developed in hitherto unexploited areas, as occurred on the Indian Ocean coast of East Java (Kendrick, 1993).

In South Asia traditional community-based fisheries management systems have been documented in Bangladesh, India and Sri Lanka. But few in-depth studies have been conducted in the sub-region, and the information available remains fragmentary.

There is little information available on traditional community-based fisheries management systems in Bangladesh. A scattered literature reveals that such systems are widespread in India but, with the exception of Mathew's (1991) study of fisheries management in Pulicat Lake, Tamil Nadu State, most reports are highly fragmentary and do not give a useful picture of management systems. There is a need for basic field research and archival studies to present a fuller picture of the types, structure and functioning of community-based fisheries management systems in India.

Although according to statutory law coastal fisheries in Sri Lanka are managed under open access, in many localities fisheries operate under locally-sanctioned systems of limited entry. A pioneering study on beach seine management was conducted in Sri Lanka by Alexander (1977, 1982), and the community-based management of fixed gear in lagoon and estuarine fisheries has been reported on by Atapattu (1987).

Such systems have been widely, but usually incompletely, described for the Pacific Basin. Traditional management systems have now either completely or largely disappeared from the Commonwealth of the Northern Mariana Islands (Freycinet, 1824; Thompson, 1945; Dugan, 1956; Souder, 1987; Amesbury *et al.*, 1989) and some countries of Micronesia and Polynesia, whereas they remain in many other parts of those same regions.

The continued importance of traditional systems varies considerably in Micronesia. For example, within the Federated States of Micronesia, in Yap State and the outer islands it remains important,

as it does in Chuuk State and the outer islands of Pohnpei State, whereas it has largely disappeared from the main island of Pohnpei and from Kosrae (Foster and Poggie, 1992; Ruddle, 1994). There is little information on the current status of systems in the Marshall Islands. On Nauru it is likely to have disappeared entirely, although in former times there were property rights to inshore waters (Petit-Skinner, 1983). In Palau the traditional community-based marine resource management system has slowly eroded since the Japanese administration formally appropriated the area below the high water mark (Johannes, 1981; 1991; McCutcheon, 1980; 1981).

In Polynesia traditional systems have all but disappeared in the State of Hawaii, U.S.A, and have been severely eroded in American Samoa (Wass, 1982; Johannes, 1988). Elsewhere they remain largely unstudied. In the Kingdom of Tonga they were abolished by Royal Proclamation in 1887 and, although residual notions of village-based rights persist in the outer islands, they have no practical implication these days (Fairbairn, 1992). There is little information available regarding traditional community-based marine resources management on Wallis, and none for Futuna. On Wallis, although in principle family rights extend to the seaward slope of the reef, the lagoon is regarded as being open of access. The only exclusive rights are for the removal of sand, which can be done only in waters fronting the collector's own village. Districts control their own sections of reef, but marine boundaries are weakly defined compared with those on land (Pollock, 1992). Similarly, there is little information available on traditional community-based marine resource management for French Polynesia (Tetiarahi, 1987), or for Tuvalu.<sup>2</sup>

In contrast, traditional systems remain strong in many parts of Micronesia and Polynesia, and especially so in Melanesia. In Kiribati, of Micronesia, there is a rich inshore fisheries tradition and lore that includes detailed local traditional rights and regulations. Many traditional management practices have been codified by island by-laws, and so incorporated into contemporary management (Ruddle, 1994). And in Yap State, of the Federated States of Micronesia, traditional fishing rights are among the most complex in the Pacific Basin (Anon., 1987; Johannes, 1988; Smith, 1991). There the supremacy of traditional rights is enshrined in the State Constitution for 12 miles seaward from an island baseline, "...a line following the seaward edge of the reef system..." (Yap State Code 18:27). Thus traditional leaders theoretically have total control over inshore waters, and the government is limited to intervening only for conservation and protection in the State Fishery Zone (Smith, 1991). In the Cook Islands, Niue, Tokelau, and Western Samoa, of Polynesia, elements of traditional systems have been incorporated into contemporary fisheries management (Ruddle, 1994).

Traditional systems remain extensive and diverse in Melanesia, although little studied. They are best described for Papua New Guinea and Solomon Islands, but have been less studied in New Caledonia (Teulière, 1990; 1991), Fiji (Zann, 1983; Kunatuba, n.d.; Veitayaki, 1990) and Vanuatu.<sup>3</sup>

In New Caledonia elements of the traditional marine resources management system in the Nenema Zone have been described by Teulière (1990, 1991). These are the first studies of local management of marine resources in the country.

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<sup>2</sup> Separate entries have not been included for Nauru, Tuvalu and Wallis and Futuna. Because the early sources of information are the same, a joint entry has been made for American Samoa and Western Samoa.

<sup>3</sup> They have also been well-described for Torres Strait Islands (Johannes and Macfarlane, 1984; 1990; 1991; Neitschmann, 1985; 1989). But because that region is part of Australia, it is not included in the present volume.

Traditional systems of fisheries management in Vanuatu remain to be studied in depth. Brief descriptions have been provided by Taurakoto (1984) and Fairbairn (1990). The situation is similar for Fiji.

In Papua New Guinea most descriptions of traditional systems of fisheries management have been based on brief surveys (e.g., Frielink, 1983a; 1983b; Otto, n.d.; Turner, 1989; Walter *et al.*, 1986). More complete descriptions are available for Ponam Island (Carrier, 1981; Carrier and Carrier, 1989) and the Trobriand Islands (Williamson, 1989; Tom'tavala, 1991).

From a survey conducted in 1985, at 43 locations, the common elements of the customary fishing rights systems in Solomon Islands were synthesized and described by Ruttlely (1987). Despite the many weaknesses in the design and conduct of the survey, and the resultant information gaps, the information generated provides a general overview of the main characteristics of traditional community-based fishery management systems in Solomon Islands. However, because of the highly complex cultural variations in the country the survey results provide only superficial information. To be of any practical usefulness, they require supplementing by in-depth, society-specific field research, such as that conducted in Marovo Lagoon, Western Province (Hviding, 1990), or the Lau and Langalanga lagoons of Malaita Province (Akimichi, 1978).

Thus there is a need for basic field research and archival studies to present a fuller contemporary and historical picture of the types, structure and functioning of community-based fisheries management systems throughout the Asia-Pacific Region.

### **The Principal Organizational Characteristics of Traditional Community-based Fisheries Management Systems**

It is evident, then, that in many parts of the Asia-Pacific Region coastal fisheries are or were managed traditionally by community-based systems of property rights and associated regimes of rights and rules that closely reflect social organization and local power structure. Such systems seem not to have been based principally on ecological conditions, which would be the case were their primary purpose resource conservation. Rather, as would be expected, since property is a social relationship that defines its holder's security of claim to a resource or to the services or benefits it provides, they reflect a correlation among property, property rights, and social organization (Ruddle, 1988b). Management systems in the aquatic domain often, but not always, mirror those on land.

In these traditional community-based systems of marine resource management an individual's sea rights depend on his or her social status within a corporate community, which ranges from villages through clans, sub-clans, and lineages, to the family. Resource territories and user groups are defined. Resource use is governed by rules and controlled by traditional authorities who mete-out sanctions and punishments for infringement of regulations. Conservation for sustainable resource use is a widespread objective of these systems (Ruddle, 1988a).<sup>4</sup>

#### **I: AUTHORITY**

In traditional community-based marine resource management systems, resource control and management is usually vested in traditional authority, the nature of which varies according to social organization. Four principal types can be recognized: traditional secular leaders, traditional religious

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<sup>4</sup> For a fuller treatment see Ruddle (1994).



leaders, specialists, and rights-owners. These categories frequently overlap, and responsibility is divided and shared.

*(a) Secular Leaders*

In many societies a group of traditional leaders or an organization, usually some kind of "village council", manages marine resources by regulating the use of community sea space and protecting resources against over-exploitation. However, in many Pacific Islands, in particular, land and sea is disposed of by a chief, who exercises his authority on behalf of the entire community.

*(b) Religious Leaders*

The role of religious leaders in traditional resource management is widespread in the Asia-Pacific Region. These can be both traditional religious leaders, as in Indonesia and in parts of the Pacific Basin, or members of a formally organized church, as in Sri Lanka.

*(c) Specialists*

Commonly, marine resources are managed by fisheries specialists, who function under some form of higher authority. Such "master fishermen" are particularly common in Pacific Island societies.

*(d) Rights-Holders*

Rights-holders themselves commonly have management authority over marine resources. Frequently, this level of authority is vested in the senior person of a lineage, family, or other small social group.

## II: RIGHTS

Under traditional community-based systems marine resource exploitation is governed by use rights to a property. A property right is a claim, consciously protected by customary law and practice, to a resource and/or the services or benefits that derive from it. Such a grant of authority defines the uses legitimately viewed as exclusive, as well as the penalties for violating those rights. The characteristics of property rights may vary situationally. Common characteristics are exclusivity, the right to determine who can use a fishing ground, transferability, the right to sell, lease, or bequeath the rights, and enforcement, the right to apprehend and penalize violators of the rights. The right of enforcement, and in particular that to exclude the free-riding outsider, is a key characteristic, for without it all other rights are diminished either actually or potentially.

Almost universal throughout the Asia-Pacific Region is the principle that members of fishing communities have primary resource rights by virtue of their status as members of a social group. Such rights to exploit fisheries are subject to various degrees of exclusiveness, which depends on community social organization and local culture. Most commonly, traditional fisheries rights apply to areas, but superimposed on these may be claims held by individuals or groups to a particular species or to a specific fishing technology.

Traditional rights to marine resources may be exclusive, primary, or secondary, and may be further classified into rights of occupation and use.<sup>5</sup> The relationship between the two main types, primary and secondary, is an important and complex characteristic of many traditional management systems, in which overlapping and detailed regulations on the use of technologies and particular species are widespread. Individual rights as sub-divisions "nested within" corporate marine holdings occur widely throughout the Asia-Pacific Region. Rights of transfer and loan and shared property rights also occur.

(1) *Exclusive Rights*

Exclusive rights have been handed on from generation to generation through ancestral families, spirits or gods, and are validated by historical-mythological associations. In the Pacific Islands myths, legends and oral history make frequent reference to islanders' exclusive rights to their islands' resources (Pulea, 1985). Subsequently, fishing rights in defined territories have been defined by customary law.

(2) *Primary Rights*

Most commonly these are rights to which a group or an individual is entitled via inheritance (*i.e.*, a birthright), by direct descent from the core of a descent-based corporate group. Primary rights are generally comprehensive, since only they confer access to all resources within a defined territory. Inheritance, ancestral interests, social obligations, and cooperative relationships within a social group provide continuity of ownership and rights.

(3) *Secondary Rights*

Secondary rights are more limited than primary rights, often being restricted to specific fishing methods. They are acquired through affiliation with a corporate group, by marriage, traditional purchase, exchange, as a gift, or as reciprocity for services. Sometimes they may be inherited. Secondary rights are often given to residents of inland villages lacking direct access to the coast, particularly when such villages have historical and kinship ties with a coastal village.

*Systems with "Nested Rights"*

In some societies rights to fisheries, which are usually to areas, are overlain by other rights, generally those to species and those to gear types. Most are quite simple, like those to locations with stone fish traps.

One complex and unusual case of such rights is that of Ponam Island, Manus Province, Papua New Guinea, where the system of rights is composed of three main independent and overlapping elements: (1) ownership of reef and inshore marine waters; (2) ownership of species; and (3) ownership of fishing techniques (Carrier, 1981; Carrier and Carrier, 1989). There, owners of sea and reef areas do not have exclusive ownership of their tenured waters, owing to strict limits set by these countervailing, nested rights.

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<sup>5</sup> Such traditional rights are better defined as those to use rather than to own. Further, rights to use can be exclusive, since they can imply primary rights-holders may have a subsidiary right to prevent others from using certain resources within the area over which traditional control is exerted (Pulea, 1985).

### *The Right of Transfer and Loan*

Some traditional management systems permit the permanent, temporary, or occasional transfer of rights to other social units. Often, temporary and occasional transfer requires users to compensate rights-owners in cash or, more commonly, in kind, usually with a portion of the catch. In other societies, however, individual fishermen are proscribed by either statutory or customary law from transferring their rights.

### *Shared Rights*

In some parts of the Asia-Pacific Region areal rights are shared between or among different corporate communities. Commonly shared rights have deep historical roots, and invariably sharing is done only for the most productive waters or where kinship ties are strong.

## III: RULES

Rules give substance and structure to property rights by defining how a right is to be exercised, through specification of required, permitted and forbidden acts in exercising the authority provided by the right. Thus, whereas a right authorizes a fisherman to work a specific fishing ground, his options in exercising it are governed by rules which may, for example, specify gear type used or seasonal restrictions, among other limitations. The more complete a set of rights, the less exposed are fishermen to the actions of others.

Basic rules define the geographical areas to which rights are applied, define those persons eligible to fish within a community's sea space, and govern access of outsiders. Operational rules govern fishing behaviour, gear externalities, assignment issues, as well as specify unacceptable fishing behaviour, conservation practises, and distribution of the catch within the community.

### *(1) The Definition of Fishing Territories*

In the Asia-Pacific Region the sea territory of a social group is commonly, but not always, defined by proximity or adjacency to its settlement(s), and by lateral and seawards boundaries. As a general principle, the exclusive fishing territory of a community is in the adjacent marine waters, within the reef. But this varies considerably according to both local history and the more recent processes of national modernization.

In most places communities maintain exclusive rights to all known adjacent submerged reefs, which are named and owned exclusively by particular families, clans, municipalities, islands, groups of islands or atolls, as the local social organization dictates. Seawards of the reefs the degree of exclusiveness of rights gradually declines.

### *(2) Eligibility Rules*

In addition to holding rights, in many societies the persons who can actually engage in fishing are limited by community-based, national or cultural rules. Whereas in a great many societies in the Asia-Pacific Region membership of a corporate descent group, and thus inheritance, and/or residence are the only rules that must be satisfied in order to become a fisherman, in others further preconditions must be met. Such eligibility rules include caste membership, gender and skill level, among others.

### *(3) Inter-Community Access Rules*

Access controls are applied to outsiders; people from other social groups. There is often boundary permeability between neighbouring groups, a consequence of long friendship, kinship or other close association. Boundaries are less permeable the more distant the "outsider" group is either socially or geographically. But increased commercial resource use often leads to strong access controls, even on close neighbours.

Throughout the Asia-Pacific Region, the rights of outsider fishermen are usually closely specified by rules defining access conditions. However, there is considerable variation in local details. Invariably, such rules require that prior permission be obtained before commencing fishing. Failure to do so is usually regarded as trespass, the penalties for which can be severe. Commonly, rules specify that some form of fee, compensation or royalty be paid once permission has been granted.

In some cases outsiders seeking fish for subsistence are allowed free access, whereas commercial fishermen might be granted access on payment of cash or kind, or prohibited entirely. Almost universally, commercialization and commoditization results in a demand for fees or prohibition, even when the target species has not traditionally been harvested by the "host" community. Species restrictions are sometimes placed on outsiders.

### *(4) Use Behaviour Rules*

#### *(a) Gear Rules*

Gear rules are widespread in the Asia-Pacific Region. Gear perceived of as either deleterious to fish stocks or habitats is widely prohibited. Similarly, generally in the interests of equity, gear regarded as being too efficient or of exacerbating socio-economic cleavages within a community is also often banned. Many gear rules are established to prevent gear externalities.

#### *(b) Temporal Allocation Rules*

In many places rules are enforced to promote both orderly and equitable fishing. Frequently, such rules limit the number of canoes in a line, and ensure that the position of canoes is changed in a specific order, so all fishermen can share equally in the best spots. Lottery systems for allocating space-time among fishing groups are widespread, especially in South Asia.

#### *(c) Fishing Behaviour Rules*

Almost universal are local rules aimed at promoting orderly fishing as well as protecting fish schools. Such rules are detailed and usually locally specific. Examples include the ban on individual fishing with flares, in favour of group efforts, acceptable levels of noise, and the way in which boats and gear must be handled so as not to disturb schooling fish.

#### *(d) Species Rules*

Rules are common regarding the harvest of certain species. Widespread, for example, is that turtles are reserved for higher ranking persons, such as chiefs in the Pacific Islands. Other rules forbid the harvesting of totemic and sacred species.

(5) *Conservation Rules*

The conservation intent within traditional community-based marine resource management systems is controversial (Ruddle, 1994). It is important, therefore, not to assume *a priori* that traditional management systems are intentionally conservationist. Rather, local rationale and possible conservational functions must be examined for in each case.

If community-based traditional marine resource management systems were originally designed as a conservation measure, admittedly an unprovable assumption in most places, they would have been the most widespread conservation measure employed throughout the Pacific Basin. Widespread in the Asia-Pacific Region is the use of "closed seasons" that follow local knowledge about the spawning periods of key fish species and prohibit their capture during such periods, together with other types of customary fishing regulations, often based a non-ecological rationale such as religious taboos, that appear to have similar conservational implications (Johannes, 1978).

Such practises are not static. And some of the new regulations that village communities devise to cope with changing technology and fishing practises are explicitly conservationist.

A wide range of conservation rules was traditionally employed by many communities in the Asia-Pacific Region, and especially in Oceania (Johannes, 1978; 1981; 1982), to ensure sustained yields. Some were clearly designed to conserve stocks, whereas others also functioned coincidentally as conservation devices. Among these were the live storage or freeing of surplus fish caught during spawning migrations; the use of closed seasons (particularly during spawning); the placing of taboos on fishing areas; the reservation of particular areas for fishing during bad weather; size restrictions (although this was uncommon in Oceania); and, in recent times, gear restrictions (Johannes, 1978).

(6) *Distribution of Catch Rules*

Rules defining access to harvested fish are widespread in the Asia-Pacific Region. These are an extremely important set of rules in many societies since, in terms of equity within a community, access to fish once harvested can be as or more important than access to fishing grounds (Collier *et al.*, 1979; Kendrick 1993). Such rules include those to provision the family and community, those required as subsequent and continual repayment for the acquisition of fishing rights, and those enmeshed in general community sharing and reciprocity and related norms concerning equity and fairness (Ruddle, 1994).

#### IV: MONITORING, ACCOUNTABILITY AND ENFORCEMENT

If rights are to be meaningful, provision must be made within the system for monitoring compliance with rules and imposing sanctions on violators. Under community-based marine resource management systems in the Asia-Pacific Region, monitoring and enforcement are generally undertaken within the local community; resource users policing themselves, and being observed by all others as they do so.

For a variety of reasons, traditional authorities frequently imposed temporary or permanent bans, as well as spatial, temporal, gear, or species restrictions on the exploitation of marine resources. These commonly took the form of taboos.

## V: SANCTIONS

Sanctions were widely invoked throughout the Asia-Pacific Region for the infringement of fisheries rights and the breaking or ignoring of locally-formulated rules governing fishing and other marine resources uses. Four principal types of sanctions were widely invoked; social, economic, physical punishment, and supernatural.

### *(a) Social Sanctions*

This category includes ridicule, shaming, ostracism, and banishment. Ridicule was widely used in Polynesian societies.

### *(b) Economic Sanctions*

This category includes monetary and in-kind fines, destruction of gear and forced labour, among others.

### *(c) Physical Punishment*

Physical punishment, including death, was a not uncommon penalty in the region, and especially throughout Oceania, for the violation of rules.

### *(d) Supernatural Sanctions*

These are all-pervasive throughout the Region, and fear of them reinforces the other types of sanction.

## Major Research Issues for the Asia-Pacific Region

Most information on community-based marine resources management systems in the Asia-Pacific Region remains largely anecdotal and unsynthesized. No nation has a comprehensive knowledge base on the range of types, functions and statuses of its systems. Equally lacking are the essential complementary and systemic data sets on basic ecological, biological, general fisheries, and socio-economic settings in which such management systems are embedded.

Further, most of the fragmented and *ad hoc* information available is dated to the point of little more than historical utility by the rapid changes at national and local levels as a result of modernization. Thus detailed, systemic, location-specific, contemporary studies of community-based marine resource management systems and of their socio-economic, political, ecological contexts are indispensable, as is verification of recently completed research.

Although more is known about such systems in the Pacific Basin than other regions, there are still major knowledge gaps within the Region. The principal ones are:-

- (i) in Micronesia and Polynesia more needs to be learned about the current status of traditional community-based management systems throughout the entire area. But information is needed especially for American and Western Samoa, Chuuk, Kosrae and the outer Caroline Islands of the Federated States of Micronesia, the Marshall Islands, French Polynesia, Tuvalu, and Wallis and Futuna; and

- (ii) much more needs to be known about the vast range of systems in Melanesia, only a few of which have been studied, and then mostly just by reconnaissance surveys. In particular, systems in Fiji, Irian Jaya Province of Indonesia, New Caledonia, and Vanuatu are in particularly urgent need of basic description, since almost nothing is known about them. Further surveys, accompanied by in-depth field studies, are required to expand the information available for Papua New Guinea and Solomon Islands.

In Asia there is a pressing need for archival and field study of countries where there is little known at all. This means *all* of continental Southeast Asia: Burma (Myanmar), Cambodia, Malaysia, Thailand, and Vietnam. Even in countries where, according to statutory law, coastal fisheries are under open access, community-based informal institutions often exist to regulate access either to the sea or to the harvest when landed, as in Java, Indonesia (Collier *et al.* 1979; Kendrick 1993).

In insular Southeast Asia virtually nothing is known about systems in East Malaysia (Sabah and Sarawak), and much more needs to be known about those in the Philippines. There are major information gaps for much of Indonesia, especially Irian Jaya and Maluku.

Much more information is required for all of South Asia. In that sub-region information is virtually non-existent for Bangladesh, scattered and very incomplete for India, and fragmented and mostly out-dated for Sri Lanka.

#### (1) *Research on Fisheries Resource Systems*

Since systems specifically designed to manage coastal resources cannot be separated from the socio-cultural and ecological systems in which they are embedded, information is required on at least the following major parameters of the larger system (Ruddle, 1994):

- (i) the ecological structure of the system, and the basic aspects of the biology and productivity of the relevant living components;
- (ii) the principal socio-cultural characteristics of the fishing community, by gender and age, including:
  - (a) demographic characteristics;
  - (b) socio-cultural factors (religion, ethnicity, social structure, caste, degree of social, economic, occupational, and cultural homogeneity);
  - (c) occupational and geographical mobility;
  - (d) attitudes (risk, time horizon, interdependency, and cooperation);
  - (e) economic activities of households (ownership of productive assets, economic role of fishing, other economic activities);
  - (f) geographical location (residential proximity to the fishery);
  - (g) community size and number of fishers by gender and age; and
  - (i) history of non-traditional organization/ cooperative behaviour (type, formal/informal, purpose, structure, membership, and outcomes).
- (iii) the energy flow through the system linking the human community with its natural resource base; and
- (iv) the estimation of the multi-species harvest productivity, definition of surpluses that may be available after local needs have been satisfied, and product distribution and/or marketing systems.

## *(2) The Nature and Management Characteristics of Traditional Fishery Resource Territories*

Given the worldwide phenomenon of the impingement of externally controlled, commercial and large-scale fisheries on inshore waters hitherto controlled locally by traditional, small-scale fishing communities, and an increasingly frequent official realization of the need to counteract this tendency, a critical area for research is the nature and characteristics of the boundaries of traditional fishery resource territories, and the rights, rules, authority structure, and enforcement associated with them. There is, thus, a particularly important need to identify and define traditional marine resource boundaries, in order to provide an effective legal basis for traditional activities while accommodating compatible development in fisheries and other sectors of the economy (Ruddle and Johannes, 1985; Ruddle, 1988b).

"Traditional" boundaries should be recorded precisely. This has more practical than academic urgency, because, when a resource becomes commercially valuable, fishing communities will quickly invent "traditional" fishing rights and boundaries to ensure that they obtain the most benefit.<sup>6</sup>

To facilitate abstraction of comparative data on an areal basis from secondary sources, these research needs have been posed here as related sets of questions (Ruddle, 1988b).

### *(a) On the Nature of Boundaries*

- What indications are there that traditional marine boundaries exist (existed)?
- What are (were) the purposes of these boundaries (*e.g.*, to protect resources, to allocate resources, to manage disputes, to demonstrate group identity, etc.,)?
- How are (were) such boundaries defined traditionally, and how did they evolve?
- What criteria are (were) used to locate boundaries (*e.g.*, depth contours, prominent landmarks, "seamarks", seaward extension of land boundaries)?
- What is (was) the seaward extent of the boundaries, and how are (were) they fixed?
- Are (were) the boundaries claimed by one community recognized by other groups in the locality?

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<sup>6</sup> It is very important to note that what is often labelled "traditional" may not be especially old-established. Here I use the term "traditional" self-referentially, and not to connote something necessarily deeply embedded in any local history. Present-day "traditional management" mostly will have little in common with that of the past; even where original principles still apply, demographic dynamics have changed, and even more so the socio-economic context in which management systems exist. The implications that today's tradition (custom) is "... substantially the same as ancient custom, or that even if it were it would have some special legitimacy, is false and misleading. The belief, however, is widespread and needs to be understood, and countered as far as possible" (Crocombe 1989:21). However, tradition is far from irrelevant; simply, its nature and content are always changing. It should be understood that "Custom is a practise rather than a principle. That is, custom is what people usually do. As behaviour changes, custom changes, as custom is the pattern of behaviour" (Crocombe 1989:23). Thus when custom becomes codified into statutory law it is, by definition, relocated from the realm of custom into that of law.



- Have traditional boundaries changed according to changed needs, altered perceptions of the resources contained, geomorphological changes, usurpation, etc?
- Do (did) internal sub-divisions exist nested within the outer boundaries (*i.e.*, are [were] there territories within territories)? (If so, repeat the above questions for each sub-division.)

*(b) On the Resources and Habitats Contained within Traditional Boundaries*

- What is (has been) the traditional significance of the contained resources to the community claiming the territory?
- What is (has been) the significance of contained resources to outsiders?
- What is (was) the nature of the rights to resources within the bounded area?
- Can (could) traditional rights be transferred? If so, under what conditions, how and to whom? If not, why not?
- What is (was) the relationship between resource territories and the associated rights defined by traditional or customary law, and those defined by statutory law (also see below, Section 5)?
- What rules govern(ed) those rights?

*(c) On the Permeability of Boundaries*

- How permeable are (were) traditional rights boundaries?
- Can (could) outsiders exploit marine resources in the area? If so, under what conditions (*e.g.*, compensation, fee, reciprocity) and with what limitations (*e.g.*, gear type, species, seasonality, kinship, etc.)? If not, why not?
- Is (was) provision made for innocent passage through the territory? Are (were) any conditions imposed?
- To what extent are (were) provisions made for adjustments to access owing to physical (*e.g.*, geomorphological), legal, social, economic, or other kind of change?

*(d) On the Nature of Boundary and Resource Control*

- What is (was) the power structure and system of social control governing resource use?
- What is (was) the source of traditional authority governing resource use within the bounded area(s)?
- What are (were) the community-based institutions of management and how do (did) they function?
- What are (were) the mechanisms for enforcing the observation of rights and the integrity of the bounded area?

- What are (were) the methods of managing and resolving disputes over rights and boundaries, both among community members, and between the community and outsiders, and how effective are (were) these methods?
- What are (were) the provisions, if any, for compensation where boundaries or rights were transgressed, both by community members and outsiders?

*(e) On the Adaptation of Boundaries and Rights*

- How robust is (was) the system in its present (past) cultural context?
- In terms of robustness, have (did) traditional boundaries changed (change) according to changed needs, altered perceptions of the resources contained, geomorphological changes, usurpation, etc, and to what extent are provisions made for adjustments to access owing to physical (e.g., geomorphological) change?
- How robust is (was) the traditional system in relation to commercial and/or cultural intrusions?

*(3) The Traditional Ecological Knowledge Base Supporting Systems*

The local cultural and social "roots" underlying traditional marine resource management systems must be thoroughly examined, and in particular the traditional knowledge base that links a system to its cultural context. Traditional knowledge and information transfer techniques of coastal-marine resources must be documented and analyzed, parallel with documentation of the related resource system (Ruddle, 1993a; 1993b; 1994).

*(4) Linking Traditional Systems with Commercial-Industrial Systems*

- What are the cash flows within the system and what is its cash-absorption capacity?;
- What are the relative advantages and opportunity costs of self-sufficiency as economically and ecologically appropriate strategies within a community?;
- Can excess productivity and specific commodities produced by the traditional sector be used to fulfil national needs for rent and national and/or international market demand?;
- Can the negative impacts of a cash economy on exploitation of resources controlled by traditional societies be mitigated? (As commercialization and commoditization inevitably develops and puts pressures on systems, local marketing arrangements must be included within the management design to ensure community benefits continue to flow, and that local or other elites do not emerge to capture and individualize the flow of benefits from the system);
- What useful links can be made between the traditional system and the development of appropriate technologies and institutions? and
- Do complementarities exist between given traditional fishery systems and national coastal resource development priorities?

(5) *The Legal Support of Management Systems*

That "tradition" is dynamic is demonstrated by traditional resource management systems that are uncodified and so can respond flexibly to change. Research is required on the nature of this adaptive flexibility of traditional management systems and their resilience when confronted by internal and external forces. Applied research should concentrate on the adaptive dynamics and resilience of systems, and emphasise the outcomes of processes where they interact with larger political and economic systems.

- First, the nature of the relationships between resource territories and the associated rights defined by customary law and those defined by statutory law must be clarified. In particular, it is important to understand what are (were) the consequences of local boundary formalization by statutory law (*e.g.*, legal definition and recognition).
- A much better distillation of the principles of the legal and institutional design of systems is required. A study is required of national fisheries legislation and its advantages or disadvantages as perceived both by fishermen and marine resource managers. This is important, since legislation introduced to protect community-based management systems could "fossilize" them by reducing or eliminating their adaptive flexibility. Formerly, many systems seem to have been able to adjust to changes in demographic, economic or ecological conditions. But these conditions are now changing at accelerating rates so that, to remain useful, the systems must adapt even more rapidly. Legislation that dilutes or removes this capacity is counter-productive.
- It is extremely important to document local systems of customary law that underpin and validate various types of management systems in the Asia-Pacific Region. In particular, it is important to examine the problems of implementation, monitoring, surveillance, and enforcement.
- In many places, legal issues are among the principal constraints on the viability or future usefulness of traditional marine management systems. Thus, if the contemporary usefulness of such systems has been formally recognized by government, they will require support by appropriate amendments to national fisheries laws, and lower order governments, such as provinces/states, with explicit and easily-understood recognition of customary law and community-based management rights as local corporate entities, accompanied by procedures for establishing the recognition of these rights. Other laws will probably require amending to recognize the authority of local legislative institutions, and so further validate the authority of (or to re-establish) traditional management systems (Bailey and Zerner, 1992). This is a very fruitful area for basic and applied research, both in policy design and research.

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