



Inshore Fisheries Research Project
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WORKSHOP ON PEOPLE, SOCIETY
AND PACIFIC ISLANDS FISHERIES
DEVELOPMENT AND MANAGEMENT:
SELECTED PAPERS



SOUTH PACIFIC COMMISSION

**WORKSHOP ON PEOPLE, SOCIETY AND PACIFIC ISLANDS FISHERIES
DEVELOPMENT AND MANAGEMENT: SELECTED PAPERS
(August 1991, Noumea, New Caledonia)**

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INTRODUCTION

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Workshop background

Fishery and fishery-related activities throughout the world are carried out by members of communities that frequently have a long, sometimes pre-historical association with the resources they exploit. This is particularly true in the Pacific Islands, where the exploitation of marine resources is interwoven with aspects of local culture, tradition and knowledge that vary greatly from place to place. Frequent characteristics of the social systems that underlie fishing activities in the Pacific include: marine tenure systems; differential access to resources by different social groups (clans, tribes or villages) or by members of social groups (men and women, members of different lineages); practices that preclude the exploitation of certain areas (taboos, seasonal closures); and practices that discourage the exploitation, consumption or commercial use of given species or products.

The development of fisheries in the Pacific Islands is seen as a means to provide social, economic and cultural benefits to individuals, communities, societies and nations. In order to achieve these benefits, the governments of Pacific Island countries, with extensive support from aid agencies, international organisations and other benevolent bodies, each year make a considerable financial commitment to promoting fisheries development in a variety of forms.

Despite these commitments, small-scale fisheries development projects in the Pacific Islands have a high failure rate and only occasionally meet with long-term success. In particular, economic development projects intended to generate income-earning opportunities at the village level have a history of falling when the initiators of the project depart and activities are left solely in the hands of the supposed beneficiaries.

In many cases the failure of small-scale fisheries development projects has been attributed to a failure to take into account prevailing social circumstances and to implement development activities in a way that reinforces the goals and aspirations of the community that should draw benefit from the project. In fact, conflicts frequently arise between the project executors and the supposed beneficiaries because of differing cultural values regarding marine tenure and resource ownership.

The management of inshore fisheries is also assuming a growing importance, and receiving more attention in the region, as commercial exploitation, or increased fishing pressure resulting from concentrations of population,

becomes more widespread. Advising and recommending on fishery management requirements and approaches is the responsibility of national government fisheries departments or equivalent agencies. However, fishery legislation and regulations intended to conserve fisheries are often inconsistent with already-established approaches to resource use and conservation. As a result, they may be ignored by fishermen, and, for various reasons, are often difficult or impossible for the government to police and enforce.

As is the case with fisheries development projects, the non-adoption by local communities of the conservation approaches that government tries to impose often reflects the fact that they contradict local perceptions of resource management needs and the procedures that are appropriate to meet those needs.

From the foregoing, there appears to be a need to:

- exchange country experiences in the gathering and application of social information, and the successes, failures or conflicts that have resulted from applying or not applying this information;
- define the social and cultural considerations that need to be taken into account in devising and implementing fisheries development activities and management measures;
- establish guidelines for reducing the likelihood of failure or conflict in fisheries development and management activities by incorporating existing social and traditional value systems;
- identify appropriate action that national and international bodies can take to improve the success rate of fisheries development and management activities.

In response to these needs, the South Pacific Commission organised a one-day workshop on *People, Society, and Pacific Islands Fisheries Development and Management* as part of the 23rd SPC Regional Technical Meeting on Fisheries (RTMF), held in Noumea in August 1991. The purpose of the workshop was to promote in-depth discussion of the social context in which fisheries development and management are taking place in the region, and thereby provide senior personnel involved in the development and management of Pacific Island

fisheries with information and ideas that would assist them in promoting the rational exploitation of their marine resources.

Agenda and presentations

The workshop took place as a special, one-day non-plenary session of the 23rd RTMF. Participants included senior Pacific Island fisheries officials, observers from technical and development assistance agencies, and resource persons and participants specially invited because of their relevant expertise. SPC financing for the workshop was supplemented by generous financial support from the Canadian International Centre for Ocean Development, as well as by contributions from the Forum Fisheries Agency, the FAO Regional Fishery Support Project, and the South Pacific Regional Environment Programme. This strong level of support enabled a high level of participation in the workshop: 68 delegates attended, in addition to 12 staff of the SPC Marine Resources Programme.

The workshop agenda was structured as follows:

- Introduction, workshop aims and outline;
- Traditional systems of resource management and control in the 20th century: case studies worldwide;
- An overview of customary systems of marine resource management in Oceania, and ways in which these can be put to use in today's fisheries management context;
- Applying traditional knowledge of marine resources to their management;
- Developing a resource management system in Palau;
- Traditional knowledge and management of marine resources in Tokelau;
- Fisheries development in Papua New Guinea: involving the people;
- Conflict resolution in the development of the Cook Islands pearl industry;
- Other country interventions;
- Improving opportunities for women to participate in the development process;
- Fisheries as a part of integrated rural development;
- The role of extension and communication skills in fisheries development;

- Future needs in research on, and application of, traditional and social systems and knowledge in the Pacific;
- Recommendations for action in this area by national and international agencies.

Each agenda item was supported by presentations, from resource persons, participants or SPC staff, and each presentation generated considerable discussion and, in some cases, controversy. Many of the presentations were of a high quality and have been included in the present volume, along with some papers that were submitted to the workshop but not presented because of lack of time or absence of the authors.

Discussions and recommendations

Workshop participants emphasised the great diversity of traditional fisheries management practices and associated knowledge across the Pacific Islands and concluded that most SPC member countries would benefit from comparative studies of these practices and this knowledge. They recommended that Pacific Island countries actively work towards sharing information on these subjects within and beyond the region, and felt that SPC would be an appropriate vehicle for the dissemination of information on these topics.

The growing problems of reconciling customary law and western law were repeatedly raised. The workshop pointed out the need for a survey and review of available information on the various approaches taken by traditional cultures to the integration of western laws and traditional customs.

Some larger Pacific Island nations contain many customary marine tenure systems, about which little is known. The structures and operations of such systems vary greatly within these countries. Rapid surveys of these systems are needed, to determine which among them most need further more detailed studies to facilitate their continued effective functioning.

Pacific Islanders' knowledge of their marine environment (including such phenomena as seasonal, lunar and tide-related migrations and spawning aggregations of various food fishes) can be of exceptional value to government resource managers. This information is no longer always being transmitted effectively from generation to generation in the region. The workshop strongly supported research efforts to record traditional marine environmental knowledge, and, where practical, put it to increased use in government marine resource management.

Community-based customary marine tenure and associated traditional management systems are facing a number of

widespread modern pressures. The workshop strongly supported research on how traditional marine resource management systems respond to such pressures as major demographic changes, commercialisation of marine resources, aquaculture and marine resource enhancement, other coastal developments (including tourism), government marine resource management and enforcement programmes, and to the wider issues of integrated rural development and gender-specific roles in fisheries.

The meeting formulated two specific recommendations to SPC for action in these areas, as follows:

The workshop recommended that the Inshore Fisheries Research Project (IFRP) set up a Special Interest Group on traditional marine resource management and knowledge in the SPC region to provide a focus for collection, discussion and dissemination of information on these subjects.

The workshop also recommended that the IFRP assist, in consultation with member countries and, where appropriate, in collaboration with other regional organisations, in the design and use of customary marine tenure questionnaires building on the experience of Solomon Islands in their survey of 43 customary marine tenure systems in that country.

These recommendations were presented to the plenary session of the RTMF and, after further discussion, adopted. They were transmitted to the SPC Committee of Representatives of Governments and Administrations, where they were endorsed for approval by the South Pacific Conference. This approval was granted in October 1991, at which time the recommendations became formal instructions to the Commission.

Follow-up activities

Subsequent to the integration of the workshop recommendations into the SPC work programme, the Coastal Fisheries Programme has been active in their implementation. The Special Interest Group referred to in recommendation 1 has been established, and now has a membership of about 160 subscribers. The first two information Bulletins of the group, prepared under the editorial supervision of Dr Ken Ruddle, have been circulated and a third issue is now in preparation.

As regards the second recommendation, the IFRP has obtained and circulated copies of the Solomon Islands questionnaire, plus the report of the survey which contains an analysis of the results obtained. The report in question is an FAO document (from the Fisheries Law Advisory Programme, Western Pacific and South China Sea Region: FL/WPSCS/87/16) entitled *Analysis of replies to a questionnaire on customary fishing rights in Solomon Islands* by Hilary Lewis Ruttley. Further work in response

to this recommendation will depend on the Commission receiving requests for assistance in this field from member countries.

The workshop clearly met its aim of stimulating more direct interest in the topic areas covered. As a follow-up, the Forum Fisheries Agency (FFA) organised a related workshop as part of the FFA Technical Sub-Committee meeting in Niue in 1992. This workshop dealt with legal issues relating to the incorporation of aspects of customary marine tenure into national legal systems dealing with marine resource use and management. It is also possible to observe a growing interest in documenting information on customary systems and knowledge throughout the countries of the region.

Maintenance of the Special Interest Group and regular publication of the bi-annual Information Bulletins will help to ensure that this topic continues to receive a high profile. The Commission will also increase its efforts to 'mainstream' the social and socio-economic aspects of small-scale fisheries by ensuring that these are regularly addressed within its own sectoral fisheries development work, and, where possible, that of SPC member countries.

Conclusion and acknowledgements

The workshop achieved its aim of increasing the profile of socio-economic aspects of fisheries development in the minds of fisheries staff of national and regional fisheries development agencies. The publication of the present proceedings will allow further dissemination of the information presented during the meeting.

The workshop also led to a formal commitment on the part of SPC to support the gathering of social and socio-economic information on fisheries, and its application to the process of fisheries development. The establishment of a Special Interest Group on Traditional Marine Resource Management and Knowledge, and the associated regular publication of an Information Bulletin on this topic, will ensure continuing attention to and awareness of the subject field on the part of fisheries officers and other research and development workers in the region.

The South Pacific Commission gratefully acknowledges the generous support received for the workshop from the Canadian International Centre for Ocean Development, the Forum Fisheries Agency, the Food and Agriculture Organization of the United Nations, and the South Pacific Regional Environment Programme. The Commission also thanks the numerous workshop participants and observers whose presentations and discussions made it such a success.

THE VALUE TODAY OF TRADITIONAL MANAGEMENT AND KNOWLEDGE OF COASTAL MARINE RESOURCES IN OCEANIA

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Introduction

Recent studies reveal that many coastal fishing societies possess systems of customary marine tenure, or CMT¹ (sometimes referred to as traditional fishing rights, or TURFS). Such traditional systems operate, or have operated, in Oceania, North America, Asia, Australia, Latin America, the Caribbean, and Africa.

The ability of CMT owners to protect their marine resources through the exclusion of outsiders provides them with an incentive to harvest in moderation; they can protect the future benefits to be gained from doing so. Indeed, some CMT owners carry efforts to protect their marine resource further by means of self-imposed size restrictions, gear restrictions, closed seasons, etc. But, until recently, government marine resource managers have tended to overlook the significance of CMT and associated local management practices.

A common approach to the problems of small-scale fishermen in the past has been to attempt to introduce co-operatives. But many of the organisational concepts of co-operatives pertain more to industrial fisheries. The failure rate of cooperatives in the SPC region, as in many other areas, has been high². An important contributing factor appears to be that the initiatives came from outside the fishing communities rather than from the fishermen themselves, and were not based on local customs and values.

Yet CMT systems, which *are* based on local customs and values, possess many of the essential features of co-operatives. Like co-operatives they are collectives organised around local groups with common interests and common resources. Like co-operatives, these groups can function to co-ordinate their members' actions, allocate and protect their resources, regulate the distribution of their catch and profits, share risks, exclude outside fishermen, and represent the fishing community in dealings with outsiders, including government officials. It

is ironic, therefore, that some who tried to establish co-operatives in the region simultaneously overlooked local CMT systems that could fulfil many of the same roles.

Today in many parts of the world there is growing recognition of the importance of examining CMT as a vehicle for the pursuit of various marine resource management objectives. A number of Pacific Island governments have acknowledged the need for expanded research in this area, including Kiribati, Papua New Guinea, Solomon Islands, Yap State (Federated States of Micronesia), Palau and Vanuatu.

Here we discuss some of the advantages and disadvantages of integrating western, science-based resource management with CMT systems in the SPC region, and suggest some practical means by which CMT may be better understood and more effectively used.

The aims of management

Despite the application of plenty of brains, sweat and good intentions, attempts at government fisheries management in Oceania over the past 40 years have had a high rate of failure. Participants in the 1988 Workshop on Pacific Inshore Fisheries Resources, organised by the South Pacific Commission, observed that there were, in fact, 'few, if any, Pacific island inshore fisheries which are currently managed' (i.e. by government departments).

The costs and complexities of effectively monitoring and managing small, multi-species, multi-method reef and lagoon fisheries along conventional lines have generally proven prohibitive. Indeed, data requirements for the management of multi-species fisheries in general are so great that it may not be simply a matter of time before adequate data becomes available (e.g. Walters, 1986). Moreover, computer models and statistical analyses have

¹ In 'CMT' or 'customary marine tenure', 'customary' refers to a system that emerges from traditional roots, constitutes part of what is often termed 'customary law', and which has continuous links with local history as it adapts to changing circumstances; 'marine' refers to the system as dealing with reef, lagoon, coast, and open sea, including islands and islets contained in this overall seaspace; 'tenure' refers to a social process of interacting activities concerning control over territory and access to resources (Hviding, 1989).

² Palau is an exception; fishing co-operatives have been operating there since 1952, although only one is functional at present.

routinely failed to provide reliable predictions to guide management even of simpler temperate zone fisheries, and 'managers increasingly recognise that many important uncertainties are political or social and beyond the scope of current modelling and statistical efforts' (Hilborn, 1987).

Under such conditions the resource manager aims not for some quantitative ideal (e.g. maximum sustainable biological yield, maximum economic yield, optimum yield) but rather to reduce ecological and economic stresses, reduce conflicts among fishermen and attain a more equitable distribution of benefits—in short, to manage in such a way that the fisheries are 'in a less bad state' (ACMRR Working Party on the Management of Living Resources in Near-Shore Tropical Waters, 1980).

One approach is to give fishermen greater roles in, and greater responsibility for, managing their own fisheries. It is a notion that has been gaining currency among small-scale tropical fisheries advisors around the world. Panayatou (1982: p. 48) has said, for example, 'the revival and rejuvenation of traditional customary systems ...with limited but crucial government involvement is one of the most promising policy options for upgrading and managing artisanal fisheries' [emphasis added]. CMT offers a framework for exploring this approach.

A recent FFA/SPC report on fisheries development and management in Oceania in the 1990s states that customary marine tenure, which has only been partly studied and documented, is increasingly being seen as a valuable institution, which, if strengthened, could help maintain the sustainability of inshore resource harvests. Effective contemporary management of in-shore fisheries based on traditional and cultural practices may be feasible. Greater efforts are needed to document traditional management systems and devise ways in which they can be made to work in a modern, more cash-oriented context.

CMT systems appear to have attained their most sophisticated development in Oceania and present a wide range of flourishing alternative models. But, before we can soundly evaluate the advantages of integrating their best elements with those of western scientific tradition, considerable research is needed.

CMT as a fisheries management tool

Customary marine tenure can play a number of valuable roles in contemporary fisheries management. It can:

- provide culturally sanctioned rules for allocating marine resources equitably, apprehending and punishing transgressors, and adjudicating disputes (usually without recourse to government, thereby greatly reducing administrative costs);

- function as a form of conservation measure by limiting entry to a fishery and providing the owners with an incentive to regulate their own harvest; and ;
- facilitate more flexible adjustments to changing biological or socio-economic conditions affecting the fishery than do government regulations.

CMT can play other important roles in marine resource management by means of the control CMT owners can exert over local development if their rights are secure. Tourism, for example, can damage marine resources if it is not properly controlled. Tourists may cause anchor damage and pollution on reefs, deplete local fish, shells and corals and generally disrupt local fishing. Coastal development, such as land clearing, dredging and filling can destroy nearshore habitats, and sewage outfalls can generate pollution in surrounding waters. But in countries where CMT is strong, owners can bring political or legal pressure to bear to stop development or restructure it to ensure its environmental sustainability, as well as its social acceptability.

The ability of CMT holders to police their tenured waters may also prove useful in marine resource enhancement programmes. Giant clam farming is a case in point. Officials in charge of giant clam planting in at least one Pacific Island country where CMT no longer operates have had to keep the clams close to shore in an inappropriate environment in order to protect them from poachers. But on Yap, where the CMT remains strong, the Marine Resources Division has been able to distribute the clams throughout the country and place them in appropriate habitats with some assurance that local CMT owners would protect them.

However, although CMT provides the incentive to manage marine resources wisely, not all CMT owners do so. Moreover, CMT can be a source of friction between rival groups of fishermen arguing over boundaries or who has what rights within bounded fishing areas. It can also hinder the full exploitation of marine resources by excluding those with the necessary capital and expertise. In addition, as Sims (1990) points out, entry into marine resource enhancement programmes involving areas subject to CMT might be limited to those villages closest to the best sites. Villages not so well-endowed would thus lose out. In such circumstances a wider distribution of benefits might be achieved by means of government allocation of marine areas for marine resource enhancement projects.

In addition, CMT systems operate today in environmental, economic, social, political, and demographic contexts that often differ greatly from those of a few generations ago. Some of these systems will undoubtedly prove more flexible than others in adjusting to such changes.

But CMT systems that create problems for government marine resource managers cannot be dismissed lightly. CMT is much more than just a resource management tool. Its functions range beyond that of organising economic activities. It forms an important part of the framework for regulating social and political relationships and defining cultural identities in cultures where individuals and society are often looked upon as integral parts of nature. The physical, economic and spiritual life of island communities is thus often centred on their natural resource assemblage and the resource space containing it. This focus is sometimes so central to island villagers' conceptions of themselves that alienation of their natural resources and tenured marine (and terrestrial) areas is, to them, unthinkable.

The significance of a given CMT system today can therefore not be judged simply on the basis of its local value in marine resource management. The fundamental importance of this fact is sometimes not appreciated by fisheries experts. Kunatuba (1989) states, 'It is important to note that the social and political setting of a fishing community is not a problem; rather it is a situation. It would prove very costly and time-consuming to try to change that "situation"'. This is valuable advice for marine resource managers and developers who agonise over the problems CMT has sometimes created for them, and who dream of getting rid of a troublesome CMT system.

They can take some comfort, however, from the fact that socio-political 'situations' are not frozen. CMT systems are evolving; they are adaptable. And the nature of the interactions that CMT owners have with government marine resource managers will inevitably influence the nature and rate of their adaptations. If CMT owners are approached with sympathy and an adequate understanding of their problems and respect for their customs, CMT may offer resource managers a variety of important benefits. The research needed to best evaluate these benefits requires not only biologists but also social scientists.

Social science in fisheries development

Studying CMT systems entails, among other things, systematic interviewing and participant observation—techniques of the social scientist. But, for a number of reasons, social scientists have played only minor roles in fisheries development and management. The problems lie both with the social sciences and with those involved most closely with fisheries management, the biologists.

One problem is that most fisheries social science research is descriptive, lacking in both an analytical framework and rigorous methodology. Further, the research style and reporting language of social scientists do not naturally

endear them to fisheries managers. It is now becoming widely accepted, however, that sound management of fisheries resources requires paying greater attention to the people who use them. Translating this acceptance into practical action has progressed in the United States, for example, to where social factors must, by law, be considered in the formulation of fisheries management policy.

But in Oceania things have not proceeded much beyond acknowledging the issue. A major impediment to the formal adoption of social science input as a matter of management policy is the operational distance between biologists and social scientists in the region. Government fisheries resource managers and members of the professional staffs of fisheries departments in regional assistance agencies are almost always trained as biologists. It comes naturally for them to study marine resources, and to hire staff to do likewise. And indeed, such work is essential.

But studying fishermen—the other essential component of any sound fisheries research programme—is generally unfamiliar to them. Their efforts to improve their research performance have tended to focus on designing more quantitatively rigorous biological data-gathering programmes rather than on the social dimensions of management research. They have tended to assume that the main obstacle to effective action is ignorance of resource dynamics, and have paid much less attention to conflicts of interest among resource users³. Thus ill-equipped to motivate the latter, they risk arousing unnecessary resistance, and end up frustrated by their consequent inability to persuade fishermen to help further biological management objectives.

There are, of course, growing numbers of social scientists who study social and cultural aspects of fisheries resource use in Oceania. But they are generally based in universities and government agencies outside the region. They are rarely, if ever, employed where the final government management decisions are made, that is, in local fisheries management offices. Their recommendations thus often go unheeded.

While it is unfortunate that Pacific Island fisheries departments rarely employ people trained in the social sciences, it is not surprising. First, the notion is relatively new. Second, fisheries managers, ever hard-pressed by governments who fail to appreciate the costs (or benefits) of sound natural resource management, rarely have the resources to address resource-based problems adequately, let alone socio-political ones. The solution does not generally lie, therefore, in redeploying funds in resource management departments. Additional funds are needed.

³ It is interesting to compare this point of view with that of a U.S. fisheries manager who stated, with regard to the United States, that 'fisheries management has changed markedly in the past 20 years from resource management to conflict resolution' (Petrovich, 1987).

Greater involvement of social scientists in fisheries management does not receive universal support from fisheries managers. Some complain that social scientists' prescriptions for development and management suffer from inadequate understanding of biological and other technical realities. This is undoubtedly true (although not universally so). But it is simply one of two logical consequences of the fact that the biologists and social scientists working in the region tend to be isolated from one another. Neither group fully appreciates the importance of the issues in which the other specialises.

Only when resource managers trained in the social sciences collaborate closely, on equal organisational footing and at the local level, with biologically trained government resource managers, are the two likely to appreciate fully the value of each others' views and forge the broader, unified approach that is essential for the sound management of natural resources.

Research needs

Here we suggest a number of subjects that require study, and methods that might be used to better document traditional marine management systems in Oceania and explore how they can best contribute to contemporary marine resource management.

Surveys

CMT and associated management practices are complex and may vary greatly not only throughout the SPC region but also even among villages within small areas. The scope for generalising from one system to another is thus limited. Preliminary surveys are therefore needed to determine not only where CMT systems operate, but also where the greatest need for immediate, more detailed studies exists. Such surveys seem especially urgent in Melanesia where there are literally hundreds of local CMT systems.

A first cut at the problem might consist of rapid questionnaire-based surveys, with researchers spending no more than a day or two in each village. Solomon Islands has pioneered this approach in its rapid survey of CMT systems in 43 villages (Ruttley, 1987). This survey serves as an excellent starting point for such work, highlighting both the advantages and disadvantages of the approach, and providing the basis for formulating improved questionnaires for future use.

Such questionnaires should be designed exceedingly carefully, to maximise the usefulness of the information they yield. Provision must also be made for careful analysis of the results. But it should not require much special training to enable regional fisheries personnel to carry out these surveys. The results would, among other things, help pinpoint those areas where conflicts over

marine resource use are, or seem likely to become, most serious.

Studies of individual systems

When these areas have been identified, more detailed local studies could then be undertaken. Such studies should encompass the natural resources being used, the detailed operational nature of CMT and the associated management system, how they fit into local cultural, legal and political frameworks, and how they serve or could serve local needs and national resource-use policy objectives. (What satisfies national priorities best will not necessarily serve local needs best.)

It may not always be practical for more than one researcher to carry out such a study. In such cases it is obviously essential that the researcher take a genuinely interdisciplinary approach.

Past studies have often focused more on how the system works in theory, than in practice. This is a bit like describing Christianity on the basis of how the Bible defines it, rather than on how typical Christian communities behave. In other words, there have not been enough studies grounded in events rather than abstract rules. Examples of research focusing on the actual day-to-day functioning of a CMT system are provided by Hviding (1989, 1990).

Fisheries should be addressed, we believe, as systems. We must learn more about the social organisation of fishing communities, especially concerning rules governing access to and distribution of the catch, and how changing values and monetisation modify traditional resource use patterns. It is also important to understand the role of fisheries within the larger framework in which they comprise one of several resource bases, as in the land-sea estates common in the SPC region. Ruddle (1989) has outlined the kinds of questions that should be addressed in a comprehensive study of this kind.

CMT and the law

The following passage from Baines (1989) highlights another reason why increased research on CMT is needed:

Though there is now a greater willingness to know, to understand and to document these (traditional tenure) systems, few appreciate their complexity or the significance of variations between culture groups. There is confusion and misunderstanding among planners, administrators and legislator—even some of those who exercise traditional rights themselves are not altogether clear about the origin and nature of those rights. In such circumstances, there is considerable risk that new policy, administrative arrangements and legislation

designed to resolve the development dilemma embracing traditional institutions may be based on half truths and distortions. A superficial, generalised version of the communal-property systems of a Pacific island nation, if written into law, is more likely to provide a new base for socially disruptive disputes rather than the desired accommodation with contemporary development.

CMT systems do not exist in a legal vacuum. Their capacity for handling emerging development issues is subject to some level of government recognition through acknowledgement of traditional rights. A number of Pacific Island nations formally acknowledge in various ways that tradition and 'custom' must be given due legal recognition in connection with matters of development. Such recognition is important for promoting decentralised village-level handling of important issues involving the sea and its resources. In Solomon Islands, for example, the devolution of power from national government to Provinces facilitates local management initiatives from customary resource managers through the Area Councils.

The value of multidisciplinary investigation of the local CMT systems becomes very obvious when disputes over local marine resources reach the courts. But delaying research until such times greatly delays the provision of essential information. Moreover, research carried out before the resources in question become the subject of formal legal dispute is more likely to elicit reliable information from informants. Once resources are at issue in the courts, informants may be tempted to describe traditional boundaries and traditional rights within them in a manner more in keeping with the interests of their village or clan than with tradition.

CMT and marine resource enhancement

The significance of CMT in the context of aquaculture and other forms of marine resource enhancement will grow in the next few years as these activities expand in the region. There are a few useful precedents to show us the advantages and difficulties that CMT may pose in this context (see Sims, 1990). What are the pros and cons of siting resource enhancement projects in areas subject to CMT? What are the relevant differences between CMT systems that are subdivided into clan or family holdings compared with those owned communally by the whole village?

Research should be encouraged on these questions. As soon as enough work has been done to justify it, a meeting of all relevant researchers should be called in order to compare notes, search for generalisations and formulate strategies for exploiting the advantages and avoiding the pitfalls that CMT may provide for marine resource enhancement projects.

CMT and integrated rural development

CMT systems are not just institutions involved with traditional subsistence fishing in the villages; they also constitute part of Pacific Islanders' means of handling the wider world, in economic and political terms. Thus there is a need to view fisheries management in the Pacific Islands in a number of contexts that are not specifically fisheries-related, both with regard to traditional perceptions and politics of resource use and to modern development issues.

The ecological integration of terrestrial and marine ecosystems and the economic complementarity of land and sea resources are cornerstones of indigenous world views. It is clear that fisheries management and marine tenure has to be viewed in relation to land resource management and land tenure. In Oceania there are few fishing villages as such; most coastal villagers lead a lifestyle that combines fishing and agriculture.

Usefulness of resurrecting CMT

Although resurrecting customary practices is sometimes fraught with difficulties, there are several recent examples of attempts to reassert CMT claims in the region—for example, in Pohnpei, the Cook Islands, and east of Port Moresby in Papua New Guinea, as well as in the nearby Torres Strait Islands. How successful are they? What problems have been encountered? Can these experiments tell us whether similar efforts should be made in other regions where CMT has declined?

New forms of local marine tenure

Although CMT in the Pacific may be referred to as involving 'traditional resource management' based on 'customary law', this does not mean that tradition is something static, rigid and non-changing. Rather, 'tradition', as it exists in the rapidly changing world of indigenous peoples, is a system of knowledge and rules which has, on the one hand, strong roots in local history and experiences, but which is, on the other hand, unwritten and uncodified, thereby allowing for flexibility in adapting to changing social, political, economic or ecological circumstances. Thus, far from being overwhelmed by commercialisation and resource scarcity, many CMT systems in Oceania appear to have considerable capacity for handling and adapting to new circumstances. They can thus be important tools in the contemporary management of fisheries and of the coastal zone in general, but their efficacy can clearly be improved if fisheries managers understand them better.

New fishing arrangements bring forth local efforts to control exploitation. In the SPC region, locally devised marine tenure arrangements are evolving, for example, in connection with fish aggregation devices (FADs).

Uncontrolled acquisition of such territorial rights by powerful groups could lead to a worsening of the general welfare of local fishermen. In such cases should the government intervene? If so, how?

Traditional environmental knowledge

Some Pacific Island fishermen's knowledge concerning the movements, behaviour and susceptibility to capture of various reef and lagoon fish is encyclopaedic and its value for management can hardly be exaggerated (e.g. Johannes, 1981; Johannes & Hviding, 1989). Indeed, island fishermen themselves sometimes request government management initiatives based on their superior knowledge of what is going on the fishing grounds (e.g. Johannes, 1981, 1991; Hviding, 1990). Some strategies for the management of the many species of reef and lagoon food fishes whose seasonal and lunar spawning periodicity are locally well known to Pacific Island fishermen have been proposed by Johannes (1980).

But the great bulk of such knowledge remains unrecorded. And more and more of it is being lost as the older people who possess it die and the young who used to inherit it leave their villages. Research on women's knowledge concerning the biology and changing availability of the animals they harvest by gleaning in the intertidal zone is especially badly needed.

Marine reserves

During the Third South Pacific National Parks and Reserves Conference, held in Apia, Western Samoa, in 1985, it was noted that although CMT serves as a marine conservation measure, this custom has not been used to advantage in establishing protected areas in waters under traditional ownership. Research is needed on how to approach the integration of CMT systems into marine reserve plans.

Practical orientation of research

Purely descriptive studies of CMT and associated resource management are useful. But of much more practical value would be studies in which researchers keep firmly in mind the relevant objectives for marine resource management; namely, identifying existing or potential opportunities and problems that CMT systems present—biological, social, political, legal, economic—and proposing means for government managers and CMT owners to work together more effectively toward common goals.

Conclusion

Local knowledge and management systems are not a universal solution to the problems of sustainable development. Not all traditional management systems worked

well; inequitable resource tenure systems are not a modern invention. Nor is all traditional ecological knowledge correct. This should not discourage us. Our modern fishery management textbooks are also less than perfect. We do not abandon them; we produce new and better editions as our knowledge and experience grows. CMT systems also evolve, but they can be overwhelmed if the changes they are confronted with come too fast and without adequate forewarning. Greater efforts to understand their nature and variety will help ensure that they adjust more effectively in a fast-changing world. And greater efforts to record traditional marine environmental knowledge will help ensure that it survives to assist future generations in the management and exploitation of their marine resources.

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USING CUSTOMARY PRACTICES IN MARINE RESOURCE AND COASTAL MANAGEMENT IN YAP

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Introduction

Much has been written and said about the potential of using customary knowledge and practices to acquire marine biological information, and especially to help resolve marine management questions in the Pacific region. Unfortunately, this potential has yet to be fulfilled by Pacific Islands' fisheries and marine resource management agencies. There are numerous, often complex, reasons for this situation, some of which usually include a lack of trained manpower, necessary funds, and the always elusive 'time' to accomplish it.

In 1987, Yap State's Marine Resources Management Division (MRMD) contracted Mrs Margie Falanruw and myself (then with the Yap Institute of Natural Science) to conduct a two-year study to document Yap State's traditional fishing knowledge and management systems. It has largely been this information, although not yet in a final form, which MRMD has been using for the projects described in this paper. These cases provide some examples of the problems we at MRMD have encountered in trying to use customary knowledge and practices in our work.

In this paper I will not discuss the 'results' of these projects and programmes, but rather concentrate on the goals, methods and problems encountered in implementing them. Our ideas and efforts are perhaps unlikely to be *directly* applicable to other Pacific islands due to differing social and political situations. However, with a little 'lateral thinking' some of our experiences may be useful elsewhere.

Background

Yap State¹ is one of the four constituents of the Federated States of Micronesia (FSM). It is comprised of the four closely associated high islands of Yap and 15 low coralline islands collectively referred to as the 'outer' or 'neighbouring' islands. Geographically, Yap State is situated within the Western Caroline Islands from approximately longitude 137°E to 148°E and from latitude 7°N to 10°N.

The Federated States of Micronesia was constituted in 1979 and gained sovereignty in 1986 through the ratification, by the U.S. Congress, of the Compact of Free Association. This treaty, among other things, establishes a framework for aid to support government operations and economic development over a 15-year period.

The economy is a dual one based on subsistence production and government employment. The cash economy results almost exclusively from aid provided through the Compact of Free Association. Despite government encouragement, the private sector is still poorly developed. Yap State, as is all of Micronesia, is heavily dependent on imports but exports very few goods.

The traditional political structures have been partially integrated into a modern representative government. The two Councils of Chiefs (one for Yap and one for the outer islands) have veto authority over legislation promulgated by an elected legislature. A governor, presiding over an administrative bureaucracy, is elected separately. In practice, accession to government posts, whether elective, appointive, or within the bureaucracy, is influenced by a person's cultural ranking.

The traditional rights of the people are protected by the Yap State Constitution. In relation to marine resources the Constitution says:

The State recognizes traditional rights and ownership of natural resources and areas within the marine space of the State, within and beyond 12 miles from island baselines. No action may be taken to impair these traditional rights and ownership, except the State Government may provide for the conservation and protection of natural resources within the marine space of the State within 12 miles from the island baselines. (Article XIII, Section 5).

The island baseline is defined for an island or atoll with a fringing or barrier reef as a '...line following the contour of the seaward edge of the reef system...' (Yap State Code, Title 18, Section 27).

¹ In this paper, 'Yap State' will refer to all the islands; 'Yap' to the islands of Yap proper; and 'outer islands' to the remainder of the State.

Yap State's waters are divided into the internal waters and the State Fishery Zone². The internal waters are those from the shore to the island baselines, and the State Fishery Zone extends from the island baselines for 12 miles seaward. Due to the ambiguous wording of the above-mentioned section of the Constitution, the traditional leaders may have total control over the internal waters; it is uncertain if the government can intervene for conservation and protection purposes in the internal waters, as it can in the State Fishery Zone, without the chiefs' approval.

The government departments and agencies which have direct responsibilities for the marine area and its resources are MRMD, the Yap Fishing Authority (YFA), and the Environmental Protection Agency (EPA).

Social environment

General

In 1987, Yap's population was 6,650 and the outer islands' 3,489, for a total population of 10,139 (OPB, 1987). The natural population growth rate is about 2 per cent per annum; however, the real growth rate is probably much lower due to the effects of emigration (OPB, 1988). The absolute populations for Yap and the outer islands are nowhere near the former highs; for example, Yap proper's population has been variously estimated at 26,000 to 50,000.

Despite differing cultures and languages, Yap and the outer islands have traditionally been linked by a system of political, economic, and religious ties. The tribute system, most of which ceased sometime around the turn of the century, obliged the outer islanders, at specified intervals, to send objects of tribute to the chief of Gagil district on Yap, as well as religious gifts to specific religious functionaries, and gifts from specific families to their Yapese 'overlords' in Gagil. The details of this tribute system can be found in Lessa (1950) and Alkire (1989) for the outer island perspective, and Lingenfelter (1975) for the Yapese aspects.

The following are brief outlines of the traditional Yapese and outer island (Carolinian) social organisations as they relate to marine usage and tenure. These systems are still in effect in Yap State, but are increasingly weakened by the effects of the current political, economic, religious and educational systems. With the introduction of Christianity after World War II, a number of the cultural restrictions on marine resource usage were inhibited. This, coupled with increased involvement in the cash economy, weakened some aspects of the following systems.

Yap

In Yapese society power and authority are defined in terms of land. The land is perceived as the chief, and the man who inherits the land serves as its voice (Lingenfelter, 1975). The *tabinaw* ('one land') is the basic socio-political unit, usually referring to one patrilineal household, and the traditional basis of land ownership. The concept of *tabinaw* is, however, exceedingly complex, with many different meanings or references. Several families may reside on lands belonging to a single, named, stone house foundation; these lands, or 'estates' (*tabinaw*), ideally include all important resources, such as several non-localised house and garden plots, parcels of taro patches, and sections of the lagoon for fishing (Lingenfelter, 1975).

Yapese villages are distinctly defined. A village is run by a council consisting of the patrilineal heads of the *tabinaw*. Within a village there are a number of ranks, the highest of which are the chiefs 'of ritual/elders', 'of the village' and 'of the young men' (Lingenfelter, 1975; Sudo, 1984). The 'chief of the village' is the executive head and the economic leader.

Lingenfelter (1975) denotes eight rankings of Yapese villages which fall into five different general groupings:

- the chiefly villages (two ranks);
- their closest and highest-ranking allies, or nobility (two ranks);
- the common villages;
- the servant rank; and
- the serfs (two ranks).

The first three are considered 'high caste' and the other two as 'low caste'.

Villages are grouped into networks of chiefly villages and lower-ranked allies. Management of marine resources serves to support the hierarchical system of each network. Marine resources are exploited for subsistence use, to support co-operative efforts within the network, and to support the head of the network. Access to fishing grounds, fishing gear and fishing rights is managed within the hierarchical system. In general, fishing methods involving the most elaborate equipment (such as special canoes and gear) are limited to higher groups. They are controlled by fishing masters of each method who oversee the conduct of the fishing, often in response to requests from, or in

² The FSM Exclusive Economic Zone extends from 12 miles to 200 miles from the islands baselines, but is controlled by the national government based in Pohnpei.

support of, their chief. In addition, particular species are the property of certain higher-ranked people.

The in shore waters of each village are within the jurisdiction of the village, and, except in the case of certain methods, outsiders are prohibited from exploiting its resources. Some fishing methods are available to all fishermen within a village while other methods, and sometimes the area within which they are used, are vested in certain estates. The lowest-ranking villages have no land or fishing rights except for a few methods practised in specified limited areas. Those of servant level have land but the title belongs to a high chief to whom the 'first fruits' and other tributes and services are given.

Outer islands

The systems of social organisation, especially as they relate to fishing rights, vary slightly between the different outer islands, but significantly from Yap. The major socio-political grouping is based on the matrilineal clan. Branches of the major clans are found on all the outer islands, whereas some of the smaller clans are restricted to only a few islands. These clans are ranked upon the sequence of their arrival on the different islands. These rankings vary on different islands. Generally, the eldest son of the most senior woman in each clan is the chief. However, under some circumstances the eldest man of the most senior branch of a clan may be the chief. The clans are further divided into subclans, lineages, and descent lines (Alkire, 1989).

The system of control and tenure of the marine areas and resources fall into three broad and overlapping categories. In all islands, however, the marine areas are not owned by the chief(s), but are only managed by them, in consultation with the other clan elders, for the benefit of the whole clan. In Ulithi atoll, for example, all the reef and lagoon areas belong to the highest-ranking clan. This clan's chief also presides as the paramount chief of Ulithi. The marine areas of the atoll are, however, divided into a number of regions. Some of these regions were said to have been given to the chiefs of each island to be controlled by them, but only on behalf of the paramount chief. Within each region are a number of sections which are controlled by the chiefs of each clan. The members of any clan have the right to fish in any sections within the atoll that belong to their clan.³

A slightly different tenure and use rights system occurs on Woleai. Here the reef and Lagoon is divided up and controlled by the ranking clan on each island or village. There is no paramount chief who has jurisdiction over all Woleai. The head of each ranking clan, in conjunction with the other elders, will control their own areas, determining when and if they should be closed, as well as deciding

upon communal fishing. Individuals are able to fish within their own clan's areas anytime.

The third form of tenure and use rights is exemplified on Satawal. Here the chiefs of the three ranking clans divide the responsibilities for island affairs. One chief takes the role of the 'chief of the sea'. He has the rights to control the usage of the marine resources and fishing methods (Sudo, 1984). The use of the fringing reef area is open to anyone who wants to fish there, but all other fishing areas (seamounts, uninhabited atolls) require permission of the 'chief of the sea'. The proprietary rights to use the food resources of the fishing areas other than the fringing reef belong to the chief of the sea.

The social organisation, especially as it relates to marine resource usage and tenure, within Yap State is much more complicated than outlined above. In Yap, for example, very few men completely understand the whole island's system of marine use rights. A further complication arises from the rights to certain resources within the distribution systems. The aim of these outlines is to give an idea of the complexity of the traditional systems that need to be taken into consideration by MRMD.

Marine Resources Coastal Management Plan

Objectives

MRMD is in the process of developing a Marine Resources Coastal Management Plan (MRCMP) for Yap State. A MRCMP is needed to provide recommendations for the use and conservation of Yap State's mangrove, seagrass, reef, and lagoon resources. The plan will include traditional knowledge, uses and customs, and modern scientific research, as well as recognising the need for development activities. The goals for the MRCMP are:

- to maintain Yap State's marine resources and coastal ecosystems in the best possible condition for future generations;
- to obtain the maximum environmentally sustainable benefits from the multiple use of Yap's coastal resources for traditional, subsistence, and development activities;
- to support and enhance the traditional resource management and marine tenure systems, so as to be effective in resource control;
- to provide appropriate marine environmental education to the public; and

³ For a more detailed description of Ulithian reef and lagoon tenure see Ushijima (1982).

- to provide a review process for making wise decisions about coastal resource use. This process should coordinate and balance the interests of the public, the government, and the developers.

Methods

The initial development of the plan was viewed as a multi-phased process resulting in the implementation of a comprehensive resource management programme. Representatives from the state government, traditional leadership and the communities at large are involved in the plan's development. Three approaches are being used to ensure this involvement:

- meetings with villages, traditional leaders and agency personnel to inform them of the plan's development and to gain their input;
- workshops focusing on critical aspects of the plan's development in which ideas can be gained and key decisions made; and
- public education using radio, TV and printed materials.

Plan development is proceeding in four phases:

- issue identification and policy development;
- programme strategies and administrative structure;
- legislative and enforcement issues; and
- plan finalisation and implementation.

Each phase has an associated workshop open to the public, which we have found a very useful tool.

Currently we are between the last two phases, and are working on two major aspects of the plan. One is a comprehensive development review process, and the other is a marine resource management system. The strategy for the development review process is essentially a western one with modifications to suit the local socio-political system, and will not be discussed in this paper.

The current tendency in the Pacific (owing mostly to western influence) is to seek legislative or regulative solutions to marine resource management problems. This approach has had mixed results, and in many cases has failed totally for diverse reasons. From the beginning of the MRCMP's development, MRMD has recognised that traditional marine tenure and use rights currently in force in Yap State need to be incorporated into the plan. MRMD is both legally, due to the Constitution, and morally required to incorporate traditional rights and ownership into the MRCMP. It

is also realistically the most practicable thing to do in terms of management enforcement.

Unfortunately, the traditional marine management systems will not be the complete answer. Apart from there being two distinct systems (Yap proper and the outer islands), there are also a number of current marine resource management problems which either fall outside the grasp of the traditional systems or cannot be adequately resolved within the traditional systems. A further complication is the complexity of the marine tenure and use rights system on Yap proper. The current state of enforcement is also quite variable between municipalities, and even between villages, partly owing to a decline in some aspects of the system. Finally, the strictly hierarchical nature of the traditional social systems results in an inequitable allocation of resources.

Practical problems

We feel that the greatest problem, but also the key to success, is 'time'. Working with traditional leaders and associated groups to try and incorporate as much of the customary structure and procedures as possible into the plan is extremely time-consuming. The realities are, however, that deadlines exist-political factors, contracts expiring, increasing development pressures, finances, etc. In having to juggle these conflicting pressures, progress has been made in sporadic bursts of frenzied activity intermixed with virtual inactivity.

Another way in which 'time' has affected the plan's progress is through not having sufficient staff (experienced or otherwise) to permit full-time work on the plan. All staff involved have numerous other projects, programmes and commitments to work on simultaneously. This is a common problem throughout the Pacific region.

The lack of trained and/or experienced staff who are familiar with *both* the traditional and western systems is another problem. To some extent we have overcome the 'western' aspects of the problem by utilising various outside agencies. The US Sea Grant Program's FSM Extension Officer has been advising and assisting since the plan's inception; the University of Guam's Marine Laboratory and the Guam Government's Coastal Management Program (Bureau of Planning) have provided technical assistance at the workshops; the University of Oregon's Micronesian Technical Assistance Program is currently providing two technical assistants for three months to work on particular aspects of the plan; and the US Forest Service will be providing a mangrove expert to provide information and recommendations on Yap's mangroves. All this technical assistance has been obtained at minimal cost to MRMD. One important point, however, is that it has been *Yap State* that has decided the areas in which we need technical assistance, rather than having

assistance thrust upon us by outside agencies. Although these people can be sensitive to the customary system, they can never gain a complete understanding of it. Whenever possible we try to have counterparts working with them, although this is, unfortunately, rarely possible on a full-time basis.

Customary marine use rights systems are inherently dynamic. On Yap, this has resulted in the patchy adherence and enforcement of customary marine controls. This patchiness is also partly due to the extremely complex nature of Yap's social system, especially as it relates to marine usage, and partly a result of western influence. The changed *perception* of the customary system is also an important factor. The 'idealised' or 'theoretical' understanding people have of their customary systems, often differs from its 'real' or 'functional' operation. Some examples of these influences on Yap are identified in the following passage.

The [traditional] system ...functioned to its fullest prior to 1886 when the Spanish, the first of a series of foreign administrators, came to Yap. By 1910, the German ethnologist Muller found that Yap's politico-religious system had collapsed from lack of capable leadership (Lingenfelter 1975). The German administration was followed by Japanese occupation and World War II. During this period Yap's very dense population declined greatly. Since the beginning of the American administration in 1946, the population of Yap has been growing rapidly, resulting in a great proportion of youth. In 1990 less than about 5% of Yap's population were men who had been born by the time Muller described Yap's culture. These elders might have experienced traditional fishing, but their own practice was limited by the requirements and prohibitions of the succeeding authorities such as the Japanese who had large canoes destroyed. This has resulted in great changes in fishing.

Under the American administration emphasis has been on developing a western type political system. Natural resources have largely been subject to benign neglect. Factors such as the introduced political, religious and education systems, dollar wage work outside the traditional system, and excessive alcohol consumption since Spanish times has weakened the traditional system and traditional control over people's use of marine resources. Fresh opportunities and new demands on men's time has resulted in less attention being given to fishing. New fishing equipment and methods have come to Yap, and control of these has not been governed as much by traditional controls. (Falanruw, 1991: 20)

Despite codification of traditional laws being specified in the Constitution⁴, we are not, as yet, taking this route. The above-mentioned changes and perception of differences in the customary system make the option of codifying traditional marine usage regulations very difficult, if not impossible.

Our method to resolve, or circumvent, these problems is to take a 'systems' approach. That is, to set up a marine resources management system that will be flexible enough to allow for changes and differing perceptions, but also be capable of encompassing those problems of introduced techniques which fall outside the scope of the traditional system. To achieve this we are reviewing recent marine conflict resolutions (at all community levels). Through this review we hope to relate what is currently happening with what should 'theoretically' have happened according to custom. This will also provide us with an indication of the effectiveness of the current system.

The administrative approach we are tentatively considering involves setting up permanent consultative groups for both Yap proper and the outer islands to advise and determine fisheries management matters in the internal waters. The groups would be part of, or at least attached to, the councils of chiefs. To avoid confusion, the overall structure should be the same for both Yap and the outer islands. Within that structure the programme strategies could vary to fit the differing traditional systems. Their composition will need to be very carefully determined. Those whose customary positions would normally involve fishing matters should be included. They should also include people to whom the traditional chiefs and resource managers will be receptive (even if they don't always take their advice), and who have a concern for marine resource issues and are interested in learning about the western concepts of management and conservation.

These two high-level consultative groups (for Yap and the outer islands) would provide recommendations, advice, and so forth, to similar groups at the municipal, island, and/or village level⁵. Members of the groups would be regularly informed on fishery matters. This could be done by training workshops in Yap sponsored by MRMD, FSM MRD, Sea Grant, etc. These groups could also form the focal point for any regional workshops by SPREP, SPC, and so forth. These groups would then, in a low-key, semi-informal way seek to inform the fishermen during their regular contacts. MRMD's main focus would be to get these groups functional, and to provide the technical, educational, and logistical backup (possibly including a full-time extension agent). We would then leave it up to the

⁴ The Legislature shall provide for the codification of traditional laws of the State within a reasonable time after the effective date of this Constitution.' [Article XV, Section 1, Yap State Constitution].

⁵ The number of levels would be directly related to the number of traditional levels that currently exist in Yap State.

groups to determine what level of regulation or government participation is necessary to address areas where the traditional system is weakening or for issues it cannot adequately deal with. An important factor in setting up such groups will be defining procedures and instigating training.

The introduction of flashlight spearfishing and monofilament gill nets has probably had the greatest effect on marine resource usage in Yap State. This is partly due to these methods falling outside the customary system's control, for example, gill nets have supplanted community net fishing, but are used without the customary controls attached to community net fishing. These methods, coupled with the increased demand for the sale of fish, represent a major management problem. These are areas where the customary system has been found wanting.

As yet we are uncertain how best to approach this problem. Some of the options are to legislate/regulate indirectly (i.e. do not attempt to directly restrict or control fishermen when fishing in their own areas), e.g. control the sale of speared fish in stores (to reduce the urge to flashlight spear fish); introduce some gill net regulations, such as licensing, and/or minimum mesh size; encourage the use of alternative (more customary) methods; control the export of reef fish; and so on. Any restrictions would need to be enforceable and approved by the chiefs⁶. Whatever approach is decided upon will need to be 'holistic' in nature, addressing all the key issues identified in the plan simultaneously. Otherwise, a restriction on one method may cause an unwelcome increase in another, such as a ban on spearing causing an increased use of gill nets.

There is a general lack, or perhaps misunderstanding, of the western concepts of 'management' and 'conservation'. This problem can be solved only through an extensive education/extension programme aimed at all community levels from elementary school through public education. MRMD is currently trying to locate funding for such a programme. We feel that in the long term, this is the key to the success of any management programme. We have already had requests from various municipalities for information and general education materials.

Reef Fish Management Demonstration Project

Objectives

Among the local fishermen there is the common impression that reef fish populations are lower than 'before'. MRMD has no data to determine whether this is the case, but we are taking advantage of the situation to encourage some changes in fishing habits by village fishermen. The specific objectives are to:

- gain permission from some reef owners to use their reef as a demonstration area; .
- survey the area;
- together with the owner, determine the best way to divide the area for rotational usage: options include temporarily closing certain areas, closing areas to certain fishing methods for periods, permanently closing an area as a reserve, or a combination of these;
- carry out regular surveys of the area, including collecting catch data. Two municipalities have provided large, adjoining sections of reef for this project.

Methods

Our main method of setting up and running this project is by meeting with all those concerned. We have informed the reef owners that this is their project and its success or otherwise depends on them. At the meetings we determine how the area is currently being fished and obtain other relevant information. With this information we work with the fishermen to determine how to rotate their fishing practices to allow areas to recover.

Problems

Again the main problem has been 'time'. It has taken more than six months to organise the meetings and set up the project. At the time of writing these meetings were just commencing.

Turtle management

Objectives

The underlying objective of MRMD's turtle work is to devise management controls which will allow future generations of these islands to also enjoy the traditional aspects of turtle usage. However, at the same time we also have an international, as well as cultural, responsibility to ensure that turtles in this region are not hunted to low levels, or to extinction. The specific objectives are to:

- tag adult turtles to determine their movements;
- raise a small number of hatchlings through a portion of the period when they are highly susceptible to predation;
- assess the current turtle catch rates for Yap State;
- develop and provide an education/extension programme on turtles to the people of Yap State; and

⁶ Some municipalities and islands have already acted: in Yap, one municipality has introduced a minimum mesh size; in the outer islands, a large proportion of the islands has completely banned flashlight spearfishing and monofilament gill nets.

- provide realistic management suggestions to traditional and government leaders.

Problems

Although green turtles are found throughout the state, they nest only in the outer islands. More turtles seem to be caught in the outer islands than in Yap proper. Any approaches we use to collect data and to disseminate information must consider the different cultural usages and different turtle behaviour (e.g. nesting) between Yap proper and the outer islands.

MRMD has had mixed success with the collection of green turtle catch data. Due to the remoteness of the outer islands, we have to rely on local people to fill out catch data sheets, and the Field Trip Officer to distribute and collect them. Some islands have co-operated 100 per cent, whereas other have neglected to fill them out, or have done so only periodically.

In an attempt to overcome this problem, we have requested the councils of both the Yapese and the outer island chiefs to consider appointing contact people for MRMD in each village/island. It would be to these people that we forward data sheets, newsletters, and so forth, and from whom we would receive information.

Legislation and management recommendations

The current turtle legislation for Yap State consists of one sentence banning the wholesale and retail sale of turtle meat in stores. There is a bill currently pending in the Legislature to amend the law; however, the amendments have been taken straight from the FSM Code, which in turn was taken from the old Trust Territory (TT) laws. The TT laws were written almost 30 years ago without the benefit of much knowledge or understanding of turtle biology and usage, particularly in what is now Yap State. The proposed legislation is culturally inappropriate and would be totally unenforceable.

MRMD has recommended that any turtle legislation would need to address at least the following topics:

- definition of the species involved, using the scientific, common English, and vernacular names;
- the commercial sale of turtle products;
- the collection of eggs;
- protection of hatchlings;
- turtle capture methods, including seasons;
- turtle nesting habitat protection;

- the use of non-traditional vessels, including government vessels, to facilitate turtle hunting; and
- customary usage and controls.

Any legislation will need to be flexible enough to allow for the different behaviour and usage of turtles in Yap State. To make it effective it will require the co-operation of the traditional leaders. To achieve this, any legislation will need to closely reflect the customary practices and reinforce customary controls.

Reef fish stock assessment

Objectives

As in any fishery, a knowledge of the standing stock is essential for management. As reef fisheries are multi-species fisheries, they are very difficult to manage and easily overfished. In the outer islands reef fish are used solely for subsistence purposes. Although there is currently no commercial reef fishing, it is possible that some small-scale commercial fishing could be introduced in the near future. In addition, with the increasing population in the outer islands there will be an associated increase in demand for reef fish. This project set out to determine an index of the fishable biomass or standing stock of fishes for various reef sites by using intensive (depletion) fishing experiments.

The project was conceived after traditional fishing methods recorded by the author were being discussed with one of SPC's inshore fisheries biologists. After the suggestion was made that one or two of the methods would be suitable for a depletion experiment, it took two years of work to bring it to fruition.

Methods

Two community fishing methods were used: a leaf sweep and group spearfishing. The leaf sweep is a traditional method, whereas the group spearfishing is a more recently introduced technique based on a traditional method. Each technique was used twice at separate sites. For each method and site, fishing was conducted on successive days at exactly the same spot until the amount of fish caught decreased considerably. Before and after each fishing experiment visual fish surveys were made using a small team of local men and MRMD staff.

Problems

Explaining to chiefs, reef owners and fishermen why we wanted to fish in the same place, with the same method, on successive days with the aim of catching less fish each day, was the hardest task! The proposed fishing methods are normally used in the same area only once or twice a year to get fish for special occasions or community use. To

get permission to conduct this 'strange' style of fishing we had to satisfactorily explain:

- how much area we would require;
- why we wanted to fish-out an area;
- what benefits they would see from the project;
- how much manpower we would require;
- if they would be paid.

Initially a request was made to the Council of Chiefs for the outer islands during one of their biannual meetings in Yap. No objections were raised. After the money for the project was approved by Yap State Legislature and the South Pacific Commission, previous informal approaches to specific islands had to be formalised. The official requests to specific islands/atolls were made through the chiefs. Although this is the official protocol, it has a number of inherent problems. Often, what is discussed with a chief at the council meetings in Yap only gets back to the island in an incomplete form, if at all. This often results in rumours which can have a lasting effect on the project. To overcome this, in addition to meeting with the chiefs and discussing the project with them, specially written explanations of the project's aims, needs and benefits were provided. Immediately afterwards, discussions were also held with outer island government officials, who, once they understood the purposes of the project, also advised those living on the islands about the project. The key to the success of the project was explaining the aims, needs and benefits of the work to as many people as possible, for as long as possible, to ensure that they understood what we wanted.

Upon arrival on the atoll for the field work, a further meeting of all the men was requested by the MRMD team, and the whole project, step by step, was explained, any questions answered, and problems resolved. After this was done the project progressed without any problems.

Familiarity with the fishing methods, how they are usually conducted, and what minor alterations were needed to satisfy the scientific objectives were essential to the project's success. This was achieved by the author's familiarity with the islands and their fishing methods, knowledge which was acquired during the traditional fisheries project.

Payment of the fishermen and hiring of the necessary boats for the time spent fishing ensured the men's continued interest. Payments were made after the completion of the work at each of the four fishing sites. Prior to the field work, considerable time and effort was put into ensuring

that the fishermen would be paid in cash, rather than the usual government cheques which can take months to get issued.

Doing visual fish surveys with local men proved successful. Once the species of fish that needed to be counted and recorded were identified in vernacular by using pictures from fish books, the men had no trouble with learning to carry out transects. Their ability to spot fish and assign them to a given category was excellent.

Conclusion

MRMD does not believe that the incorporation of customary marine knowledge and systems into its work will solve all our marine management problems. It does, however, provide a very useful mechanism to alleviate problems which would otherwise arise by following the 'western' management approach.

The time and money spent on documenting the traditional fisheries and management systems has been of benefit to us. Having information on what Yap State's customary marine practices were, and relating them to what is currently occurring, provides us with valuable management information. Yap State's situation is, however, different from most other Pacific islands, as all the internal waters are privately owned and controlled.

The following are some brief suggestions on incorporating customary marine knowledge and systems into current marine management/research, based on MRMD's experiences:

- document what is known of traditional fisheries, especially marine tenure and use rights;
- relate that information to what is currently occurring;
- assess which direction(s) the community wants to go with management, i.e. they might not want to 'go back' to traditional or neo-traditional systems;
- allow enough 'time' to work with traditional leaders and fishermen;
- develop education programmes for all community levels, including government agencies.

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TRADITIONAL MARINE CONSERVATION IN TOKELAU

CAN IT BE ADAPTED TO MEET TODAY'S SITUATION?

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Introduction

Tokelau consists of three atolls set on a north-west-south-east axis between 8° and 10° S and 171° and 173° W. Each atoll is made up of a number of reef-bound islets encircling a lagoon. These islets vary in length from 90 m to 6 km and in width from a few to 200 m. At no point do they rise higher than 5 m above sea level.

The total land area is 12.2 km². Nukunonu, the biggest atoll, is 4.7 km². Fakaofu is 4.0 km² and Atafu 3.5 km². The atolls are basically coral rubble and sand mixed with a thin layer of humus. Tokelau has an average mean annual temperature of 28° C and an annual rainfall of 290 cm. The population is approximately 1700 for the three atolls.

Tokelau is highly dependent on its marine resources for protein and livelihood in general. The harvesting of marine resources is one of the most important aspects of the traditional Tokelau lifestyle, and there is a growing amount of literature on the subject. Conservation practices in Tokelau, however, have never been adequately documented.

Until fairly recently each of the three atolls of Tokelau had just one village. This may be one factor responsible for traditional conservation practices having a character somewhat different from other areas of the Pacific Islands. For example, the concept of reef tenure does not exist. This departure from the more typical conservation systems may have caused some researchers to assume that there were no explicit marine conservation strategies in Tokelau. Alternatively, because some of the practices are quite subtle, they may have been overlooked by outside workers.

An understanding of the governing structure in Tokelau is a requisite for a discussion of conservation. Central governing authority in Tokelau is vested in a Council of Elders, comprised of most adult males over the age of 60. The Council, about 25 people on each atoll, historically has had total responsibility for the management of marine resources. In recent times, however, this authority has somewhat eroded.

Many of the current conservation issues involve species where there is some degree of concern over the present abundance. These include turtles (*Chelonia mydas* and *Eretmochelys imbricata*) and giant clams (*Tridacna squamosa* and *Tridacna maxima*). It is interesting to note that in Tokelau for the purpose of conservation, birds and

land crabs are placed in the same category as marine organisms.

Marine conservation measures

In Tokelau traditional marine conservation measures can be thought of as falling into three categories: those that are specifically designed for conservation; those aspects of the Tokelau traditional system which indirectly result in a reduced amount of fishing effort on particular species; and finally the elaborate process of perfecting fishing skills which has the effect of reducing the need for destructive fishing.

Probably the most important explicit conservation measure is the **lafu** system whereby all types of fishing are banned in specific areas of the main reef. An example would be prohibiting activity on the entire windward reef shortly after the bi-annual change in direction of the prevailing wind. The decision to establish a **lafu** is made by the Council of Elders and an attempt is made to define the geographic area in such a way that no family will suffer a disproportionate amount of hardship because of the ban.

Although the **lafu** may be established for reasons other than a reduced abundance of a particular species, it is generally agreed that it results in a substantial increase in the availability of fishery resources in that area. At times a **lafu** may be established in anticipation of a future need. To ensure that marine foods will be especially plentiful at an important festival, fishing may be banned from a section of the reef until just prior to the event.

Another specific conservation measure is the rejection of undersized fish when captured alive in most types of fishing. Fishermen believe that the potential benefits of returning fish to the sea are worth the reduced catch. Scolding by one's father and elders serves to reinforce this practice.

For conservation purposes, destructive fishing methods are discouraged in the traditional system. The best example of this is the ban on the use of the toxins from *bêche-de-mer* as a fish poison. Although the technique is highly effective in killing fish, it is thought that the use of the poison is detrimental to coral in the vicinity of its use and results in long-term negative effects.

In addition to the specific conservation measure above, there are a wide variety of practices in the Tokelau traditional system which result in the conservation of marine resources through restricting the amount of specific fishing effort. Customs associated with turtle fishing illustrate how this can operate. Green turtles are relatively easy to capture when they are copulating in the open ocean, however not everybody is allowed to take turtles in this fashion, only certain highly respected masterfishermen. When somebody is successful in locating a turtle nest with eggs, he is traditionally obliged to capture the nesting turtle. As the exercise may require several nights of uneventful, boring waiting on the nest beach, it is in effect a deterrent to hunting for turtle eggs. Turtles in Tokelau are considered 'sacred fish', meaning that a captured turtle must be divided among the entire community. This requirement results in a reduced incentive for an individual to participate in turtle fishing.

In Tokelau there is the perception that the pelagic fish (tunas and billfish) resources are far greater in magnitude than the reef and lagoon species. There are a number of mechanisms whereby offshore fishing effort is encouraged which, in effect, relieve pressure on the more vulnerable inshore species. The elevated status in the community of a good tuna fisherman serves to influence fishing effort. There is also the opinion that many of the lagoon species should be reserved for harvesting only when weather conditions do not allow journeys into the open sea.

There are examples of attempts at marine conservation in Tokelau which, although they have a doubtful biological basis, demonstrate an intent to manage marine resources for conservation purposes. When giant clams are harvested, there is a requirement that the string of clam meat must be towed around the reefs where they were collected in order to release eggs from the harvested meat.

Another category of marine conservation is the elaborate process of perfection of fishing skills which has the effect of reducing the need for destructive fishing. The title **tautai**, known in many areas of Polynesia, is conferred on those individuals who have spent years or decades under the instruction of an older **tautai**. This long, intensive training refines the skills used in the capture of hundreds of types of fish. In effect, those individuals who have acquired this knowledge prefer to use the 'proper' technique, rather than anything that may work. For example, in octopus fishing, a knowledge of octopus behaviour, the manufacture of an octopus stick and its use eliminate the need for crushing coral or using fish poisons.

Modern problems with the traditional conservation system

Recently there have been difficulties with the traditional marine conservation system in Tokelau. Probably the most

serious is a general reduction in the authority of the Council of Elders which results in less effective management of marine resources. This diminished power is due to several factors including the introduction of a cash economy lowering respect for the now-salaried elders, ventures by the Council into non-traditional areas such as budgetary processes, having Tokelauans who were raised in New Zealand outside the traditional system present on the atolls, less severe punishment for violators which could consist of a relatively painless cash payment, the presence of an educated elite who can more easily escape the wrath of the system, and the convenient option of escaping the authority of the Elders by departing for New Zealand.

Another difficulty with the traditional conservation system concerns the development of overseas markets. The isolation of Tokelau has until recently resulted in all harvesting of marine resources being exclusively for local use. There was no incentive for accumulating surpluses in excess of domestic needs. The improvement in the transportation situation has created the possibility of marketing marine products in Western Samoa. The demand for giant clams has grown tremendously, and is now far greater than the resource can support, resulting in a marked drop in clam abundance.

The introduction of modern fishing gear has also created conservation problems. The virtual absence of pearl oysters in the lagoons has been attributed to the use of diving goggles, unknown in traditional times. Gill nets and spearguns have also presented difficulties which the traditional system has yet to resolve.

With changes to the economic and educational systems there has been a marked deterioration in the level of fishing skills. Fishing effort is becoming more concentrated in the 'easy' fisheries, while the types of fishing requiring special knowledge or intense physical effort, such as chasing giant maori wrasse or eel fishing, are being practised much less often. The end result is an excess of fishing effort on certain easy-to-capture fish, such as parrotfish.

Since the deterioration of traditional fishing skills is having a negative impact on marine conservation, there have been attempts to document the knowledge associated with particular fisheries. This has included the tuna, nearshore pelagic, and bottom fisheries, in both written and photographic forms. There are plans to continue this work for reef and lagoon species. It is important that aspects of this documentation be introduced into the curriculum of primary and secondary schools. There is some opposition to this concept from those well-intentioned workers who have laboured so hard to introduce an effective western-type educational system to Tokelau.

Additionally, there is the perception of the superiority of the western curriculum and that the educated elite might lose some status when having to rely on master fishermen with no formal education. There was an attempt to include instruction by Elders on fishing and marine resources at the primary school level, but the value was downplayed by the educated elite and the instruction was transferred out of the primary school system to a less recognised institution which has since become defunct.

Adapting traditional marine conservation to modern realities

The people of Tokelau feel that the traditional conservation system has served them well over the centuries. They are also aware, however, of the need for modification of the system to reflect recent changes.

Some Tokelauans believe that the foremost need with regards to traditional marine management is to restore the authority of the Council of Elders. Although this is an area of great controversy, many educated Tokelauans feel that this could be at least partially accomplished by restricting the Council's activities to those areas of their expertise and delegating responsibility for subjects alien to them, thus preserving the perception of the wisdom of the Elders. Alternatively, another option would be to have a Tokelauan with a substantial background in fisheries biology act as technical adviser to the Council.

It is also believed that the effective management of marine resources by the Elders could be improved by establishing a more effective system of punishment for violators, which could deal with both the traditional and introduced aspects of Tokelau life.

Tokelau law is now undergoing major changes. Former de facto legal practices are now being codified (ironically for

approval by the Parliament of New Zealand). Unfortunately much of this work is being done by individuals without an appreciation of the positive value of traditional marine management. It is important, however, that the authority of the Council of Elders over marine management should not only be recognised, but strengthened in the new code.

Biological information from stock assessment studies could be used to enhance traditional management. Scientific studies have been carried out in Tokelau on tuna, baitfish, turtles, clams, bêche-de-mer, coral, bottomfish and crabs. Although output from these studies has been utilised to some extent, a mechanism should be established so that the results are more fully incorporated into the Council of Elders' management plans.

The realities of modern life in Tokelau are that most bright young Tokelauans spend a substantial portion of their educational years overseas. Unfortunately, those are the years in which a major portion of traditional knowledge would formerly have been acquired. Recognising this, consideration should be given to modifying the age at which traditional education begins.

It is essential that the educated elite be convinced of the positive value of including traditional knowledge instruction within the primary and secondary school curriculum.

The positive value of traditional marine conservation in Tokelau is undisputed by the residents. The future challenge will be to modify the traditional framework to allow flexibility for the realities of modern life and to establish a mechanism for the consideration of results from scientific studies.

RESOURCE OWNERS AS IMPLEMENTING AGENCIES OF PAPUA NEW GUINEA COASTAL MARINE RESOURCE MANAGEMENT REGULATIONS

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Introduction

Since the 1940s, coastal fishermen of Papua New Guinea (PNG) have been commercially exploiting the sedentary resources of shallow inshore waters. These resources include two species of bivalve—the black lip pearl oyster (*Pinctada margaritifera*) and the gold lip pearl oyster (*P. maxima*)—and two gastropods—trochus (*Trochus niloticus*) and green snail (*Turbo marmoratus*). Records of PNG exports since 1948 show that the highest trochus production (1030 mt) was recorded in 1951; that of green snails was over 100 mt/yr in the period 1951–1957 (Glucksman & Lindholm, 1982). Black lip and gold lip pearl oyster production, grouped as mother-of-pearl (MOP), reached a peak production of 50 mt/yr during the period 1970–1973.

In the 1980s the international market prices for trochus, green snail, black lip and gold lip began a steady increase. This was reflected in the prices paid to fishermen, which provided an incentive for fishermen to shift from the finfish fishery and farmers from agricultural cash cropping to the harvest of commercial shells and bêche-de-mer. There was also increased foreign interest in the fishery, with businessmen from Korea, Singapore and Hong Kong going directly to provincial and villages agencies to harvest, process and export the products.

This led to a fairly heavy exploitation of commercial shells and bêche-de-mer without management plans, except for the National Continental Shelf (Living Natural Resources) Act. This Act was seriously flawed in that it dealt only with harvesting, and, although it served as an initial management tool, it was never seriously enforced by the national Department of Fisheries and Marine Resources (DFMR).

From 1987 to 1990 the Sedentary Resources Assessment Project (SRAP), in Kavieng, monitored the production for Kavieng and Manus and carried out initial resource surveys. In 1989 a management plan was submitted to the National Government, through the National Fisheries Council (NFC), and a second attempt, in 1990, is still to be considered by the National Executive Council (NEC).

The affected provinces, such as Manus, New Ireland, and, more recently, Milne Bay, have taken their own initiatives to draw up management plans to protect their sedentary resources. Since 1990 Manus has enacted a Marine Resources Protection Act (MRPA), New Ireland is in the final drafting of its MRPA, which may be enacted by the end of this year, and Milne Bay is considering drafting its own provincial MRPA. The main concern now is by whom and how are the management regulations to be implemented? Thus SRAP is now examining management options suitable for PNG.

In this paper we provide an overview of the National Government concerns in marine resource management, and of the constraints on implementing management plans and on providing effective surveillance and enforcement. For demonstration we use two contrasting case studies: the Mouwe (Milne Bay) sandfish (bêche-de-mer) fishery and the Tigak (New Ireland) sandfish fishery. Finally, based on the Manus Survey (Lokani & Chapau, 1992), we propose an alternative form of resource management using resource owners (the community) for surveillance and enforcement of the Manus Provincial MRPA.

Background

PNG has an estimated 10,000 km of coastline, approximately 4 million ha of shallow waters less than 30 m deep, and 17 million ha of 30–200 m depth (PNG, 1989). In 1980 an estimated 13 per cent of the population of 3 million lived in the coastal zone and on offshore islands. Population growth rate was estimated at 2.5 per cent (Freiling, 1983).

Fishery

During the last 20 years an estimated 20,000 mt of marine aquatic resources were harvested for subsistence consumption and 2,000 mt were harvested by the artisanal sector. Some resources, such as lobster, barramundi, trochus shell, green snail, black lip and gold lip pearl oysters, and some species of sea cucumber (bêche-de-mer) were exploited commercially for export.

The Fishery Sector Review (PNG, 1989) estimated the combined potential yield for waters less than 30 m deep at 80,000 mt based on a factor of 20 kg/ha/yr. Even greater estimates have been made for coastal waters less than 200 m deep, based on 8 kg/ha/yr (Freiling, 1983; Munro, 1976; Wright & Richards, 1985). Present harvest levels clearly suggest that most reef areas in PNG are underexploited.

However, some resources are being exploited at or near maximum sustainable yield (MSY). These include prawn, lobster and trochus (*Trochus niloticus*). Some localised overfishing occurs, such as that for sandfish (*Holothuria scabra*). Apart from prawn, lobster, tuna and tuna baitfish, no management regulations protect PNG coastal marine resources from overexploitation.

Management acts

PNG's marine resources are being developed and managed according to five National Acts: The Fisheries Act, Continental Shelf (Living Natural Resources) Act, National Seas Act, Fisheries (Torres Strait Protected Zone) Act and Export (Fish) Regulations. More recently, East New Britain enacted a Provincial Marine Park Protection Act, Manus Province passed a Marine Resources Protection Act, and New Ireland Province is close to passing a Marine Resources Protection Act. There are thus eight fisheries-related acts altogether.

Sedentary resources harvest

Since 1985 the harvest of sedentary resources such as trochus shell, green snail, black lip, gold lip, and some 10 species of commercial sea cucumber (bêche-de-mer) has increased concomitant with gradual increases in market prices. As a consequence, localised overfishing of trochus and some species of bêche-de-mer became a major concern for such main producing areas as North Solomons, Manus and New Ireland (trochus) and Mouwe Island, in Milne Bay Province, and Tigak, in New Ireland Province (sandfish).

Traditional marine resource conservation and management practices

Soon after Independence, in September 1975, the national government became concerned about the rapid erosion of traditional customs and related conservation practices, as a result of religious influences and the general impact of westernisation. Modern approaches to natural resources development and management were applied to fisheries development projects, with a fairly high rate of failure.

In October 1980, the then Office of Environment and Conservation together with the Institute of Applied Social and Economic Research (IASER) invited foreign and local

experts to discuss traditional conservational knowledge and practice, and its implications for contemporary resource management and development in PNG. In 1985, at the Torres Strait Seminar, similar issues relating to traditional use of resources and conservation practices relevant to the implementation of the Torres Strait Treaty were examined. The UNDP/PNG Fisheries Sector Review (PNG, 1989) pointed out a number of major constraints in developing coastal fisheries. Two of these were traditional resource ownership and problems relating to surveillance and enforcement capability. The final report of the ADB/Agrodev study expressed the need for the PNG Government, through the DFMR, to involve resource owners in the early stages of planning fisheries projects and in the management of coastal marine resources (Stockwell & Tumbull, 1991).

The messages conveyed by these various conferences, seminars and studies set the scene for a new approach to developing and managing the coastal marine resources of PNG. Problems hindering fisheries development and management activities such as marketing, transport costs, improved fishing methods, the funding of extension activities, fishing rights, surveillance and enforcement capabilities, among many others, remain the same as those problems identified a decade ago (Waigani Seminar, 1980; PNG, 1989; Stockwell & Tumbull, 1991). Hence we are more concerned with the problems associated with the implementation of fisheries management.

As a result of these experiences, SRAP submitted in 1989 a management plan to the national government, through the National Fisheries Council (NFC) Meeting requesting that the regulations of the Continental Shelf (Natural Living Resources) Act be amended to incorporate new management plans. The NFC endorsed the management plans and directed the DFMR and the Justice Department to act on the request. No action was taken during 1989, so a second attempt was made at the 1990 NFC meeting in Rabaul, at which the affected provinces, such as Manus, New Ireland, East and West New Britain, and Milne Bay, provided strong support. This management plan is still being examined by the National Legislative Council. Meanwhile, various areas are experiencing localised overharvesting.

The proposed management approach

Normally, the amendment of management regulations or the enactment of new management acts requires just over two years. But even if good management plans are made and enacted, experience shows that man power, funds, equipment, and effective programmes are lacking for surveillance and enforcement. Thus despite good management plans, such fisheries as the sandfish fishery of Tigak and Mouwe have collapsed and the trochus fisheries

of such provinces as Manus, New Ireland, North Solomon, West New Britain, and Milne Bay have declined.

To overcome these situations, more suitable management systems are being examined that both speed the processes of passing management regulations and reduce government expenses by involving resource owners in carrying out surveillance and enforcement in remote areas where government services are minimal. The success of such systems depends essentially on four basic instruments:

- an administrative system;
- a legal system at the village level;
- a traditional system to handle fishing right issues and provide a traditional leader; and
- provision of a technical assistant to determine sustainable harvesting levels in development projects aimed at improving village economies.

Government system

The decentralisation of political and administrative powers to provinces after Independence and, subsequently, the establishment of community government enabled villages to make decisions relating to their own development. Otto (1989) noted that in Manus and New Hanover (New Ireland Province) village communities are characterised by having two leaders. One is a traditional leader, who has no political authority but who leads his clan in traditional ceremonies and makes important decisions relating to the use of land, sea and resources. The second is a political leader who is either a community government representative or a local council representative. The latter is elected by the community to implement provincial government instructions. In general, communities have more respect for village-level political leaders than for those elected to the provincial and national levels.

This system would provide a vehicle for implementing sedentary resources management plans and regulations at the village community, by involving villagers in the management of their own resources. It is also intended to make people more responsible than hitherto for managing their own resources, and hopefully, more accountable for the entire welfare of village communities.

Village court system

In most provinces national legal power has been decentralised via creation of a village court system. This is an important legal instrument for enforcing regulations at the community level. It allows minor offences to be dealt with quickly at a village level, and the imposition of minimum

penalties if required. Major offenders are referred to the District or relevant court system. Interviews conducted in Manus, in 1991, demonstrated that most people consider that, according to tradition, relationships between offenders and surveillance officers could have serious repercussions. We suggest that penalties on offenders should be imposed with care, should the proposed system be implemented.

Technical assistance

The national and provincial governments should continue to provide technical inputs to the village-based management approach, by assisting in surveys and advising on the overall management of provincial fisheries. We are now examining the feasibility of training young educated villagers to collect catch and effort data, and to conduct simple surveys before the opening and at the end of each harvest season. These data would be sent to the National Fisheries Research Station at Kavieng, for analysis and reporting back to the respective management area, to assist in management decision-making. Their management strategies should be based on a combination of sound technical advice and good, consistent miles of thumb.

Conclusion

We feel that the management approach now being looked at would reduce such current constraints as the lengthy process of getting management plans accepted by national and provincial legislatures. It could also create savings for the government in enforcement and surveillance. The system would transfer the power of management accountability, responsibility for managing their resources, and community maintenance back to the community. This would allow and require resource owners to become more responsible for the development of the entire village community. In the long term, development plans that would increase employment opportunities, reduce foreign involvement, and, ultimately, ensure the management of resources on a sustainable yield base must be locally designed and implemented.

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CONFLICT RESOLUTION IN THE DEVELOPMENT OF THE COOK ISLANDS PEARL INDUSTRY

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Background

Before the establishment of the colonial government in the Cook Islands at the turn of the century, the management of the lagoons and its resources had largely evolved over a considerable period of time. Families over the years had laid claim to certain areas of the lagoon, usually as an extension, or in close proximity, to where their dwellings were, or to land that they owned. These claims to ownership of parts of the lagoon formed the basis for management. The lagoon was divided into several areas, with the outer limits of each area clearly demarcated by visible coral out-croppings or islets. Maps that show the apportioning of the lagoon to the various families are still in existence. Each family had total jurisdiction over the exploitation of the resources within its particular area of the lagoon. This system, by all accounts, worked quite well. However, it was not unusual for members of one family to seek permission to fish or harvest pearl oysters in another family's area of the lagoon.

At the turn of the century, traditional lagoon management measures that had always served the people well over the past began their sure and steady slide into obscurity. The colonial government based in the capital Rarotonga unilaterally decided what was best for the people on these remote atolls. Traditional practices were swept aside and western-type laws were introduced and rigidly enforced. A number of well-intentioned laws for the management of the pearl oyster resources of these atolls were implemented during this colonial era. For example, there was a moratorium placed on the harvest of pearl oysters, and this could only be lifted at the discretion of the Resident Commissioner who was based in Rarotonga. There was also the introduction of a legal minimum size limit placed on the harvesting of pearl oysters. These were all excellent management measures, however, the manner in which they were brought into force without consultation with the owners of the resource left a lot to be desired.

In 1965 the Cook Islands became internally self-governing. This major political change did not, however, give rise to any change in the manner that decisions were arrived at with respect to matters affecting the management of the resources within the lagoons of the northern Cook Islands. Laws inherited from the colonial era, as they related to pearl oyster management, remained in force until the early 1980s.

In 1975, the Cook Islands Government entered into a pearl farming agreement with an Australian company without consultation with the people of Manihiki or its island council. The Island Council, which is, an elected body, has the responsibility of ensuring that the collective will of the people is taken care of through representation to government. In the case of this Australian company, the government had not sought the views of the people, through the Island Council, with respect to this new development.

As a foreign entity carrying out business in a very remote location, and without the people's blessing, the company naturally came into conflict with the inhabitants of the island. The company, which had to purchase oysters from the people for its farm (it was not permitted to carry out this activity on its own), found it difficult to meet its target, not because there were insufficient oysters, but because the people were reluctant to sell. The company was forced to purchase oysters of a lower quality as people sold their best oysters to traders for mother of pearl. Company equipment would mysteriously disappear and the company found it difficult to impose the eight-hour working day on its labour force.

Apart from the problems that the company was experiencing with local attitudes and prejudices, it was also having great difficulties in recruiting and maintaining the services of Japanese pearl seeding technicians because of the extreme isolation of Manihiki. By the late '70s, the company was facing financial difficulties and was finding it hard to keep up its licence payments to the Island Council. This was the opportunity that the Council had been waiting for, as grounds for approaching the government to terminate the company's licence. In 1981, the company was finally forced to curtail its pearl farming activities on Manihiki.

Developments over the last decade

The 1980s can perhaps be labelled as the decade that pearl farming became established in Manihiki. It was also the period in which government decided to repeal legislation pertaining to the management of pearl oyster resources that had been in force since the colonial era. New legislation was introduced in 1982, which effectively gave island councils total control over management of the living

marine resources in their respective lagoons. For the people of Manihiki, this was a very welcome move. A treasured heritage was no longer being controlled and managed by bureaucrats from the capital 700 miles away.

One of the first decisions that was made by the Island Council under this new management regime was to open the hitherto closed lagoon to the harvest of pearl oysters. This open harvest season continued unabated until very recently, despite the appearance of several indicators showing that the stocks of wild oysters were at dangerously low levels. The bulk of the oysters that were harvested from 1982 to 1987 were killed and sold off as mother of pearl.

In the mid '80s, one local Manihikian began establishing a pearl farm. By 1987, this person had collected over 30,000 oysters which were in various stages of readiness for nucleation. During the same year, approaches were made to the Island Council and government by no less than five pearl farming entities that were operating out of neighbouring French Polynesia for permission to establish a pearl farm. One company received permission from the Island Council, and started operations the same year.

Under the terms of the licence, the company was given permission to cultivate up to 300,000 oysters and to have these oysters seeded. In the meantime, the sole Manihikian who had been cultivating oysters for a number of years was still unsuccessful in obtaining a pearl farming licence from the Island Council. He needed this licence in order to hire pearl seeding technicians. Threats of court action by this person only led to a greater resolve on the part of the Island Council not to issue him with a licence.

One must understand that up to this point, no person, other than the foreign company, had been given a licence to produce black pearls. What most of the people had received from the Island Council was permission to collect wild oysters and to set spat collectors. As most people were selling and receiving good prices from this company for oysters that they collected either from the wild or from their spat collectors, they were not in the least concerned at the future implications for them if the Island Council steadfastly refused to issue Manihikians with what became known as pearl seeding licences. The matter was finally resolved when the Minister invoked his power of veto and granted the farmer in question the necessary approvals to bring in pearl seeding technicians. This action led to a deterioration of trust and co-operation between government and the Island Council. However, it did break the impasse as well as opening up the release, by the Island Council, of pearl seeding licences to the local populace.

One area that is often overlooked in terms of good co-operative approaches to management is the lack of effective communications. Prior to the middle of last year, there were no scheduled flights to Manihiki. Sea transportation was at its worst ever, prior to the introduction of regular air services to Manihiki. It was during this period that relations between government and the Island Council were at their worst. Opportunities for face-to-face dialogue with the Island Council and the people of Manihiki were extremely limited. A great many of the problems and mistrust that were inherent on both sides could have been laid to rest if opportunities for frequent dialogue had been available. With the greater interaction that now occurs between government and the people of Manihiki as a result of regular air transportation, problems of management and user group conflicts are slowly being resolved.

The Island Council has recently appointed a representative based on Rarotonga to service the needs of the pearl industry and to liaise with government on matters affecting the industry. The pearl farmers on Manihiki have formed an association and therefore are able to deal directly with government if they wish to do so.

Government, through its Ministry of Marine Resources, continues to provide management and scientific advice to the industry through the Island Council and extension services.

Pearl farming has grown rapidly in Manihiki over the last three years, with total numbers of oysters under cultivation approaching 500,000. It is estimated that the capacity of the lagoon to sustain a safe population of farmed oysters is between 500,000 to one million oysters. The 500,000 figure will be reached this year. Unlike other islands in the Cooks, the population of Manihiki has been steadily growing, as the prospects of wealth and worsening unemployment in New Zealand combine to lure people home.

The future of the pearl industry on Manihiki lies with the Island Council. The time is fast approaching when it will have to make hard management decisions such as putting a cap on the numbers of oysters that can be farmed. It will also have to deal with many issues that will prove extremely unpopular, such as limiting the number of licences and allocating oyster numbers for each licence. Government will continue to give the industry the best advice that it can; however, one thing is absolutely certain: the industry cannot continue to grow unchecked if an outbreak of disease is to be avoided.

WOMEN AND FISHING IN TRADITIONAL PACIFIC ISLAND CULTURES

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Introduction

Women are involved in many types of fishing in the traditional cultures of the Pacific Islands. The extent to which women fish varies greatly from island to island. Most women, however, tend to fish in shallow waters close to shore, without the use of canoes and with no implements other than baskets and sticks.

An examination of the role of women in the Pacific Islands is complicated by several factors:

- fishing studies tend to focus on the often highly ritualised, dangerous pursuit of ocean-living fish, which is a primarily male-dominated activity;
- studies have often overlooked gender roles in fish collection by the use of general terms such as ‘fishermen’ and the emphasis placed on documenting techniques and implements;
- early researchers were often men, and thus had access to male knowledge;
- men in the Pacific islands often minimise the importance of women’s contribution to fish collection; and
- women occasionally fish even though it is called men’s work.

From the data that have been collected, the tremendous variety of women’s roles in fishing throughout the Pacific is immediately apparent. Generalisation is not possible, even within the confines of a particular cultural group, i.e. Melanesia, Micronesia, or Polynesia, since each individual island has developed its own unique set of confines, owing, in large part, to geography. However, some generalisations can be made if traditional Pacific island cultures are viewed as a whole. Exceptions, of course, exist and tend to be better documented than the general, mundane fishing activities of women. In this paper I explore some of the variety of women’s roles in Pacific islands fishing, briefly discuss possible reasons why this role is often restricted to shallow water fishing practices, and comment on the importance of this often overlooked aspect of fish collection.

The ocean is an important resource for cultures with limited land areas and resources. Marine resources

apparently have been exploited ‘quite extensively’ by most coastal islanders in the Pacific (Oliver, 1989). The extent of this use varies from island to island due in great part to the geography of the shoreline environments and the accessibility of the sea. Cultures inhabiting islands with steep shorelines, few reef or beach areas and deep, turbulent waters developed open-sea fishing strategies using canoes. Deep-sea fishing activities are generally dangerous, periodic and surrounded by ritual and magic. Both men and women are involved in such fish collection strategies when those are the only options available to the Islanders. On the other hand, peoples inhabiting coral atolls that have shallow lagoons and inshore reefs in addition to the deeper waters further offshore were able to exploit more types of marine environments, and gender roles became more stratified as more people in different environments could be involved in seafood collection (Oliver, 1989).

Women’s role in fishing

The dangerous, exciting pursuit of deep-sea, pelagic fish, such as shark, tuna and bonito, tends to be a male occupation throughout the islands that have shallow reefs. Women (and often children) are usually found collecting fish, shellfish and other organisms from the shallower waters closer to the land. Deep-sea fishing is generally restricted to men, since it requires considerable strength and the acceptability of being exposed to great personal risk (Oliver, 1989). The ability to fish is often synonymous with manhood in these societies. Men who do not fish are sometimes ridiculed. For instance, in Pukapuka, in the Cook Islands, a man who does not fish outside the reef is called a ‘female god’, which implies that he is only concerned with the feminine pursuits that would interest a female god who is not interested in masculine pursuits such as fishing (Beaglehole, 1938).

However, the generalisation that men fish from canoes in the deep waters while women stay close to shore in the shallower waters is misleading. In a few Pacific societies, women are involved in all forms of fishing. In New Ireland, on the island of Tanga, ‘every man and woman, boy and girl, is a potential if not an actual fisherman’ (Bell, 1947). In the Marianas both women and men are excellent swimmers, divers and sailors, and both sexes participate in catching fish from off-shore boats (Thompson, 1945).

Women from Fiji also catch fish in deep waters (Hocart, 1929; Thompson, 1949). In addition, although offshore fishing may technically be men's work, in reality women may also participate. Schoeffel (1985) described an experience she had while studying fishing in Solomon Islands. She had observed two canoes carrying groups of women when she first approached one of the islands. Once onshore she asked several old women about fishing practices on the island. They told her about 'men's fishing' techniques: those using lines, nets, hooks and canoes. When she asked where the women she had seen earlier in the canoes had gone, the old women replied that they had gone fishing and that they would be using those very same 'men's fishing' implements—nets, lines and hooks. Apparently, the men own these objects but the women can use them as well

These, however, appear to be exceptions to the more general rule that women stay closer to shore and fish without boats, canoes and the implements and ritual that accompany deep-sea fishing expeditions. Often, restrictions are placed on women, their ability to fish and their access to fishing gear. Not only are island women banned from houses where boats are being built, but they often may not even enter the water when their men are fishing (Hanson, 1982). Throughout the Pacific restrictions limit women's access to deep-sea fishing: a woman in a canoe could bring bad luck in Niue; fishing could be destroyed if the canoe or gear was touched by a woman in Samoa; in the Marquesas women could not have sex, light fires or leave their houses while their husbands fished; in the Society Islands women 'would have neutralised the **tapu** of the craft, gear and fishermen' if they went out in a fishing canoe (Hanson, 1982). These traditions are strong and many hold true today. In 1988, Marie-Claire Bataille-Benguigui, an anthropologist, recounted her difficulties in attempting a study of beliefs associated with Tongan fishing: 'I was never openly forbidden to go on a fishing trip, but unforeseen, inexplicable circumstances usually prevented it!' She was forced to gather information from elderly and resting fishermen on shore (Bataille-Benguigui, 1988).

As one result of these restrictions women are much more involved in fishing activities in shallow near-shore waters, such as reef gleaning, fish poisoning, patch reef construction, and collective net fishing. Reef gleaning is the practice of collecting octopus, shellfish, sea urchins, crabs and other invertebrates from along the reefs (Chapman, 1987). Women (and in some instances children) use sticks to probe animals from their coral shelters. They collect small fish, shellfish and crustaceans in baskets. These practices have been documented throughout the Pacific: Tabiteuea in the Gilberts (Luomala, 1980), Pukapuka in the Cooks (Beaglehole, 1938) and in many other areas (Chapman, 1987).

Fish poisoning is another fishing technique that women use in shallow reef areas. In Niuatoputapu, Tonga, women place pulverised stems of the **aukava** plant in a sack and shake it under coral heads and overhanging rocks in the reef. Fish are stunned and float to the surface where they are speared, knifed or picked up by hand (Dye, 1983). In Futuna, women use a toxic substance from the seed of the *Barringtonia* fruit to poison small fish. This form of fishing, however, can be very devastating to a reef community since juveniles from as many as 40 species of fish are affected (Galzin & Mauge, 1981). Construction of small patch reefs to attract juvenile fish is yet another way the women of Futuna catch fish (Galzin & Mauge, 1981).

Assisting with communal harvests of fish with nets is common in many areas in the Pacific (Beaglehole, 1938; Luomala, 1980). For instance, in Tabiteuea as many as one hundred men, women and children participate in an organised deep-water fishing harvest. The 'participants swim in a great semi-circle carrying a coconut leaf sweep [braided by the women] to drive fish towards a large purseless seine held by other swimmers'. Traditionally, married women were not allowed to participate in this event because their husbands would be jealous if their sexual parts were exposed if their kilts were lifted by the water. All women could participate once the British introduced cloth trousers in the late nineteenth century (Luomala, 1980).

Thus women are involved in a wide range of fishing activities, from deep-sea fishing alongside men in boats to reef gleaning and communal fishing activities in shallow lagoon waters. These fishing activities tend to be secular rather than spiritual, whereas men's fishing activities, even if they take place in the cairn, shallow reef areas are usually surrounded by magic and ritual. Women do not generally use magic (Fiji, which appears to be the unique documented exception to this, will be discussed in more detail below). This is partly because women collect fish and other marine resources on a daily basis for food. Men, on the other hand, embark on the occasional, usually dangerous, journeys into deeper waters that are often part of ritual feasts (Chapman, 1987).

That women do not usually participate in fishing rituals in many societies may be a reflection of the traditional beliefs of their relation to the gods and things spiritual. As noted earlier, Polynesian women are often restricted from such practices as canoe-building and deep-sea fishing, due to strict taboos on their participation. Menstruating and pregnant women are especially restricted from these activities—to the extent that they are not allowed out of their houses or into the water when their husbands are out at sea. Canoe-building and fishing are highly sacred acts in many Pacific cultures; the men involved are in contact with the gods and spirits at these times and are **tapu** (in a sacred state). Women can somehow disrupt this spiritual state and

cause the gods and spirits to leave the canoes, the men or the fishing grounds. Women are especially capable of this 'secularising' ability when they are menstruating or pregnant. This has generally been interpreted as being a result of the polluting effects of women and their contaminating bodily fluids which cause the spirits and gods to flee.

An alternate view of this ability has recently been expounded by F. Allan Hanson. Hanson claims that women are conduits between the secular and the spiritual world: it is through women that ancestral spirits are born into the secular world in the form of newborn babies. Not only are spirits born into the secular world through women, but through them they can also return to the spiritual world. A woman in the Marquesas could draw the evil spirits out of her husband and other male relatives if she sat naked on the afflicted part or if she jumped over him (Hanson, 1982). Rather than repelling the spirits from the objects they inhabit because of their inherent baseness and uncleanness, Hanson claims women attract spirits because of their connection to the spiritual world. Women are particularly attractive to spirits when they are menstruating or pregnant (Hanson, 1982).

This view can explain many previously confusing beliefs in Polynesia quite satisfactorily, as Hanson demonstrates in his study. However, there are still those societies that do not restrict women from fishing all areas of the sea. Perhaps women fishermen in those societies do face taboos and are not allowed to fish when they are menstruating or pregnant. In the Lau Islands in Fiji, where women fish at least as often as men, the mere glance of a pregnant or menstruating woman can destroy turtle nets. Also 'during the first 100 days of pregnancy a woman may not bathe in the sea [or] participate in fishing' (Hanson, 1982). Systematic, detailed studies have not been undertaken to further substantiate the relationship between women's fishing taboos and their degree of fishing participation.

Importance of women's fishing

Women's contribution of fish and other shellfish to the diets of traditional Pacific island cultures has often been underestimated. Women fish every day while men fish less often but with great fanfare and ritual secrecy. In addition, Pacific island men occasionally belittle women's fishing efforts and the fish that they catch as not being worth a man's attention (Dye, 1983). Although it may not be a highly esteemed occupation, in some instances women's fish collection may actually contribute more substantially to Pacific Islanders' diets than men's. The women, at least, take it very seriously: shellfish, small crustacea, squid and octopus collecting are considered part of a woman's daily work in Tanga, New Ireland, whereas the women see men's fishing as a pastime (Bell, 1947).

Because women fish on a daily basis they supply a great deal of the protein obtained in many subsistence diets (Bell, 1947; Chapman, 1987; Luomala, 1980). The importance of women's fishing contribution to the diets of several island societies is illustrated by the following examples:

- 32% of the total fishing yield in American Samoa is supplied by the women, even though they make up only 17% of those engaged in fishing (Chili, 1978);
- in Western Samoa 17% of the daily seafood consumption is made up of invertebrates collected by women;
- in Kiribati 84% of the seafood is collected by both men and women and the remaining 16% is caught solely by reef gleaning by women and children;
- 11% of the households in Kiribati rely completely on shellfish collected by women and children for protein; and
- in one village in Papua New Guinea 25–50% of the seafood is supplied by women (Chapman, 1987).

Unfortunately, quantitative data such as these are rare. There is, however, some evidence that women's fishing may provide the necessary protein for a village when fish are scarce. For instance, the Tanga rely on meals of lobster, crab, prawns and cuttlefish when bigger, deep-sea fish are in short supply (Bell, 1947). It is reasonable to assume that many other island cultures in the Pacific depend on women's fishing to a greater extent than the men give them credit for.

A second aspect of the underestimation of women's fishing is that their knowledge of marine resources is terribly overlooked. Much has been written about the ethnobiological knowledge of male fishermen and that knowledge has proved to be extensive for their local areas. Often this knowledge is greater than that of the researchers who come equipped with scientific books and university training (Johannes, 1981). Undoubtedly women have similar knowledge of the biology and ecology of the resources they collect or they would not be so adept at finding food on the reefs and in open waters.

For instance, in Fiji, an island society that values women's efforts in fish collection and has relatively few of the more restrictive taboos associated with fishing, women have considerable access to the power and knowledge of marine resources. Fijian culture is an exception to the general rule that women do not possess ritual knowledge or magic control of marine resources. A woman in Fiji can have great knowledge and power over some of the fish resources. One woman of a particular clan knows all about

the habits of a special species of worm that swarms seasonally. The worms attract sharks that are in turn attracted to the woman and her powerful magic. She watches these worms until the time is right to call the rest of the Islanders. The sharks collect at the base of the rock that the woman stands upon chanting and the villagers are able to collect the sharks as they sit passively at her feet. This woman can even cause the fish to become stranded (Hocart, 1929).

Myths from other areas in the Pacific also portray women possessing fishing knowledge. A myth from Tabiteuea describes how knowledge was passed from a woman spiritual ancestor to a fisherman. This knowledge consisted of techniques for catching a certain kind of fish as well as where to best catch them. Fishing methods have also been credited to ancestral women. In another story from Tabiteuea a woman 'imitated the action of [a migratory wading bird's] beak' as it pokes in the mudflats for marine worms. With a pointed stick, the woman was the first to find how best to catch the edible marine worms. These worms are now caught every day to be eaten raw, cooked or sun-dried (Luomala, 1980).

Whether it is probing for worms, catching crabs and shellfish as they hide in the shallow reef waters or venturing out in canoes to catch deep-sea fish, women contribute greatly to the fish collection in many of the Pacific islands. On some islands, women's access to the marine resources is limited to the shallow near-shore areas, while on others women fish alongside men in deep-sea fishing canoes. As traditional cultures change upon contact with outside (especially European) influences, the roles of the native peoples change and the management of their resources is affected. In many Pacific islands fisheries are expanding and becoming more commercialised. Tuna is of both subsistence as well as commercial importance in Samoa, Tuvalu, Kiribati, Solomon Islands and Fiji, among others (Schoeffel, 1985). However, in shore fisheries have largely been ignored as the development emphasis is placed on offshore resources. This is unfortunate, as the inshore areas have been successfully fished by women and their families for generations, providing a substantial amount of protein to the Islanders' diets.

It is equally unfortunate that more anthropologists have not studied the ethnobiological knowledge of women. Why a woman anthropologist such as Bataille-Benguigui did not opt to study the women's knowledge of fish beliefs and resources in Tonga rather than being forced to sit on the beach while the male fishermen were out to sea is not clear. A woman anthropologist is in a good position to study that side of fishing knowledge that is passed from a woman to her daughters. While a woman's role in Pacific island fishing is not often as exciting and magic-filled as that of her ocean-going husband, it is very important in terms of its contribution to her society's protein input.

Without further study of the importance of women's fishing and resource knowledge in the Pacific islands, a complete appreciation of Pacific island culture is impossible. Without this appreciation, commercial development in the islands will not reflect the reality of the traditional culture since it emphasises and encourages the importance of male-dominated fish collection methods as it omits the role of one half of the population-women. Self-sufficiency and balanced development, however, depend on the contribution of both women and men to the collection of fish resources in the Pacific islands. Development projects should not ignore the importance of the resources that are under the domain of Pacific Island women.

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WOMEN IN FISHERIES DEVELOPMENT

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Introduction

Women in the South Pacific have always played a major role in fishing communities, yet it is only during the past decade that consideration has been given to bringing women into the fisheries development process. This paper will briefly (1) analyse what 'women in development (WID)', and more specifically 'women in fisheries development', mean, (2) review some of the mistakes that have been made with respect to 'WID' and (3) explore some concept critical to the implementation of an integrated development programme that will enhance the quality of a fisherwoman's life.

Many of the issues relating to women in fisheries development are the same as those which have been and continue to be addressed within the general area of WID. I hope this article will act as a catalyst for future dialogue and stimulate people to consider new ways to approach this complex issue.

Development

My own observations and the literature on WID show that in the past, women's economic roles have been undervalued and ineffectively supported, their potential as partners in development largely ignored, and their needs and interests as human beings neglected. Since 50 per cent of the population in the developing countries are women, we must also acknowledge that 50 per cent of the population in these countries are not achieving their full potential as individuals in their own right or as economically productive members of the community.

To address this imbalance the concept of WID has evolved. Although every country and every organisation may have its own specific definition, the general aim of WID is to allow women to participate on an equal basis with men in the social, economic, and political processes. More precisely, but consistent with the general aim of WID, FAO states that the basic goal for women in fisheries development is to make them equal partners, and productive and self-reliant participants, in the process of improving their own and their family's nutritional and living standards, and to enable them to realise their full potential as human beings in their own right and as members of their family and community (Haque & Tietae, 1988).

This is the goal to which I refer in discussing the need to improve the role of women in fisheries development.

'Equality' does not necessarily mean the same to everyone. I have frequently heard the comment that equality 'between' the sexes is impossible because men and women *are* different. Yes, men and women are different, and will most likely have different roles within the fishing community, but that does not mean they are unequal. Equality or equity recognises differences among human beings, acknowledges that men are different from women, that people from different countries are different, but does not attribute greater value to one than to the other. So when I speak of equality for women in fisheries development, I am not suggesting that women necessarily be treated in the same way as men, but that their roles must be accorded value equal to those of men. 'Equal' partners implies that neither partner is superior or more important, even though they have different roles within the family and community.

Past mistakes

There have been numerous studies in the last number of years to determine the progress that has been made in the advancement of women, particularly those in the rural areas, since International Women's year. The picture is far from brilliant. In fact a general consensus is that the developing world is littered with projects that have failed (Mathie & Cox, 1987).

There appears to be a genuine interest within the South Pacific Commission and its member countries in pursuing initiatives for women in fisheries development. While this increasing interest is encouraging, it is vital that we do not repeat past mistakes. If instead we can learn from them, even those projects that have been labelled failures will contribute to future successes.

What were some of the main mistakes?

The concept of 'women's work' and lack of recognition of the woman's role in the community

The unpaid, unrecognised nature of much of women's work leads to lack of status/recognition and confusion over who the productive members of the family are.

Every society has its own ways of assigning worth to individuals, but too often an individual's worth and value are based on how much they earn. As women have not traditionally been paid for their work, their roles have often been perceived as unimportant and non-productive.

We must, therefore, begin to accept the fact that women do *real* work. In fact, they usually work longer hours, a 'double day'—producing and preparing food and supplying the other basic needs of their families and communities such as water, fuel, shelter, health care, child care and other household chores. International statistics claim that most women do two thirds of all the world's work, yet only receive one tenth of all the world's income (Mathie & Cox, 1987). But because most of their work centres on the family, and they do not receive wages, society fails to call this important contribution of women 'work', and consequently gives it no value.

If development is to be beneficial to society at large, recognition and awareness of the work of rural women and the enormous importance of their contribution must be heightened.

The mounting/developing of women's programmes in isolation

There are two aspects of isolation which need to be addressed.

First, men must not be excluded from the development process for women, and women must not work in isolation. Without support from men, it is often difficult for women to move ahead. This is why it is very important for husbands, fathers and brothers to understand the value of what women are trying to do. Encouraging men's support rather than men's alienation will surely help the women to reach their goals and be more productive.

It is fair to say that men hold the balance of power in the Pacific Islands. Therefore if men are not involved in the solutions to the problems facing women, the chances of the solutions working are very limited. Men must be made aware of the concerns and needs of women and understand what the women are striving for. In recognition of the customs in various countries where women are not encouraged to speak out, it will be the responsibility of the male leaders and the planners to ensure that the women are invited to articulate their concerns and needs. Men should not dictate policies and programmes, but if they are ignored and excluded the women cannot expect to receive their support for on-going activities.

One of the major mistakes the feminist movement in Canada made in its initial stages was excluding men from the movement. There were groups of women throughout Canada who had their awareness heightened and who realised that they had not been given equal opportunity, but

rather had been relegated to traditional roles which were no longer acceptable to them. But the men who held the power in Canada, be it in government, banking or business, had largely been ignored throughout this awareness period. When women reached the stage of wanting some choice in their destiny, society in general (which was largely controlled by men) was not receptive to their concerns and interests. This lack of receptiveness was primarily the result of lack of understanding and awareness. Another aspect that was lacking was the infra structure to absorb these enlightened women—women who now wanted to be part of the paid working world.

It is only in the last 10 years that we have seen real progress in the area of equality for women in Canada. Much of this is the result of finally bringing men into the development process and creating an awareness throughout society of the potential of women as full economic, political and social partners.

The other mistake that has been made, in respect to isolation, is believing that women's lives will be enhanced by the possession of training and economic opportunities. Experience has demonstrated that one does not necessarily follow the other.

As I have already mentioned, many village women at present do a double day's work. By introducing training sessions or income-generating opportunities, we may be adding to their burdens rather than helping them live more productive lives. Unfortunately for women, development has often meant an increased workload—not a diminished one. Development must, therefore, consider ways of lessening their burdens so that they can have more time for the welfare of their families and for cash generating activities. Planners must begin to design training and support services that will help reduce the workload, so that women have the time to develop skills and resources which will give them some economic rewards.

For example, in order to make fish processing economically viable, it is usually not sufficient simply to train women in improved fishing preservation and processing techniques. It may also be necessary to provide support and/or training in child care, sanitation, water and fuel supply, banking, business practices and improved methods of food preparation.

Failure to consider the impact male-dominated development programmes will have on women and on community life

Experience demonstrates that large-scale development projects, mechanisation and improved technologies, which have largely been aimed at men, can have a negative rippling effect on women's lives. Great care must be taken to minimise this.

Mathie and Cox (1987) present a number of examples which illustrate how women's positions as individuals have worsened as the result of improved technology.

In the Vanimo district of West Sepik, Papua New Guinea, it was found that the introduction of speed-boats, outboard motors and nylon nets had a positive impact on the income of men. The negative side was that men were frequently away from home and from their responsibilities to the family, thus leaving women with much more work. It was also found that very little of the increased income was directed back to the family.

In the Southern Highlands Province of Papua New Guinea, village people live on a diet of sago and fish. New technologies have changed travel methods from canoes with paddles to dinghies with outboard motors. Fishing is now done on a large scale with nets. Although these things seem to make life easier, there are fewer fish and the grasses where many prawns and crayfish used to hide are disappearing because of increased pollution. These changes may help men to make more money, but are reducing women's capacities to support themselves and their families.

Although it is important to support and encourage improvements and enhanced economic opportunities for men as well as women, these activities must take into account the impact they will have on women. It is critical that men be part of development for women, but the converse is just as important: women must be included in the development process that is mainly aimed at men. Often, it is only by talking to the women that the outsider can determine the real needs and constraints within the village.

So what can we do?

To address the imbalances and the injustices that women have experienced in the past, and to ensure successful women-in-fisheries development, it is crucial that the framework for all fisheries development be based on three important concepts: sensitivity, integration and support—the SIS design'.

Sensitivity. Planners and field staff must be sensitive to local patterns and methods of work, traditional attitudes and habits and existing economic and social structures, including women's roles. They must understand and be empathetic towards the real and perceived needs of the people the project is designed to assist. They must allow women to be involved in the decision-making processes: sensitivity cannot occur if planners ignore what the women have to say.

Integration. Women's development should not be planned separately or treated in isolation. It must be part of regional development strategies and/or local government directives.

Women's development programmes that are mounted separately often isolate women still further from the mainstream economy. Activities can be specific to women but still part of the mainstream. Our ultimate goal should be complete integration of development activities. This, however, will only occur when women have been accorded true equality within society.

Support. Women must be given appropriate organisational, technical and financial support for their domestic, economic and social activities so that they can make better use of their time. This may mean introducing technologies that will improve the efficiency of their activities, not displace them. It may also entail providing equipment and training to bring them into the realm of modernising for advancement.

This support can be demonstrated in various ways:

- research aimed at developing improved technologies in fish processing or non-fisheries enterprises in which women are engaged;
- provision of banking services and credit facilities;
- extension services and training;
- improved facilities that will ease the burden of such domestic chores as collecting water and fuel;
- better sanitation, housing and medical facilities;
- nursery day schools;
- introduction of improved methods of food preparation and cooking; and
- ensuring women have equal legal rights to property and other assets.

Anyone proposing to establish an income-generating project with and for the women within a village will need to look at the other factors that affect the women's lives. To achieve success within the project, consideration may need to be given to child care, sanitation and water supply. Therefore, the planning process should involve not only fisheries advisers but also rural development advisers, youth workers and, possibly health care workers. The project will thus become better integrated and address the principal factors that could contribute to its success or failure.

Conclusion

To conclude I would like to refer to an article entitled 'Women in the fisheries of the South Pacific' (Schoeffel, 1985).

Schoeffel points out that government fisheries departments in the South Pacific are primarily committed to the development of commercial and industrial fisheries. This involves training local men to become full-time professional fishermen or skilled workers on government or private industrial fisheries vessels. She further states that the subsistence and small part-time fisheries characteristic of most fishing communities in the South Pacific receive little attention in the face of more pressing national economic priorities. Since women's contribution is greatest in subsistence fishing and in selling fish on local markets, it tends to be ignored or underestimated.

Schoeffel concludes that the fundamental structure of fisheries development in the South Pacific is the greatest barrier to increasing women's participation in fisheries. Although she appreciates why regional governments pursue this type of fisheries development, she suggests that a more balanced policy is required which would allocate more staff, funds and other technical resources to increasing the efficiency and productivity of small-scale part-time commercial fisherwomen and women fish vendors.

In addition to other requirements for successful development programmes, attention must therefore also be given to Government policies and strategies and to analysing the impact they have on the quality of women's lives. Sensitivity, integration and support are required not only at community level, but also at government level.

As Schoeffel observed, it is understandable that regional governments are committed to large commercial ventures-economic growth is essential for the development and stability of any country. It is therefore not logical to suggest that all such development be halted. But governments must carefully plan these ventures to ensure that one segment of the community or country is not benefiting at the expense of others. Should the development of commercial initiatives have a negative impact, it is the government's responsibility to incorporate corrective action to redress the potential imbalances.

Government fisheries officers can play an important role in identifying and modifying government policies that may unintentionally have a negative impact on certain segments of the population in the South Pacific. Even though governments have not intentionally set out to discriminate against women, we can no longer ignore the negative rippling effect upon women of some economic initiatives. Consideration must be given to incorporating at the national level policies and programmes which will help to offset some of the detrimental consequences of social and economic change. Just as men must support women and women support men, so must governments support community initiatives and concerns. Without this support, local initiatives will not be sustainable.

As stated in the introduction, the issue of women in fisheries development is extremely complex and cannot be resolved easily or quickly. I have only briefly touched upon some of the problems and some possible action that can be taken to assist the women in fishing communities. What is important is to recognise that action can be taken to empower women to be self-reliant partners in development. A famous quote from John F. Kennedy was, 'Ask not what your country can do for you but what you can do for your country'. To conclude I leave with you a similar remark, 'Ask not what the women can do for you but what you can do for the women'.

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LITERATURE SUMMARY: WOMEN IN FISHERIES DEVELOPMENT

*S. Steele,
South Pacific Commission,
Noumea, New Caledonia*

Centre on Integrated Rural Development for Asia and the Pacific (1989). Rural women in fishing communities. Naga, The ICLARM Quarterly 12 (2): 10-12.

In 1984, the Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) launched a three-year action research project on Rural Women in Fishing Communities in Indonesia, Philippines, Sri Lanka and Vietnam. The project sought to develop a model of participatory data collection on women's role and activities in fishing communities as a basis of planning, monitoring and evaluation, and to help them improve their living and working conditions by establishing pilot action projects to provide input and services to help meet their basic needs.

One of the findings from the consultations was that small-scale fisheries in general face problems of inadequate capital, low productivity, low levels of improved technology in catching, handling and processing fish and weak organisational bases. It was also demonstrated that government measures in most cases fall short of providing benefits to the small-scale fisherfolk.

Indonesia

In Indonesia, rural women were trained in fish preservation and processing, credit, public health, child care, co-operative management and participation in community development. To improve their economic situation, they organised themselves and engaged in fish marketing and fish processing.

The project was considered successful, particularly in augmenting household income and raising the women's level of participation in organisational activities.

Philippines

Sixty-two women from three fishing villages received financial assistance and training to undertake projects on fish processing, preservation and marketing. Profits earned helped to augment their incomes and the beneficiaries also acquired information on community development, health, sanitation, education and fund-raising.

Vietnam

Twenty-eight war widows were given grants. Difficulties encountered included poor communication and transportation; uncertain sources of fish stocks; undetermined ecological effects of shrimp culture; low literacy rates and cultural awareness of the people; and lack of health and sanitation services, water supply, transportation, education and other basic facilities. Despite these, the project helped the families to manage stable jobs and had a favourable impact on their social and cultural life.

The consultations recommended that government policies and programmes explicitly recognise the specific needs of rural women in fishing communities.

Some of the needs identified were:

- opportunities for knowledge and skill acquisition;
- support and extension services, including credit and marketing facilities;
- viable economic organisations to institutionalise and sustain their role in development programmes;
- recognition of their important contribution to the development of the family and the fishing community;
- sensitisation of different disciplines, donor agencies and the scientific community to the problems of rural women in fishing communities;
- continuous monitoring of the impact of policies and programmes on rural women in fishing communities.

The recommendations further stated that projects must enlist the direct participation of fisherwomen in development activities and that the project strategies should be reflected in the national policies and programmes of the government.

Chapman, Margaret D. (1987). Women's fishing in Oceania. Human Ecology 15 (3): 267-288.

According to Chapman, women's fishing in Oceania has been overlooked in most subsistence studies in the region

and, as a consequence, there are few quantitative data available upon which to base an assessment of its importance. This article, which centres on a study completed by Chapman, demonstrates that women contribute significantly to marine food yields in the region. It also suggests that the highly regular nature of women's fishing makes women more reliable and therefore more effective than men as suppliers of protein for subsistence.

The implications of these findings for future development policies in the region, as stated by Chapman are as follows:

Plans for promoting greater incorporation of the women into the commercial fisheries must be approached with as much or perhaps even more caution than similar plans involving men. For example, in many parts of Oceania, particularly the smaller coral islands with few alternative sources of animal protein, women have traditionally fished the reefs and lagoons daily, providing their families with a regular supply of much needed protein to supplement a high carbohydrate diet. The regularity of such contributions can be disrupted if women are incorporated into the market system to the extent that they have little opportunity to carry out their subsistence activities.

The results of such activities are now so evident in modern Africa where there is overemphasis on the development of cash crops at the expense of basic food crops.

Every effort must therefore be made to ensure that the new social and economic developments occurring in the South Pacific do not endanger the continued existence of women's subsistence fishing, at least not until there is a cheap and reliable alternative available to the marine protein which women have traditionally provided.

David, Gilbert (1989). The role of women in post-harvest fisheries activities in Vanuatu. South Pacific Commission Fisheries Newsletter (50): 23–28.

Gilbert's main thesis in this article is that it is time to encourage methods of fish conservation other than that of cold storage, which appears impracticable in Vanuatu. Based on experience in Africa, Gilbert contends that smoking and a combination of salting and drying techniques are appropriate for implementation at village level in inter-tropical countries.

After discussing techniques for smoking, salting and drying fish, Gilbert looks at the feasibility of introducing these in Vanuatu. Of the three, Gilbert suggests that smoking would be the simplest to implement. He goes on to recommend that an extension programme on these techniques be included in the Fisheries Development Programme and aid funds be made available for solar driers and salting units. An important consideration would

be the distribution of coarse sea-salt at duty-free prices in order to minimise the production costs of salted fish.

The benefits of introducing such techniques in Vanuatu would be both economical and nutritional. On a nutritional basis, it is recognised that smoked, salted or dried fish has a higher content of protein, mineral salts and vitamins for equal weight than fresh fish.

As for economic benefits, Gilbert contends that these techniques would not only enhance the value of the fish but would also substantially extend distribution networks. It is also suggested that where the fishermen fish to satisfy their own needs only, smoking, drying and salting would enable them to make the most of the occasional abundance of small pelagic fish, which they cannot do at present because they lack the means to preserve their catch. This would enable them to build up a surplus and sell it if they so wish.

In that women are primarily responsible for processing and marketing the fish, the introduction of such techniques could enable them to earn an income of their own. This would give them some financial independence, which has so far been denied them in the area of cash crops such as copra, coffee, and cocoa.

Drewes, Edeltraud (1982). Higher incomes for Sri Lankan fisherwomen—lessons from a pilot project. Bay of Bengal News (9): 18–20.

A crucial lesson was learnt from the pilot project, which was that the emphasis should not be on production skill training. This conclusion was based on the fact that most women who are compelled by economic need to contribute incomes already possess some technical skills handed down from mother to daughter. It was suggested that further training centres for village-based industries should focus as much on marketing and sales management as on technical demonstration, with arrangements for suitable follow-up to replicate any spread of beneficial impact on a wide scale.

Drewes, Edeltraud (1982). Why women's projects. Bay of Bengal News (5): 22–25.

This article concludes that when one talks about women's extension services, one cannot restrict one's self to the extension of techniques and training for income-generation. Extension must include education to eliminate social and cultural discrimination against women—the discrimination that is manifest in fishing communities where 80 per cent of women earn a great portion of the family income from fish selling and yet are subjected to physical violence by husbands, less food and education, and lack of any decision-making powers in community activities. Drewes suggest that a Fisherwomen's extension service must therefore contain several components:

training for income generation, information about various schemes available in the government specially for fisherfolk, organisation, and participation in groups. Drewes purports that the social and cultural discrimination of women calls for a specific female component in an income-raising project, aimed at developing fisherwomen's own grassroots-level organisations and ensuring better access to extension education.

Economic and Social Commission for Asia and the Pacific (1983). Report of the pilot project planning workshop on improving the socio-economic condition of women in fisheries, 22–26 November 1982, Suva. AD/SECWF/1, 62 pp.

This report was prepared only for participants at the workshop held in Suva, Fiji, 22–26 November 1982.

In collaboration with FAO, ESCAP initiated a project, 'Improving the socio-economic condition of women in fisheries'. The first phase of the project was a survey to assess the involvement of women in productive activities in fisheries. It was conducted in selected fishing communities in Fiji, Indonesia, Papua New Guinea and the Philippines. The second phase of the project consisted of pilot projects on income-generating activities for women in small-scale fisherfolk communities, to be planned on the basis of the survey results.

The purpose of this workshop was to discuss the survey results, present the pilot project proposals and discuss the follow-up activities and the possible expansion of the project.

These were some of the findings from the survey results:

- The most significant finding of the survey in Fiji was the extensive role played by Fijian women in both subsistence and commercial fishing. It was found that usually only women carried out crustacean and shell-fishing. Women brought in quite substantial amounts of fishing income in many households in villages surveyed.
- It was also found in Fiji that the trend towards an increasingly commercial rural production pattern had some negative effects. One of these was on diet. Villagers in all six villages surveyed had high expenditures on food, particularly where income levels were high. A definite shift from self-sufficient subsistence economy to a market-oriented mode of production was noted.
- One of the problems most voiced to the survey team by fisherwomen was the lack of marketing facilities in Fiji.

- One of the principal conclusions of there search was that the condition of women in fishing communities in Fiji could not be improved simply by the establishment of small-scale projects specifically aimed at women in those fishing activities in which they have become isolated. To improve the condition of women effectively in these communities would require a greater encouragement of their participation in the rural and artisanal fisheries development programmes, as well as a changed attitude at both official and community levels.
- Five villages located in West Java were surveyed and the basic problems found in respect to fish capture were unreliable sources of stock, low prices, lack of credit and limited markets.
- The villages surveyed in Papua New Guinea were located in two areas: the Sepik River area and Daugo Island. The survey found that money flow in Sepik villages was minimal and that most people had onlypaddlingcanoes, whereason Daugo Island the assets were more significant.
- Most Sepik villagers did not think their condition had changed materially in the last five years but without exception, Daugo settlers thought that they were better off now than five years ago.
- The Sepik women villagers believed their worst problem to be transport and felt no incentive for starting work on any project while markets were so inaccessible and expensive to reach.
- Daugo Islanders identified the lack of water, a health centre and a school as their three main problems.

Pilot project proposals

Fiji

To encourage women's participation in fisheries programmes, it was recognised that the Fisheries Division would need to change its approach to its rural and artisanal fisheries development programmes. This proposed change in approach by the Division would involve the women in the actual planning and decision-making process at the village level as well as in the various training programmes available.

The Division also agreed to provide the necessary training and support facilities, the processing of fisheries products such as the highly specialised smoking of **walu** or other fishes, and the processing of **kai** and other shells for button-making.

While shells were made into buttons for export, it was believed that other small-scale processing activities such as

the making of fish paste and sun-drying of small fishes could be encouraged.

Papua New Guinea

The proposed project for PNG was a fish marketing facility at Koki Market. Once established, the centre would also act as an agency for bulk fish buyers.

Food and Agriculture Organization (undated). The Role of Women in Small-scale Fisheries. Paper prepared for World Food Day, 16 October.

Harvesting, processing and marketing

This paper suggests that though women are rarely involved in fish capture at sea in many of the developing countries, there are probably as many women engaged in fisheries as men. It is once the boats land that the small-scale fisherwomen tend to dominate activities. For example, it is often the women who empty the nets, sort the catch, gut and clean the fish, process it and sell it.

In Sierra Leone, many of the village women buy the fish from their husbands and then smoke the fish on a **banda** for retail. The entire operation from the buying of the fish to the completed smoking requires some 12 hours of almost continuous work, above and beyond women's usual household and child-rearing duties.

The introduction of the chorkor fish-smoking technology by FAO in Ghana in 1970 has proven to be far more efficient in terms of labour and wood consumption, and also reduces suffering from smoke inhalation.

Fish marketing, i.e. working as auctioneers, retailers, trash fish vendors and dealers for export, forms the greatest single source of income for women. Fish auctioning is one of the more profitable businesses, as a woman auctioneer takes a share of fish from every basket she auctions.

In Ghana, as in much of the rest of coastal West Africa, the famed fish mummies have become responsible for the distribution not only of fish but of many other food products in the country. Known for their acute business sense, some of these women, who may have begun as simple local peddlers, now own one or more sea-going fishing vessels, and are in fact responsible for many tons of fish entering the country's economy.

However, as this paper points out, these are the exceptions and more often than not, fish traders barely make enough money to support their family from day to day, even when combined with their husband's incomes. Incomes in fishing families from capture, processing and marketing must often be supplemented by other activities, either in support of the fishery itself or unrelated to it.

As suggested by this paper, women who manage to make an income from fishing and related activities enjoy better status within their families, but their income contribution does not necessarily help improve the status of fisherwomen as a group nor does it significantly improve women's control over their development.

Changing conditions and modernisation in the fishery sector of the Third World have often had an adverse influence on the situation of small-scale fisherwomen, much like that which has happened in the developed countries. For example, the introduction of improved technology can make women redundant; nylon nets and net-making machines have displaced women in many countries from the cottage industry of hand-braiding. Motorised boats and nylon nets catch greater quantities of fish, which have to be handled mechanically. Women's bargaining power has also been reduced by the growth of a large wholesale fish trade buying in bulk from fishermen. The report contends that improving fisherwomen's socio-economic conditions through income-generating activities in fisheries seems problematic when the nature of fisheries themselves is taken into consideration. The resource is a renewable but finite one: in many areas, it cannot support more people than it already does. Thus, for instance, providing families with more gear to catch more fish does not solve any problems at the community level.

However, as the report goes on to state, improvements can certainly be made in women's working and living conditions. Improvements in fish handling and processing, such as the chorkor smoking oven, and better means of transportation can lighten women's workloads while at the same time reducing post-harvest losses, leading to increased incomes. As women are generally responsible for food storage, improvement in the storing of fish could help reduce losses and lead to better health and nutrition.

This paper suggests that one of the main areas for improvement is general education for women and training in a variety of skills. Many fisherwomen have very little education and are often illiterate. Due to lack of information, they are unaware of public services for infrastructure, credit, welfare or extension.

In recognition of the problems faced by the women, many governments have sought FAO's assistance in supporting rural women's roles in fisheries. From its beginning in 1979, the FAO/UNDP Bay of Bengal Programme (BOBP) recognised the active and important role played by women in fisheries and strove to design women-oriented development projects and training courses. Workshops and courses were held in both fisheries-related activities and in other fields. In 1982, BOBP commenced a project in a small village in Sri Lanka, giving jobless women from poorer families an opportunity to earn some money. The

women had to overcome many difficulties in management, participation and responsibility, and had to become familiar with the basics of marketing and book-keeping. This has provided a regular income for about 17 women working on raw coir fibre combing and bundling.

The experiences under the BOBP have demonstrated that women must be incorporated more fully into the planning process and that their input must be taken into consideration throughout the evolution of the project.

Haque, F. and U. Tietae (1988). FAO Fisheries Department' guidelines for consideration of women in fishing communities as a special target group of regular programme activities and field projects. Draft Report, FAO, Rome, Italy. 48 pp.

This document was prepared by the Fisheries Department of FAO as a way of providing guidelines to ensure that women, as an important section of the target group of fisheries development efforts, are adequately considered at every stage of identification, preparation, implementation and evaluation of development activities.

The section on policy objectives and principles clearly states that too often in the past, the priority given to large-scale operations and to production, activities which are normally dominated by men, has caused project planners to ignore the contribution and needs of fisherwomen. This often results in the women's economic role being undervalued and their needs and interests as human beings neglected.

In 1984, the World Conference on Fisheries Management and Development adopted a strategy of guiding principles and approved five programmes of action. In recognition of the prominent role women play in production, processing and marketing in small-scale fisheries, the Conference endorsed their inclusion in all appropriate development programmes enhancing that role.

As set out by the Conference, the basic goal for women in fisheries development is to make them equal partners, and productive and self-reliant participants in the process of improving their own and their family's nutritional and living standards, and to enable them to realise their full potential as human beings in their own right and as members of their family and community.

The Conference also recognised that fisherwomen must be given the opportunity to acquire appropriate knowledge, develop adequate skills and use appropriate technologies enabling them to make the greatest possible economic and social contribution. It is therefore essential to provide direct support to women in their domestic, economic and social role by such activities as providing basic education and literacy training, and by education in child care,

sanitation and nutrition.

Depending on local needs, resources, and economic and social patterns, the proposed project may concentrate on providing support for women in one or more area. Consideration could be given to economic activities, social services and community activities, organisational, technical, and financial support, household food security, and/or population activities. Whatever the focus, this paper stresses the need for project planners to assess carefully the impact of new technologies and new economic and social structures on the role, productive capacity and welfare of women. Planners must be sensitive to local patterns and methods of work, traditional attitudes and habits and existing economic and social structures, including women's roles.

One of the major goals of development for fisheries is strengthening the fishing community and increasing the participation of women in its various functions. Women need to be aware that they are important as individuals and as contributors to community welfare; they must be given opportunities to develop and exercise leadership roles; and they must be given the chance to share in making decisions that will affect their own future and that of their community. The success of a development project may hinge on the degree to which women are given the appropriate organisational, technical and financial support for their domestic, economic and social activities.

This publication concludes by reviewing some of the constraints faced by women, contending that women not only face most or all of the constraints confronting men but also many which men do not face. These constraints must be addressed. For example, too often when training and extension services are offered, they are geared to the needs and interests of men rather than women and even when appropriate for women, may be held in locations or at times which make regular attendance a hardship.

Included in this booklet are checklists which help to identify, formulate, review and evaluate projects.

Heyzer, Noeleen (ed.) (1985). Introduction. Missing women-development planning in Asia and the Pacific, xi-xxx.

Heyzer suggests that women are still neglected in development planning in countries of Asia and the Pacific and contends that women need to be central and not marginal to the processes of development.

Over the short experience in development planning in Asia and the Pacific, it has become clear that the planning and implementation of development programmes involves many complex processes. Central to the planning process are the identification of the problem, the decision-making

process and the information base that guides the making of decisions.

Ideally, development planning should be a rational process which aims to set out systematically the steps to achieve sustained improvement in the quality of life for all. It should involve not only an economic process which seeks to allocate scarce resources rationally for the productive purposes of society, but also a change of orientation of this development process to benefit the disadvantaged in society.

Because women are politically weak in the sense that no government will fall from power because of its policies affecting women, it is rare that the interests of women are explicitly considered in either the economic or political aspects of development planning. The creation of various women's organisations and national machinery for women during the Women's Decade has not changed this.

While there have been some progress and some changes in the status and participation of women, the efforts to include women tend to remain compartmentalised and isolated from the mainstream of development.

It is in the enlightened self-interest of governments to be genuinely concerned with women in their development planning. Including women in development planning not only increases women's well-being but also the total human resource of the nation.

The author suggests that the most important starting point for integrating women successfully into society is to ensure that plans are based on the reality of women's lives, not simply assumptions or ideals. Too often the 'integration of women into development' means providing women with services without involving them as active participants in the development process in control of their lives.

The article concludes that only when women participate in the whole process of planning, decision-making and resource allocation, can they develop the capacity to determine their own lives and to some extent the direction of the social world around them. Policies must begin with the understanding that all development policies affect women, although often in ways different from men.

King, Hannah (1989). Fisheries development programs and women. Naga, The ICLARM Quarterly, 12 (2): 6-7.

King, Fisheries Officer of the Food Production and Rural Development Division of the Commonwealth Secretariat, identifies a number of success stories of women in fisheries. These include the small-scale project in Papua New Guinea where women of Daugo Island exclusively market fish caught by their men, and the situation in Ghana where 'fish mummies' are a force to be reckoned with,

owning businesses which often involve leasing out fishing boats to men who, in turn, supply them with fish. However, King also suggests that these cases may be extremes of the norm, and in most cases, fisherfolk are marginalised. To sustain growth, King suggests sensitive planning and an appreciation of the contributions fisherfolk can make to the community.

A good example of this is the FAO Bay of Bengal Programme (BOBP) which, in association with local government, has benefited fisherfolk tremendously. The crucial factor leading to success in some of the areas was the integration of the whole community in the project development. Thus activities have included instruction on small business management, net-making, aquaculture, fish processing and marketing. Some of these activities focus specifically on women, and benefits have included the establishment of day-care centres and schools which offer equal opportunity to girls and women.

King contends that there is great potential for integrating women into fisheries development programmes. But this potential remains untapped, mainly because women's views are not considered in planning. She further states that, with sensitivity, their needs can be built into viable projects wherein the women affected become partners in implementation. The spirit of partnership is vital in sustaining community interest.

King concludes her article with a word of concern. From recent observations in artisanal fisheries, it is becoming evident that women who are the object of research are beginning to feel that they are being studied to death and to no avail.

Madhu, M. R. (1989). Fisherwomen of the Bay of Bengal. Naga, The ICLARM Quarterly 12 (2): 3-5.

In the Bay of Bengal region, women are engaged in:

- retailing fish;
- making and mending nets;
- collecting prawn and fish seed;
- drying and salting fish;
- preparing fish products such as fish crackers and fish balls.

In spite of their extensive involvement in the area of fisheries, Madhu points out that fisherwomen get scant reward or recognition. Their potential is hamstrung by taboos, by denial of basic educational opportunities and by lack of access to finance.

In respect of income-generating activities, Madhu has

stated that money-making opportunities for fisherwomen do not abound. The cash outcome of the income-generating activities has hardly been spectacular throughout the Bay of Bengal. Coir rope making at Ulhitiyawa was one of the more successful activities. Thirty trained women operated looms, produced ropes and sold them through a co-operative. When the demand for coir ropes plunged, the women made combed raw fibre which was more profitable; it fetched a price 30 per cent higher than coir rope. However a tailoring activity at Mirissa failed; the trainees could not sell their product. They lacked the marketing and management skills needed to cash their production skills; they could not compete with city-based tailoring centres.

The lesson from Sri Lanka was that marketing opportunities are as important as training in production skills. In the absence of the former, the latter is quite futile as an income-generator for women.

Madhu, who is an Information Officer of the FAO Bay of Bengal Programme for Fisheries Development, concludes that while income-generating opportunities depend on local circumstances, encouraging and activating fisherwomen for more vigorous participation in development is an approach that can be tried everywhere. However, to be successful an effort must be made to get the fisherwomen to analyse their condition, highlight their major needs and come up with their own solutions.

McManus, Liana Talaue (1989). The gleaners of Northwest Lingayen Gulf, Philippines. Naga, The ICLARM Quarterly 12 (2): 13.

McManus, who is Assistant Professor at the Marine Science Institute, University of the Philippines, concludes that gleaning as an economic activity imposes a heavy workload on women. The increasing rarity of commercially important organisms in degraded habitats means longer gathering hours. Today, dwindling returns from fishing by the menfolk have also altered patterns of gleaning and the role women play in it.

McManus suggests that the role of women in providing for their families has become crucial with the declining returns from artisanal fisheries, and that gleaning as one of their activities will probably outlive mechanised forms of fishing. Deteriorating habitats will constrain how much the women can harvest, but they could manage to earn enough for food while the men find viable alternatives to the dying occupation that is small-scale fishing.

Although a fishing household derives a monthly income of about US\$20 from fishing, this is barely a third of what it needs for subsistence.

Nauen, Cornelia E. (1989). Women in African artisanal fisheries. Naga, The ICLARM Quarterly 12(2):14–15.

Nauen, a Fisheries Development Officer of the Commission of the European Communities, writes that despite the best of intentions, male dominance in 'expert' and government positions is a serious obstacle to the change that is required.

One striking feature that Nauen has identified is the predominant role of women in the post-harvest sector. Though there are great differences from one African country to another, the women's contribution to the sector cannot be overemphasised. In these countries, the men and women have complementary activities but separate budgets, each contributing to part of the household expenses. However, women continue to suffer lower social status than males and, on the average, have inferior access to food, formal education and health care.

Some of the obstacles to development as perceived by Nauen are as follows:

- projects are too often conceived by experts (men) for the producers (fishermen) without considering their effects on the post-harvest sector;
- it is assumed that production increase in itself leads to the greater well-being of the 'family'. However, because of traditional social partitioning of labour and duties, the opposite has often been achieved;
- the introduction of advanced technologies for catches of higher-value species for export may, in some cases, erode the mainstay of cheap pelagic species for domestic consumers;
- the degree of illiteracy is high amongst women in rural and fishing communities.

Nauen concludes by asking when donors and governments will have the vision and courage to act on these observations and involve women systematically and on their own terms from the planning stage of a project. When will they recruit more women into responsible positions and ensure better education and training for the 'average' woman as the most cost-effective and sustainable, not to mention equitable, way to overcome some of the shortfalls?

Rahman, M. Mahbubur (1986). Rural women in fishing communities. CIRDAP Newsletter 26: 2–6.

In 1984, the Centre on Integrated Rural Development for Asia and the Pacific (CIRDAP) launched its first action programme for women in fishing communities in

Indonesia, the Philippines, Sri Lanka and Vietnam.

The programme had two long-term objectives:

- to help improve the living and working conditions of rural women and their families in fishing communities by collecting relevant data and information on their role and activities in community development and by providing required inputs and services to help meet their basic needs through action programmes; and
- to enhance the participation of rural women in development efforts by involving them in decision making and in implementing the decisions.

The components of the programme were:

- conducting of village socio-economic surveys to construct a primary database on households and the activities of women;
- identification of potential leaders of women's groups after formation of target groups, based on the collected data;
- arrangement of village seminars and in-country workshops;
- on-the-job training of women participants;
- monitoring and evaluation of the programme at various levels.

The action programme was planned for three years and scheduled to be completed in June 1987. A review meeting was to be held at the end of the three years and a mid-term consultation in August 1986.

Sandhu, Ruby (1987). Women and fish-smoking technology. *Appropriate Technology* 14 (3): 14–16.

Sandhu, who works with the UNIFEM section of UNDP, examines some of the reasons why a smoking technology, the chorkor, found different rates of acceptance in Ghana, Guinea and Togo.

In Ghana, the chorkor has had a very high acceptance rate because its design corresponds very closely to the traditional smoker, differing only in that trays can be stacked, allowing a greater number of fish to be smoked at one time. It was believed that although the introduction of the chorkor in Ghana allowed women to increase significantly the amount of fish smoked, its acceptance was due also to its similarity to traditional methods. It seems there is a greater motivation for people to accept an improved income-generating technology than one used only for domestic purposes.

The response to the chorkor in Guinea was mixed. While the recipients were able to recognise the value of a dosed fire, they found that the trays were not sufficiently deep to prevent the fish becoming crushed or breaking apart. As a result of the chorkor's introduction, Guinean women modified their traditional techniques to get better fuel-efficiency.

Sandhu suggests that one of the major considerations when designing a new technology is the traditional method. Ideally, the improved technology should build on the traditional method. If a new technology is significantly different from a traditional one, it can be rejected because the users may not understand the advantages. A technology must never be looked at in isolation if it will be introduced into a community whose work patterns, social arrangement and traditional beliefs have evolved over a long period. Any effective introduction of an improved technology must begin with an understanding of the various activities and organisation. Efficiency and economic profitability are not the only factors influencing the acceptance of a new method; compatibility with people's habitual patterns of doing their work is also important.

Schoeffel, Penelope (1984). The fisheries of the South Pacific: strategies to assist the participation of women in fish marketing, small aquaculture and fish processing, Volume 1: Draft report, Pacific Multi-country Women in Fisheries Project. Australian Development Assistance Bureau, October 1984.

In this draft report, Ms. Schoeffel looks briefly at what has happened in a number of South Pacific countries in respect to women in fisheries and identifies strategies that could assist the women.

Fiji

Fiji has commenced a new aquaculture enterprise in Eucheuma seaweed farming. The seaweed is presently being grown in trial plots at Rakiraki. It is estimated that the value of the crop from a single small farm of about 4000 m² will be \$3000 per annum.

Training in non-ice methods of fish processing would be beneficial to fisherwomen and fish vendors. Improved smoking and drying preservation methods would enable fisherwomen to preserve and accumulate fish for a week or so prior to market day, making for better returns.

At the time this report was written, the Fisheries Division's Fish Processing Unit concentrated on two products: smoke-dried beche-de-mer, which was exported, and salt-dried mullet, which was marketed locally.

Kiribati

Fish drying is an established subsistence technique but requires technical product improvement before the commercial development of fish drying as a small industry can be pursued. Two in-country projects have been proposed for Kiribati.

Tuvalu

A number of islands with atoll lagoons appear to be promising sites for fish drying through the island women's groups.

Tonga

The author suggests that more research needs to be done in Ha'apai to examine ways of making salt fish and dried octopus production more efficient and productive.

Western Samoa

Village women could possibly be assisted in their fish marketing efforts if techniques for drying and smoking fish were introduced.

Schoeffel, Penelope (1985). Women in the fisheries of the South Pacific. Women in development in the South Pacific: barriers and opportunities. Development Studies Centre, Australian National University, Canberra, Australia: 156–175.

Schoeffel contends that women's role in the contemporary fisheries of the South Pacific is characterised by four paradoxical facts:

- women's contribution to subsistence fishing is indispensable in most Pacific fishing communities, yet women have minimal access to boats, fishing tackle, or fisheries extension assistance;
- fishing follows an established but culturally variable division of labour between men and women, which is often a practical and mutually supportive arrangement. Yet where commercial fisheries have been formally planned and developed, women are largely excluded from direct participation;
- the traditional fishing grounds of women—the in-shore reef tops, tidal pools, swamps, shores, lakes and rivers—are the areas with potential for aquaculture, yet so far women have not been involved in trial aquaculture projects in the South Pacific region;
- the greatest and most technically varied participation in fisheries by women is to be found in certain Melanesian communities, yet it is a great deal easier to

identify ways to assist women in fisheries in Micronesian and Polynesian societies.

Schoeffel concludes that the fundamental structure of fisheries development in the South Pacific is the greatest barrier to increasing women's participation in fisheries. A more balanced policy in fisheries development would require governments to allocate more staff, funds and other technical resources to increasing the efficiency and productivity of small-scale and subsistence fisheries and of small-scale part-time commercial fisherwomen and women fish vendors.

The author suggests that there are many opportunities for women to increase their participation in fisheries, both in catching and in on-shore supporting activities, but these activities will be difficult to promote effectively unless they form a recognised part of national development strategies. For example, in order to make fish processing more efficient, it is not enough simply to train women in improved preservation techniques. Their activities must be co-ordinated with extension on effective fishing techniques which yield a catch of sufficient size to make the processing activities economical. Furthermore, there must be a means of transporting and marketing the products. Therefore, extension assistance from fisheries is essential if such ventures are to be successful, as well as advisory assistance from departments of commerce or national marketing authorities.

Thomas, Pamela (1986). Women and development—a two-edged sword. Development Dossier 19: 1–16.

Thomas suggests that all planned development is interventionist, intending to change political, social or economic structures through changing what people do or the ways in which they do it. Until recently most development has been concerned with changing what men do and little consideration has been given either to involving women in the development process or to the impact of male-dominated development programmes on the lives of women.

Although development programmes aimed specifically at women have only been established since the mid-seventies, it is already obvious that projects aimed specifically at women are in danger of incorporating the same mistakes as projects which involved only men.

This report looks at a project to improve village sanitation and maternal and infant health and nutrition, introduced into Western Samoa in 1923 by the New Zealand Administration. This project also studied the ways in which European innovations and European health information brought about changes in Samoan women's lives, while at the same time Samoan social structure and the actions of Samoan women brought about changes in

the innovations and the way in which information was delivered to villagers. The author found that for 60 years this project had not been evaluated. The lack of adequate channels for feedback and contact between those working in the field and the administration was also identified by Thomas. Thomas states that, above all, the impact of the Samoan social structure and rapid social change in committee attendance and committee activities has been ignored.

The report concludes by suggesting that if innovations are to be accepted by village people, it is likely that they will be adapted to conform in some way to existing values and patterns of organisation. While this may ensure the continuity of the project, it may also reduce its effectiveness. Finding an acceptable balance between project acceptance, adaptation and effectiveness is, I believe, like using a two-edged sword. To ignore indigenous values and patterns of behaviour probably means failure; to incorporate them fully means ineffective or no intervention.

Yap, Chang Ling (1980). Proceedings of 19th Session of the Symposium of the Development and Management of Small-scale Fisheries, Kyoto, Japan, 21–23 May 1980. Indo-Pacific Fishery Commission, IPFC/80/SYMP/SP/5, 14 pp.

Until recent years, few specific attempts have been made by national governments and international agencies to bring women into the mainstream of fisheries development activities. In many instances this has been due to the lack of analytical information and knowledge on the contribution women make to fisheries development, a situation made worse because many of these contributions are not quantifiable. In other cases, it is because of the tremendous social, cultural and economic constraints that have to be overcome before their involvement can be successfully attained. The result, unintentionally perhaps, has been a clear dichotomy in development thrust. Programmes of assistance for projects involving men have been mainly aimed at increasing their economic

productivity. Programmes of assistance for women have been confined mainly to improving their role as wives and mothers. In view of this, the paper attempts to:

- define what women are involved in fisheries;
- indicate their number, using examples and figures drawn from individual countries;
- discuss their role and, in the process, examine their problems and needs and the impact on women of development programmes;
- identify how women might be brought, into the mainstream of development activities.

This report concludes that socio-cultural factors, particularly household responsibilities, prevent many women from taking advantage of fishery programmes. On the other hand, introducing programmes to fit the requirements of women who have to combine income-earning with household responsibilities is also frequently politically, technically and economically impossible. But until the problems and needs are met, women will remain outside the realm of development activities.

It was agreed that instead of talking mainly to fishermen when investigating problems and needs for fishery development planning, women could provide much of the sociological information. In this way, the socio-economic needs of the industry, which other wise could escape the notice of planners, may be better taken care of. Certainly, as a means of spreading innovations, women have been extremely useful. The aquaculture promotional programme in Swaziland achieved much of its success through such an approach. Women were informed. Through them, the men were persuaded. Instead of fisheries being promoted in isolation, its development should be treated as part of the entire rural development programme. Also, instead of increasing women's participation in fisheries, assistance to improve their present activities should be given priority.

CONTRIBUTION TO A BIBLIOGRAPHY OF PACIFIC ISLAND TRADITIONAL FISHERY PRACTICES

*R. Gillett, K. Ruddle, R. Johannes, M. Pelasio and E. Hviding
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This is a first contribution to an eventual bibliography of the published and unpublished literature on the traditional fisheries of the Pacific Islands. The geographical area covered is essentially that of the South Pacific Commission. Relative to that of other regions, published literature on traditional fisheries in the Pacific Islands is scattered and sparse. The unpublished 'grey literature' is rich, but little known and difficult to locate.

It is acknowledged that this contribution is far from complete. We therefore urge that additional material on traditional fishery practices be copied and sent to the South Pacific Commission, B.P. D5, Noumea Cedex, New Caledonia.

Significant contributions to this compilation were made by the South Pacific Commission, Forum Fisheries Agency, International Centre for Living Aquatic Resource Management, University of the South Pacific and Dr Lu Eldredge.

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