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I N F O R M A T I O N B U L L E T I N



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Introduction

Welcome to the 11th issue of the *Women in Fisheries* bulletin. Beginning with this issue, the bulletin will be taking a somewhat different approach to keeping its readers informed about women and community fishing matters. Rather than a geographical orientation, the articles here touch on three primary themes of continuing relevance to women and communities everywhere: community-based management and conservation of marine resources, the socioeconomic status of fisherwomen, and the documentation of fishing practices. To be effective, community-based management needs to take into account a wide range of factors, from fundamentals such as documenting which organisms are being harvested, and the types of gear and techniques that are used, to understanding the impacts of globalisation on both coastal communities and resources themselves. Although the themes themselves are not new, the fact they are recurrent topics of fieldwork, papers and discussions says something about their continued significance and relevance. There is interesting and important work being done in each of these areas, and the articles here include examples drawn from within the Pacific region and beyond.

The demand for fresh seafood remains high in many areas despite modernization and changing lifestyles. This demand is typically met, at least in part, through the harvest of nearshore marine organisms by women and children, and women continue to contribute significantly to the subsistence and artisanal fisheries sectors in much of the Pacific. Mecki Kronen (see article p. 17) suggests that children contribute significantly to the household portion of a women's fish catch. In one village in Tonga she estimates that children regularly fish two days a week. Children's contribution to their mother's catch is rarely looked at by fisheries personnel or scientists, yet Kronen's results suggest that this is an area that should be examined closer. Changing lifestyles and food preferences and consumption patterns also affect reef fisheries stocks, but

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and more...



how much? Kronen's research is looking into this in Tonga and Fiji Islands, and in the future she will be examining food consumption patterns in other countries.

Given their important role in supplying household food needs, community members, researchers, fisheries scientists and resource managers have advocated for many years that women and communities should play a more active and significant role in managing marine resources, and have recommended that they be included in consultations and decisions regarding nearshore coastal resources. Fortunately, this is now happening in many places, as is discussed in the 'News from the Community Fisheries Section'. But as Liz Matthews suggests in her article on p. 13, it may be time to go further, and do more to educate women and communities about the dangers of overfishing, the need for sound conservation practices, and the importance of all species to the health of the marine ecosystem. Subsistence and artisanal fishing is often neither monitored or regulated by local fisheries departments, and unless the species has a commercial value (such as trochus), very little information is likely to be available. Matthews, in a second article (p. 15), illustrates this point with regard to the collection of land crabs. Although an important and popular food item, land crabs are completely unmonitored in Palau; the same applies in many Pacific Island countries, and probably outside the region as well. This is also true for other organisms, especially marine invertebrate species.

In addition to a lack of information about many subsistence species, there's still much we don't know about how those species are being harvested. Although it has been done for decades, there is still a need to document traditional knowledge about fishing. As Mark Merlin's article (p. 27) points out, in Micronesia alone there are numerous plants used to make fish traps, baskets, nets, poles and poisons for catching fish. For community-based management of marine resources to be effective, we need to better understand such traditional methods.

The article by Mohammad Ali Shah, under the socioeconomic theme, brings to light the problems of women from fishing communities who become marginalised when cheap labour and modern fishing gear nudges them out of their traditional role of net weavers and fish cleaners. On a more positive note, Denise Cardoso's article (p. 24) discusses how access to paid labour greatly improved the socioeconomic status of women in some parts of Brazil.

I hope you'll find the articles in this issue of the *Women in Fisheries* bulletin interesting. I welcome any feedback on them and encourage you to submit articles about women and community fishing matters from your country.

Kim Des Rochers

NEWS FROM THE

Community
Fisheries
Section



Staff changes - New SPC Community Fisheries Officer

Aliti Vunisea joined SPC's Community Fisheries Section in July as the new Community Fisheries Officer (formerly held by Lyn Lambeth). Aliti previously worked at the University of the South Pacific (USP) as a lecturer with the Marine Studies Programme. While she was at USP, Aliti complemented her academic responsibilities with community work, especially in the field of women in fisheries and rural development. Her post-graduate studies work focussed on the subsistence fisheries

in Fiji Islands, specifically looking at changing women's role in the face of modernization and monetization. Since then, Aliti has also worked with NGOs, conservation agencies and government departments in Fiji on areas relating to community fisheries and development and management, and women's roles in fisheries in Fiji and the region. She was also actively involved with the Women in Fisheries Network, a regional NGO based in Suva, which actively participates in com-

munity training for women, organises meetings for rural women, conducts train the trainers workshops, and many other activities. Aliti has also been involved with Fiji Locally Managed Marine Areas (FLMMA), a network of practitioners involved in assisting communities set up community-based marine resource management in Fiji.

Aliti hopes to continue the work started by Patricia Tuara and Lyn Lambeth on assessing the contribution and participation of men and women in fishing activities in the region, and highlighting ways of maximising participation by different sectors of the

communities. Aliti also hopes to document traditional marine resource knowledge and compile a basic inventory of the most used marine products (for food and other basic needs) by local communities. She believes that such information is useful for long-term planning and management projects for coastal resources. Depending on funding, Aliti would like to conduct research into marine resource dependence at the community level, identifying food changes, changing consumption and needs patterns.

Aliti will continue the section's tradition of training and capacity building.

Community-based fisheries management initiatives

By Aliti Vunisea, SPC Community Fisheries Officer

The Community Fisheries Section is working to facilitate the establishment of marine protected areas (MPAs), or fisheries reserves, through its work with regional fisheries departments. The community-based initiative, which looks at offering technical advice and expertise in the establishment of management initiatives, has adopted a participatory approach to ensure community involvement. The approach is based on the Samoa community-based resource management initiative, which has been implemented in more than 70 villages in the country and which has been in place for the last six years. The section also considers models and approaches used elsewhere.

Other Pacific Island countries such as Fiji Islands, Cook Islands, Solomon Islands and Vanuatu, have adopted their own approaches to community-based management. Most of these efforts have been facilitated by non-governmental organisations, learning institutions and conservation agencies, and most have been small-scale, covering limited areas. SPC's Community Fisheries Section attempts to assist countries in approaching fisheries management from a broader perspective, with the fisheries departments taking the lead role in conservation attempts. The increasing concern for coastal fisheries and the need to retain or regenerate fisheries stocks to ensure a reliable food and economic source base, has prompted an emphasis on fisheries management at the community level.

Samoa

The Samoa community-based management programme has been a success, and the funding received from AusAID has allowed for the recruitment of extra staff and the acquisition of more facilities to carry out the project. The well-defined *matai* or chiefly system in Samoa has also been a contributing factor to the success of the project in this country.

American Samoa

A community-based management project was initiated in American Samoa in 2001. The local fisheries department has established a Community Management Section to take over management responsibilities. The initiative received considerable support in American Samoa in the beginning, but the first six-monthly project review indicates that many community members are finding it difficult to attend fisheries management committee meetings because of their own work commitments. The timing of community meetings has been difficult in American Samoa because many people have full-time jobs on top of other domestic duties.



SPC Community Fisheries Adviser with staff from the Department of Marine and Wildlife Resources in American Samoa

Marshall Islands

The Marshall Islands community-based fisheries management project began in 2001 and has received considerable support from local communities. Workshops in the Marshall Islands have been conducted and the project will be reviewed in late 2002.



Women's group at a community-based participatory learning workshop in the Marshall Islands



Training participants conducting a 'stroll through' assessment in the Marshall Islands

Fisheries training workshop in Fiji Islands: The I Qoliqoli Management Project

By Aliti Vunisea, SPC Community Fisheries Officer

A training workshop on community-based marine resource management for fisheries extension officers in Fiji Islands was conducted by SPC's Community Fisheries Adviser and Community Fisheries Officer 29 July to 9 August. The workshop, which was held at USP's Institute of Pacific Studies, involved 28 extension officers from throughout Fiji. The workshop was held in response to a request from Fiji's Fisheries Division for advice on setting up a model for marine resource management for the country. Training of trainers was a first step in the initiation of the I Qoliqoli Management Project for Fiji.

At the end of the workshop, a sample management plan for the I Qoliqoli Management Project was drafted. Participants were expected to be equipped with the skills to conduct or facilitate community-based workshops and learning. They were also expected to have acquired enough skills and knowledge to identify community needs and assist communities in the drafting of marine resource management plans, and the establishment of a community management committee. In addition to this, trainers were expected to be able to hold their own training workshops for their officers. The sample management plan to be used by the Fisheries Division, is a plan for Marau village.

The schedule of activities for the first six-months of the project are:

- The implementation of an ongoing marine awareness programme to promote both the importance of sustainable marine resource use and the need for management to local communities and the public in general.
- The provision of in-house training for fisheries officers in the four main divisions in Fiji: Central, Northern, Eastern and Western.
- The drafting of management plans for 12 different villages or communities in Fiji. The sites

and locations of these will be determined by requests and interests from coastal communities.

- The submission of funding proposals to the Ministry of Foreign Affairs for possible SPREP funding.
- The securing of facilities and equipment such as vehicles, computers, and equipment for field exercise.
- The monitoring of progress on the project, which will also determine any follow-up work to be undertaken by SPC.

Project contact persons from the Fiji Fisheries Division are Sunia Waqainabete and Vasiti Vuiyasawa.

To implement the tasks outlined in the work plan, Fiji Locally Managed Marine Areas (FLMMA), ministries and NGOs will work closely with the Fisheries Division.

FLMMA is an association of practitioners working with community-based marine resource management in Fiji, including NGOs, institutions, ministries of government, and interested individuals.

Background to the project

Fiji Islanders, like other Pacific Islanders, depend heavily on coastal resources. With an ever-increasing population, commercialisation of previously subsistence food sources, increasing urbanisation, improved fishing methods and gear, and other internal and external factors affecting the availability of resources, there is an obvious need for management. Most Pacific Island peoples still live a subsistence lifestyle, and the long-term sustainability of their coastal resources is crucial for the survival not only of the current population but also of future generations. Marine resource management is, therefore, essential for long-term food security and social livelihoods.

Of primary importance, therefore, is the empowerment of coastal communities to manage their own resources. Most fisheries departments are ill equipped to take over all management responsibilities, and involving local communities gives citizens the opportunity to be responsible for their own resources and the future of their peoples' livelihood. Furthermore, in most Pacific Island countries, local people have jurisdiction or ownership rights over their resources, so their involvement is crucial.

For the last six years in Fiji there have been ongoing attempts at raising awareness about the marine environment, and attempts to establish marine resource management projects. Most of these efforts were spearheaded by NGOs and the Institute of Applied Sciences at USP.

Organisations involved in community-based marine resource management recently formed an association where they could exchange ideas on the different projects they were involved with so that similar community-based work project standards could be established.

Community-based projects in Fiji are underway with the following institutions and organisations:

- Foundation for Peoples of the South Pacific (FSP) — Cuvu District, Nadroga.
- World Wide Fund for Nature (WWF-Fiji) — Ono District in Kadavu and Wai in Nadroga
- Institute of Pacific Studies — Verata District in Tailevu, Votua in Ba, Marine Affairs Programme, USP, Vanuaso in Gau, and other areas
- International Marinelife Alliance (IMA) — Nakasaleka District in Kadavu
- Women in Fisheries Network (WIFN) — Namena District in Tailevu.

Note that district means several villages under the same administrative authority. Interest in community-based management is evident in the number of requests to FLMMA from interested communities. The association has requests from 13 communities for the establishment of community-based marine resource management projects.

Tools used by FLMMA and other NGOs in Fiji

FLMMA and other NGOs have adopted a participatory approach with participatory learning activities (PLA) forming most of the awareness work. Visits and initial awareness work usually takes a

year to two year and requires a process where communities can accept their responsibility before management initiatives are in place. In areas where management has been in place for more than a year, monitoring skills and processes become part of the PLA tools taught. Some of the stated cases are success stories, for example Verata in Tailevu and Waisomo in Kadavu. In these cases the organisations have pulled out from the projects and only pay visits when required. The communities have taken over the management and monitoring work, and in both cases, both men and women are involved in all activities. This is a clear indication of the potential for success of community-based management initiatives if implemented on a wider scale.

This I Qoliqoli Management Project is an attempt to get the Fisheries Division to implement resource management initiatives on a broader scale. At the same time, the department can put existing facilities and funding towards other projects. The I Qoliqoli management project was initiated in September 2002, and will be reviewed in early 2003.

Recommendations

- Establish a vigorous media campaign to promote the I Qoliqoli management project.
- Raise community awareness about the need for long-term sustainability of marine resources.
- Take an integrated approach to the marine awareness and community-based marine resource management project.
- Work with FLMMA and other ministries, NGOs and institutions already working in marine resource management in Fiji, to ensure that local situations, traditions and needs are taken into account.
- Involve all stakeholders at all levels of the project.
- Implement the project as requested from the communities.
- Involve SPC's Community Fisheries Adviser at the initial community workshop in Fiji, and at FLMMA-organised workshops so that tools and procedures already used in Fiji can be observed.
- Follow up on possible SPREP funding for the project.



Community-based management and conservation

Community-based marine resource management in Fiji: The challenges

By Aliti Vunisea, SPC Community Fisheries Officer

Community-based marine resource management — argued by researchers, writers and community workers as the best approach to modern fisheries management practices — is a more regularised and organised version of traditional management practices that have been widely used in Fiji and other Pacific Island countries for generations.

Community-based management promotes maximum community participation, and the inclusion of all sectors of a community (including both men and women). This approach faces the challenge of relying on community cooperation (or existence) within a semi-capitalistic, primarily individualistic, lifestyle. Community management work in Fiji over the last six to seven years has enjoyed varying degrees of successes depending on the location, implementing agencies, and the initial contact made at the community level. Recently, a network of people involved in community-based fisheries management has managed to establish contacts and networks with government departments, NGOs, conservation agencies and individuals. The FLMMA (Fiji Locally Managed Marine Areas) have firmly established their initiatives, forming partnerships with communities and other organisations. FLMMA is also using pilot management areas and those involved in these projects to facilitate continuing community management work. The Fiji Fisheries Division, with assistance from SPC's Community Fisheries Section, has also established their own programme, which will make community-based fisheries management a government initiative. The vulnerability of coastal resources and the need for awareness-raising and management proposals has prompted this initiative. Like other established initiatives, the fundamental concept is to mobilise resource owners or communities to take over resource management responsibilities.

Traditional community-based controls and check systems on resource use may not have been intentional management measures, but they served to either directly or indirectly manage resource use. These controls included periodic closures due to the death of those of chiefly birth, seasonal closures on fishing grounds or on certain species, taboos on eating totem fishes, declared sacred fishing areas, ritualised fishing and associated activities, which

on numerous occasions, eased pressure on fishing for certain periods of time. There are also legends of turtle and eel calling in certain areas of Fiji. Such management practices were similar to those known and practised in most other Pacific Island countries, varying only in form and implementation. In most instances, these control systems were not direct fisheries management practices but were part of a wider community mechanism on the use of a diverse range of resources. In most cases there was no exact distinction between the land and the sea, as these were seen as integral parts of each other; thus, regulated use applied to all resources that were encompassed under the word '*vanua*' (which means the land, the sea, and all the resources and people).

These traditional practices have, over time, gradually been affected by modern thinking, Christian beliefs and other such factors, but the 'institution' and its associated leadership structures, protocol, respect and beliefs still exist. Community mobilisation is, in most cases, already built into people's daily work schedule and routine. Traditional roles and resource use systems within these communities are still well defined, but like any other system, these roles are undergoing change and their usefulness and relevance are being questioned.

The modern approach to community-based management, which people will need to adapt to, is working with outside 'intervention' and adapting to new leadership and learning modes. Village leaders must deal with distributing money, working out monetary compensation and organising people's time to balance both traditional lifestyle needs and modern demands and requirements.

Complicating all this, is the gradual change in leadership structures and community dynamics, a result of rural-urban migration, urbanisation, western oriented education and global networking and telecommunications. Therefore, common at the community level are changing eating preferences, the exploitation of new fisheries and arrangements for such ventures infiltrating traditional village settings, and employment both by men and women outside the village, and many other such new challenges.

People in rural areas and villages still perform specific traditional functions within their community, but many of these have been adapted to modern lifestyles and new forms of socialisation.

The current community-based resource management approach primarily utilises participatory learning activities (PLA). These tools are well known and widely used around the world for information gathering and for mobilizing people to participate in development and management initiatives. Non-governmental organisations (NGOs), ministries and conservation agencies involved in community-based work in Fiji utilise a wide range of PLA tools. The success of community-based initiatives are due in part to these PLA activities as these allow for a wider interaction with communities, the participation of all sectors of the community, and provides forums for discussions, debates and questioning without any social or traditional restrictions.

Discussions on gender, ethnic and culturally sensitive issues that may have not been possible in the past are easier dealt with through current community participatory learning processes. In spite of these, there remain major areas that need to be addressed before meaningful participation can happen.

The following are questions that remain unanswered, or areas that remain to be explored further:

- The dual mode of ownership and understanding of resource use or access has been an accepted operational fact. Will change in ownership of the *I qoliqoli* systems upset the current equilibrium?
- Changing administrative and leadership structures. How will the re-structuring of the Fijian Affairs Board affect the modern needs and aspirations of the Fijian people?
- Should women be considered participants or partners in fisheries management?
- More networking among the various sectors involved in community-based management work.
- Continuity of projects.
- Indicators of success.

1. Change in ownership of the *I qoliqoli* systems

Marine tenure in Fiji is, in the majority of cases, well defined and registered. Customary understandings on marine resource use allow for access to and ownership of fishing grounds and rights to all foreshore and shore areas up to the outer reef (*kanakana* and *I qoliqoli*). *Kanakana* is the subsistence fishing area, which usually refers to the immediate shore area adjacent to a village and includes all mangroves, mudflats, sandflats, lagoons and reefs. *I qoliqoli* refers to the total fishing area, including the areas beyond the *kanakana*.

Legal access allows customary owners proprietary fishing rights over their *I qoliqoli* while the state has ownership rights of waters up to the high-water mark. Thus, there exists dual ownership and understanding of resource use. Customary owners in both instances still have significant rights over their coastal areas, so that any marine resource management initiative must involve the community. This dual ownership is at times a source of conflict and concern for customary owners. There are 410 *I qoliqoli* areas in Fiji, more than 200 of which have been surveyed and registered by the Native Lands and Fisheries Commission. Most of those that have not been registered are rivers and creeks.

Ownership or user rights of *I qoliqoli* areas are at a higher level than the *yavusa* or *vanua* (land). Therefore the *liuliu ni yavusa*, or chief of a *yavusa* has ownership rights. Unlike land tenure in Fiji, which is *mataqali* or clan owned, demarcation of specific *I qoliqoli* areas has always been disputed. In many cases the communal ownership of the *I qoliqoli* is complex. Sometimes the paramount chief who has the *I qoliqoli* ownership can sign fishing licenses or make agreements with coral harvesters or other outside investors, for example, without the knowledge of the several villages and districts under his or her jurisdiction.

The current government has stated in its blueprint the need to return full ownership rights to customary owners of the *I qoliqoli*. This, however, prompts several questions:

- How will this be specifically drawn if the argument in traditional ownership is where land ownership extends to foreshore areas? Will ownership be along *mataqali*, or clan lines, as in land ownership?
- If this is adopted, will this effectively leave people without any land adjacent to bodies of water or foreshores?
- What will be the future of the *I kanakana* and *I qoliqoli* arrangements for subsistence fishing areas, if these are demarcated and specifically owned? Where will communal ownership fall?
- How will these changes in ownership affect community-based management initiatives, where consent may depend on one clan as opposed to the *yavusa* as is the case now?
- If ownership remains with the *yavusa*, and *liuliu ni yavusa* as is the case now, does ownership mean the right to negotiate for and deal with investors for all members or sub-groups of such a large amalgamation of clans or villages?

Ownership can also mean total control over development in coastal areas, which may be an advantage for management and detrimental if development becomes the focus of the *yavusa* with ownership rights. It will also mean more responsibility on

the part of *I qoliqoli* owners to look after their resources. The question of ownership and access by all community members as highlighted above can only be solved at the initial stages of the attempt to revert ownership to traditional owners and this will need the goodwill and support of all the parties concerned before any finalisation of demarcated grounds and ownership status.

2. Changing administrative and leadership structures

In addition to the complexity surrounding ownership and user rights, there is also a dual administrative or control system for the people. The government administrative system and the traditional system both come into play when working with people in communities. This is important because any work in communities still uses both systems. In the village for example there is a village headman who is the administrative head or village headman.

The headman may have no high traditional positions. The village traditional head or *liulu ni yavusa* is different from the village headman or *turaga ni koro*. The village headman then liaises or works with the traditional leaders in projects. Their roles are mostly administrative and they are contact persons for government or other external contacts or developments.

A review of the Fijian Affairs Board is currently being undertaken. The question is whether the restructure will take into account the aspirations of all Fijians, including urban-based Fijians. This is important for many resource owners with decision-making powers now reside away from their communities. Thus, there remains a sort of remote control over resources and the people using them. People living away from home may also have very different views of how resources should be used, developed or managed as they have different lifestyles and aspirations. The models above depict a simple process that people should be able to work with, but in some situations, elders or leaders in communities have migrated to urban areas and there is a new leadership at the community level. The challenge, therefore, is how the restructuring of the Fijian Affairs Board will take into account these changes, and how best they plan communities' future direction and linkages to the modern administration.

3. Should women be considered as participants or partners in fisheries management?

Women play a major role in most community-based work in Fiji, and every attempt has been made by NGOs, ministries and conservation agencies to include women. Yet women are still expected to pre-

pare and cater food for the very workshops and training activities they are attending. So, women must both attend meetings and workshops, and cater these affairs. The challenge then is for women to be *partners*, not just participants, in the decision-making, planning, monitoring and evaluation process. Some NGOs, such as the Women in Fisheries Network, specifically target women. The question, however, is whether these activities should continue to target only women or, should women's development come under a community approach to fisheries management? To do so would require that all hindrances and social restrictions that may deter full partnership in such activities be identified and addressed.

4. More networking among the various sectors involved in community-based management work

In spite of all the progress made in community-based management in Fiji, there remains considerable room for linking different ministries, and NGOs and other sectors. Coastal resource management involves not only the shoreline, but all activities within watershed areas, the upper reaches of rivers and farming areas. Factors affecting coastal fisheries are varied and inter-linked, and attempts to address them should likewise be inter-connected. These activities directly or indirectly affect any resource management work. Management initiatives should include the departments of forestry and agriculture, tourism and health, and take into account the Agriculture, Land and Tenant Agreement. Such connections will help keep various interested groups informed of each others' activities, and enable collaboration on community-based work. Increased networking among the various sectors will enhance the fisheries management work that has already started.

5. Continuity of community-based projects

A question that has haunted developers and managers in the past has been how projects can continue and be maintained long after the initiators, donors, specialists or experts leave. Monitoring and evaluation are essential for the success of a project. What happens three years after the 'outside' partner of a management project pulls out? Does the partner need to periodically visit the project throughout the following years to check the progress? This might be possible if only 20 marine reserves or taboo areas are considered. If, however, there are 200 or more *I qoliqoli* areas, then there must be a huge financial and human resource back-up system to continue the project. NGOs can play a crucial role in keeping the necessary groups informed and in touch with one another. The government could also consider building these management systems into the current restructuring of the Fijian Affairs Board, as this can

provide for a permanent mechanism of continuity for the people.

6. Indicators of success

There are numerous examples of success in Fiji Islands and most of these have been on biological measures, with little socioeconomic indicators. Complementary social indicators of success should also be drawn up where those people specifically identified as being dependent solely on marine resources within their *I qoliqoli* areas for the economic and social livelihoods, can be continuously surveyed over certain periods of time to ascertain change in lifestyle, social attainment, educational attainment and other such social and economic indicators. This should be divorced from other collective factors that can contribute to general social improvement at the village level. This will involve rigorous research, study and data collection but should be instrumental in establishing needed factors to gauge success of projects. Most importantly, this should involve communities doing their own research or being part of the assessment process.

Fiji Islands has come a long way with regards to community-based marine resource management, but it has a long way still to go. The above stated challenges reflect questions that continuously plague people at all levels about the relevance and success of these initiatives. FLMMA continue their work with vigour and enthusiasm after the success in the pilot areas of study, the Fiji Fisheries Division's recently introduced community-based fisheries management project will also be pursued with enthusiasm. These challenges remain and need to be answered and addressed in the near future.



Community valued in Pacific conservation

By Scott Radway, *Pacific Islands Report*, 28 June 2002

Simpson Abraham remembers bringing a new land-use plan to the people of Kosrae at a community meeting, and how his own uncle told him the plan was no good.

'My uncle stood up in the back and said, "To hell with that report. I will never, never support it," said Abraham, Director of the Kosrae Resource Management Program. 'He thought we were taking over rights to his land.'

Abraham told that story yesterday at a workshop at the annual Pacific Islands Environmental Conference.

The people of Kosrae — an island state in the Federated States of Micronesia — rejected the land-use plan because no one had consulted them, he said. Officials just showed up one day with the finished copy of the plan, he said.

Abraham was part of a panel of regional leaders who discussed the need to engage the community if any environmental program is going to work.

Pacific Islanders, especially in more traditional areas, do not respond to outsiders dictating what should be done with their land and reefs. There is a great strength in working through traditional leaders and employing traditional practices that have successfully maintained the environment for

thousands of years, said Noah Idechong, a Palauan delegate.

Idechong said many Palauans were dispirited in the 1980s because fish stocks were being severely harmed by poor fishing practices. Idechong turned to grass-roots leaders and worked with village chiefs to temporarily ban fishing in certain areas, as was often done long ago to preserve resources.

That action later led states to establish official marine protection areas and Idechong is now working at a national level to establish a united system of preserves. Idechong, who has won several prestigious national awards for his work, said that by building from the village up, the effort was successful.

If the national government had decreed marine preserves from the beginning, villagers would never have enforced them.

Alan Freidlander, from the Oceanic Institute in Hawai'i, said the state has had greater success protecting coral reefs and fish stocks in areas where traditional culture survived. Traditionally, people have had a stronger connection with the land and sea. Freidlander cited the deterioration of culture in Hawai'i as a reason for reef degradation.

Guam officials, too, said fighting coral reef degradation has been harder because of a dilution of tra-

ditions there and the loss of a strong connection to the environment.

But Willy Kostka, executive director of the Conservation Society of Pohnpei in FSM, said that while traditional culture is a great strength, balancing village input with government designs is a great challenge.

'If you deal with the community too much, the government gets jealous. And if you deal with the government too much, the community gets jealous,' Kostka said. 'It's a balancing act.' Kostka said he tells his staff never to forget that if each side doesn't support a goal, the plan will fail. Political will is as important as community support, he said. 'It has to be the dream of everyone,' Kostka said.

Pacific Community Reef Restoration Project lauded In Washington, D.C.

News Release, Pacific Islands Report, 16 April 2002

Community leaders from the Pacific were in Washington, D.C. recently to share the successes of a unique coral reef restoration initiative, which rehabilitates reefs while sustaining rural livelihoods. The Coral Gardens initiative of Counterpart International also aims to enhance the cultural heritage of coastal regions.

Environmental leaders, representatives from multi-lateral agencies and private foundations lauded the success of the Coral Gardens programme in restoring reefs that in turn rejuvenate fisheries, and the local communities that feed off them. Coral Gardens sites are in the Melanesian archipelagos of Fiji and Solomon Islands.

Through a community-based initiative developed by Counterpart International and its Pacific partner, the Foundation for the Peoples of the South Pacific, Fiji (FSP), Coral Gardens methodologies provide the tools for conservation, fisheries restoration, and sustainable income generation.

Developed by acclaimed biologist Austin Bowden-Kerby, Coral Gardens leaves to communities, the acceleration of natural coral reef formation and recovery, the development of no-fishing marine protected areas, and the stewardship of reefs by the local communities that own them.

Luxury resorts such as the Shangri-La in Fiji Islands are helping to conserve and highlight the aquatic splendor by hiring local 'reef guides' trained by the programme to share the reef's beauty with the 400,000 guests that visit Fiji annually.

Small aquaculture enterprises owned by women are providing alternative livelihoods and technical training is helping to develop ecotourism enterprises to boost the Fijian economy.

Counterpart and partners hope to establish a regional training center and environmental trust fund through Coral Gardens, ensuring adequate resources for long-term conservation of the region's reefs.

'We have these resources on loan, and are the stewards that must carry them to future generations,' said Alisi Daurewa, Executive Director of FSP.

Counterpart International, born as The Foundation for the Peoples of the South Pacific, has worked with Pacific Island communities since 1965, helping them to solve their own self-defined needs.

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Population and gender dynamics in coastal conservation in East Africa

By Bronwen Golder, Senior Research Fellow, and Mia MacDonald, Population and Environment Consultant, Conservation Strategies Unit, World Wildlife Fund

Source: InterCoast, Winter 2002

Along the east coast of Africa lies one of the richest marine ecosystems in the world, spanning over 300,000 square miles from Somalia in the north to Mozambique in the south. The World Wildlife Fund (WWF) defines this area as the East Africa Marine Ecoregion (EAME) (Ecoregions are large units of land or water that contain geographically distinct assemblages of species, communities, dynamics, and environmental conditions.)

With its diversity of fish, corals and mangrove forests, the EAME is among the ecologically richest, rarest and most endangered marine ecoregions on earth.

Today, extensive fishing, destruction of coral reefs, and the clearing of mangroves are increasingly threatening this unique marine system. To address these threats, WWF has initiated conservation plan-

ning and action across the ecoregion. Effective conservation action at such a large scale requires an understanding of, and response to, far more complex biological and socioeconomic interactions and trends than site-level work demands. Population is one of the key socioeconomic factors at work across the ecoregion scale, often shaped by gender dynamics. Along with factors such as fertility rates and migration patterns, gender dynamics play an important role in determining the amount of pressure that is likely to be placed on human and natural resources.

In late 2000, WWF undertook an analysis of population and gender dynamics in a number of coastal communities within the EAME, specifically in Tanzania and Mozambique. This article describes the study's findings, what they suggest about the links between gender and population, and ways of addressing these links to advance conservation goals in coastal ecosystems.

Findings: Gender and population links

Population dynamics provided important information about current and anticipated pressures on the resources of the EAME, and, as anticipated, gender emerged as a key element determining men's and women's access to and use of resources in the ecoregion.

Gendered use of resources

The following were the main findings regarding gender and resource use:

- As the main household breadwinners, men control access to almost all resources and are primarily responsible for much of the destruction in the marine environment. Men's primary activity is fishing in open waters, often using dynamite and poison to secure their catch. Men also cut mangroves for boat and home construction. In the Tanzanian communities studied, palm leaves used for handicrafts are the only resource women alone control. And in most villages in coastal Mozambique, women are not allowed to fish, although they do process and market the men's catch.
- Women, as household managers and increasingly to earn extra income, use primarily those marine resources that are close to land. This is largely the result of prevailing cultural mores. Women use mangroves for fuelwood and make charcoal for household consumption or sale in markets. They also collect small marine life such as seaweed, crustaceans, oysters, and turtle eggs, often damaging coral reefs and disrupting turtle breeding in the process. Women are increasingly processing these marine resources and selling them, often to tourists.
- Women, although they are generally the main producers of food through subsistence agriculture, tend not to own or control land. In addition, they rarely have access to technology that would enable more sustainable use of resources. In many cases, men also lack such access, but conservation programs more often target men with programs that provide new sustainable technologies.
- Poverty plays an important role in gendered use of resources. In general, and especially in Tanzania, women in wealthier households do not traditionally or by necessity earn money, so they rarely use marine resources directly. But most people in these coastal communities are poor and so are heavily reliant on local marine resources. Widespread and, in some cases, growing poverty are putting new pressures on women to contribute to household income.

Population and gender

Population dynamics in the two countries have strong links to gender. Fertility, though falling, is still high, with an average of five children born to each woman in Tanzania, and nearly six to every woman in Mozambique. In rural areas such as the coastal villages studied, fertility is even higher. Women in these communities have limited access to family planning and reproductive health care, and overall rates of contraceptive use remain very low. The 2001 report by the New York United Nations Population Fund, *State of World Population 2001*, states that only 16 per cent of women in Tanzania and 5 per cent in Mozambique use a modern contraceptive method, with even smaller percentages the norm in rural communities. Women's status is also low, with only a small proportion of girls completing school. Because secondary schooling is a strong predictor of lowered fertility, lower education levels for women often lead to higher levels of population growth. Another outcome is that large numbers of women are illiterate. Estimates from the *State of World Population 2001* suggest rates at the national level of 31 percent in Tanzania and 70 percent in Mozambique. As a result, women's power to determine family size is limited.

Dynamism of the situation

The state of both gender and population are dynamic in the EAME. In most of the coastal communities studied, poverty and population are rising, in some cases very quickly, suggesting even greater future demands on resources. Ironically, some communities view the growing population as positive since it provides a larger market for their wares, including processed marine life. At the same time, out-migration is increasingly common

and also has a link to gender. Men usually migrate in search of waged work in cities, leaving women in charge of households and in need of money, which is largely secured through increased use of forest and marine resources.

Indeed, throughout coastal Tanzania and Mozambique, growing numbers of women are undertaking economic activities, the result of household food security needs, male out-migration, a desire or need for more household income (often to pay for health care or schooling for children), and changing social mores. In some communities in Tanzania, women have been driven by these changing circumstances to begin fishing, breaking long-standing gender norms. Structural factors are also playing both planned and unplanned roles in this change; among these are the increasing marketization of local economics, government commitments to gender equity in employment and education, and donor-funded conservation programs that emphasize women's role as resource managers.

Interpreting the findings and moving forward

The results of the analysis suggest that conservation objectives will not be met in the EAME or many other coastal ecosystems if gender and population realities are not addressed. The following are some of the realities revealed by the analysis that should be applied to the EAME and other coastal areas:

- Women are important resource users and managers who, along with men, need education, training, and inputs that will enable them to use coastal resources more sustainably. The analysis revealed that women resource users were generally more open than their male counterparts to shifting harmful economic activities such as the collection of turtle eggs to less environmentally destructive, income-earning pursuits such as basket weaving or sustainable mariculture. But, although the law in Mozambique guarantees women and men equal access, women still have limited control over assets and resources. This suggests the need to encourage involvement of both men and women in community discussions and actions rather than engaging only those who can claim principal use or ownership of resources (which in most cases are men).
- Greater awareness of gender-based resource management can play an important role in policy development and action. At national levels, both Tanzania and Mozambique have policies that are gender-sensitive in writing, but government agencies lack the necessary capacity in gender analysis and programming to imple-

ment them. Support for gender training of key stakeholders and government coastal resource administrators could be an effective response.

- There is a strong link between high fertility and the low status of women in coastal communities. Limited family planning, reproductive health services, and educational opportunities reinforce these links. Health and education infrastructure in coastal areas and governmental actors that can prioritise its delivery are critical. Also important is long-term monitoring of population trends, joined with planning to address their potential impacts on coastal resource use.

This could be accomplished through support for NGOs that deliver reproductive health care in underserved communities, and partnerships with government agencies or NGOs to improve health or school facilities. Government agencies or conservation managers might also undertake or support studies of migration patterns and their impacts on gender.

The importance of collaboration

Collaboration will be a critical factor in the success of coastal conservation. As success increasingly depends on existing and shifting socioeconomic realities, coastal resource managers' traditional areas of expertise may not be sufficient to implement a broad-based conservation strategy. Such a strategy may require attention to issues of reproductive health, migration, and women's status. It is neither efficient nor desirable, however, for coastal resource managers to become experts in such areas. Rather, collaboration with governmental, non-governmental, and community groups will most effectively address critical gender and population dynamics. Throughout most areas of the world, and even in the most remote communities, organisations exist that can take responsibility for promoting or providing reproductive health care, education, or support in sustainable resource management. The challenge for conservation organizations is to build a dialogue and shared understanding with those groups so that issues of common interest can be addressed constructively.

Lessons for future action

The EAME gender analysis makes a strong case that successful conservation action in the EAME will be impossible without recognizing the links between gender and population and strategically responding to the different roles of men and women in resource management. High rates of fertility and poverty are unlikely to change unless women have more access to reproductive health care and education. And, as resource users, women

also need to be involved in community decision-making about the use or protection of resources.

Finally, because the analysis revealed that migration patterns are gender-related and have a direct impact on resource use, conservation planners should understand and address both the drivers and impacts of migration.

Integrating women's subsistence fishing into Pacific fisheries and conservation programmes

By Elizabeth Matthews, Marine Affairs Department, University of Rhode Island, Kingston, Rhode Island, USA

Source: InterCoast, Winter 2001

Fishing is generally thought of as what fishers do — catch fish. A sentiment among some Pacific Island fisheries departments is that 'women don't fish, they just collect shells'. The extent or affect of that shell collecting is often minimized or overlooked completely. This has helped to isolate women's concerns from mainstream fisheries programmes. For instance, the Secretariat of the Pacific Community (SPC) began a Women in Fisheries programme within its Coastal Fisheries section. Although women's needs and collection activities are increasingly acknowledged and studied, they are usually the focus of a separate and special office, not integrated into the fisheries development programme as a whole. In addition, regional organisations and governments rarely integrate the impacts and needs of these collection activities into broader fisheries conservation and management programmes. Many women in the Pacific Islands ensure a daily supply of fresh seafood for their families by gathering invertebrates from nearshore areas. This aspect of the traditional food production pattern has remained prominent even as imported and processed foodstuffs have gained wide local acceptance. Various fresh and saltwater molluscs, crustaceans, sea cucumbers, urchins, and prawns are eaten on a daily basis throughout the region. These invertebrate species are collected from the reef flats at low tide, or from mangroves, rivers, and streams in both rural and urban areas. Often the invertebrates are collected in rural locations, transported, and then sold in urban areas where adults are more likely to work in offices than in traditional gardens and lagoons.

Although lifestyles have changed, the taste for traditional foods remains. Some invertebrates are exported, most notably trochus, dried and smoked sea cucumbers, and in some areas both live and dead corals. After centuries of continued exploitation, some invertebrate species are showing localized signs of depletion. Stocks that could once support daily harvest are feeling the effects of overexploitation and pollution. The combina-

As pressures on the EAME and other coastal ecosystems around the world increase, the resources that support millions of people are threatened. Protecting the biodiversity of these rich systems will require strategic action that is sensitive to the critical role that gender dynamics play in the use of coastal resources.

tion of overexploitation from a growing population and from increasing commercial enterprises, habitat degradation (especially mangrove destruction, erosion due to land-based construction and development, destructive fishing, collecting practices, and pollution), and the lack of conservation programs for invertebrate species have contributed to this decline.

Women's activities and impacts

Women generally engage in reef gleaning by walking along the reef flats at low tide, collecting invertebrates, small fish, and seaweeds. They engage in other activities as well. In Fiji Islands, women collect freshwater mussels from rivers, small crabs, shells, sea cucumbers, and urchins from reef flats, and mud lobsters and crabs from mangroves. In Palau, women collect clams from mangrove areas as well as molluscs, sea cucumbers, crabs, and urchins from reef flats. In Kosrae, women use gill nets to catch a variety of fishes from shallow reef flats. A quarter of Kosrae's fish catch is caught by women in this way. Women also collect mangrove crabs, octopus, eels, anemones, seaweeds and numerous kinds of molluscs. Little quantitative data is available on the extent of these activities. However, in 1993 it was estimated that women in Vavau, Tonga, collected about 230 tons/year from the reef flats. This includes shellfish, mangrove crabs, jellyfish, sea cucumbers, and algae (especially sea grapes, *Caulerpa* sp). At one time these were purely subsistence activities; today, however, most women sell at least part of their catch in markets.

Occasionally women resort to destructive methods in order to collect some species. They break coral heads, overturn rocks, and walk on delicate corals in their search for food species. In Tonga, for example, reef gleaners often use knives, iron poles or hammers to smash corals in order to find shells. They also leave coral encrusted rocks overturned after their visits to the reef flats, which can cause the death of the exposed organisms. Women in

some areas continue to use traditional methods that utilize poisons obtained from plants and sea cucumbers to stun fish, possibly affecting other species as well. In Fiji, women may collect freshwater prawns by pouring bleach, pesticides or fertilizers into streams and rivers. Although many of these practices have not been officially documented in the region, fisheries and conservation department personnel have acknowledged them as one of the serious threats facing the reef environment.

Environmental degradation

Environmental degradation of inshore areas is an increasing concern as many countries in the region contend with growing populations and increasing urbanization and industrialization, under the difficult island conditions of limited resources and space. The major environmental problems affecting coastal areas in the region include land-based sources of pollution, deforestation leading to erosion and sedimentation, mangrove and other habitat destruction, unplanned and rapid coastal development, and destructive fishing methods. These are compounded by rapid urbanization, a growing population, and the low priority given to environmental concerns in many places in the region.

Invertebrate species, because they often live close to land on the lagoon or shore bottom, can be very susceptible to land-based pollutants. They can accumulate bacteria or diseased organisms from human wastes, pesticides, or heavy metals making them dangerous for human consumption. The invertebrates can also be killed outright by contaminants, suffocated by sedimentation, or eliminated due to loss of appropriate habitat.

Integrating women's needs into fisheries management

Fisheries departments throughout the Pacific region are concerned with downturns in nearshore fish stocks, due to overfishing and habitat loss. One of the most common solutions is to encourage the use of offshore resources. Men receive gear, training, and advice on how to move their fishing activities offshore to take the strain off the heavily utilized inshore coastal resources. Women, however, receive little or none of the benefits of these programs due to oversight or isolation from mainstream fisheries programs.

In fact, even as men are moving into deeper waters to protect the inshore lagoon resources, women continue to collect small fish and invertebrates from the shallow waters. Many nearshore invertebrate species are showing signs of decline. In order to more fully protect invertebrate species and women's collection activities, a more holistic and

integrative view of fisheries management should be taken. A management strategy should:

- Include invertebrate species in fisheries management programs. Species important for subsistence and small-scale local markets should be included.
- Increase priority of environmental protection of inshore areas and their resources in the Pacific Islands region.
- Decrease the amount of mangrove and other habitat destruction.
- Develop local education and outreach programs focusing on wise collection strategies, especially the use of non-destructive methods, the need for environmentally sound local practices at the village level, and the importance of all species to the health of the lagoons and nearshore areas.
- Use locally important and depleted species (i.e. sea cucumbers, molluscs, urchins, small crabs, and seaweeds) instead of non-native-introduced species in aquaculture and mariculture trials. Small-scale village aquaculture projects could be used to rejuvenate popularly harvested species in local areas and contribute to local participation in stock management and conservation.
- Integrate conservation plans into all future women's fishing and collecting projects. There is going to be an increasing danger of overexploitation of invertebrate species as women's fishing projects become more prevalent in the region.
- Explore non-fisheries-related income generation schemes for women to take additional pressure off local resources.
- Use a holistic view of fisheries management that focuses on ecosystems and habitat rather than individual species. One means of creating holistic conservation and management strategies is through the use of linked marine and terrestrial protected areas as part of a larger management program.

Women and other reef gleaners will continue to collect these inshore invertebrates, whether or not fisheries personnel take notice. They will collect invertebrates from reef flats that may not be able to sustain a continued harvest if the environment is continually assaulted by damaging human activities. Serious efforts should be made to assess the status of these inshore invertebrate stocks and to develop sensible management strategies for their protection.

Learning about land crabs in Palau

By Elizabeth Matthews, Palau Conservation Society

Land crabs are a very popular food in Palau. Women and children collect the crabs in large numbers as they emerge from their burrows in the forest in the late afternoons. Some land crabs migrate to the sea to release their eggs around the full moon. Others stay closer to the forest. In Peleliu, an island at the edge of Palau's southern lagoon, land crabs are an important resource. Peleliu crabs are sold in markets and restaurants around Palau, and are common delicacies on plates served at local customs.

Although land crabs are a popular food item throughout the Pacific region, very few studies have been conducted on them. In Palau, they are a completely unmonitored resource. No one tracks their status, sales or export. In addition, local markets do not keep detailed records of sales for any of the species that are sold.

It is often assumed that the land crabs are an abundant and inexhaustible resource. However, there are signs that these crabs are beginning to be over-exploited. In 1994, Palauan law made it illegal to export crabs and lobster from the country.

Although land crabs are included in this export ban, it is still possible to export them as *ukaeb* (mixed with coconut and stuffed in a crab shell). No records are kept of how many land crabs are leaving the country in this form.

Some women who have traditionally collected these crabs for subsistence and commercial purposes have begun to notice declines in the numbers of crabs they collect.

In fact, in 2001, the women's group Ngaratatirou, asked staff at the Palau Conservation Society to

conduct a study of the land crabs in Peleliu because they were concerned with a diminishing harvest.

The Palau Conservation Society recruited three eighth-grade students from the Peleliu Elementary School to help conduct the study of land crabs. The research team interviewed 23 women about their land crab collection activities, and measured and weighed close to 500 land crabs found in the wild and in containers at peoples' homes. Fieldwork for this study was conducted from April to June 2002. These are the peak harvesting months for Peleliu land crabs.

The most commonly collected land crabs in Peleliu are *Cardisoma hirtipes* (*rekung el beab*) and *Cardisoma carnifex* (*rekung el daob*). *Gecarcoidea lalandii* (*kesuar*) is less commonly collected in Peleliu, since many people have allergic reactions to the crab. A fourth crab species (*cheoich*, *Eriphia sebana*) was often seen in markets along with land crabs. Although sold with land crabs, this species is not a land crab. It is found in and around mangrove areas.

Much of Peleliu's coastline contains long stretches of sandy beaches. Peleliu also contains large forested areas. The land crabs can be found among the



Students weighing and measuring land crabs being raised in a truck tire.



Rekung el beab
(*Cardisoma hirtipes*)



Rekung el daob
(*Cardisoma carnifex*)



Kesuar
(*Gecarcoidea lalandii*)

roots and brush in many sites on the island. All of the forested areas are secondary growth due to the massive destruction of vegetation that occurred on the island during World War II. Many areas appear to have been upturned from the impact of bombs exploding and then regrown with vegetation. These areas are dense and tangled messes of roots and scrubby second growth trees — a perfect site for land crabs to find protective holes.

Land crabs can be collected all year, but at certain times of the year they can be seen almost everywhere in Peleliu. In southern Palau, they are most abundant from April to May, especially around the time of a full moon. Land crab eggs need to be in salt water in order to hatch. *Cardisoma hirtipes* (*rekung el beab*) females migrate from their holes in the forest to beaches to release their eggs in the sea during the few days before or after the full moon. The land crabs are easily harvested during this migration. They are also harvested at other times of the month when they emerge from their burrows to feed in the early morning or late afternoon. Peleliu state law prohibits land crab collection the three days before and the three days after the full moon. At the beginning of this study there was little enforcement of the law; however, enforcement was increased towards the end of the study.



Female land crab heavy with eggs

In the late afternoon, groups of women and their children drive to their favourite sites. The dark crabs are quite visible on the white coral roads that cross all over southern Peleliu.

During the interviews, there was general acknowledgement that people preferred to collect female land crabs. Collecting gravid females is not illegal, but some women told the research team that they thought it was better to let the females with eggs go. However, the team did not see an overwhelming number of females, with or without eggs, in the collection bags the team randomly sampled.

Many of the women who collect land crabs bring them home and raise them in pens. The land crabs in these containers were much larger than any that the research team measured in the wild. The crabs are fed a richer diet in the pens than they regularly eat in the wild. Women feed them coconut, rice and a variety of non-toxic leaves. The crabs are usually kept in the pens for several days before the household eats them.

Half of the women interviewed sold crabs. They are sold cooked whole, or more commonly as *ukaeb* (cooked with coconut and stuffed into a crab shell). *Ukaeb* is a very sought-after food for special occasions and customs. Most of the women who sell crabs from Peleliu receive requests from people living in the main town of Koror who need 100 or more pieces of *ukaeb* for a custom. Other women sell crabs in local markets.

The research team learned about several activities that could contribute to a decline in the land crab population: collection of gravid females, preference for females in general, unmonitored export of land crabs, initially unenforced state conservation laws, more people who are collecting the crabs, use of freezers to store crabs, and use of cars to reach land crab collection sites.

Construction of roads throughout Peleliu may also be disturbing the monthly spawning migrations of crabs if the crabs can no longer travel from the forest to the sea. Finally, several women mentioned that some areas have been remarkably dry in recent years. Land crabs, which must remain wet while in their burrows, may be affected by such dry weather. It was beyond the scope of this research project to study the affects of these or other factors (such as predation by birds) on the land crab population.

Many women suggested management strategies to protect the land crabs from over harvest. They mentioned that previously women did not always collect the whole crab, but only broke one of the large front claws off. Some women recommended several sites that could be closed to all harvest for a year or more. They also suggested setting minimum sizes on both crabs collected as well as those that are sold as *ukaeb*. Many women thought it should be illegal to collect crabs with eggs. Some women were curious about the possibility of farming the crabs.

This study is the beginning step in understanding the status and uses of the land crabs in Peleliu. The Palau Conservation Society will continue to work with the people of the state to see what actions they want to take in regards to land crab collection activities. If they decide to develop a management strategy, the suggestions offered by the women in this study would be a strong starting point.

Socioeconomic status of fisherwomen

Women's fishing in Tonga: Case studies from Ha'apai and Vava'u islands

By Dr Mecki Kronen, SPC Community Fisheries Scientist

Introduction

Over the last two decades, women's contribution to the subsistence and artisanal fisheries sectors in the Pacific has increasingly gained recognition. Contributions include not only subsistence but also small-scale, village-based commercial activities. Chapman (1987) showed that the total fishing yield supplied by women fishers is 32% in American Samoa and between 25 and 50% in the Gulf of Papua New Guinea. In Fiji Islands, invertebrate sales averaged 2000 tonnes, worth FJD 4.5 million, over a three-year period. Salt- and freshwater clams, which are exclusively harvested and marketed by women, comprise about 48% of this volume (The Women in Fisheries Network, www.wifn.org.fj, 11 June 2002).

Although considerable efforts continue to target women in fisheries development and management projects, women's contributions at both subsistence and commercial levels have yet been given due recognition by the relevant national and regional institutions. This gender bias is highlighted by the fact that national and regional statistics do not yet reflect women's – and children's – share in the fisheries sector, which has resulted in the characterisation of women as the 'invisible fisherfolk' (Ram 1993).

This paper addresses two issues that have been underestimated and undervalued in the past: the role and magnitude of women's and children's involvement in fishing activities in the South Pacific. Accordingly, this paper examines how Tongan women's fishing practices contribute to the family's seafood consumption and income generation. It aims at reviewing today's behaviour in comparison to documented gender related traditions and customs. Furthermore, an attempt is made to analyse if gender related fishing attitudes are already developed at an early age.

Methods

The results presented here are derived from socio-economic surveys implemented in the framework of an interdisciplinary research project (DemEcoFish¹) assessing the status of reef and lagoon resources in

the South Pacific. Socioeconomic survey methods involved random interviews with men and women of all adult age groups (> 15 years) in four Tongan village communities. Primary school children of both genders were surveyed using participatory scoring and ranking tools.

Four villages were selected (Fig. 1): two each from the Ha'apai and Vava'u island groups. Each pair of villages per island group comprises one more traditional and one more urbanised community. Thus, Lofanga on Ha'apai and Ovaka on Vava'u represent the more traditional communities as they are located on small isolated islands where access to the main island is by motorised boats only. In contrast, Koulo on Ha'apai and Mataika on Vava'u are considered more urbanised villages because they are located in close proximity to the island groups' main centres.

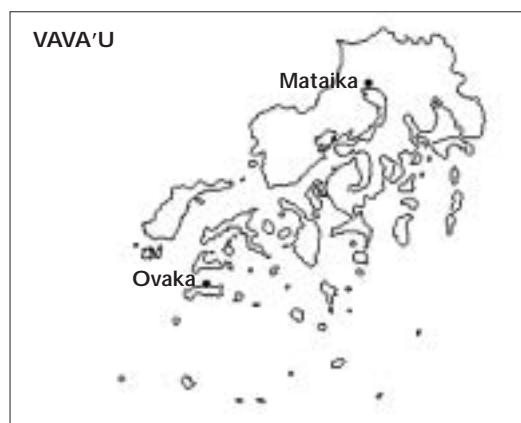
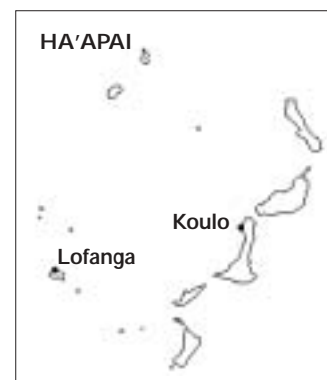


Figure 1
Location of the four villages surveyed in Vava'u and Ha'apai island groups of Tonga



¹ DemEcoFish is an ongoing research project (2001-2003) implemented by SPC's Reef Fisheries Observatory, and funded by the MacArthur Foundation. The major objective is to identify socioeconomic indicators to assess fishing pressure and thus the status of marine resources (reef and lagoon) used for subsistence and small-scale artisanal fisheries in the South Pacific.

Individual questionnaires were used to assess seafood consumption and fishing habits. Information on frequency of fishing activities, main fishing techniques used, target species, and reasons for fishing was gathered through participatory children's surveys. The children's survey results are presented as percentages of three village samples. A children's survey was not carried out in Lofanga due to holidays.

The assessment of women's role and contributions is based on comparisons between answers given by female and male individuals in each village.

In this paper, fishing is defined as the harvesting of all edible seafood. Differentiation is made between finfishing and the collection of other seafood (reef gleaning).

Results

Adult individual surveys

Survey sample

As presented in Table 1 survey samples represent between 25% and 55% of the total adult village population (> 15 years). Sample sizes of women and men per each village survey are comparable.

Seafood consumption

The consumption of finfish and other seafood is important in each village (Table 2). Canned fish is an

established food item in all communities, and seems to be slightly more preferred by women than men. Also, consumption of other (non-fish) seafood is prominent (88–100%). Variations in percentages may be explained by religious taboos² rather than individual or gender determined taste preferences.

Fishing activities

Seafood consumption patterns correspond to the involvement of village people in fishing activities. About half of all women villagers questioned in Ha'apai said they finfished, as did 6% to 21% of the women in Vava'u (Table 3). However, the involvement of women in reef gleaning activities is higher (72% to 92%) and more consistent when comparing all four villages.

By comparison, men's involvement in finfishing is higher but their participation in reef gleaning is substantial, too. In the case of Mataika (Vava'u) the percentage of men reef gleaning exceeds that of women.

As shown in Table 4, the frequency of finfishing trips is only slightly higher for male fishers in the small island communities of Lofanga and Ovaka. Frequency of other seafood collection is comparable and consistent between villages and gender groups. The high number of collection trips by men in Ovaka village is the exception. Duration of finfishing trips by women and reef gleaning trips by either gender group are comparably short, ranging from two to four hours each.

Table 1: Survey data

Village	Total no males surveyed	Age range surveyed	Total no females surveyed	Age range surveyed	Total population surveyed	Total population >15 years	% representation >15 years
Ha'apai							
Koulo	32	15–83	32	11–72	64	146	44
Lofanga	17	17–76	13	22–59	30	114	26
Vava'u							
Mataika	41	16–78	44	15–75	85	339	25
Ovaka	20	15–71	16	15–65	36	65	55

Table 2: Seafood consumption patterns

Village	Eat finfish (%)		Eat other seafood (%)		Eat canned fish (%)	
	males	females	males	females	males	females
Koulo	100	100	94	91	94	94
Lofanga	100	100	92	94	71	85
Mataika	100	98	76	100	98	98
Ovaka	100	100	100	88	80	94

Table 3: Fishing and reef gleaning activities by percentage

Village	Go fishing (%)		Go collecting (%)	
	females	males	females	males
Koulo	50	78	72	66
Lofanga	54	88	92	59
Mataika	21	59	82	90
Ovaka	6	80	75	10
mean:	44	76	80	56

² E.g. members of the Seventh Days Adventist Church do not eat shellfish.

³ Usually lobsters are spearfished by men at night in habitats that require motorised boats.

Table 4: Frequency and duration of all fishing activities

Village	No of finfishing trips/week		Duration of finfishing trip (hours)		No of collection trips/week		Duration of collection trip (hours)	
	females	males	females	males	females	males	females	males
Koulo	2-3	2-3	3	8	2	2	2-3	2-3
Lofanga	2	3-4	3-4	7	1-2	2	<6	<6
Mataika	2	2	4	5	1-2	1-2	3	4
Ovaka	2	3-4	2	3-4	2	4	3	3

Table 5: Time of finfishing

Village	Fishing (%)					
	night		day		night & day	
	females	males	females	males	females	males
Koulo	6	40	81	36	13	24
Lofanga	0	14	100	43	0	54
Mataika	11	8	67	24	22	68
Ovaka	0	0	100	63	0	37
mean:	4	16	87	42	9	46

Table 6: Time of shellfish collection – reef gleaning

Village	Collecting (%)					
	night		day		night & day	
	female	male	female	male	female	male
Koulo	0	0	96	100	4	0
Lofanga	0	0	100	100	0	0
Mataika	0	7	94	73	6	20
Ovaka	8	0	34	45	58	55
mean	2	2	81	80	17	19

Table 7: Fishing techniques

Technique	Koulo		Lofanga		Mataika		Ovaka	
	females	males	females	males	females	males	females	males
reef gleaning:								
iron bar ¹	24	0	54	26	21	11	17	3
collecting by hand ²	56	12	13	0	59	41	47	28
sub-total reef gleaning:	80	12	67	26	80	52	64	31
finfishing:								
catching by hand	3	0	0	0	0	0	0	0
handline	8	18	0	29	5	13	0	22
cast netting	3	9	25	3	3	8	7	15
netting	0	23	0	5	3	2	0	16
group netting	0	5	8	0	5	0	0	0
spear fishing ³	3	28	0	16	0	20	4	12
spear throwing ⁴	0	0	0	0	0	0	0	3
night fishing ⁵	3	0	0	0	4	5	25	1
deepbottom fishing (handline)	0	5	0	18	0	0	0	0
trolling	0	0	0	3	0	0	0	0
sub-total finfishing:	20	88	33	74	20	48	36	69

¹ Includes maka feke, a lure to catch octopus (according to a traditional Tongan legend) that simulates the shape of a rat.

² May involve the use of knives, woven baskets, plastic bags and containers, and using the feet to feel for some shellfish

³ Involves apna (breath-hold diving) and is performed during day and night, at Ha'apai mostly at night.

⁴ Throwing a long spear from mangroves or reefs, or from a boat.

⁵ May involve several techniques used by foot or from a boat, performed using a light (lantern) to attract fish.

Major differences occur in the duration of men's finfishing trips. With the exception of Ovaka — where men spend in average only three to four hours on each finfishing trip — men usually finfish for five to eight hours at a time.

Similarities and differences in fishing activities are highlighted in Tables 5 and 6. Women prefer fishing during the day, whereas most men finfish during the night or the during the day, or exclusively at night. Other kinds of seafood are mostly collected during daytime, irrespective of gender³. However, all Ovaka villagers and, to a lesser extent, Mataika villagers also reef glean during the night and day.

Fishing techniques

The fishing techniques used mainly by women fishers in all villages surveyed, predominantly target invertebrates and shellfish (Table 7). However, while 80% of women in more urbanised villages reef glean, women fishers in isolated and more traditional communities such as Lofanga and Ovaka use such techniques less (~65%) in favour of finfishing. Finfishing techniques vary considerably between women from both villages. Women in Lofanga (Ha'apai) prefer cast netting and to a lesser extent group gillnetting, while night fishing and to a lesser extent cast netting and spear fishing are employed by women fishers from Ovaka (Vava'u). Finfishing techniques used by women in the more urbanised villages of Koulo and Mataika include handlines and catching fish by hand.

In comparison, male fishers use mainly handlines and all kinds of netting techniques in addition to deep-bottom fishing and trolling. Spearfishing is widely practiced in Ha'apai and also in Ovaka (Vava'u).

³ Usually lobsters are spearfished by men at night in habitats that require motorised boats.

Habitats fished

Preferences for certain fishing habitats (as depicted in Table 8) are determined by accessibility and availability. Most women fishers reef glean without using a canoe or boat. Thus, none of the women interviewed said they fished in deep sea areas. However, while both Ha'apai villages are mainly surrounded by reefs, Mataika village on Vava'u has direct access to soft-bottom habitats. These characteristics are reflected in the percentages for either gender group. In the case of Ovaka, however, the balance of both habitats fished is determined by access to the reefs surrounding the isolated island and visits using boat transport to soft bottom habitats around the main island.

Objectives of fishing

The majority of all women fishers surveyed stated that they fished mainly for subsistence purposes, although finfish and other seafood were also collected as gifts. However, women, particularly those based at Lofanga (Ha'apai) also harvested for sale. By comparison, although male fishers concentrate on subsistence finfishing and the collection of seafood they are more commercially oriented. On average, the share of finfish for sale exceeds shares of other seafood sold. The percentage of men finfishing to generate income is particularly high in Lofanga (Ha'apai).

Surveys of children

Results given in Table 10 are average figures for primary school students (7–9 years) surveyed in the three villages of Koulo, Mataika and Ovaka. Data shows that girls go fishing either 'often' (1–3 times a week on a regular basis) or 'sometimes' (e.g. during school holidays and on most Saturdays), while boys mostly opted for sometimes only.

Household consumption was quoted as the main purpose by both girls and boys. However, more girls than boys fish for sale, and their mothers sell the catch.

Girls from all three communities almost exclusively use reef gleaning or general collection techniques. The majority of boys questioned cited primarily finfishing techniques although a considerable percentage of boys were found to also reef glean. However, this seemingly gender-related division of fishing activities at an early age is challenged by the contrasting information on the main species harvested by girls, which includes a considerable amount of finfish. This suggests that girls also use techniques other than just reef gleaning and collection by hand.

Table 8: Habitats fished

Village	Reef		Lagoon (seagrass, sand/soft bottom)		Deep sea	
	females	males	females	males	females	males
Koulo	90	69	10	28	0	3
Lofanga	91	77	9	3	0	20
Mataika	21	31	79	69	0	0
Ovaka	50	52	50	48	0	0

Table 9: Reasons for fishing by percentage

	Koulo		Lofanga		Mataika		Ovaka	
	females	males	females	males	females	males	females	males
finfishing:								
consumption	50	40	0	0	50	23	100	6
sale	0	0	0	0	0	4	0	0
consumption & gift	44	44	71	0	38	30	0	56
consumption & sale	0	4	0	40	12	8	0	0
consumption & gift & sale	6	12	29	60	0	35	0	38
collection:								
consumption	57	41	17	10	50	40	17	10
sale	0	0	0	0	0	0	8	0
gift	0	0	0	0	0	0	0	0
consumption & gift	30	45	58	58	39	26	67	60
consumption & sale	9	0	8	8	3	8	0	10
consumption & gift & sale	4	14	17	17	8	26	8	20

Table 10: Fishing activities of primary school children at Koulo, Mataika and Ovaka villages (%)

		Girls (%)	Boys (%)
Frequency of fishing	often (1–3 times per week)	33	16
	sometimes (during school holidays and most Saturdays)	63	85
	never	4	0
Purpose of fishing	family consumption	80	89
	sale	24	11
Fishing techniques used	reef gleaning	99	43
	finfishing	1	57
Fishing catch	finfish	19	73
	other seafood	81	27

Discussion

Overall, results support the statement that women's participation in fishing activities in the South Pacific region has been underestimated and undervalued (Dye 1983; Ram 1993; Matthews 1991; Vunisea 1997). An analysis of the frequency and duration of fishing trips performed by both gender groups suggests that women's contribution to household supply is at least as regular and reliable as men's. While alternative income sources to fisheries exist in each of the communities surveyed, women's fishing must be considered as a means to secure the household's protein and food provision when financial and agricultural resources are poor. Children's fishing activities give substantial support to women in providing seafood for household consumption (and as a potential source of income). As demonstrated, primary school children in Ha'apai and Vava'u fish between one and two times a week, and about 25% of the girls' catch is sold by their mothers. These figures indicate a much higher participation than found by Rawlinson et al. (1994) in the case of Viti Levu, Fiji.

Results of this study also challenge a number of observations stated elsewhere. The percentage and frequency of finfishing performed by women contrasts with the generally held belief that women are responsible for the collection of invertebrates only (Tonga et al. 2000), or that women only occasionally perform men's fishing (Matthews 1991). It also opposes the often-cited sexual division of labour in fishing (Bataille-Benguigui 1988). This study agrees with statements made by Schoeffel (1985), that Tongan women will use fishing gear if it is available at home (e.g. cast nets, handlines and spear guns). Based on the fact that women's fishing activities stretch far beyond shellfish collection, it is argued that little difference exists between men's and women's fishing activities.

To be successful, women must have as much knowledge of the marine environment and the ecology of marine resources as do men, as well as the expertise and skills in fishing techniques.

Similarly, men's fishing certainly includes octopus fishing (*maka feke*), and the collection of certain molluscs (*hoka fimgota*), which are usually considered as part of women's domain (Tonga et al. 2000). The men interviewed stated they were not selective in the techniques used or species targeted, nor did they feel they were performing women's work when they reef gleaned.

The results of this study indicate there are three substantial differences between women's and men's fishing activities: 1) women tend to prefer daytime fishing, 2) women focus on shallow waters close to shore, and 3) women mainly fish

without using canoes or motorised boats. Possible reasons for these differences are: 1) Oliver (1989) argued that the more fishing habitats that are available, the more stratified the gender roles in fishing become. All fishing communities have access to soft bottom lagoon and coral reef habitats, deep bottom and open ocean fishing grounds; 2) anthropologists and ethnologists argue that gender roles, including fishing activities, are determined by tradition (Vunisea 1997), and by mystical beliefs that are associated with men's fishing (Chapman 1987; Matthews 1991; Bataille-Benguigui 1992).

Traditional gender role definitions and mystical beliefs may explain why women are not actively involved in commercially oriented longline fishing or any of the organised night time spearfishing trips. None of the women questioned went fishing for more than six hours at a time. Also, only very few women take the risk of venturing to reefs and shallow water areas at night time.

This survey also revealed some questions yet to be answered. Conflicting with Matthews (1991) and Tonga et al. (2000), women from isolated and more traditional villages stated that they visit uninhabited atolls by motorised boats to reef glean and fish. Questions as to whether such fishing expeditions are composed of mixed gender groups, whether women organise themselves and thus command motorised boats, and whether women handline or use nets while boating, have not been conclusively answered yet. These answers may further elucidate whether women's preference for fishing in shallow waters is determined by practicability, traditions and customs or maybe simply reflect a lack of motorised transport. In the case of Mataika (Vava'u), changes associated with the introduction of motorised transport are not restricted to motorised boats but include vehicles. Most Mataika households are equipped with a vehicle, which both women and men use to gain access to fishing grounds.

Results indicate there have been substantial changes in the social role of women fishers in rural Tonga. However, education of children and overall social attitudes, regardless of the degree of geographical isolation of communities surveyed, still reflect a close connection to traditions and customs. Consequently, this study prompts the question: How much do traditions and customs continue to determine gender-specific roles and participation in Tongan fishing activities?

Despite a certain amount of urbanisation among the four communities surveyed, it is clear that women's role is still regarded as one of performing domestic duties. Similar to Lal and Slatter (1982) this is surprising as Tongan women have recently extended their production for consumption activi-

ties to bring in income. The women who operate small shop outlets, or receive salaries from employment in nearby urban centres are as much proof for this change in women's social role as those women who do not venture outside their village boundaries but harvest marine resources for sale.

In addition, there is a growing number of female-headed households in rural areas of Tonga due to the overseas emigration of male workers. Taking into account that reliable and regular submitted remittances may not be women's role in ensuring a daily food supply for the family, and generating income to cover school, church and basic monetary requirements, is increasingly important.

The question emerges as to whether Tongan women fishers' activities have expanded or whether even during historical times (when traditional circumstances predominated) Tongan women already informally performed fishing activities socially regarded as men's activities? Since the beginning of the 20th century, fishers have lost social status to farmers (Bataille-Benguigui 1992), and the economy has become increasingly cash based. In addition, social and gender roles have been redefined to accept a wider participation of women in village fishing activities. Deterioration of fishers' general social status may limit the future of small-scale artisanal fisheries in Tonga as more and more focus is given to alternative and financially more attractive income sources such as maritime fisheries, agriculture and other sectors. As a consequence, the importance of reef and lagoon fisheries in Tonga may further decrease. And thus it seems to be impossible to even speculate how far Tongan women fishers may further progress in fishing activities, and whether they may ultimately participate in commercially oriented artisanal fisheries.

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A bleak future: Women of fishing communities in Pakistan face increasing marginalization

By Mohammad Ali Shah, Pakistan Fisherfolk Forum (PFF)

Source: *Yemaya* 9, April 2002

In Pakistan, fishing communities are considerably more liberal than their agrarian counterparts. In earlier times communal property was the norm and personal property was almost unheard of in fishing communities. There was no gender discrimination and women were the virtual heads of the family, responsible for distributing the harvest. Unlike in other rural communities, there was no 'veil system' and women enjoyed a lot of freedom. As men spent more time fishing, women had a greater role in family matters and in dealing with problems of the family.

In fact, several women of fishing communities developed reputations of being the chief of not only the family but also of the locality or caste group. People, including men, were identified by the names of their mothers, not their fathers — a practice that still continues in fishing communities. Similarly, some caste groups engaged in fisheries are also named after women. Even Karachi — the metropolitan coastal city of Pakistan and the provincial headquarter of Sindh province — was named after a woman called Mai Kalochi, who was the chieftain of this small fishing village of earlier times. It is said that she herself used to run the fishing business and engage in other trade activities.

Presently, however, two trends can be discerned. While traditional fishing communities still tend to be liberal vis-à-vis women, this is not the case with the large number of agricultural communities who now derive their livelihood from the fisheries, following their displacement from agricultural activities in the Indus deltaic area. Agricultural societies have usually been rigid with regard to the accepted roles of women.

Women tend to be considered as a commodity whose ownership rests with the male and are often confined within the four walls of the house in the name of morality and decency. Many of these values have now also been transmitted to fishing communities.

Women in fishing

In the past, women often accompanied their male family members on fishing trips. There was no major division of work. The fishermen would take the entire family to fishing trips to remote islands, where they would all engage in fishing as well as in cleaning and drying fish. In the case of big nets,

men and women would jointly throw the net in the water and pull it back.

Back in the village women would sell the fish in local as well as in distant markets while the men would continue to fish. In cases where men left for longer fishing trips of 10 to 20 days, women would stay home and continue to fish on a smaller scale in shallow coastal waters. In the coastal regions of Sindh province, women fished with nets in creeks off the coast. However, with the commercialisation of fisheries and the entry of outsiders (non-indigenous fishermen) into the fisheries, women were gradually pushed out of fishing activities. With the industrialization process, fishing no longer remains a family-based activity in Pakistan and the role of women of fishing communities within the family unit has almost come to an end.

Women as net weavers

In the sub-continent, women of pre-historic times are said to have been the architects of fishing nets, baskets, etc. The earliest nets were made of fibre collected from the jungle. Cotton thread was introduced at a later stage. Even after women of fishing communities more or less withdrew from active fishing and focused more on the home, they continued to make fishing nets. This brought in a steady income. Women who wove nets were paid for it, even within their own families.

Women earned a stable and regular, if modest, income. Earnings depended on the complexity, strength, and weight of the net. When nets were made exclusively of cotton thread, women earned between PKR 5 to 10 per day. The currency then had a very high purchasing power. Income was steady, as work was always available. Buyers of fishing nets gave work to women on a piecemeal basis. Many sections of nets were then pieced together to make a larger net.

However, after the late 1960s, processes of modernization began to affect women net-weavers adversely, ousting them from this profession in the same way as they were ousted from fishing activities. This began with the import of nylon nets into Pakistan. Later, factories were set up in Karachi for the manufacture of nylon fishing nets. These nets quickly started replacing the traditional cotton nets, and, as a result, the demand for cotton nets dwindled, depriving a large number of

women net weavers from this source of livelihood. The governments of the time never gave it a thought or even considered creating alternative means of income for the affected women.

By the early 1970s women had effectively been thrown out of the net weaving business. Today, few of the present generation have any memories of their womenfolk working as skilled, paid craftswomen fashioning fine fishing nets. The impacts of the nylon net on fishing communities are multidimensional. Women have been particularly adversely affected as this income-earning activity came to a standstill.

Post-harvest activities

Women have always been involved with post-harvest activities such as drying and cleaning fish. Women have also been working in fishmeal plants, producing fishmeal or powder sold to poultry farms. They have been involved in processing crabs for export. Crabs are caught from the roots of the mangroves and are kept in baskets covered with mangrove leaves, until they are processed. This involves boiling them, extracting the meat and putting this into plastic bags in ice. Women would extract the meat while the men filled the bags for freezing. However, jobs of local women in fish processing factories and fish cleaning sheds have been taken over by

the arrival of illegal immigrants from Bangladesh and Burma. Desperate for work, the immigrants are willing to work for half the wage, outside the terms of formal employment. Illegal immigrants who have settled along the coastal areas of Karachi have thus affected the earnings of women of local fishing communities.

The role of the government

With the decline in their economic roles within the fisheries, the status and clout of women of fishing communities has decreased. Women no longer manage the business as they once did. A very small number of local women are involved in peeling shrimps, weaving nets, making fish baskets, etc. as wage labourers. Their economic condition has deteriorated and poverty has become endemic. The government has pursued no policies or programmes to improve the socioeconomic condition of women of fishing communities. The complete lack of acknowledgement of the role of women in the fisheries sector can be judged from the fact that women of fishing communities have not gotten a single mention in government policy documents, laws and rules, etc. The Handbook of Fisheries Statistics of Pakistan — the annual publication of Pakistan's Marine Fisheries Department, last published in 1993 — for example, has no mention of women, even though it carries a full chapter on the fishermen population.

As world fish stocks decline, researchers turn to an untapped resource — Women

Source: *Future Harvest*, 04 April 2002

From backyard ponds in Bangladesh to the deep-water fisheries off Africa's Atlantic coast, women's role as 'fisher folk' is fast changing one of the most tradition-bound segments of the world's food supply chain. Changes in fishing practices and in the relatively new field of aquaculture, researchers say, bring with them new challenges and opportunities, but few signposts to provide guidance.

'The international community is paying more and more attention to women and their role in maintaining the health of the world's fisheries,' says Meryl Williams, Director-General of the World Fish Center, a Future Harvest Center based in Penang, Malaysia. 'But our knowledge is sketchy, and our ability to reach out is limited. 'Until quite recently,' she adds, 'the macho image of the fisherman coloured much of our thinking, but that image is changing fast.' Williams estimates that at least 50 million developing country women are employed in the fishing industry, usually in low paying but important jobs such as net making,

processing, and marketing. Already mired in poverty, their circumstances are sure to deteriorate as they come face to face with the challenges of globalisation, declining fish supplies, and competition from modern fishing fleets, she says.

Williams notes that most women involved in fishing lack access to tools and credit, a voice in decision-making, or the opportunity to receive training. 'To succeed in a world where privatisation is on the rise and subsidies for fishing are disappearing, women will need a lot of extra help,' she says. 'Until now, however, the very groups that you would expect to provide support have literally missed the boat.'

Low pay, little security, high rates of AIDS

Stella Williams, an economist from Nigeria's Obafemi Awolowo University notes that gender programmes rarely reach out to women working in fisheries and that fisheries programmes have been slow to take steps to improve their lot. 'In

developing countries,' she says, 'the work of women fishers is mainly found in the informal economy, where they continue to receive low pay and little in the way of job security. Most women lag far behind men in terms of earnings and in the services that would improve profitability.'

'When fishing activities are expanded or mechanized, they are frequently taken over by men, adds Lyn Lambeth, former Community Fisheries Officer with the Secretariat of the Pacific Community in New Caledonia. 'When women find work in the production sector, for example in tuna processing plants in the Pacific, it's usually in low-paid production line work,' she says.

Ironically, one of the few areas where women do not seem to lag behind their male counterparts is in their rate of HIV infection and AIDS. Epidemiological studies show that fishermen are among the groups most prone to be HIV positive and that they are passing on the virus to their partners. The phenomenon is believed to be associated with long absences, visits to commercial sex workers, and drug use. In Tanzania, workers in the fishing industry are five times as likely to die from AIDS as are farm workers.

The good news

Although women working in the fishing industry lag far behind their male counterparts in almost all categories, there is some good news says Ida Siason, Vice Chancellor of the University of the Philippines. Asian women, she says, have made headway as fish farmers. Moreover, expert networks have been established to assist women in Cambodia, Laos, Thailand, Vietnam, and the Philippines. New technology also helps. In Bangladesh, the only country in the world where men have a greater life

expectancy than women, the introduction of farming in backyard ponds is helping thousands of women take greater control of their lives. Fish farming is helping women not only feed their families, but also provides much needed income, and even aesthetic pleasure from growing attractive fish such as silver barb and tilapia.

But progress has been uneven. Community-based management of the country's small, seasonal, inland bodies of water indicates that attempts to empower women through women-only management schemes have largely collapsed because women managers were not respected. Committees involving both men and women have apparently been more successful.

'Working together will be key to overcoming many types of problems,' says Williams. 'New research in the fisheries sector is needed to develop appropriate actions, programmes, and policies that address gender. A focus on women alone will not be sufficient.'

She cautions, however, that women's roles in fishing — as in society as a whole — are changing. As these roles change, it is important to ensure that women not only become more equal partners with men, but that they also expand their work beyond the subsistence level. 'To achieve that objective,' she adds, 'it is essential that more women be brought into decision-making to assure the survival and improved well-being of the world's fishing industry.'

'The world's fish stocks are in decline,' says Meryl Williams, 'and science can provide the technology to help deal with this problem. But even with the best technology, it's going to be increasingly difficult to resolve these problems unless women are given a fair opportunity to compete.'

Changing women's lives: Income women earn from processing crabmeat is leading to socioeconomic and cultural changes in some parts of Pará State in Brazil

By Denise Machado Cardoso, Department of Anthropology of the Federal University of Pará, Brazil

Source: *Yemaya* 10, August 2002

Women's work in fishing communities is little recognized or acknowledged, especially when it involves processing shellfish. This can be explained by many factors, one of them being the division of labour in these communities. Whereas women are shore-bound to 'drudgery' work, men engage in the more prestigious seafaring activities. For example, net repair and maintenance as well as the preparation and salting of fish are frequently relegated to a 'non-work' status. Thus, women's involvement in productive activities is considered of little consequence.

In spite of its significance, the work of women processors in Guarajubal is not recognized by their companions or by the women themselves. Apart from the reasons mentioned above, women themselves do not want to upset the existing social order in their community.

Women processors will not openly admit to the significance of their work because to do so would be tantamount to claiming that their companions are unable to sustain their roles as providers. Within the domestic sphere, one notices that women play

a significant role in decision-making, but upon further investigation one finds that women tend to accede more power to the men in their family.

Residents of Guarajubal, like in other fishing communities, are not strictly limited to fishing as they also farm and hunt to sustain themselves. Situated in the coastal region of Pará state in northeastern Brazil, Guarajubal forms part of the municipality of Marapanim. Marapanim, on the Atlantic coast, is crisscrossed by many rivers and streams, and is home to extensive mangrove areas. Fish, shrimp, crabs and other species of crustaceans and molluscs have been harvested in this region for a long time although harvesting crabs has become an important activity in the last decade.

The work of women shellfish processors starts after the crabs are caught in nearby swamp areas and ends with packaging the crabmeat in plastic wrappers. Crab collection and processing started approximately years ago in Marapanim and, since then, this type of work has led to sociocultural changes in the many towns that comprise this municipal district.

Shellfish processors are predominantly healthy, adult married women, with children, since some income can be earned from this activity without necessarily travelling too far from the domestic space. Concern over reconciling remunerative work as collectors and processors with the non-remunerative activities of housework (childcare, cooking, garden cultivation, livestock raising, etc.) is encountered more among married women, as their single counterparts without children seek working opportunities elsewhere, in the municipal district headquarters or in other municipalities of northeastern Pará.

The work of women shellfish processors begins at daybreak, starting with household chores such as preparing food, washing clothes, childcare, sewing and maintenance of fishing equipment. After lunch, the women head off to begin their work, returning only by the evening. Men, who manually catch the crabs by reaching into their burrows and pulling them out, usually do the physical capture of the crabs. The task of removing the crabmeat from the shell is that of the women. This is stored for delivery to the middlemen, locally known as a *marreteiro*, who usually monopolize this trade.

Women may start off in this work accompanying their relatives or neighbours, ostensibly to help them. Help may not be as much towards production as towards giving company to friends to render their work more pleasurable. Thus, 'help' in itself is more of a leisure strategy among women of Guarajubal than an effort to reduce the overall workloads. Children also engage in shellfish pro-

cessing to help their mothers. It is more the girls who learn these skills, as the boys prefer to engage in work considered more 'masculine'.

To become a shellfish processor in this region requires patience. The amount of crabmeat processed daily depends on the amount of time invested in this activity and can take up to six hours to shell 120 crabs yielding about 2 kg of crabmeat. In addition to taking care of their young children, shellfish processors have to display great perseverance in performing a repetitive task that can also cause injury as they often cut their fingers in the process of separating crabmeat.

Although women do face some risks and adverse conditions in their work, there are hardly any other alternatives for paid work in this region. Despite these problems, therefore, women recognize the positive changes that the processing activity has brought about, both to their lives and that of their families. These changes are evident from a socioeconomic as well as a cultural perspective. The socioeconomic status of working women has improved and, at the same time, women now enjoy more decision-making powers within the family as well.

Nowadays, in Guarajubal, the decision as to how many children a couple will have, rests primarily on the woman. This change is a direct consequence of a married woman's increased participation in the job market and their greater purchasing power. Of course, other factors such as television have influenced behaviour in Guarajubal.

The observation that women now have greater control over the number of children they have is reinforced in other ways. When comparing the degree of domestic violence suffered by women in Marapanim's communities, we can observe that married women processors who have started earning an income are more prone to resisting their companion's aggression than are women who do not engage in this activity.

The processing of crabmeat, known as *massa de carangueijo*, has thus stimulated many changes in the lives of people in northeastern Pará. Until recently, women had few prospects for gaining access to paid labour. They are now able to reconcile earning an income with other activities normally attributed to women, such as being mothers and companions.

People engaged in harvesting and processing crabs are aware that increasing production can eventually compromise the sustainability of this species. Public policy, so far blind to this issue, could eventually see the implementation of a 'closed season' for harvesting crabs.

Proceedings of the Global Symposium on Women in Fisheries now available

The proceedings of the Global Symposium on Women in Fisheries are now available on ICLARM's website (www.iclarm.org/Pubs/Wif/pub_wifglobal.htm) in pdf format.

ICLARM's Director-General, Meryl Williams writes:

All over the world, women contribute in multiple ways to the production, processing, marketing and management of fish and other living aquatic resources. The first ever Global Symposium on Women in Fisheries, held in Kaohsiung, Taiwan on 29 November 2001, generated the present collection of papers on women in fisheries. These published proceedings go beyond the actual Symposium in two ways. First, the papers that were initially presented have been revised and, therefore, more detailed and richer in information content than the short, spoken versions. These written versions have also benefited from the discussions during and around the Symposium. Second, two additional papers, from Africa, are presented in this volume, thus increasing the richness of African material on women in fisheries. The reader of this volume will find in it a wealth of information, albeit in a very heterogeneous form, that the authors have had to draw from many different sources. Some are primary research studies whereas most are historical reviews from first hand experience of the authors or derived from other written materials, often contained in reports of fisheries development projects, newspapers and source materials well outside the fish sectors. Such is the nature of our knowledge in the field of women's, and also gender, roles in fisheries that few of the primary sources were actually designed to address the field in a rigorous and analytical way. They rather addressed other aspects of fish and fisheries and incidentally revealed much of value, at least by description, on women's roles.

The papers for the proceedings are arranged by geographic region and there is an index to the contents so that information can be found by topic.

Documenting fishing practices

Traditional uses of plants for fishing in Micronesia

By Dr Mark Merlin, Biology Program, University of Hawaii at Manoa



Western and other scholars have traditionally divided the massive Pacific region beyond Southeast Asia and Australia into three sub-regions or categories: Melanesia, Micronesia and Polynesia.

More recently, with the elucidation of a suite of characteristics (e.g. linguistics, pottery, island location in the remote, deep Pacific Ocean), Green (1991) and others have suggested that the region be re-divided into two parts: Near Oceania, encompassing Australia and western Melanesia, which was settled as much as 60,000 years ago as part of the world's second great wave of human migration into previously unoccupied lands (Roberts 1998); and Remote Oceania, which encompasses the multitude of islands formerly grouped into eastern Melanesia (from the eastern Solomon Islands to Fiji), and all of islands formerly contained in Polynesia and Micronesia.

The many high and low islands of Remote Oceania were only first discovered and settled by humans 3800 to 1000 years or so ago. These were difficult exploratory discoveries, made by peoples collectively referred to as Austronesians (or in the earlier phases, the Lapita Peoples). They had a common heritage of language (formerly known as the Malayo-Polynesian group), and several other cultural traits, not the least of which has been their relatively similar transported landscape of agro-forests, irrigated swamps and dry field agriculture.

The Austronesians theoretically originated somewhere in Southeast Asia, possibly on or near Taiwan. These seafaring people needed three things to successfully sail long distances, back and forth across broad stretches of the Pacific Ocean.

First, of course, they developed the skills to fabricate durable, seaworthy craft. This involved the use of plant material and stone tools to make canoes that were stabilized by an outrigger, or in parts of eastern Melanesia and Polynesia by large, very sturdy double-hulls. In addition, these long

distance voyagers developed and passed on a complex navigational body of knowledge. Secondly, they successfully introduced a collection of viable cuttings and/or seeds of cultigens, along with the concomitant gardening knowledge needed to provide the sustainable carbohydrate food sources of these stone age, horticultural peoples. Thirdly, and most important for this article, these early island colonizers had an intimate, practical knowledge of how to harvest the edible animals of the reefs, lagoons and deep ocean.

In addition to their introduced domesticated plants, these early Austronesians used many species of the wild, native biota. Over time, on all the islands of Remote Oceania occupied by colonizing Austronesians, including those in Micronesia, an intimate and sophisticated series of relationships developed between the people, plants and animals.

What follows here is brief review of the use of plants, both native and introduced, that were related in some way with the important activities of fishing in the Micronesian areas of Remote Oceania. Plants are (or in some cases were) used to make or acquire many different kinds of equipment or materials used to collect edible sea organisms. These fishing items include spears, nets, traps, fishing poles, fishing line, fishhooks and poisons.

Plants used in fishing in Micronesia

The uses listed here come from a variety of sources and are by no means comprehensive for fishing applications throughout the region, nor, of course, for many other uses for which most of these plants have traditionally served in Micronesia and the rest of Remote Oceania.

Fishing hardware — poles, lines, nets, floats, traps, torches, spears, goggles and lure

Allophylus timoriensis – Wood from this tree is used to make traps in Ifaluk and fishing poles in Marshalls.



Artocarpus artilis – On Woleai the leaves of breadfruit trees are used to make a kite for trailing fishing line and as a lure. The insect resistant trunk and large branch wood of breadfruit trees is used in Chuuk (and other islands) to make the hulls of small fishing canoes.

Bambusa vulgaris – On Yap, bamboo is used to make net spacers and fish traps, and on some islands, such as those in Chuuk and Kiribati, the stems of bamboo are used to make fishing poles and floats for fishing nets.

Bruguiera gymnorhiza – In the Marshall Islands the fruit of this mangrove tree has been used to strengthen fishing nets, and in Kiribati its wood has been used to make fishing rods.

Calophyllum inophyllum – On some atolls, such as Namoluk in the central Carolines as well as in Kiribati, the wood is traditionally used to make goggles for spearfishing. In Kiribati stems of this tree are used to make scoop net frames and fishing rods.

Casuarina equisetifolia – In Kiribati the dense, heavy wood of this tree is sometimes used to make fishing rods.

Clerodendrum inerme – This sprawling or climbing, shrub is used on some islands such as Ifaluk and in Chuuk to make fish traps. In the Marshall Islands the wood of this plant is used to make fishing poles as well as fish traps (with *Pemphis acidula* and *Allophylus timoriensis*). In Kiribati, branches of this plant are said by some to be used to make fish traps, scoop net frames and fishing rods.



Cocos nucifera – Coconut palms are extremely useful plants. On Yap stems are used to make fishing spears, and the shell of the nut is used to make fish hooks. On Ulithi the sennit fiber is used to make 'sweeps' to drive schools of fish into traps, the burning leaves serve as 'torches' for night fishing, and the shell is used to make one-piece fishhooks. On Namoluk, wood of this palm is used to make fishing spears. On Kosrae, leaves also traditionally served as a burning torch for night fishing. In Kiribati smaller saplings are traditionally used for fishing poles, and its wood is used to make fishnet floats.

Crinum asiaticum – The shining, white, basal part of the leaves of this large, bulbous, lily is used as a lure to cover hooks in traditional Yapese fishing. It may have been used in some islands, such as Guam, as a remedy for sickness caused by eating poisonous fish. On Namoluk the hollow 'skin' of the trunk is used in trolling lines in deep sea fishing.

Cyperus laevigatus – On the island of Onotoa in Kiribati, this native 'nut sedge' was used for weaving fishing lines and nets.



Derris trifoliata – On Kosrae, the stem this sprawling, woody plant — often used to poison fish — is sometimes used as cordage to fasten bundles of Nipa palm fronds, or to bind mangrove crabs when *Hibiscus tiliaceus* fiber is not available.

Dodonaea viscosa – In Kiribati the stems of this widespread woody plant are used to make fishing poles and frames for dip nets.

Enhalus acorides – In some islands, including those in Yap, Chuuk and Pohnpei, the persistent bundles of vascular fibers (or strong leaves) of this seagrass or saltwater herb are utilized in the construction of long lasting nets for catching reef fish. It is also used as protective medicine for women who are going into the ocean.

Ficus prolixa – This large, sometimes huge, native fig or banyan tree produces strong fibers on its roots that are reportedly used for fish lures on Ifaluk. On Puluwat the aerial roots are said to be used occasionally in large (seine) net fishing.

Ficus tinctoria – On Ulithi, Ifaluk, Kosrae and perhaps other islands fishing lures or bait are made from the fine fibers extracted from the bark of this fig tree. On Puluwat the wood is used in fishtraps, and the rope-like, aerial roots were used in fish drives. In Kiribati, the easily bendable roots are used to make scoop net frames, and sometimes fishing rods.

Hernandia nymphaeifolia – This large indigenous coastal tree is sometimes used in Kiribati to make fishing rods.

Hibiscus tiliaceus – The light wood of this tropical shrub or small tree in Yap is sometimes cut into small pieces to make local net floats and frames of fish nets because it does not rot easily. In Chuuk, fishing equipment such as poles, floats, and fish net frames such as those used to catch flying fish are also made from its wood. On Puluwat, where it is plentiful only in swampy depressions on Alei Islet, the wood is used to make fishing net floats. On Pohnpei it is said to have replaced coconut fibers for fishing net fibers after it was introduced by people. On Kosrae the light wood is used to make fishing floats and poles. In the Marshall Islands it is used to make frames for nets to catch flying fish; and floats of the light wood are used to hold a submerged string which attracts shell bearing animals; the captured shells are then used to beautify handicrafts. In Kiribati, the sprouts, when straight, make good fishing rods.

Lumnitzera littorea – This native mangrove tree is used in Kiribati to make fishing rods, and fish traps, because it does not deteriorate in sea water.

Morinda citrifolia – This useful upright growing shrub or small tree is known as in English as the Indian Mulberry. In Kiribati, the wood may be used to make fishing rods.

Pandanus tectorius – In Kiribati, roots of this common coastal or lowland native tree are used to make floats for fishing nets.

Pemphis acidula – This native, coastal woody shrub or small tree is sometimes referred to in English as ironwood because of its heavy, hard, rot-resistant wood. In Kiribati, it is used as building material for fishing rods and to make traps for moray-eels, and in earlier times, fishing hooks.

Phymatosorus scolopendria – This creeping fern has sturdy, dark-colored rhizomes (roots) that produce erect, glossy green fronds which, in Yap, and are tied to outriggers of canoes for good luck when fishing.

Pipturus argenteus – On Nomwin, Namoluk, and Puluwat, fishing lines are or were made from the inner bark of this native shrub or small tree. On Puluwat the leaves are used in fishing lures, and the strong fiber extracted from the inner bark was also used for attaching fish hooks. In the Marshall Islands the bark of this tree furnishes strong strands useful for fish line, and branches are also said to attract live cowries when placed under a rock in the sea.

Plumeria rubra – This small, ornamental tree is known in English as either 'plumeria' (its genus name) or 'frangipani'. On Ulithi and Namoluk atolls these trees are a source of wood that is sometimes made into frames for underwater goggles.

Premna serratifolia – This native shrub or small tree provides fruit used in Ulithi as one of eight fruits placed in the 'flying fish bundle'. On Kosrae, branches are used to make the frames for two kinds of fish nets used by women in reef fishing. And in the Marshalls and Kiribati, the straight, pliable saplings and branches make good fishing poles.

Rhizophora apiculata – The prop roots of this common native mangrove species are used to make fishing gear in Yap.

Rhizophora mucronata – On Puluwat this mangrove tree, which is found commonly in lagoon areas, provides wood for fishing spears and parts of fish traps. In Kiribati, it is used also to make stakes for fish traps because it resists seawater and 'ship worm' (*Teredo navalis*).

Schizostachyum lima – This native bamboo species in Yap, which is smaller and thinner than the alien *Bambusa vulgaris*, is used there for fishing poles.

Tacca leontopetaloides – This large, stemless herb, often referred to in English as 'arrowroot', is used in Kiribati in the construction of fishing lines and nets.

Terminalia catappa – This small to large, spreading tree is used in Kiribati to make fishing rods.

Tournefortia argentea – This small native tree, known in English as 'tree heliotrope', is used in Kiribati in the construction of fishing rods.

Fish poisons made from plants

Barringtonia asiatica – The large, one-seeded fibrous fruits are buoyant, and after maturing on the tree they drop off and may be carried out to sea by the tides and drift along with the currents, eventually washing up on the shores of many tropical Pacific islands. The seeds of fruits contain a poisonous saponin, which has been used traditionally on many tropical Pacific islands to stupefy fish and octopus. To stun fish in tidal pools of the reef, the firm white seed is pounded, pulped or grated to release the poison, then mixed with water, and thrown into pools where fish are found. This method of stupefying fish does not appear to harm the flesh of the fish as food.

Derris trifoliata and *Derris elliptica* – These sprawling, woody plants are found growing near wetlands, as well as in forested areas inland. Parts of these members of the pea or bean family contain rotenone, and when crushed and spread in streams or on the reef they will kill fish and shrimp. The introduced *D. elliptica* is, today, the major source of the poison used in some islands, however it is illegal to cultivate these plants or to engage in fish poisoning on several of these islands.

Miscellaneous uses

Bambusa vulgaris – On Yap, the long wide stems of this large bamboo are used to make the common rafts sometimes used for fishing when skin diving.

Calophyllum inophyllum – On Ulithi, the fruit of this tree are one of eight fruits placed in the 'flying fish bundle', which was traditionally offered to spirits by 'public fish magicians' during their long, annual ritual.

Claoxylon carolinensis – On Pohnpei this small native tree is believed to have magical properties, and consequently, cut stems of the tree are applied to fishing nets to make them more efficient.

Crinum asiaticum – Some parts of this large lily may have been used in some islands, such as Guam, as a remedy for sickness caused by eating poisonous fish.

Cyperus javanicus – This perennial sedge is said to be used as 'fishing medicine' in Chuuk.

Enhalus acorides – In Chuuk, parts of this seagrass are said to be used as protective medicine for women who are going into the ocean.

Hibiscus tiliaceus – Ulithi the bark of this plant is traditionally used to treat constipation and running ears, caused by eating a tabooed octopus, which angered a spirit. And in Chuuk the fruit of

this woody species has been used as a magical medicine against sea spirits.

Morinda citrifolia – In Kiribati, the fruit is used as a stimulant on long fishing trips or ocean voyages, during cruises of three or four days, as it is said to be 'hot and comforting to a tired body'.

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Maka feke – Octopus fishing Tongan style

Dr Mecki Kronen, SPC Community Fisheries Scientist, Reef Fisheries Observatory

Traditional Tongan fishing techniques are partly based on myths, legends and beliefs. Bataille-Benguigui (1988) concluded that Tongan fishing techniques have a religious basis, are associated with rites or taboos, or are non-ritual but still concerned with the art of fishing.

Increased urbanisation and westernisation of Tongan society and life have resulted in a relaxation of traditions as well as a replacement of old fishing techniques and customs with more modern ones. However, remnants of traditional fishing practices and techniques are still alive.

In Tonga, octopus is caught for consumption, bait, for sale in the local market, and to give as a gift. Octopus, or *feke*, is caught by women, men and children. Common techniques include the use of iron bars (*a'a feke*) by reef gleaners of all ages and by both genders, free-dive spearing (mainly by male fishers), and *maka feke*. *Maka feke* is done by both men and women of all age groups while they are reef gleaning, or is done by men from (motorised or non-motorised) boats.

This article focuses on *maka feke*, the 'stone for the octopus catching', which is a traditional Tongan method for catching octopus. Sources indicate that the legend of *maka feke*, as well as the technique, is widely spread across Polynesia (www.webcentral.co.uk/ilegends.htm; Bataille-Benguigui 1988; www.ocean-park.go.jp/kaiyo_e/d/d401000.html).

According to legend, there was once a rat on a canoe. This canoe got hurled around in a storm and eventually started to break up. Afraid and shivering, the rat looked for help or something to cling to. When the rat noticed an octopus swimming nearby he asked it to take him to land. The rat also promised a generous payment for this rescue service.

The octopus agreed and allowed the rat to sit on his head while he carefully swam towards land. Once they reached the beach, the rat jumped off and quickly ran up onto dry land. When the octopus demanded his reward, the rat mischievously replied 'feel the top of your head'. Another ending to the tale is that the rat made fun of the octopus' naivety.



Completed 'maka feke' lure.



Two maka feke lures ready for use.

'Maka feke' lure showing how the 'rat's feet and tail' are tied to the cone-shaped stone coated with a cowrie shell.



Whatever the 'true' ending of this tale may be, the fact that the rat insulted the octopus is considered the reason that ever since then, the octopus seeks revenge against the rat for its betrayal. As a result, the Tongan *maka feke* lure resembles the shape of a rat.

The *maka feke* lure is expertly crafted. A carefully selected cone-shaped stone of enough weight to avoid floating, constitutes its main part. Half of this stone is covered with a cowrie shell to mimic the rat's fur. The rat's 'feet' are made from palm tree leaves, which are also used for the long 'tail'. Palm tree root material is used to fix all components together. A line is tied to the lure with which it is lowered into the water. On one trip with fishermen from Manuka village on Tongatapu, the lure was used on a shallow coral reef. Here, the line was lowered into the water and rhythmically shaken up and down, about one metre above the bottom. After about an hour, a medium-sized octopus, darted towards the lure and grabbed it. In the same moment, the fisherman jiggling the lure quickly caught the octopus with his free hand.



The lure is lowered into the shallow water above coral ground and rhythmically shaken up and down to attract octopus.



An octopus attracted by the lure, darts towards it and grabs it.

The octopus is killed and cut into small pieces to be used as bait for handline fishing.



The octopus was killed and cut into small pieces for use as bait for handline fishing. The fishing party preceded to a known fishing ground, where five handlines, each equipped with a sole hook with octopus bait, were lowered into the water. Within 2.5 hours, 20.4 kg of reef fish were caught using the medium-sized (1.2 kg) octopus caught with the *maka feke* lure.

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Tongkah – Unique gear for catching octopus

By P. Balan, Penang Inshore Fishermen Welfare Association

Changkat is a small village in Seberang Perai Selatan (Malaysia) where Malays, Chinese and Indians live within their individual communities, yet side-by-side with each other. The village is not very remote but there is no public transport to it.

The Changkat jetty is quite a distance from the village and it is a 10-minute motorcycle ride to reach it. The jetty at Tengah River, which is also the river that marks the boundary of Batu Kawan island from this side, is home to almost 20 boats. Like Changkat village, and unlike most small jetties in Penang, the fishermen are multi ethnic: Malays, Chinese and Indians.

The jetty by the river is about 400 metres to the sea and flanked on every side by beautiful, lush mangrove forest. The fishermen here prefer to fish at night rather than during the day, which is the norm in other areas. It is here that the practice of using 'tongkah' to catch small octopus is found. Tongkah is unique to Penang State and to the whole of Malaysia.

A tongkah is 7 1/2 feet in length and 15 inches wide, and looks somewhat like a surfboard. It has a 'hand stand' for the arm to rest. A rope is set at the front for the user to manipulate the tongkah on the mudflat. A sack is tied to the armrest where the catch is thrown into as the tongkah moves.

Because octopus fishing is done at night, the fishermen use carbide as their source of fuel for their light source. It is not only cheap but also emits very strong light.

A tongkah is very easy to use once you get the hang of it. Since the purpose of using it is to catch small octopus that are trapped on mudflats at night, the fishermen must know exactly when the tide is low and the location where octopus can be found. Hence a fisherman go out just before the tide falls and place a pole into the mudflats for the boats to be tied to and wait. As the tide drops, a fisherman prepares his tongkah.

First, the armrest is placed on the tongkah and the rope is prepared. Carbide is then put into a container with a funnel. When water is added, the carbide emits gas at the end of the funnel. With the strike of a match, the modified torchlight is now ready to be used. A sack is then tied to the armrest, and the tongkah is set onto the mudflat.

The fisherman's left arm rests on the armrest while holding the carbide torchlight. His right arm is used to catch the octopus. One of his legs is placed on the tongkah while his other free leg pushes the tongkah forward along the mudflat.

The search for octopus starts immediately, and the fisherman does not stop until the tide comes back almost two hours later. On a good day, as much as 15 kg of octopus can be gotten.

When octopus are abundant, the scene on the mudflat is like a festival with many fishermen on their tongkahs gliding along the mudflat with a strong beam of light, on the lookout for the shy animal. The fisherman must be quick because once an octopus feels threatened, it quickly disappears into the mud.

One fisherman explained, "The tongkah has been used here for as long as I can remember". He is rightly proud of this tradition that has served him and his fellow fishermen well.

The Lakemba art of *vono*

By Dr Mecki Kronen, SPC Community Fisheries Scientist



On Lakemba, a small island in the southern Lau Group of Fiji Islands, there are women who are still regularly perform the old Fijian tradition of catching fish called, *vono*. Due to specific habitat requirements along with fishing strategies specific to Lakemba, this fishing

method is exclusive to fisherwomen from the villages of Nasaqalau and Waitabu only.

A *vono* comprises three different steps, involves at least four women, and about four different fishing methods. The overall strategy is to prepare a hiding place where fish can be trapped and easily harvested.

Although *vono* is considered an easy way to catch fish, it requires a substantial amount of effort and patience. There are three steps involved. Step one: At low tide a group of women head towards the outermost reef that fringes the lagoon. Their faces are blackened with charcoal to protect from sunburn, and they carry a couple of freshly cut leafy branches. The women know suitable places at the outer reef line that have been continuously used in the past. Suitable sites are natural holes in the hard coral cover that can be easily enlarged and deep-

ened. Every time one of the sites is selected, large hard coral blocks and pieces, and hand-fuls of coral debris are scooped out until a smooth basin is created. The basin may measure about 1–1.5 m² and may be 0.80–1.00 m deep. The basin is then carefully covered using large flat coral pieces. The *vono* site is now marked with some of the leafy branches, which are stacked into coral holes. Thus, the site will be easily identifiable if approaching from distance. Big pieces of hard coral are collected and laid in two, 100-m-long lines reaching from the sides of the *vono* radially in the direction of the beach. These blocks will be used to hold in place the nets to be set later on.

After completing step one, women may reef glean, or *qoli*, a kind of group netting in shallow water



during low tide, to make the most use out of the long walk to the outer reef fringes.

Step two: During the next high tide — weather permitting — the women return to the same site. Now, about 100-m-long and 1.5–2 m-wide nets with small mesh sizes are put into place. The nets surround the *vono* and extend at either side along the radial lines of hard coral pieces laid out during the previous low tide. One woman unfolds the net. Another woman weaves into it an equally long cord from which palm leaves are dangling in 50 cm intervals. This is mostly done under water and the woman in charge wears goggles. She also secures the net with the hard coral pieces. Once the nets are set, the group may split up. However, at least two women must stay behind to watch and tend to the nets while the rest of the group may return to the village.

Step three: During the second half of the next low tide, the women's group reassembles at the *vono* site. One or two women take charge of grinding *duva*, a poisonous root (*Derris* sp.), which they dilute in the artificially enlarged basin. The desired effect of stupefying fish becomes visible after 10 to 15 minutes. Fish escaping from their hiding places are slowed down in their movements and show obvious signs of distress. Smaller fish may die quickly. Other women surrounding the *vono* hold up the net to prevent fish from escaping. Women inside the netted

Setting the *duva* under rocks in the reef to stupefy fish.



Grinding *duva* and diluting it.



Sorting and cleaning the catch.

area collect the fish by hand, stab the bigger and still fitter ones with a knife or chase them in the net where they are easily killed and collected. Teenage boys, using home-made spears to expertly spear down all the fish that managed to slip the net, help out with this final *vono* step.

Depending on the area encircled, and the amount of fish trapped, this last step may last 1 to 1 1/2 hours. The catch is collected in hand-woven baskets made from coconut palm leaves and

d e f e n d e d against the hungry seabirds circling the site.

Before collecting the nets, the fisherwomen may settle on a spot in the reef where the catch

is sorted into suitable fish to be brought home, and those to be eaten on the spot. Fishermen from the village may walk by and be rewarded with some smaller fish that they can use as bait for handlining. All fish are cleaned and the livers are eaten; smaller fish are consumed raw. Usually, this feast is well prepared as the women bring cooked root crops, chillies and lemon to accompany and improve the fresh fish meal *al fresco*. Once, everybody is satisfied, the equipment is gathered up and the group heads home to the village where the catch is shared equally. On the way, small shellfish may be collected to complement the next family meal.

The life of a commercial fisherwoman

By Lyn Lambeth, former SPC Community Fisheries Officer

After five years of working in community fisheries management in the Pacific, I decided to spend a year in my old job — fishing for Spanish mackerel, *Scomberomorus commerson*, in Australia's northwest. I caught up with the boat I used to work on, F/V *Rachel*, in Darwin in February 2002, and spent a couple of months helping with the pre-season maintenance before heading to sea in April. I first worked on the *Rachel* 20 years ago when she was shark fishing in the Northern Territory. I maintained my friendship with her owners-operators, Pam Canney and Ian Lew, after leaving the capture side of the fishing industry eight years ago. This

year was to be a 'working holiday' — a chance to catch up with old friends, get away from computers and deadlines, see some more of the wonderful Kimberly coast, and exercise arm muscles by pulling in some of those big, fighting fish.

Pam and Ian are relatively unusual in the industry in that they often choose to have one or two women in their crew of three to four deckhands. The *Rachel* is their home as well as their workplace, and they've found that a mixed crew creates a more balanced work and living environment. The work can be physically demanding, but

everyone has their strengths and weaknesses — the main requirement is the ability to work well with a small group of people in an isolated environment. This year there are five of us on board — Pam and Ian, myself, and two other deckhands, Tony and Ed. Tony and I are veterans of five or six mackerel seasons while Ed has only just left school and is a newcomer to the industry. Everyone on board is expected to help out with the various tasks, including cleaning and cooking, watchkeeping, pulling in fish, filleting and packing, and maintaining fishing gear.

Spanish mackerel are caught by trolling lures or bait behind a boat travelling at around four knots. The fish, which can reach over 30 kg, are pulled in by hand. *Rachel* carries three fishing dories — 5–6 metre fibreglass boats with inboard diesel motors — that operate independently once out on the fishing ground. Each dory runs two or three lines, while *Rachel* runs eight. The dories are specially designed for this type of fishing, with the operator standing in a 'steering pit' separated from the 'killing pit' into which the fish are pulled. Most dories have a foot-operated tiller, leaving both hands free to pull in the fish. Spanish mackerel have razor sharp teeth so it's best to keep well away from their mouths — even a dead fish can leave a nasty scar if you accidentally run into them on deck. The fish are well known by game fishermen for their size and fighting spirit and it can be a struggle to pull the larger ones on board. Often we have problems with sharks chasing the fish as we pull them in. We can end up with half a fish, a head, or worse — a big shark on the end of the line. If that happens we can only try and pull the shark on board or cut the line, though often they just straighten the hook and escape.

Rachel's dories have names and personalities of their own and the three main 'dory men' on board (Ian, Tony and myself) are quick to defend their personal workboats — we each use one particular dory and rarely venture out in another. While the three dories are out working, Pam trolls with *Rachel*, with Ed on the stern to help pull in the fish. When travelling between fishing grounds the dories are lifted up by a hydraulic winch and chained in place, one on either side of the main boat and one along the stern. In rough seas the dory lifts can become quite tricky as we try to control a boat weighing up to a tonne from swinging into the side or stern.

A typical fishing day at this time of the year starts at 4 a.m. Everyone is up and straight into work before first light. The three dories are lowered and Ian, Tony and I head off as the first glimmer of light enters the sky. *Rachel* also starts trolling, and we all try to keep out of each other's way in the half-dark. From there it all depends on the fish. We can be

immediately busy with all lines catching, or it can be a slow and peaceful start to the day, sipping a cup of hot tea and watching the sunrise with one eye on the lines. Generally the dories will stay out for two hours or so before taking the catch back to *Rachel*. A good morning will see each dory with around 20 to 30 fish, on a busy run they can double that. Often enough we traipse back with less than 10 fish each. When the fish are really biting, *Rachel* can end up with 80 or 90, so an exceptional morning or evening run can see us with around 300 fish to process. After unloading the fish and lifting the dories it's time to grab a quick breakfast and start filleting and packing. All the fish are filleted, quartered, packed into 10 kg boxes and placed in the freezer. The previous day's boxes must first be moved from racks in front of the blast fans to the holding room before fresh boxes are put down. *Rachel's* freezer holds around 1000 of these boxes, or 10 tonnes of fillets.

Often while we're filleting and packing we travel to another fishing ground. Once there, dories are lowered again and the process starts over again. Generally though, the best fishing runs are the first and last runs of the day, and we often have some time off in the middle of the day to fix gear, make up baits, make cartons (for packing the fish), eat, read and sleep. If the fish keep us really busy on the last run (from 3.30 to around 6.30 p.m.) we may still be filleting and packing late into the night. We also travel between grounds at night, taking turns to do two- or three-hour watches throughout the night, but generally we can count on working during the day and sleeping at night. As far as fishing goes, it's a fairly civilised existence — I've worked on prawn trawlers and barramundi gillnetters where much of the work was done throughout the night with sleep coming in three-hour stretches.

It's a very nomadic existence — the *Rachel's* fishing grounds stretch from the northwest top of Australia down to Port Hedland, a distance of around 1000 nautical miles. The fishing season lasts around seven months and during that time we travel almost constantly from fishing ground to fishing ground. We spend from one week to three weeks at sea before calling in to Port Hedland, Broome or Darwin for a day or so, to provision and sometimes unload. Unloading is mainly done by hand — a chain gang of eight people is usually enough to shift 10 tonnes from the freezer to the truck in a couple of hours of hard work. The huge tidal range in the northwest of Australia, however, means we sometimes have to use cranes and winches to move the boxes up to the wharf, if it's a low tide. The tidal range in Broome, for example, can be close to ten metres.

From June until September we share these waters with humpback whales, which come up from

Antarctica to have their calves, and seem to spend time 'playing' in the tropical waters. In the peak of the season we see several whales each day, often leaping out of the water in great displays. Other highlights are seeing dolphins, turtles, sailfish, manta rays, flyingfish, sea snakes, and countless sunrises and sunsets over the water. A few months ago, I unexpectedly caught a two-metre marlin on a lure (a very unusual occurrence in mackerel fishing). I initially thought it was a huge Spanish mackerel and so pulled like crazy. But after the initial adrenaline rush of getting this large fish into the dory I suddenly realised we didn't want or need it, and I was frantically trying to get it back into the water unharmed. One of the other dories came over to assist, and we lassoed it around the tail, hauled it overboard, and released it.

We are now heading into a wonderful part of the season — the fishing is slowing down, we've

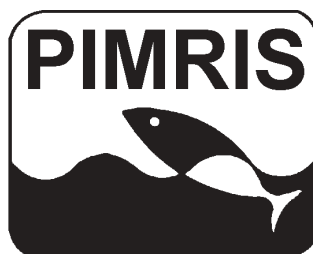
caught the bulk of the year's catch, and we'll be taking more time off to explore the myriad islands, rivers and inlets of the Kimberly coast. That is, perhaps, the best part of the work — seeing some of the most inaccessible parts of Australia. In addition, the weather is moving from the 'dry' season to the 'wet' season and we can expect spectacular tropical clouds, storms and seas, though hopefully not cyclones. For the remaining two months of the season I hope to be beachcombing, exploring and swimming in between pulling in those fish.

I love being at sea and have not yet tired of the excitement of Spanish mackerel fishing, despite the hard work, long days and sometimes broken sleep. Next year may see me working back on the other side of the coin, in fisheries management instead of fishing, but at least I know I can still go and catch Spanish mackerel whenever I feel the lure of the sea.



Vono fishing in the Lau Group, Fiji Islands – Photo by Mecki Kronen

PIMRIS is a joint project of five international organisations concerned with fisheries and marine resource development in the Pacific Islands region. The project is executed by the Secretariat of the Pacific Community (SPC), the South Pacific Forum Fisheries Agency (FFA), the University of the South Pacific (USP), the South Pacific Applied Geoscience Commission (SOPAC), and the South Pacific Regional Environment Programme (SPREP). This bulletin is produced by SPC as part of its commitment to PIMRIS. The aim of PIMRIS is to improve



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the availability of information on marine resources to users in the region, so as to support their rational development and management. PIMRIS activities include: the active collection, cataloguing and archiving of technical documents, especially ephemera ('grey literature'); evaluation, repackaging and dissemination of information; provision of literature searches, question-and-answer services and bibliographic support; and assistance with the development of in-country reference collections and databases on marine resources.