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Editor's note

Welcome to the 22nd issue of the *Women in Fisheries Bulletin*, which highlights gender roles in coastal fisheries, women's fishing activities in urban and rural communities, and gender issues in development.

In this edition, Tuara and Passfield provide information on issues relating to gender in fisheries science and management. The current status of gender participation in the fisheries sector is assessed for three countries: Marshall Islands, Solomon Islands and Tonga. The study was funded by SPC through its SciCOFish Project. It is not surprising that the study shows that there are still more men than women employed in the fisheries management sections of governments in the three countries. Tuara and Passfield also indicate that women make up 18% of the total number of staff working in fisheries, environmental institutions and environmental non-government organisations in the three countries. But when the fishing vessel observers (work that is heavily dominated by men) were eliminated from the statistics, the participation of women increased to 25%. As expected, the percentage of women working as administrators and clerks is about 60%. This is an interesting study as it shows that the effort to actively involve women in fisheries has not really progressed in the last 20 years. This is a male dominated field in the Pacific just as in other parts of the world. How can we fast track the work to make quicker progress from where we are? This study has made some interesting recommendations and it is worth reading. But it may also be time to take stock and reflect and identify where women's strengths lie and where women can be effectively utilised in this sector, as for example in aquaculture and post-harvest activities.

The two papers by Meryl Williams deal with gender in fisheries. The first paper reflects on the transitional path to move women in fisheries issues from marginalisation into the mainstream. In the second paper, she reports on the 3rd Global Symposium on Gender and Aquaculture and Fisheries of the Asian Fisheries Society. This symposium was held as part of the 9th Asian Fisheries and Aquaculture Forum at the Shanghai Ocean University from 21 to 23 April 2011. An overview of the papers presented is reported in this paper. The common theme indicates that women are still marginalised and are not visible.

Zelda et al. discuss the process involved in training women to support community-based management of marine resources (CBRM) in Solomon Islands. This paper highlights the key components of the training and identifies the lessons learned. The objective of the process is to empower women and to improve gender equity in community-based management.

Recently, the Solomon Islands government established a community-based fisheries section in its fisheries department. This section deals with issues relating to communities, gender, etc. This might help solve some of the problems we encounter in the region with inshore fisheries management.

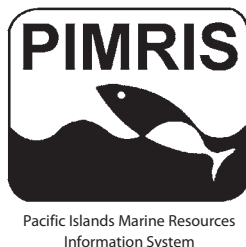
In a paper on seaweed harvesting, Novaczek describes her trip to Alao in Chile. She then gives a brief overview of the sea plants that are harvested for food and medicine. Finally, the last two papers are on the traditional fishing methods and roles of men and women in Aorangi (Cook Islands) and Foueda, Malaita (Solomon Islands). Both papers describe the fishing methods utilised by men and women. Traditionally, men and women fish in different areas and also use distinct fishing methods. Because of better access to modern fishing gear technology, the gender differences in the use of fishing methods are disappearing in Arorangi.

I welcome any feedback on these articles and encourage you to submit articles on gender and fisheries issues from your country or region.

Veikila Curu Vuki

Cover picture: *Emma Kabua, Endangered Species Officer, Marshall Islands*
(Image: Marshall Islands Marine Resources Authority).

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 Pacific Islands Forum Fisheries Agency (FFA), the University of the South Pacific (USP) and the 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 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.

Issues on gender in oceanic and coastal fisheries science and management in the Pacific Islands: case studies from Solomon Islands, Marshall Islands and Tonga¹

Patricia Tuara² and Kelvin Passfield³

Summary

The purpose of this study is to benchmark the current situation with regard to women's participation in the science and management of oceanic and coastal fisheries in the Pacific region, and to make recommendations on how it might be made more equitable. The study was commissioned for the SciCOFish Project (Scientific support for management of coastal and oceanic fisheries in the Pacific Islands) funded by the tenth European Development Fund.

To gain an overview of the participation of women in fisheries science and management in the Pacific Islands, case studies were undertaken in three countries: Solomon Islands (Melanesia), Marshall Islands (Micronesia), and Tonga (Polynesia). In each country a gender analysis was completed for the fisheries science and management sector. The quantitative and qualitative information on the current situation, including identification of barriers to participation, is the basis for the recommendations for Secretariat of the Pacific Community (SPC) support.

As expected, the study showed that there are more men than women employed in the fisheries science and management sector. The case studies in Solomon Islands, Tonga and Marshall Islands show that women comprise 18% of the total number of staff working in this sector in government fisheries, environmental institutions and environmental non-governmental organisations (NGOs).

If fishing vessel observers (work that is always likely to be heavily dominated by men) are removed from the calculation, women's participation increases to 25% of the total. In contrast, the percentage of women employed in administrative and clerical roles in government fisheries departments exceeds 60%.

While each of the three countries studied is unique and has its own specific barriers affecting the participation of women in fisheries science and management, there were a number of commonalities, mostly based around societal perceptions that:

- the traditional role of women is that of homemaker and caregiver, with the resultant extra obligations placed on women who are also pursuing a career; and
- fisheries in general and science and management in particular are technological fields best suited to men, whereas women who may pursue a career in science are more suited to employment in teaching, health or other fields generally dominated by women.

In order to overcome barriers, we need to change these perceptions. There are three ways to increase women's participation in fisheries. The first is by raising the profile of fisheries as a potential career as well as the profile of women already working in the sector; the second is by providing a support network; and the third is by strengthening the institutional level (work environment and conditions). A list of recommended interventions that could be undertaken to make a career in fisheries science and management more accessible to women and thereby improve the gender balance in the sector is given in Section 4.

SPC's SciCOFish Project can play a role in assisting countries to implement many of these interventions. Some would require collaboration between SPC divisions and other national and regional institutions. Women who have an aptitude and desire for a career in fisheries science and management need to know that this is in fact a perfectly reasonable option for them, and equal opportunities need to be made available for them to choose it.

¹ Extracted from the 68-page report of the same title available from: http://www.spc.int/DigitalLibrary/Doc/FAME/Reports/Tuara_11_GenderOceania.pdf

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1. Introduction

The overall objective of the SciCOFish Project, which commenced in July 2010, is the conservation and sustainable use of coastal and oceanic fisheries resources in the Pacific members of ACP (African, Caribbean and Pacific Group of States).

The project purpose is to provide a reliable and improved scientific basis for management and decision-making in oceanic and coastal fisheries. The gender objective of the project is to increase the benefits from the fishery sector for women by creating an environment of equal opportunity for the participation of men and women in different components of oceanic and coastal fisheries science and management.

The Gender in Oceanic and Coastal Fisheries Science and Management study reported on here was commissioned by the SciCOFish Project. The scope of the study includes: conducting a literature review of gender roles in the fisheries sector in the Pacific region; collecting information from sector stakeholders currently working in fisheries science and management (public sector, private sector, NGOs, academic institutions); identifying and assessing factors that form barriers for women's participation in these sectors; identifying specific approaches to address barriers, and identifying specific interventions in each country; reporting back to stakeholders in each country; and producing a report and a gender mainstreaming toolkit.

It is generally accepted that balanced, equitable and sustainable development of the fisheries sector must take all social groups into account. However, studies have shown that the role of women in the sector has, for a long time, gone unrecognised and their voice is rarely heard by managers, policy-makers and legislators (Maetala 2009; Novaczek, Fitzpatrick and Roach-Lewis 2009). The lack of recognition and representation is not only unfair but also leads to an incomplete understanding of how the sector as a whole operates and functions (MRC 2006).

Recent studies show that women are an integral and important part of the fisheries workforce, and their dominance (in numbers) in the processing sector is well known. Formulating the measures necessary to redress gender imbalance requires knowledge about why issues relating to gender are neglected, and why the role and position of women in fisheries is an important issue.

1.1 Why are gender issues neglected?

Gender issues have been neglected for several reasons, including the following:

- a belief that fishing and fisheries are primarily the domain of men;

- the concept of fisheries as largely limited to direct fishing activities;
- the gender stereotype of women as being physically weak and therefore unsuited to the physical demands of fishing;
- the gender stereotype that women are not technically minded; and
- the fact that there are disproportionately few women in fisheries departments and in academia.

1.2 Why are gender issues in fisheries important?

In addition to the obvious concerns about fairness, equal opportunity and discrimination, there are other reasons why effective and efficient development of Pacific Island oceanic and coastal fisheries must take the role of women in the sector into account.

Women make significant contributions to fishery-related activities other than fishing. They play a major role in processing fish and fishery products, as well as in marketing.

While these roles may be different from those of men, they are integral parts of the industry, and ignoring these activities means ignoring a large portion of the sector. The different work done by women generates different kinds of knowledge. Only with knowledge of both women's and men's opinions and expertise can we understand the fishery sector in its entirety, and manage its development appropriately.

The under-representation of women in decision-making takes away a large portion of the available pool of expertise — from both the government and the community. Studies have shown that having more women in an organisation leads to better cooperation among team members and facilitates the decision-making process (Woolley, Chabris and Pent 2010). This might be because mixed teams of men and women are better than single-sex groups at solving problems and spotting external threats. Women may be better than men at building teams and communicating.

In the context of this study, fisheries science refers to the academic discipline of understanding fisheries, and it draws on (but is not exclusive to) the disciplines of oceanography, marine biology, marine conservation, ecology and population dynamics. Fisheries management draws on fisheries science and other disciplines in order to find ways to protect fishery resources so that sustainable exploitation is possible. The line dividing fisheries science and fisheries management is blurred, especially in the Pacific, where the few qualified staff available are usually called on to work in both areas.

Therefore, it was necessary to incorporate numbers of participants in fisheries science and management into a single category for some aspects of the analysis, rather than trying to report on them as separate categories. These staffing positions include: fisheries research officers involved in surveys of inshore and offshore fishery resources, aquaculture research officers, fisheries economists, policy and legal officers, post-harvest specialists, and marine conservationists.

2. Methodology

A literature and Internet search of gender mainstreaming methodologies, gender in fisheries and gender in fisheries science and management was carried out in preparation for the research. Fieldwork in Solomon Islands, Marshall Islands and Tonga was carried out in November 2010. The research methodology includes interviews (formal and informal) with representatives from government, NGOs, the private sector, academia, development agencies, and regional organisations. To examine a possible bias caused by education opportunities, information on scholarships was collected from the relevant government departments, as well as information on school enrolment and curriculum from the education departments, and population data from the statistics departments.

Focus group sessions were held with a selection of male and female staff at the fisheries divisions, as well as a selection of final year male and female high school science students. Prior to departure from each country, a feedback session was conducted at the fisheries department, in which people who had been interviewed and other interested parties were invited to participate. This provided some feedback in the form of initial results of the in-country studies to the stakeholders, and also facilitated a final review and revision of in-country findings by the consultants. Following the in-country fieldwork, data were analysed for the preparation of this report.

3. Results

The gender balance of personnel working in fisheries science and management in the Pacific region is heavily weighted towards men. The average percentage of female staff working in the sector in the three countries, including observers on fishing vessels, is 18%.

3.1 Gender balance in fisheries science and management

The findings are based on the information collected in each of the three countries, which is summarised in this section.



Cynthia Wickham, Tuna Tagger, Solomon Islands
(Image: SPC Oceanic Fisheries Programme)

3.1.1 Solomon Islands

There are fewer girls than boys enrolled in schools. The percentage of girls starts at 47% in year 1 (age six), and decreases to 32% by the end of high school. There is also a relatively low number of girls in form 6 science classes. According to data from 2001 to 2011, young women received only 30% of the scholarships awarded for tertiary education.

In the government fisheries agency, women comprise 14% of all staff, and make up 11% and 12% of the staff working in fisheries science and fisheries management respectively. Fisheries science in particular has only two women staff members, both with a Bachelor of Arts in Marine Affairs (a marine management degree). There are no women in the Ministry of Fisheries and Marine Resources who hold a science degree at the present time. There are also no women in senior management positions.

Representation of women is more favourable in the government's environment agency. Of the five staff members working at the professional level on the marine conservation aspects of the Coral Triangle initiative, three, or 60%, are women with science degrees. In four NGOs based in Solomon Islands, the percentage of women employees working in fisheries science and management averages 44%. Solomon Islands women are starting to enter non-traditional areas of work, such as being observers and tuna taggers onboard fishing vessels.

Private sector tuna processing in Solomon Islands mostly employs women as unskilled labour. There is one local woman with a degree working as a trainee, currently in trans-shipment, for a local private sector fishing company. There are seven Solomon Islanders with degrees working for the tuna cannery, one woman and six men.

3.1.2 Marshall Islands

Although dropout rates for girls are higher than for boys at primary and secondary levels, girls do better at the tertiary level. From 2000 to 2005, women outnumbered men in the awarding of scholarships. More women than men pursue postgraduate studies.

Women comprise 13% of the staff working for the Marshall Islands Marine Resources Authority (MIMRA). This figure includes two women out of the six members of the Board of Directors. Of the staff carrying out scientific work, 20% are women, and of the staff carrying out management work, 35% are women.

In MIMRA there are two women in positions of responsibility at the senior middle management level — one is the Chief of Oceanic and Industrial Affairs, and the other is the Chief of Inshore Coastal

and Community Services. With the support of the Executive and Deputy Directors, the two chiefs are in charge of a mostly male staff for all coastal and oceanic work.

Gender numbers are more favourable in semi-governmental organisations, where the Republic of the Marshall Islands Environmental Protection Authority is headed by a woman, and two of the five board members are women. However, only 20% of the staff working in fisheries science and management are women. The environmental NGO, the Marshall Islands Conservation Society, has one woman among the seven technical staff (16%), but has three women sitting on the five-member Board of Directors.

A majority of private sector workers are women, but they are mainly unskilled labourers. In one tuna processing plant, women comprise 65% of total staff. The majority of the women are low paid workers who process the fish. There are some Marshallese men and women in management positions and conducting scientific work (laboratory analysis) and quality control, but most of the staff in these positions are recruited from overseas, as few Marshallese have skills in these areas.

In terms of academic qualifications — in MIMRA, of the women graduates four have a Bachelor of Marine Science and one has a Bachelor of Marine Biology. Two of the five women are currently pursuing a Master of Science (one in cell research and one in marine biology) and two others are studying statistics at the University of the South Pacific (USP) Marshall Islands campus. In the environmental field, the Manager of the RMI Environmental Protection Authority, a woman, has a Bachelor of Management Studies in environment and management.

3.1.3 Tonga

In high schools, girls and boys are approximately equal in terms of overall student numbers. However, in senior science subjects such as biology, physics and chemistry, there are significantly more girls.

Despite the dominance of young women in science, scholarship data since 2003 show that 41% of science scholarships have gone to young women, although they have received 55% of all scholarships. The largest proportion (39%) of young women pursuing science chose scholarships for medicine, dentistry and computing. Women comprise 30% of the staff working for the Tonga Fisheries Division.

In areas of work, women comprise 8% of staff in science and 35% of staff in fisheries management. There are no women in senior management positions, although there are women (with no tertiary qualifications) in charge of outer islands fish bases in Vava'u and Ha'apai. These positions are

responsible for only one or two staff, and are relatively low in the public service grading system.

In the government environment agency, there are ten permanent staff (five women, five men) who work in marine and coastal conservation. One woman has an MSc, and the other four have a BSc. Three of the five men have diplomas, while the other two have no tertiary qualification. None of the Tongan NGOs are currently involved directly in marine conservation, and none have staff with a marine-related qualification. The private sector in Tonga is not particularly active at present. The most proactive local company is headed by a woman, who also plays a major role in the Tongan Chamber of Commerce.

3.2 Country comparisons

Solomon Islands, with 21%, has the lowest percentage of females working in fishery science and management, followed by Marshall Islands with 27% and Tonga with 30%. It should be noted that, as this study specifically looked at people with formal tertiary qualifications in science and management, observers were not accounted for as in nearly all cases, while they have completed the regionally recognised observer training course, observers do not have tertiary qualifications. Note that although the figures for Tonga show a higher overall percentage of women, this is mainly due to the number of women working for the environment department (50% of staff working in the marine conservation sector).

Analysis of the hierarchical levels of staff by gender in each of the three countries shows greater imbalance, on average, at the senior management levels. The cumulative total column shows that there are no women and 18 men in the top two levels of management (permanent secretaries, chief executive officers and divisional managers). The situation improves at the third level of management, where numbers are around the overall average figure of 16% females.

3.3 Common barriers to women's participation

This section identifies the barriers that prevent or restrict young girls and women from entering and progressing in the fields of fisheries science and management. General constraints are included as they are contributing factors that perpetuate gaps in participation. The information in this section was collected as part of the in-country research. Barriers or constraints can be grouped under four headings: social context, access to opportunities, access to resources and institutional support.

3.3.1 Social context: Culture and traditional roles

Culture, traditional roles, perceptions and gender stereotypes determine behaviour, set boundaries

and perpetuate beliefs that impact on women's participation in fisheries. In some societies there are cultural taboos that prescribe a woman's participation — they may determine whether she can fish, where she can fish, and the type of fishing method and equipment she uses (Tuara 1998; Lambeth et al. 2001).

In some societies, it is taboo for women to engage in diving, netting, trapping and fishing from a boat. In others, there is a belief that women bring bad luck and a poor catch when they are on a boat or anywhere near the fishing activity of men (Embersson-Bain 1998; White 2000). Taboos restrict women's participation in the fisheries sector and reinforce the belief that fisheries activities are the domain of men, not women.

A girl typically learns from her mother or other female elders the traditional roles of being a daughter, wife and mother. She is raised to perform numerous roles of household manager, family caretaker, income earner and active church and community member. A boy, on the other hand, learns from his father or other men how to fish, hunt, build houses and canoes and protect his family. Men are taught to be the main income earner, the head of the house, the leader, the speaker and the decision-maker (Graham and Paul n.d; Fidali-Hickie 2010; Maddison 2011).

Traditional roles of women set boundaries on what women can or cannot do. They are restrained by multiple obligations, limited time and mobility. This can have a negative impact on women's participation in education and the work force. According to a fisheries officer in Solomon Islands, young girls sacrifice their education and are kept at home to look after the family, while boys, seen as future primary income earners, are encouraged to continue their education and seek good jobs.

Perceptions and gender stereotypes can have a negative impact on the fisheries sector in general, and on the work of women fisheries officers in particular. Such perceptions need to be changed in order to increase and sustain the number of women participating in fisheries in general, and science and management in particular. One of the initial barriers to overcome is the negative perception of the role of women in a field of science and technology that is portrayed by the mass media as being the domain of men and boys (UNESCO 2010).

3.3.2 Gender stereotypes, and their role in access to education and employment opportunities

Universal access to good quality education should be the right of all. Without education, the career choices for young girls are limited. In Solomon Islands and, to a lesser extent, Marshall Islands,

the study shows that there are fewer girls than boys receiving an education. In Tonga, an approximately equal number of girls and boys attend all levels of school.

Employment data show that there are fewer women than men working in the fisheries sector in general. Although some women are now working in non-traditional areas, employment data show that there are more men than women holding positions in government, NGOs, and subregional and regional organisations. This is still less than the critical mass needed to show society that women are capable of working in the male dominated areas of science and management (see Etkowitz, Kemelgor and Neuschatz 1994, for a general discussion of critical mass in regard to participation of women in science).

The only area where women outnumber men is in private sector tuna processing, where the majority of women work as unskilled labourers on the processing line (Tuara and Nelson 2000; Wichman 2001; Vunisea 2006; Sullivan and Bidesi 2008). In one Marshall Islands fish factory, 65% of the staff are women who are mainly responsible for loining tuna fish.

There are also some Marshallese men and women working in the laboratory, conducting water quality and histamine tests and carrying out hazard analysis and critical control points (HACCP) quality control work, but these positions are mostly filled by recruits from overseas, as few Marshallese have the required skills. In Solomon Islands and Tonga, there is currently a freeze on public sector employment, even though vacancies exist. This means that a number of Solomon Islands marine graduates do not have a job in the fisheries sector.

In Tonga, when a staff member leaves, he or she is not replaced. The freeze on employment is a barrier, but it is important to note that, prior to this, the number of women recruits was low. According to one fisheries scientist, in Solomon Islands there have been virtually no new posts within the sector, and existing posts rarely become vacant due to low attrition rates.

In Samoa, a similar situation to that in Solomon Islands is currently occurring. Three women graduates with an MSc in Marine Science have returned to find that, due to budget constraints, there are no jobs available in the fisheries department. They have found employment elsewhere, one in the environment sector, and two in the private sector (M. Sapatu, Senior Fisheries Officer, Samoa Ministry of Agriculture and Fisheries, pers. comm). These examples reaffirm the need to carry out a thorough training needs analysis in the sector, with a long-term view of future requirements, before embarking on an ambitious recruitment campaign.

In Marshall Islands the dropout rate for girls is higher in secondary schools due to teen pregnancy and family obligations. However, girls do better at the tertiary level (EPPSO 2003; EPPSO and SPC 2008). More women than men obtain marine scholarships and pursue graduate studies (Director of National Training Council, pers. comm).

In Solomon Islands fewer girls make it through to form 6 (senior) science and so fewer girls than boys obtain scholarships to do first degrees, and very few young women go on to do postgraduate degrees (Fidali-Hickie 2010). In Tonga, girls tend to do better academically in high school, and more girls than boys pursue science subjects. Despite this, more boys than girls are awarded science scholarships, and most Tongan science students pursue a career in medicine or teaching.

3.3.3 Access to resources – Information and networking

There is a lack of gender sensitive fishery science and management career information. There is also limited or no outreach to young people who could consider a career in fisheries. There are very few female role models or champions who can put an end to gender stereotypes and misconceptions that perpetuate the myth that fisheries careers are for men. Although there are women in the sector, they are not being used as role models at the national level.

There are no women's fishery networks in any of the three countries studied. There are also no organised groups for women scientists, and no active alumni associations. Without a network, women working in a male-dominated fisheries sector are marginalised, with no support system. They have no voice (outlet) to raise issues, share experiences, support each other or lobby for change. There is, therefore, limited opportunity to inspire and attract young women to the sector. Networks of women working in the fisheries sector could help get recognition and validation for the role of women. They could share concerns about the sustainability of fisheries resources, and link researchers and activists interested in fisheries development issues with women and women's groups working in fisheries in the region.

Active networks have an impact on the ground. Networks at national and regional level, with links to mainstream women's and gender programmes, can have a lasting impact. Fisheries specialists, especially researchers, have raised awareness of the importance of women in fisheries and this has led to a few such networks being formed in other parts of the world, such as in the lower Mekong Basin, the Philippines and Latin America (Williams and Choo 2001).

3.3.4 Lack of institutional support – Working conditions for women

With the help of fisheries departments, NGOs, the private sector, development organisations and donor agencies, women are being provided with opportunities that facilitate choice, but more is needed at the institutional level to build the capacity of key stakeholders in the fisheries sector to promote gender mainstreaming in organisational change and management.

With more women joining the sector, their needs may be overlooked if their contribution is not recognised or valued. Employing more women will not address gender imbalance unless a supportive institutional framework is in place to keep women in the sector and attract others. The lack of relevant policies can restrict recruitment and retention of staff. There is no gender policy for fisheries in Solomon Islands, Marshall Islands and Tonga, although there are national policies. Solomon Islands has the National Policy on Gender Equality and Women's Development (2010–2015) and Tonga has the 2001 National Policy on Gender and Development.

An inability to move upwards can lead to frustration and non-performance. Most senior and middle management positions in fisheries departments are held by men. Although women are now in technical positions, data show that in some countries they appear to be less likely to be promoted to decision-making levels. One Solomon Islands informant said that most women in the department do not have a formal qualification but some attained mid-level seniority through many years of experience. There are no specific programmes in place to encourage the movement of women into senior level positions.

3.3.5 Career path mobility

Marshall Islands had the National Women's Policy 1996–2001, which has not been replaced (SPC 2010 a, b, c). Unfortunately there seems to be very little knowledge of these policies (current or expired) outside of the agencies responsible for women. Limited knowledge about gender and gender policies leads to misunderstandings and the belief that 'gender' means 'women' and is the concern of departments responsible for women's affairs. Fisheries departments have very little, if any, contact with the women's departments, and vice versa.

Working in an unsafe environment that does not promote fair workplace practices can deter women from applying for jobs in any sector. Workplace policies should ensure that the working environment is one that promotes good work practices for both men and women.

Policies need to ensure that fisheries staff members have the support and facilities they need. For

example, working alone with men may restrict the ability of women to carry out their work. Unless facilities are available to support the work of both men and women, it can be difficult for men and women to undertake fieldwork together.

Separate secure accommodation and amenities for both men and women fisheries officers is one requirement. In order to attract and support staff of both sexes equally, equitable maternity and paternity leave are also needed, as well as childcare considerations within the community. For example, the Health and Safety policy commits the Cook Islands Ministry of Marine Resources to provide a safe and healthy work environment for all staff, while the Conduct and Behaviour policy states that all employees must treat each other with courtesy and respect.

3.4 How to overcome the barriers

This section provides examples of approaches used to break down the barriers that restrict women's effective participation in science and management.

3.4.1 Social context – Dispelling cultural taboos, perceptions and gender stereotypes

Cultural taboos restricting women from participating in the sector are beginning to disappear, largely due to women taking up jobs in fisheries departments, the private sector and NGOs. Solomon Islands women working successfully as observers and tuna taggers onboard fishing vessels dispel the belief that women on or anywhere near a boat bring bad luck.

Marshallese women conducting stock assessment field surveys dispel the perception that women cannot do physically demanding work. Marshallese women working as private sector quality control analysts dispel the gender stereotype that women are not technically minded. Tongan women managing outer islands fisheries bases dispel the belief that women cannot make decisions about fisheries and should be in support positions. Though these are signs of progress, there is still a long way to go, and more work is needed by regional organisations to accelerate this progress. (Feedback from Australian High Commission in Solomon Islands to local consultant K. Fidali-Hickie.)

3.4.2 Access to education and employment opportunities

Development agencies provide both scholarships and training courses to national students. In most cases they try to ensure a gender balance. In Solomon Islands, the Australian government provided 44 marine and environmental scholarships – 33 to men and 11 to women. Scholarships to study agriculture, forestry and fisheries totalled 69 (59 went to men and 10 to women).

From 2006 to 2009 the Japanese government implemented eight training courses in community-based fisheries diversification, community fisheries planning, and sustainable coastal fishing techniques. These courses were attended by seven men and one woman from the Ministry of Fisheries and Marine Resources (A. Yoko, JICA Solomon Islands office, pers. comm.). In Tonga, the New Zealand Government provided 281 scholarships for tertiary education between 1997 and 2009. Of these, 140 went to women and 141 to men. Information on courses of study was not available for a more thorough analysis.

In Marshall Islands the use of student interns by both government and NGOs has proven successful in providing students with on-the-job training opportunities. MIMRA also has a career day for tertiary students. Cook Islands Ministry of Marine Resources is trialling a student intern programme with one young female high school graduate and one male final year high school student as a means of encouraging young people to enter the sector (P. Maru, pers. comm.).

Internships and training are other ways to facilitate an increase in interest in the marine science and management fields. Regional organisations such as FFA and SPC help develop the skills of fisheries officers through workshops, attendance at meetings and attachments.

From 2001 to 2010, the Japanese government provided 15 training courses in Marshall Islands in environmental management, environmental protection, deep-sea mineral resources, integrated resource management, fishing techniques, refrigeration systems, quality assurance for marine food, handling and primary processing of fishery products, maritime search and rescue, and community-based fisheries diversification. Eleven trainees from MIMRA, three from RMI Environmental Protection Authority, and one from the Ministry of Justice attended the courses. Four courses were attended by women from MIMRA—one course on deep-sea mineral resources, one integrated resource management course and two courses on community-based fisheries diversification (T. Jack, JICA Marshall Islands office, pers. comm.).

At the regional level, SPC provided two postgraduate scholarships to science students as part of the ProcFish (Pacific Regional Oceanic and Coastal Fisheries Development) Project. Both the Oceanic Fisheries Programme and the Coastal Fisheries Programme mentor graduate and postgraduate students. In 2010 the Coastal Fisheries Programme provided supervision to four masters students and one postgraduate student from the University of the South Pacific who were studying aquaculture. In 2011, two postgraduate students will be mentored

by the Aquaculture Section. Fisheries departments, environment departments, environmental NGOs, the private sector and academic institutions are the main providers of jobs in the fisheries sector. A freeze on government employment has meant that marine studies graduates in Solomon Islands have found employment in the private sector or in environmental NGOs.

In 2002, MIMRA employed the first woman scientist as a community-based officer. Earlier, a woman held a management post in policy. Today, the number of women in technical positions has increased to nine, with another two currently on overseas study. Of significance is the fact that women scientists hold two positions of authority, the Chief of Offshore Oceanic and Industrial Affairs, and the Chief of Inshore and Coastal and Community Services (B. Muller, Chief of Offshore and Industrial Affairs, MIMRA pers. comm.).

Regional organisations such as FFA and SPC help develop the skills of fisheries officers through workshops, attendance at meetings and attachments. Information from SPC annual reports for 2010 indicates that women comprise 19% of the trainees (SPC 2010d). This probably approximates the gender balance in the sector. Of particular interest is the fact that a higher percentage of the women trainees attended courses in oceanic fisheries, rather than in the traditionally accepted women's area of coastal fisheries. This is probably a reflection of the increasing number of women being employed in oceanic fisheries jobs.

Young Pacific Island women are increasingly turning to careers in oceanic fisheries (Deirdre Brogan, SPC Monitoring Specialist, pers. comm.). They may be motivated and encouraged by the training and employment opportunities that are opening up with the new Tuna Commission (Western and Central Pacific Fisheries Commission, WCPFC).

Although the final selection of observer trainees rests is the responsibility of national governments, the Oceanic Fisheries Programme can encourage fishery departments in Pacific Islands countries and territories to include women (D. Brogan pers. comm.). The region's observer programme has provided 100 per cent observer coverage on purse-seine vessels with the support of SPC and FFA. A total of 150 observers have been trained. Most training has been done by SPC training officers, but Papua New Guinea delivers its own training courses to nationals, and other countries are developing this capacity (FAME 2010).

In 2010, the Oceanic Fisheries Programme provided training in data processing, tuna stock assessment and tuna tagging. National tuna data workshops for staff who collect, manage and disseminate data were held in Solomon Islands, Federated States of



Micronesia, Nauru and Kiribati. The Coastal Fisheries Programme trained men and women in reef fisheries survey methodologies, collection and analysis of data, and the production of resource management policies and plans.

SPC's Coastal and Oceanic Fisheries Programmes continue to provide training attachments to national fisheries officers. In 2010, as part of the Coastal Fisheries Science and Management section, attachment training in desktop publishing was provided to one fisheries officer from Cook Islands and one from Fiji for the development and dissemination of fisheries information. Currently, an officer from Samoa is on a one-year attachment to learn more about stock assessment, analysis and the production of management plans. She will be leaving shortly for Marshall Islands to do one month of fieldwork on invertebrates and aquarium fish stocks (M. Sapatu, Trainee Attachment, pers. comm.).

FFA has provided training and attachments for Pacific Island fisheries personnel in areas such as observer training; monitoring, control and surveillance (MCS); licensing; dockside boarding; prosecution; and other legal areas. An analysis of data from 2007 to 2010 shows that only 17 out of 204 participants, or 8%, were female.

3.4.3 Producing gender-sensitive career information

In addition to the production of curriculum materials, gender sensitive career information is needed

to support outreach by fisheries departments. The information needs to show that fisheries careers are equally suited to men and women.

SPC and FFA have produced reports on women in fisheries and gender in the tuna industry, as well as profiles of women in non-traditional roles. By using positive role models, this information elevates fisheries as a career choice for women. Observers and women scientists are featured in the publications as examples to other women, and to men. The SPC *Women in Fisheries Bulletin*, first produced in 1997, continues to provide stories for and about women in the sector.

As more women enter the traditionally male-dominated fields of fisheries research and management, their skills and leadership are dispelling other beliefs that may have kept interested women from entering these fields (White 2000). The Japan International Cooperation Agency (JICA) has produced national gender profiles, including one each for Solomon Islands, Marshall Islands and Tonga. The profiles are useful sources of information that include policy, legislation, socio-economic data and information on gender in fisheries (JICA 2010 a, b, and c).

3.4.4 Use of role models

Positive female role models should be enlisted. This can begin in the classroom; young girls and women need women teachers and scientists as mentors

and role models. Mentoring programmes are known to benefit both mentor and student.

Other role models include Solomon Islands women observers, port samplers and tuna taggers, female Pacific Island nationals working in regional fisheries and environmental organisations, and female fisheries scientists and managers working in national fisheries and environmental agencies. The expertise and knowledge of such role models need to be tapped to encourage women to go into the fisheries sector, as well as to support those currently in the sector. In Marshall Islands, fisheries staff from MIMRA visit schools on Careers Day to talk to secondary school students about the work they do.

3.4.5 Networks

Women in fisheries networks have been set up around the world, including in Fiji (1992), Africa (2010), United States of America (1983), the Netherlands (2000), the lower Mekong Basin, the Philippines and Latin America (Williams, Williams and Choo 2001). Networks recognise and validate the role of women in the sector. They allow members to share concerns about the sustainability of fisheries resources, and link researchers and activists interested in fisheries development issues with women and women's groups that are engaged in fisheries in the region. Active networks have an impact on the ground. Networks at national and regional level, with links to mainstream women's and gender programmes, offer the opportunity to make a lasting impact.

3.4.6 Using the media

In Marshall Islands the government fisheries department (MIMRA), the environmental semi-government authority (RMI Environmental Protection Agency), an environmental NGO (the Marshall Islands Conservation Society, MICS), and an academic institution (RMI-USP) work with the media to provide public awareness programmes about their work.

Through the media, the fisheries sector's profile is raised and the importance of marine resources is elevated, as is reflected in the cooperative projects among stakeholders. Young people are more likely

Sharmaine Siaguru, Fisheries Technician,
National Fisheries Authority, Papua New Guinea
(Image: Malo Hosken).



to be attracted to a career that is exciting and is an integral part of their life, as it is in the Pacific Islands.

3.4.7 Institutional support

As equal opportunity employers, fisheries departments aim to hire qualified men and women. An equal opportunity policy (combined with educational qualifications) enables women not only to enter fisheries, but also to take on jobs in research, management and other areas not traditionally entered by women.

In 2002, MIMRA employed its first woman scientist as a community-based officer. Today, the number of women in technical positions has increased to nine, with another two on overseas study.

The tertiary institution, College of the Marshall Islands (CMI), affirms its commitment to the goal of equal opportunity for its faculty, students, staff and administrators. The College does not discriminate

in matters of employment or of admission to educational programmes and activities on grounds of race, colour, gender, religion, age, sexual orientation, national or ethnic origin, ancestry, disability, marital status or veteran status.

3.4.8 Being an equal opportunity employer

Fisheries departments can implement work projects and programmes that recognise and address the needs of women in the sector. In Solomon Islands, the fisheries department set up a Women in Fisheries Unit. Unfortunately, this ended in the 1980s and has not been replaced. At the regional level, SPC implemented the Women's Fisheries Development Project in 1994 to provide support mainly to women in the sector.

The *Women in Fisheries Bulletin* and women in fisheries reports were produced to raise the profile of women and acknowledge their contribution to the sector. Assistance was provided in terms of workshops and attachments. The project was renamed the Community Fisheries Development Project in 1999 and the focus changed from assisting women to assisting communities.

From 2010 the Coastal Fisheries Science and Management Section continued the work of supporting women as part of its support to both men and women. According to the Section Adviser, the current community-based management programme provides assistance to women in communities so they can be involved in resource management, and also provides skills training to female fisheries officers in such areas as finfish/invertebrate resources assessment and analysis (I. Bertram, pers. comm.).

4. Proposed interventions

The study has shown that the main barrier to having more women in fisheries science and management is people's perceptions and the attitudes of society. These are often rooted in the culture and customs of a country. There is a need to change the way people perceive a career in fisheries. Fisheries science and management needs to move up the ladder of preferred careers; at present it appears to sit close to the bottom rung of that ladder in many Pacific Island countries.

Our intention in choosing one country from each subregion was to get reasonable basis for making general recommendations for the Pacific on appropriate actions to increase the participation of women in fisheries. However, there is no such thing as a typical Pacific Island country, and therefore the recommendations are not necessarily appropriate for all countries. Some countries are already ahead of others in terms of women's involvement in the fisheries sector. Nonetheless, even these more progressive countries still have a long way to go, and

may benefit from applying gender analysis and gender mainstreaming tools.

Several interventions could be undertaken to make a career in fisheries science and management more accessible to women and thereby improve the gender balance in the sector. However, it is important to note that there is a freeze on public service employment in some countries, and opportunities in the sector vary by country, depending on how dynamic the sector is. Some forward planning and discussions with human resources departments, senior management in fisheries, environment divisions, environmental NGOs, and the private sector is needed before embarking on ambitious recruitment programmes that may lead to having qualified graduates who cannot find employment.

SPC's SciCOFish Project can play a role in assisting countries to implement many of these recommendations. Others would require collaboration between SPC divisions and other national and regional institutions. Potential interventions are listed as A) those that the SciCOFish Project might reasonably be expected to undertake, B) those activities that would require significant collaboration with other partners, and C) those where SciCOFish could tap into existing projects.

- *Produce a booklet summarising the findings of this report, highlighting barriers, approaches and interventions.* The information would be of use to fisheries sector stakeholders. Support should also be provided for the development of promotional material using special interest stories of successful women in the sector, with the aim of encouraging more young women to embark on a fisheries career. This material can help to open the public's eyes (changing society's perception) to the varied aspects of working in fisheries. As an initial step, a gender balanced promotional pamphlet should be produced to attract more young people into fisheries science and management. This could be followed by a short promotional DVD that could be distributed to schools, human resource departments, television stations, etc. around the region.
- *Undertake a training needs analysis in the fishery sector to determine short- and long-term expertise requirements, so that future training and scholarships are targeted appropriately. Facilitate dissemination of information to schools, universities and human resource departments on opportunities for training and graduate studies in fisheries and marine science and management.*
- *Provide funding for scholarships in fisheries science and management at the postgraduate level as a means to promote capacity building. Funding should be allocated to fisheries staff training*

and attachments in the areas of oceanic and coastal fisheries data analysis and management, stock assessment methods and the development of management policies, plans and strategies. With a view to improving the gender balance in these areas, the training could include facilitating short-term attachments in the fisheries sector (with regional and national organisations and the private sector).

- *Provide funding to support short-term attachments for youth in the fisheries sector.* In collaboration with government, NGOs and the private sector, selected final year science student interns would be mentored by experienced fisheries staff and given a variety of interesting tasks to introduce them to fisheries science and management. The aim would be to attract potential staff with an emphasis on increasing the ratio of women currently employed in the sector.
- *Support national (upon request), subregional, and regional women in fisheries networks.* In this male-dominated sector it is particularly important for working women to have a platform to share their experiences and learn from each other in order to overcome specific problems they are facing. Acknowledge appropriately skilled individuals in the region by developing a gender-balanced database of qualified nationals with experience in fishery science and management for use as consultants and resource persons in relevant national, subregional and regional workshops and meetings.
- *In collaboration with ministries of education, and regional and international secondary and tertiary educational institutions such as USP and UNESCO, urge curriculum development units to put more emphasis on marine resource education in both primary and secondary schools as a major factor in the life of Pacific Islanders.* Material developed would need to be gender balanced, avoiding stereotyping and making clear the potential of fisheries careers for young people of both sexes.
- *In collaboration with USP, develop course material of a practical nature that provides marine science and marine affairs graduates with the practical, analytical and writing skills needed to conduct, for example, a fishery stock assessment, produce a policy paper or write a management plan.*
- *Where necessary (as in Solomon Islands) investigate ways in which girls can be assisted to continue their education through to the end of secondary school and achieve high academic grades, thus enhancing their potential to gain an equitable share of scholarships.* Assistance should be provided to help fisheries departments create a supportive work environment that attracts potential women employees

and recognises and supports existing women staff. For example, assistance could be provided in developing equal opportunity policies as part of a work environment that promotes good workplace practices such as maternity and paternity leave, safe working conditions, and a policy that deals with sexual harassment.

- *Under the SciCOFish or DevFish Project, provide women and men in the private sector with training in water quality testing, and quality control methods such as hazard analysis and critical control points (HACCP) so that they can perform skilled jobs in fish processing plants.*

5. Career paths

If we are to encourage wider participation by women in fisheries science and management, it is useful to elaborate on the variety of career paths that can be followed. A number of them are also applicable for careers with environment departments and environmental NGOs in the Pacific.

An individual would probably progress along the career path based on performance and completion of higher degrees, such as a masters degrees. Note that fisheries divisions within the Pacific are usually small and operate on limited budgets. Thus it is likely that individuals will be called on to undertake multiple roles. For example, fisheries management and research may sometimes be combined in a single position. These positions are equally suited to both male and female candidates. The career paths in all cases have the potential to lead to the head of the fisheries department, depending on the individual merits of the employee.

6. A final word

This study is about gender and equality, not about women. There is a need to emphasise that a fisheries career can be equally acceptable for women as well as men. The approach should not be so much to increase women's participation, but rather to raise the status of fisheries as a career for young people who have an interest in or who are studying science. At the same time, the fact that women are just as able to participate in the sector as men needs to be reinforced.

While this study has shown that there is a gender imbalance in the sector, women should not be pushed into fisheries science and management if a country does not need more fisheries scientists and managers and if women are not interested in pursuing such careers. However, where there is a need and an interest, women should have the options made clear, the opportunities should be made available, and the choice left to the individual concerned (for a fuller discussion on this topic see Bouville 2007). Women who have an aptitude and desire for

a career in fisheries science and management need to know that this is in fact a perfectly reasonable option for them, and equal opportunities need to be made available for them to choose it.

References

- Embersson-Bain A. 1998. Women in Tonga. Country briefing paper. Asian Development Bank.
- EPPSO (RMI Economic Policy, Planning and Statistics Office). 2003. RMI Statistical Yearbook.
- EPPSO and SPC (RMI Economic Policy, Planning and Statistics Office and Secretariat of the Pacific Community). 2008. Republic of the Marshall Islands Demographic Health Survey 2007. Final Report. New Caledonia: Secretariat of the Pacific Community.
- Etkowitz H., Kemelgor C., Neuschatz M., Uzzi B. and Alonzo J. 1994. The paradox of critical mass for women in science. *Science* 266:51–54.
- FAME (Fisheries, Aquaculture and Marine Ecosystems). 2010. Annual report. Fisheries, Aquaculture and Marine Ecosystems (FAME) Division. New Caledonia: Secretariat of the Pacific Community. February 2011. Accessible from: http://www.spc.int/fame/doc/meetings/7thHOF/HOF7_WP2.pdf.
- Fidali-Hickie K. 2010. Unpublished research notes. Curriculum Development Division. Solomon Islands.
- Graham B. and Charles P. n.d. The economic status of women in the Marshall Islands – Is it really getting better? Note: This essay is produced under the auspices of the Insular Areas Statistical Enhancement Program and is not an official RMI or US Census Bureau report. www.pacificweb.org/DOCS/rmi/pdf/Status%20of%20women.pdf. Retrieved from the Internet 12 December 2010.
- JICA (Japan International Cooperation Agency). 2010a. Country gender profile: Solomon Islands. IMG Inc. <http://www.jica.go.jp/activities/issues/gender/pdf/e09sol.pdf>. Retrieved from the Internet 8 November 2010.
- JICA (Japan International Cooperation Agency). 2010b. Country Gender Profile: Tonga. JICA IMG Inc. <http://www.jica.go.jp/activities/issues/gender/pdf/e09ton.pdf>. Retrieved from the Internet 17 January 2011.
- JICA (Japan International Cooperation Agency). 2010c. Country Gender Profile: Marshall Islands. JICA: Public Policy Department. <http://www.jica.go.jp/activities/issues/gender/pdf/e08mar.pdf>. Retrieved from the Internet 15 December 2010.
- Lambeth L., Hanchard B., Aslin H., Fay-Sauni L., Tuara P., DesRochers K. and Vunisea A. 2001. An overview of the involvement of women in fisheries activities in Oceania. Paper submitted to Global Symposium on Women in Fisheries, November 2001, Taiwan.
- Maddison M. 2011. Men and women of the Marshall Islands. PowerPoint presentation. www.unisa.edu.au/pacificproject/presentations/Men_and_Women_of_the_Marshall_I.PPT. Retrieved from the Internet 10 December 2010.
- Maetala R. 2009. Gender issues in fisheries. A look into gender issues in Solomon Islands Fisheries. Report Prepared for the NZAID Fisheries Review, 2009. Draft.
- MRC (Mekong River Commission). 2006. Gender and fisheries in the Lower Mekong Basin. Mekong Fisheries Management Recommendation No 4. Cambodia and Lao: MRC. http://www.mrcmekong.org/download/free_download/TAB-Management-Rec-No4.pdf. Retrieved from the Internet 21 February 2011.
- Novaczek I., Fitzpatrick S., Roach-Lewis S. and Mitchell J. 2009. At the table – exploring women's roles in the PEI fishery. <http://dc.msvu.ca:8080/xmlui/handle/10587/630>. Retrieved from the Internet 12 December 2010.
- SPC (Secretariat of the Pacific Community). 2010a. Human Development Programme. 2010. Unpublished draft Gender Stock take report – Solomon Islands.
- SPC (Secretariat of the Pacific Community). 2010b. Human Development Programme. 2010. Unpublished draft Gender Stock take report – Marshall Islands.
- SPC (Secretariat of the Pacific Community). 2010c. Human Development Programme. 2010. Unpublished draft Gender Stock take report – Tonga.
- SPC (Secretariat of the Pacific Community). 2010d. Strategic Engagement Policy and Planning Facility. 2010. Joint Country Strategic annual reports for Solomon Islands, Marshall Islands and Tonga. New Caledonia: SPC.
- Sullivan N. and Ram-Bidesi V. 2008. Study on gender issues in tuna fisheries: Case studies in Papua New Guinea, Fiji and Kiribati. Forum Fisheries Agency. DEVFISH Project. Available at <http://www.nancysullivan.net/pdf/companyreport-genderassessmentofthetunaindustryforpng.pdf>.

- Tuara P. and Nelson G. 2000. Gender analysis of the tuna industry as part of the Tuna Industry Management Plan of Solomon Islands: Stakeholders in the Tuna Industry. Pacific Islands Forum Secretariat, Fiji.
- Tuara P. 1998. An assessment of the role of women in fisheries in the Republic of the Marshall Islands. New Caledonia: Secretariat of the Pacific Community.
- UNESCO (United Nations Educational, Scientific and Cultural Organization). 2010. Women's and girls' access to and participation in science and technology. Paper presented to United Nations expert group meeting on gender, science and technology, 28 September–1 October 2010, Paris, France.
- Vunisea A. 2006. Republic of the Marshall Islands national tuna development and management plan – social and gender considerations. New Caledonia: Secretariat of the Pacific Community.
- Wichman V. 2001. Gender study on the tuna industry. Fiji: Pacific Islands Forum Secretariat.
- White G. 2000. From Johah to NOAA: Women in the fisheries profession. Women in Natural Resources Magazine. Reprinted in Institute for Women in Trades, Technology and Science. <http://www.womentechworld.org/bios/fisheries/articles/women.htm>. Retrieved from the internet 25 October 2010.
- Williams M., Williams S. and Choo P. 2001. From women in fisheries to gender and fisheries. Paper submitted to Global Symposium on Women in Fisheries. November, Taiwan.
- Woolley A.W., Chabris C.F., Pentland A., Hashmi N. and Malone T.W. 2010. Evidence for a collective intelligence factor in the performance of human groups. *Science* 330 (6004): 686–688. October 29, 2010.

Heading towards the mainstream from the margins¹

Meryl J Williams²

Change takes time and its direction can meander towards the desired target, or not. I want to reflect on the journey that the Asian Fisheries Society (AFS) has taken so far towards making gender in fisheries and aquaculture, with all its angles and complexities, a mainstream topic on its programmes.

AFS, the pre-eminent and mainstream fisheries and aquaculture professional society in Asia-Pacific, was created in 1984 and soon (1986) established a major and comprehensive triennial forum, the Asian Fisheries Forum (now the Asian Fisheries and Aquaculture Forum, see www.9afaf.org). Along with the Forum, several national chapters (India, Japan, Taiwan); specialist networks, e.g., fish health, social science; and thematic conferences, e.g., cage culture in Asia; and a scientific journal, *Asian Fisheries Science*, have established the interests and themes of AFS.

Starting at the margins

In 1995, a photo competition, organized by PADEK of Cambodia, highlighted graphically the presence of women in fisheries. Following this, in 1998, a new programme theme was introduced — women in fisheries — via the International Symposium on Women in Asian Fisheries.³ This symposium was treated very seriously by the leaders of the society and also the hosts in the Thailand Department of Fisheries. Indeed, in his welcome remarks, the Director General of the Department pointed out that one third of his staff were women. As the proceedings reveal, the papers were stimulating; many were descriptive but others were more analytical. One of the more memorable aspects of this event was the reaction many of the predominantly male attendees at the Forum. The most common question the organisers, male and female, received, was “can men attend?” Social science topics were not new to the society but somehow this topic seemed to be controversial. The implication was that this was not a totally serious issue and would only be of interest to women. I am pleased to point out that the idea was actually the initiative of a man, Dr M.C. Nandeesha, who then was working on aquaculture development in Cambodia and had previously organised a Cambodia Women in Fisheries Conference (1994) and an Indochina Women in Fisheries Conference (1996).⁴ I am also pleased to report that many men as well as women attended the 1998 symposium and took an active part in the discussion.

Holding the course

Undeterred, even emboldened, we went global, with the 2001 Global Symposium on Women in Fisheries. The papers, largely contributed rather than invited, were still predominately descriptive, but slowly more research and analysis were entering the discourse. We were and still are trying to find our feet in terms of a firm logical base. Some contributors are driven by feminist and human welfare considerations, others by theme-based research on topics such as small-scale aquaculture, or fish trade and women. Women’s development, fisheries and aquaculture development, and regional and national comparisons were all addressed. One important result was that a paper by Mary Huang was one of the first in the world to raise the issue, later confirmed in more detailed studies, that unfortunately HIV/AIDS was a prominent disease in many fishing communities. This dimension had not been picked up, even by countries taking AIDS action seriously, but it now is.

From “women in” to “gender and” fisheries

Our next symposium, the 2004 First Global Symposium on Gender and Fisheries, attempted to make the transition from “women in” to “gender and” fisheries.⁵ We also attempted to attract a greater research focus to get beyond the more descriptive work. Women in seafood processing became more

¹ The views expressed in this article are the personal views of the author and do not represent the policies or positions of any of the organisations referred to.

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³ <http://genderaquafish.org/resources-3/>

⁴ Nandeesha M.C. and Heng N. (compilers). 1994. Women in Cambodian fisheries. Proceedings of the National Workshop on Women in Fisheries. Bati Fisheries Station, PADEK, Cambodia. 128 p.

Nandeesha M.C. and Hanglomong H. (eds.) 1997. Women in fisheries in Indo-China countries. Proceedings of the seminar on Women in Fisheries in Indo-China countries. Bati Fisheries Station, PADEK, Cambodia. 167 p.

⁵ <http://genderaquafish.org>

prominent as the whole fish supply was increasingly taken into account. Thoughtful papers on women's economic contributions, the gender dimensions of fisheries management and power and empowerment aspects of aquaculture development were explored.

The 2007 2nd Global Symposium on Gender and Fisheries continued many of these themes, with a strong emphasis on reaching women through micro-finance, self-help groups and development projects. The globalisation dimensions and marketisation of fisheries received attention, as did the lack of access of many women to training to access new aquaculture technologies.

Throughout this period of more than a decade, the fisheries and aquaculture sector had made little progress globally in addressing gender issues, despite the burgeoning importance of dynamic, high investment supply chains to provide fish to markets across international boundaries.⁶ FAO, especially in Africa, had started to codify good practice on gender in fisheries, but the mainstream fisheries instruments, such as the FAO Committee on Fisheries, paid no attention to the topic. Slowly, this may be changing, however, if the 2010 Global Conference on Aquaculture (Phuket, September 2010) is any barometer. This decadal event had an Expert Panel that partly addressed gender issues (Expert Panel VI.3 on Human Capacity Development and Gender Issues) and its report was well received at the Global Conference.

The 3rd Global Symposium on Gender in Aquaculture and Fisheries at the April 2011 9th Asian Fisheries and Aquaculture Forum promises to be a well-attended and lively two-day event. It will break new ground in terms of breadth and depth of papers, which will be reflected in the proceedings expected later in the year. In addition, FAO will be holding a focused invitation-only consultation to brainstorm future priorities on gender in aquaculture and fisheries. We remain quietly confident that, along with the new small-scale fisheries declaration, the United Nations' UN Women organisation, and the International Collective in Support of Fishworkers' (ICSF) Casting the Net initiative, we may be seeing a groundswell of support for gender and fisheries entering the mainstream of fisheries.

In the case of AFS, the society's interests in gender dimensions are broadly to help the development of the sector through ensuring equality of access to men and women in professional and industry terms, and giving the sector access to the broadest and best expertise. Individual society members and supporters have more activist agendas that are not incompatible with the broader interests of the society. And although we may sometimes think that AFS has only progressed slowly, though surely, on gender and fisheries, I note that other mainstream professional societies in fisheries and aquaculture have made almost no progress, with the possible exception of the World Aquaculture Society.

⁶ Meryl Williams 2010. Gender Dimensions in Fisheries Management. In: Grafton, R. Quentin, Ray Hilborn, Dale Squires, Maree Tait and Meryl Williams (Eds) 2010. Handbook of Marine Fisheries Conservation and Management. Oxford University Press, New York, p. 72–86.

Shining a light on gender in aquaculture and fisheries: Report on the 3rd Global Symposium on Gender in Aquaculture and Fisheries

Meryl Williams¹

More than 30 years after the 1979 Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), discrimination on the basis of gender and its consequences for society is still struggling for mainstream attention, especially in aquaculture and fisheries. The Food and Agriculture Organization (FAO) 2010/11 flagship report on the *State of Food and Agriculture*² highlighted the gender gap in agriculture and estimated that raising women's farm productivity by 20–30% could lift 100–150 million people out of poverty. Held as part of the 9th Asian Fisheries and Aquaculture Forum at Shanghai Ocean University from 21 to 23 April 2011, the 3rd Global Symposium on Gender in Aquaculture and Fisheries (GAF3)³ of the Asian Fisheries Society shone a light on the gender gap in the fish sector. This, the Society's fifth women/gender symposium, attracted a record number of papers and stimulated lively discussions. It was followed by an FAO Special Workshop⁴ on Future Directions for Gender in Aquaculture and Fisheries Action, Research and Development, which will be reported on separately.

Common themes were revealed: the social context needs deeper diagnosis than gender alone in order to understand the complex 'back stories'; women are still invisible and often marginal in the fish sector, in trade and in natural resource management, although mainstream exceptions exist; the conundrum of women's access to micro-finance but their lack of progress in building assets; and the struggles and successes of achieving gender equality in institutions. Messages of hope also emerged, founded on intrinsic community and personal resilience strategies and innovations such as training and inclusive governance.

Gender is not a solitary social factor

In opening GAF3, Nandini Gunewardena of FAO urged researchers and agencies to take strategic initiatives to put gender more firmly on the aquaculture and fisheries agenda, especially by building the evidence base, and engaging in advocacy and networking to voice issues, especially those in which vulnerabilities are strongly gender biased.⁵ According to Marilyn Porter, simply adding the gender lens to fisheries research is not enough; social, culture, power and household lenses must also be added.⁶ With three examples, she illustrated why researchers need to understand complex 'back stories' when helping to improve women's lives. The examples were: Tanzanian development projects that underachieved because they ignored household economies, the social consequences from the collapse of the Atlantic cod fishery that resulted in the re-structuring of coastal communities in Canada, and the power of shore dealers over boat owners and workers in West Sulawesi, Indonesia.

Making women's contributions visible

Regardless of whether the aim is to improve women's position or envision a new, more gender-equitable society, GAF3 agreed that women lacked profile and recognition in fisheries and aquaculture. To make women's contributions more visible, Dr B. Shanthi shone a light on 13 particularly successful women aquaculture entrepreneurs of Tamil Nadu, India, showing that women can and do work successfully at all levels.⁷ The women included one who manages a freshwater prawn (*Macrobrachium*) and crab (*Scylla serrata*) hatchery and five women's self help groups from the Irrular tribal people raising ornamental fish. These successful cases also give clues as to how more opportunities can be created.

Since 1986, the International Collective in Support of Fishworkers (ICSF)⁸ has been shining a light on small scale fisher's contributions. Naina Pierri Estades summarised the 2010 outcomes of a major global ICSF initiative to revitalise the 'gender

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² <http://www.fao.org/docrep/013/i2050e/i2050e00.htm>

³ <http://genderaquafish.org/>

⁴ <http://genderaquafish.org/fao-special-workshop-2011/>

⁵ <http://genderaquafish.files.wordpress.com/2011/04/01-n-gunewardena-fao-intro-and-welcome.pdf>

⁶ <http://genderaquafish.files.wordpress.com/2011/04/02-m-porter-why-the-coast-matters-for-women1.pdf>

⁷ <http://genderaquafish.files.wordpress.com/2011/04/25-dr-b-shanthi-successful-women-entrepreneurs-tamil-nadu.pdf>

⁸ <http://www.icsf.net/>

agenda' in small-scale fisheries.⁹ Based on national and regional studies of gender issues, 'Recasting the net: defining a gender agenda for sustaining life and livelihoods in fishing communities' culminated with crystalising dreams for the future and an agenda for action. The new gender agenda puts women firmly at the centre of gender analysis, and stresses that small scale fisheries are those in which women are most involved.

How gender analysis adds value to fish supply chains

What theoretical base can researchers use on which to build their analyses and probe the complexity of gendered impacts in the 'global fish food regime'? Using the recent decades of fisheries development in Kerala State, India, as the context, and case studies of three Kerala women, Holly Hapke proposed a research framework that extends and links commodity chain approaches, such as multi-scaled gendered commodity chain analysis, with household level analysis down to the livelihood and household level.¹⁰ Among the complexities, the case studies revealed some common elements such as migration of husbands for work, diversification of family income sources, and combining of family skills to meet the globalisation challenges that have shifted Kerala's forms and loci of fish production and processing.

Another conclusion drawn from Dr Hapke's inquiry into gender theory and analysis in fisheries is the need to understand fish supply chains, including processing and marketing. Who does what and who controls what in fish processing was the subject of several other GAF3 papers, helping to shine a light on the complexities of gendered divisions of labour and identify suitable entry points for interventions.

Della Grace Bacaltos described gender roles in seaweed production and marketing in Davao del Sur, Philippines, based on studies by herself, N. Revilla and R. Sordilla.¹¹ The studies revealed the family-based nature of the farming. Men do most of the site preparation, care, maintenance and harvesting; women and men share the tasks of procuring planting materials and planting. In marketing, women share the load of negotiating prices and are more likely to receive the family's money. Industry wide, women take part in all stages, even management, although men take the lead. Della Grace Bacaltos also described a Davao region development project that established model farms and industry clusters

to help with value-added products and link the farmers, some of whom are former dynamite fishers, to markets.¹²

The global supply chain for farmed giant tiger prawn, *Penaeus monodon*, is one of Asia's most important and it has been subjected to repeated trade upsets over product quality and production methods. In Bangladesh, Mohammad Nuruzzaman reported how large farms have been fragmented to small holder farms that export over 50,000 tonnes of giant tiger and freshwater shrimp, and which rely mainly on family labour, including that of women. Farm productivity and profitability are decreasing and, more frequently, export shrimp consignments are failing quality checks. A new project included women in training programmes. Early experiences revealed what could be improved in family capacity building efforts, such as overcoming initial household resistance to including women, and minimising the dominance of men that can inhibit the women's classroom learning.

In 2004 in Bohol, the Cebu Technological University (CTU) assisted the only Philippine shrimp export factory to gain hazard analysis and critical control point (HACCP) certification. Recently, CTU examined the gender side of maintaining HACCP standards. Cecilio S. Baga reported that 80% of the workers were women below 30 years of age who undertook other work when not processing shrimp, which provides only intermittent work, depending on harvests.¹³ CTU helped train lowly paid, 'on call' women and men workers in processing *Penaeus monodon* (*pansat* in Cebuano), opening up job opportunities for potential workers. Despite pride in working in the HACCP plant, however, half the workers wished for better work for their children.

Milkfish (*Chanos chanos* or *bangus*) is the Philippine 'national fish' yet little is known of the gender contributions to its production and processing. *Bangus* was the focus of CTU's efforts to revitalise local production and extension by using 55 hectares of its own instructional fish ponds as a test-bed. Venerando D. Cunado reported that, in production, 90% of workers were men, whereas in processing of the product, 68% of workers were women.¹⁴ With the exception of some of the heavier work, however, women and men engaged in the same activities. According to Rosario Segundina Gaerlan, whose participation was supported by FAO-Spain RFLP, in the study done in eight project sites in Region I (northeast Luzon Island), value can be added to

⁹ <http://genderaquafish.files.wordpress.com/2011/04/41-n-pierri-icsf-gender-agenda.pdf>

¹⁰ <http://genderaquafish.files.wordpress.com/2011/04/04-h-hapke-complexities-of-globalization-in-fisheries.pdf>

¹¹ <http://genderaquafish.files.wordpress.com/2011/04/29-della-bacaltos-gender-roles-in-phil-seaweed-cluster.pdf>

¹² <http://genderaquafish.files.wordpress.com/2011/04/30-nuruzzaman-gender-in-small-scale-shrimp-farming-bangladesh.pdf>

¹³ <http://genderaquafish.files.wordpress.com/2011/04/32-c-baga-penaeus-monodon.pdf>

¹⁴ <http://genderaquafish.files.wordpress.com/2011/04/39-v-cunado-gender-in-bangus-production-cebu-tu.pdf>



Women workers in Periyar Mud Crab Hatchery, Tamil Nadu, India

(Image: B. Shanthi).

bangus production by enhancing the processing and business skills of women and men in the supply chains.¹⁵ With good management practice, attention to sanitation procedures, as well as equipment, capital and know-how backed up by government programmes, surplus aquaculture production was turned into household and community profit.

Canned tuna may be the most recognised tuna export globally, but, in parts of the Philippines, hot smoked frigate mackerel (*Auxis thazard*), known as *tinap-anan*, is a favourite. In 2005, Corazon. P. Macachor, a food technology researcher, developed methods for monitoring the histamine levels in *tinap-anan* to ensure food safety during *tinap-anan* processing, using the new facilities at Danao City fish port.¹⁶ Recently, she examined gender roles in frigate mackerel supply chains and found that both women and men contribute to the safety of *tinap-anan* processing. Quality control starts with men's on-board handling. Women dominate the processing and need periodic training in safety aspects of *tinap-anan* processing and in how to make other value-added products of abundant tuna species.

Gender in the aquaculture and fisheries mainstream

Frequently, projects to assist women focus only on small scale and minor industries within the fish sector. The GAF3 Symposium heard three presentations

on gender dimensions in mainstream sectoral industries, namely, carp culture in India, carp polyculture with small indigenous species (SIS) and prawn in Nepal, and fisheries development projects.

'India is basically a carp culture country,' said M.C. Nandheesha. India's freshwater carp aquaculture was studied in ten states in the north, east, north-east and south.¹⁷ Women's participation varied greatly across states, being very low in Andhra Pradesh (south) and Punjab (north), both states with large production. Women's participation was considerable in Manipur, Assam and West Bengal (east and north-east), although largely in pond fertilisation, nursery rearing, feeding and harvesting. Self help groups were often the vehicle for women's participation. Traditions, cultural differences and the economic level of the women appear to account for the large inter-state differences.

Sunila Rai's work in Nepal presented a different angle on women in carp-SIS-prawn polyculture.¹⁸ In Nepal, carp polyculture is the main aquaculture industry but it does not supply household food. For family consumption, small indigenous fish offer greater nutritional value, as, for example, some have up to twice as much vitamin A than carp. Working with the Tharu community of Chitwan, experimental aquaculture demonstrated that, despite water quality problems, polyculture

¹⁵ <http://genderaquafish.files.wordpress.com/2011/04/31-r-segundina-rural-women-and-post-harvest1.pdf>

¹⁶ <http://genderaquafish.files.wordpress.com/2011/04/40-c-macachor-processing-frigate-mackerel.pdf>

¹⁷ <http://genderaquafish.files.wordpress.com/2011/04/06-mc-nanceesha-women-participation-in-carp-culture.pdf>

¹⁸ <http://genderaquafish.files.wordpress.com/2011/04/19-sunila-rai-nepal-carp-sis-culture.pdf>

of carp, *Macrobrachium* and SIS gave overall higher production without affecting carp production. The women farmers' ponds with SIS returned 50% more income than those without. The fish were partially harvested over 250 days and households consumed more than half the harvests.

Rarely is gender mainstreamed in large fisheries development projects to the extent it is now happening in the FAO-Spain Regional Fisheries Livelihood Programme (RFLP) for South and Southeast Asia. Typical fisheries development projects tend to marginalise women and their work and focus on 'more important' technical issues. Drawing on development theory and practice, Angela Lentisco reviewed tools that could be of use for gender analysis in fisheries development projects, including the gender roles framework, the triple roles framework, the gender analysis matrix, the women's empowerment framework and the social relations framework.¹⁹ With the focus on small-scale fisheries projects, the RFLP has put together a set of tools for use in different phases of the project cycle, from planning to evaluation. The RFLP also conducted a workshop to gain information on the gender approaches and tools that were being used by the different fisheries agencies and development organisations in the Asia-Pacific Region. She presented a summary of the recommendations of this workshop, and concluded that, despite the richness of materials available, 'we need to make the topic of gender more accessible, palatable and punchy (without losing the real meaning)'.

Vulnerable and marginal

Many women are considered marginal and vulnerable in fisheries supply chains but women and vulnerability should not be confounded. However, Ramachandran C Nair's analysis in India exposed how even success can make women vulnerable in the contested space of Indian marine aquaculture.²⁰ Across five Indian states, mussel farming and seaweed culture were developed largely as platforms of women's empowerment, whereas, from the start, open-sea cage culture is masculine in its conduct. Once women's mussel and seaweed farming became profitable through state support, banks joined and the industries seem headed towards male-dominated coastal privatisation, led by the more mature mussel farming, for which common property rights are becoming defined. The women-dominated industries started out without

any common property rights, whereas cage culture has these from the start. The states, which earlier promoted women's development at the community and household level, are silent on the contest for capital and coastal space rights.

For poor households, microfinance has become a popular though increasingly questioned solution. It is often targeted at women, even if the gender dimensions are rarely studied. Two presentations at GAF3 showed that microfinance, while well regarded by the recipients, usually does not increase their assets and productivity. In two districts of Kerala, India, Nikita Gopal reported that government-run and non-government-run microfinance schemes had helped family finances and improved household financial decision-making in low-income families but, since most of the funds had gone into meeting household expenses and not into entrepreneurial opportunities, asset creation had been minimal.²¹ In Guimaras, Philippines, Alice J. G. Ferrer found similar results when she studied women and men in fishing and non-fishing households.²² The decision to seek credit was typically taken jointly by the wife and husband but women then sought the majority of credit, mainly from informal sources. The credit, however, fed consumption rather than production and hence failed to improve productivity or living standards. Both studies stressed the importance of examining all sources of credit and better understanding the need for credit.

Women sea divers in Japan and Korea have long been a source of wonder but the reality of their way of life has been little understood. In Japan's southwest Iki Island, Nagasaki Prefecture, most *ama*, or sea divers, are women and more than half of them in the study presented by Cristina P. Lim were already in their 50s. While having formal rights to harvest sedentary species such as abalone and sea urchin, the *ama* earnings are declining, and their overall fishing rights and access to decision-making in the fisheries cooperative associations are secondary to those of the men.²³

In contrast to Japan where men still dive, in Korea, only women now dive. As in Japan, the divers are an aging group. Sun-Ae Ii traced the history of Korean women divers, many of whom are in the south and originally came from Jeju Island over 100 years ago.²⁴ Despite their ecosystem knowledge, and their household and community contributions, the women divers are marginalised on account of

¹⁹ <http://genderaquafish.files.wordpress.com/2011/04/07-a-lentisco-tools-for-gender-mainstreaming.pdf>

²⁰ <http://genderaquafish.files.wordpress.com/2011/04/09-ramchandran-sea-of-ones-own.pdf>

²¹ <http://genderaquafish.files.wordpress.com/2011/04/03-n-gopal-microfinance-india.pdf>

²² <http://genderaquafish.files.wordpress.com/2011/04/37-a-ferrer-gender-and-credit-access-guimaras.pdf>

²³ <http://genderaquafish.files.wordpress.com/2011/04/11-c-lim-braving-the-sea.pdf>

²⁴ <http://genderaquafish.files.wordpress.com/2011/04/17-sun-ae-ii-why-do-korean-women-dive.pdf>



Ama woman diver, Japan, protecting her face before diving (Image: C. Lim).



Woman fisher, Malaysia (Image: Z. Zainalaludin).

their gender, the fact that their fishing is inshore and targets only sedentary species, and they come not from peninsular Korea but from Jeju Island. The needs of the women divers are not addressed in fisheries policies and assistance.

Newcomers to a community are often marginalised. In Taiwan, however, where the rate of marriage with foreigners is currently about 15%, Nai-Hsien Chao found in five fishing villages that foreign spouses, predominately from China and Vietnam, tended to be self-motivated, hard working and well integrated into society.²⁵ Of the interviewees, 70% contributed all their earnings, much also from the aquaculture and fisheries sector, to family expenses.

Fishers and fishing communities are still vulnerable to poverty, even in fast modernising economies such as Malaysia, from which four GAF3 presentations examined poverty, aging and gender perspectives. Jariah Masud's work analysed Malaysian national poverty eradication programmes which, despite their considerable achievements and the growth of the fisheries and aquaculture sector, did not change the endemic poverty in fishing communities.²⁶ As women's roles in fisheries are invisible, special fisheries programmes never targeted women, even where women contribute as fishers, such as on Bruit Island, Sarawak. Likewise, women-only poverty eradication programmes were outside the economic mainstream, focusing mainly on the perceived social problems of poverty. Assumptions and practices with respect to gender, poverty and fisheries need to be rethought

and based on better understanding of poverty among fishing households. In another presentation, Jariah Masud explored the constraints faced by fishing community women in becoming entrepreneurial, and graduating from survival to high-income status from fish-related and other enterprises.²⁷ Several rural Malaysian women have succeeded in redesigning their businesses to become more productive and profitable but further study is needed to better understand what factors contribute to success, including how to best use or even avoid credit.

Tengku Aizan Hamid's detailed analysis of the demographics of Malaysia's fishing population showed an aging trend, although in Sabah and Sarawak, foreign labour is causing 'younging' of the fishing population.²⁸ On average, traditional fishers are older than commercial fishers. Statistics on women's employment may need improvement before reliable patterns can be identified. National fisheries development policies seek to revolutionise the sector through subsidies, injection of equipment and infrastructure but these interventions do not reflect the realities of the skills available nor address the need for human capacity development that would be needed.

To stimulate GAF3 inputs to its design, Zumilah Zainalaludin presented draft plans for a regional workshop on empowering vulnerable stakeholder groups in fish farming that is part of the European Union-funded ASEM Aquaculture Platform.²⁹ The critical point will be who to target in order to stimulate mindsets on gender in aquaculture.

²⁵ <http://genderaquafish.files.wordpress.com/2011/04/05-nai-hsien-chao-foreign-spouses-taiwan.pdf>

²⁶ <http://genderaquafish.files.wordpress.com/2011/04/15-jariah-masud-poverty-eradication-fishing-malaysia.pdf>

²⁷ <http://genderaquafish.files.wordpress.com/2011/04/38-jariah-masud-enhancing-womens-role-in-fishing-communities-malaysia.pdf>

²⁸ <http://genderaquafish.files.wordpress.com/2011/04/16-tengku-aizan-populating-aging-fishing-communities-malaysia.pdf>

²⁹ <http://genderaquafish.files.wordpress.com/2011/04/20-zumilah-zainalaludin-asem-workshop-design.pdf>

Women in coastal cities and remote fishing communities

In two coastal cities of Central Java, Semarang (a large city) and Pekalongan (a small city), Indonesia, Zuzy Anna used rapid quantitative appraisal (rapfish) analysis on ecological, economic, social and institutional uncertainties facing two groups of women — wives of traditional fishermen and wives of non-fishermen but engaged in fishing-related activities.³⁰ The areas studied have among the highest divorce rates in Indonesia. Fishers' wives near Pekalongan tended to experience the least uncertainty and those near Semarang the most. Non-fishers' wives experienced less seasonal effect than the fishers' wives. The most important drivers for the different dimensions of uncertainty were: ecological — drought, pollution and season; economic — volatility in production and income; social — family instability, unemployment and health; and institutional — dependency on credit and savings and local financiers. The women used many different strategies to cope with fishing and non-fishing uncertainties, such as reigning in spending and taking up piece-work outside the home. Personal and cultural attitudes also played their part, including a 'life goes on' outlook.

Although satisfying the national criteria for classification of fishers, women in the remote Pantar islands of East Nusa Tenggara, Indonesia, are less regarded than men as marine resource users. Using participatory rural appraisal and focus group discussions, Ria Fitriana thoroughly documented the women's and men's fishing-related activities, throughout the supply chain, revealing a great range of overlaps and complementarities in fisheries activities.³¹

In coastal Sri Lanka, the poor fishing village of Naguleliya is heavily dependent on fishing. C.D.A.M.P.A. Dissanayake found increasing dependence on women's fishing by hand or helping in seasonal beach seining, especially in households supported by widows or where husbands were unemployed.³²

The central coastal region of Vietnam also presents challenges, especially to women dependent on fisheries resources, according to Nguyen Dang Hao who, under the FAO-Spain RFLP studied 16 communes in the provinces of Quang Tri, Thua Thien Hue and Quang Nam.³³ Here, on average, women bear more children than the national average and work 12 to 14 hour days, three to four hours longer

than the men. People in these poor provinces suffer from low education levels, combined with escalating fishing pressure on open access resources under sometimes dangerous and risky conditions, such as hurricanes. These handicaps mean that women, while having access to credit, know little about financial management and have almost no voice in managing the natural resources due to the prejudices of traditional beliefs. Women generally have fewer money-earning opportunities than men, except in raising livestock and trading fish. Although women and men have high participation rates in the Women's Union and Farmer's Association respectively, these bodies offer little more than sympathetic support and the opportunity to share experiences.

'Edging up the ladder' was how Cristina P. Lim characterised the progress of most women in Ban Thung Maha, a Thai-Buddhist village on the Andaman Sea coast of Thailand.³⁴ Women undertook a wider range of complementary activities than the men — fishing and coconut, rubber and palm oil plantation and household tasks — but held little in terms of formal fishing rights and positions in local institutions. Case studies show five women forging their own and joint family income opportunities to survive but some did not even dare to dream of a better life.

HIV/AIDS and tsunami affected communities

Aquaculture and fisheries may be especially important to households affected by natural calamities and heavy disease burdens. In Namibia, Africa, the need to find food and income-producing opportunities for women affected by HIV/AIDS resulted in the Mangulukeni Fish Farm project. According to the results presented by Gosbert Hamutenya and facilitated by Kibria Ghulam, the first harvest of tilapia was poor due to an unexpected flood that shortened the growing season, but women still felt empowered by the farming experience.³⁵ GAF3 participants offered suggestions for building on the early sense of empowerment experienced by the women. Suggestions to improve future harvests included assistance through special project funding and greater technical assistance to diagnose the productivity problems.

In the 2004 Indian Ocean tsunami, 189 people, 150 of whom were women, were killed in Thotamuna village, Sri Lanka. Yet, today, women outnumber men by more than two to one. Fish are the main

³⁰ <http://genderaquafish.files.wordpress.com/2011/04/35-zuzy-anna-fisherwomen-in-face-of-uncertainty.pdf>

³¹ <http://genderaquafish.files.wordpress.com/2011/04/22-ria-fitriana-pantar-island.pdf>

³² <http://genderaquafish.files.wordpress.com/2011/04/14-dissanayake-naguleliya-village-sri-lanka-poor-women-and-fishing.pdf>

³³ <http://genderaquafish.files.wordpress.com/2011/04/23-nguyen-dang-hao-gender-issues-in-fishery-communities-in-vietnam1.pdf>

³⁴ <http://genderaquafish.files.wordpress.com/2011/04/33-c-lim-edging-up-the-ladder-thailand-ppt.pdf>

³⁵ <http://genderaquafish.files.wordpress.com/2011/04/36-gosbert-hamutenya-empowerment-mangulukeni-aquaculture-project.pdf>



Women attending training programme in shrimp production, Bangladesh
(Image: M. Nuruzzaman).

source of income and yet most local fish, caught by the men, bypass local women and go, via wholesalers, processors and exporters, to national and international markets, according to the work of Bandara Basnayake³⁶ whose participation in the Symposium was made possible by the RFLP. A detailed and gendered analysis of the causes and effects of poor growth in micro-enterprises has indicated that local gender relationships offer untapped potential for gradually building the amount of fish processed by local women with their skills enhanced to provide products to meet different market demands. Such efforts, if they could gradually break the existing trade cycle, could lift households out of poverty and further strengthen gender relations.

Climate change and environment

Climate change

Pacific island case studies from Melanesia (Fiji, Solomon Islands), Polynesia (Niue, Samoa) and Micronesia (Federated States of Micronesia) illuminated, albeit with some variations, the dominance of women in inshore, reef and lagoon fisheries and fish marketing. Young people are also major users of the coastal zone and therefore also impacted by climate effects such as sea level rise and greater salt intrusions to coastal gardens. While market-savvy,

women are not very knowledgeable on climate change and its impacts, even though the coastal locus of their work and the use of traditional fishing methods make them keen observers of the environment. While not underestimating the cultural shift required, Veikila Vuki concluded that women, young people and institutions that included them should urgently be brought into climate change decision making so that society can understand their needs and make use of their special insights.³⁷

In Barangay Bislig, Leyte, Philippines, a fishing-dependent village with many migrant families, Marieta Bañez Sumagaysay found that most women fish driers were aware of climate change through local signals, such as prolonged rain and unpredictable weather.³⁸ The impacts on fish drying, already challenged due to declining fish availability, were to increase the women's labour, the costs for additional salt and the losses from spoilage, all leading to lower income. Given limited livelihood alternatives, the women are adapting by paying more attention to weather forecasts, and adjusting their drying practices and technologies to copy with the new, irregular rainfall patterns. For these women, more long-term and lasting solutions will need greater technology changes and development of more livelihood options beyond fish drying.

³⁶ <http://genderaquafish.files.wordpress.com/2011/04/28-bandara-basnayake-gender-and-fish-supply-chains-a-case-from-sri-lanka.pdf>

³⁷ <http://genderaquafish.files.wordpress.com/2011/04/12-v-vuki-aliti-gendered-impacts-of-pacific-cc.pdf>

³⁸ <http://genderaquafish.files.wordpress.com/2011/04/13-m-sumagsaysay-adapting-to-cc-fish-dryers.pdf>



Discussing mangrove replanting plans, Philippines
(Image: Farisal U. Bagsit).

Mangrove replanting

Mangrove destruction has been serious in most tropical countries, not least the Philippines, where efforts to reforest coastal sites have met with mixed success. In two presentations, Farisal U. Bagsit³⁹ and Alice Joan Ferrer⁴⁰ delved into gender roles and responsibilities in mangrove reforestation programmes in the Western Visayas, Philippines. The studies examined different types of institutions involved in reforestation, namely a 14-year-old concerned citizens association (F. Bagsit) and six people's organisations, formed or recently strengthened in a three-year-old project led by a United Kingdom-based non-government organisation, the Zoological Society of London (A. Ferrer). In both studies, women tended to remain active longer than men in people's organisations and undertook a greater range of roles in the mangrove replanting and nursery activities. Where gender comparisons were possible, men tended to take on more leadership positions and tasks requiring greater physical strength, but women performed many different roles and substituted for husbands when they were not available. In Farisal Bagsit's study, the women earned low incomes from their other activities and valued the small additional income from sales of mangrove seedlings and propagules. Both studies revealed an appreciation of the importance of

reforestation and a shared camaraderie in the work, despite the work being onerous and taking people from other duties and jobs.

Gender matters in institutions

Gender is an important dimension in human institutions. In fisheries, this dimension is often ignored or, worse, women frequently are not given access to membership or rights. Even when gender is ignored, such as in some education institutions, wider social changes are altering the gender ratios in aquaculture and fisheries institutions. Rather than waiting for slow, passive, externally-driven change, actors have taken to activism and advocacy.

Over the last decade, successful activism by representatives of fishers' wives, fishing women's organisations and feminist academics in Europe has yielded major steps forward in formal standing and rights of women, e.g. achieving the 2010 EU Directive 2010/41 on spouse rights. Katia Frangoudes, from the frontline experience of academic research and activism in AKTEA, the European women's organisation, described how the European Union rather than national governments has demonstrated political willingness.⁴¹ The movement has observed that women activists have been critical to these achievements, and also that it cannot rely on women parliamentary leaders to advocate for women.

³⁹ <http://genderaquafish.files.wordpress.com/2011/04/18-farisal-u-bagsit-gender-mangrove-replanting-phils.pdfcom/2011/04/13-m-sumagsaysay-adapting-to-cc-fish-dryers.pdf>

⁴⁰ <http://genderaquafish.files.wordpress.com/2011/04/24-a-ferrer-women-and-men-roles-in-mangrove-rehab.pdf>

⁴¹ <http://genderaquafish.files.wordpress.com/2011/04/10-k-frangoudes-fisherwomens-organizations-europe.pdf>

In 2006 in Cambodia, where late 20th century wars reduced cohorts of men even more than those of women, the Ministry of Agriculture, Forestry and Fisheries developed and is now implementing, through the Fisheries Administration, a gender-mainstreaming policy and strategy in the fish sector. Heng Ponley, whose participation was made possible by the RFLP, stressed that, despite gender being a controversial and complex subject, and with limited resources and information on gender roles in fisheries, the policy and strategy had made encouraging progress in raising awareness and mainstreaming gender in the central Fisheries Administration.⁴² This is the vital first step to eventually achieving gender equality in the sector.

Women in research and education

As in many scientific fields, the aquaculture and fisheries career pipeline from education to research 'leaks' women at a greater rate than men, and women's career progress generally ends in lower salaries and less senior positions. This is despite equal opportunities, reported Hillary Egna, using data from nearly 30 years of work by the USAid-funded Cooperative Research Support Programmes (CRSP) for aquaculture.⁴³ Women represented about half the graduates in recent years; in 1999 an upward inflection occurred after earlier lower rates. Although the CRSP's director and principal investigator is a woman (Hillary herself), the numbers of women leaders and researchers are low (12–25%) and active efforts are being used to understand and break through the persistent career barriers and use the full potential of women graduates.

Stella Williams stressed that world development had ignored women for nearly 50 years, including in the field as farmers and fishers and in science, education and research.⁴⁴ African agricultural education and R&D statistics showed the typical 'leaky pipeline' with fewer women in higher positions. Stella shared her personal experience in aquaculture education, research and development and recent lessons from the African Women in Agricultural Research and Development (AWARD) programme, which is now engendering the African agricultural R&D through post-bachelors, masters and doctoral fellowships,

mentoring, networking and role modeling. Science and leadership skills are targeted in the fellowship holders from the ten AWARD countries.

Women and law enforcement

Based on a survey of over 600 people in five coastal municipalities of Southern Iloilo on Panay Island, Philippines, Caridad N. Jimenez reported on views of gender in fisheries law dissemination and enforcement.⁴⁵ Gender was not a major issue among the fishing communities, although women and men are perceived to have different strengths. Legal material was not regarded as gender-biased and women were seen as better than men at disseminating the materials. Two thirds of people had no preference on the gender of extension workers, and 95% thought that the gender of an enforcement officer was not an issue. Women were well regarded as effective in fisheries intelligence and surveillance. As expected, concerns were expressed at the idea of women having to deal with troublesome fishers, travelling far from home and going to sea.

Posters

The poster by XiJie Xu on women's roles in China's new fishing villages, inland and coastal, highlighted the critical roles and opportunities of women, who make up about 60% of the labour force and carry a substantial share of the work but have not yet taken full advantage of opportunities in China's new economic era.⁴⁶

Mundus Maris — *Sciences and Arts for Sustainability* — exhibited three outstanding posters, primarily on people in aquaculture.⁴⁷ 'A mosaic of people' presented the range of women's and men's roles in aquatic farming on the different continents;⁴⁸ 'Rapid aquaculture expansion and continued change' addressed the human capital challenges of aquaculture's rapid expansion;⁴⁹ and 'Making the rules work for people' stressed social and environmental justice.⁵⁰

Zumilah Zainalaludin found high levels of poverty in both able-bodied and vulnerable Malaysian fishing households but households with higher ratios of women tended to be most affected.⁵¹

⁴² <http://genderaquafish.files.wordpress.com/2011/04/26-h-ponley-mainstreaming-gender-cambodia-experience.pdf>

⁴³ <http://genderaquafish.files.wordpress.com/2011/04/08-h-egna-gender-biotech-research-programmes.pdf>

⁴⁴ <http://genderaquafish.files.wordpress.com/2011/04/42-stella-williams-award.pdf>

⁴⁵ <http://genderaquafish.files.wordpress.com/2011/04/42-stella-williams-award.pdf>

⁴⁶ <http://genderaquafish.files.wordpress.com/2011/04/p02-womens-role-on-the-construction-of-novel-fishery-towns.pdf>

⁴⁷ <http://www.mundusmaris.org/>

⁴⁸ <http://genderaquafish.files.wordpress.com/2011/04/p03-mare-1-people-in-aquaculture-today-mosaic-of-people-poster.pdf>

⁴⁹ <http://genderaquafish.files.wordpress.com/2011/04/p04-mare-2-people-in-aquaculture-expansion-and-change-poster.pdf>

⁵⁰ <http://genderaquafish.files.wordpress.com/2011/04/p05-mare-3-people-in-aquaculture-today-making-the-rules-work-for-people-poster.pdf>

⁵¹ <http://genderaquafish.files.wordpress.com/2011/04/p06-zumilah-zainalaludin-gender-poverty-and-fisheries-community-malaysia-poster.pdf>

G. Arul Oli and colleagues' poster stressed the importance of fisheries in India, the lack of attention to gender and outlined well-advanced plans for a non-credit certificate course on 'Gender in Aquaculture and Fisheries' for Indian fisheries colleges and research institutes.⁵²

GAF3 background information

GAF3 (<http://genderaquafish.org/>) was supported by the Asian Fisheries Society, the Food and Agriculture Organization (FAO), the National Network on Women in Fisheries in the Philippines, Inc., the FAO-Spain Regional Fisheries Livelihood Programme for South and Southeast Asia, the Indian Council of Agricultural Research, Shanghai Ocean University and Mundus Maris, as well as the personal support of all presenters and their organisations. It was held as part of the 9th Asian Fisheries and Aquaculture Forum hosted by Shanghai Ocean University, Shanghai, China, 21–23 April 2011. All supporters are gratefully acknowledged.

GAF3 was the 5th women/gender in fisheries/aquaculture symposium in the series hosted by the Asian Fisheries Society (AFS, www.asianfisheries-society.org) over the past 13 years. Founded in 1984, AFS is a non-profit scientific society that promotes networking and co-operation among scientists, technicians and all stakeholders involved in fisheries (including aquaculture) production, research and development in Asia. Its ultimate objective is to enhance food security and income-generating

opportunities for fisheries workers via sound management practices, environmentally sustainable development and efficient utilisation of aquatic resources.

At GAF3, 48 papers were presented, 41 oral papers and 7 posters, as well as a discussion session in preparation for the FAO Special Workshop that followed GAF3. Presentations and posters covered the following geographic areas: global — 9 presentations; countries — *Asia*: Bangladesh, Cambodia, China, India, Indonesia, Japan, Korea, Malaysia, Nepal, Philippines, Sri Lanka, Taiwan, Thailand, Vietnam; *Africa*: Namibia, Tanzania; regions — South and Southeast Asia, Pacific, Europe. Presenters came from 21 countries.

On 23–24 April 2011, FAO convened a Special Workshop on 'Future Directions for Gender in Aquaculture and Fisheries Action, Research and Development'. FAO will report on the outcomes of this Special Workshop elsewhere and notice of outputs will be posted on <http://genderaquafish.org/>.

GAF3 Organizing Committee. Meryl Williams (Chair), Melba Reantaso (Vice Chair), Choo Poh Sze (Vice Chair), Rosario H Asong, Katia Frangoudes, Kibria Ghulam, Mafaniso Hara, Hisashi Kurokura, Kyoko Kusakabe, M. C. Nandeesha, Marilyn Porter, Ida Siason, Katherine Snyder, Kripa Vasant, Nireka Weeratunge, Stella Williams, Sijie Xu, Veikila Vuki, Yinghua Xu.

For further information

Website

<http://genderaquafish.org/>

Facebook

<http://www.facebook.com/pages/AFS-Gender-in-Aquaculture-and-Fisheries/181176555231544>

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⁵² <http://genderaquafish.files.wordpress.com/2011/04/p01-g-arul-oli-certificate-course-on-women-in-fisheries-in-india-poster.pdf>

Strengthening the role of women in community-based marine resource management: lessons learned from community workshops

Zelda Hilly,¹ Anne-Maree Schwarz² and Delvene Boso²

Introduction

Community-based resource management (CBRM) forms an important component of the Solomon Islands Ministry of Fisheries and Marine Resources (MFMR) inshore fisheries strategy. The strategy recognises that community-based initiatives will be the engine of sustainable economic development in the inshore marine resource sector. Key activities in the strategy include developing and refining community-based management plans and testing livelihood diversification/supplementation strategies. CBRM is now supporting more than 113 locally-managed marine areas in Solomon Islands (Govan et al. 2009) and all members of a community — men, women, youth and children — contribute to the success, or otherwise, of CBRM initiatives.

Women play important but often undervalued roles in fishing-dependent families and communities in Solomon Islands. They collect, process, prepare and market fish and other marine resources, contributing directly to the well-being of their families and communities (Weiant and Aswani 2006). In Solomon Islands, women are traditionally (as wives and mothers) also nurturers, caregivers and supporters. These roles ideally position women to teach and pass on concepts such as those related to resource stewardship. Despite these vital roles in the household, women have tended to have less access to secondary education than men and a greater proportion of women than men is illiterate (Solomon Islands census 1999). Along with cultural barriers (e.g. Vunisea 2008), this can create a perceived barrier to being actively involved in decision-making in marine resource management. Accordingly, in communities where the WorldFish Center has been active in working with resource owners and users to implement CBRM, only small numbers of women (and youth) have tended to be actively involved (Paul et al. 2010; Boso and Schwarz 2010).

The important roles that women can play in contributing to CBRM has been recognised as essential to achieving sustainable management outcomes in Solomon Islands (Weiant and Aswani

2006; Kronen and Vunisea 2009; Boso, Paul and Hilly 2010). In order to facilitate greater engagement, WorldFish has tested an approach to marine resource management awareness and training for women, driven by requests from women in rural communities. Through an Australian Centre for International Agricultural Research (ACIAR)-funded project titled Diagnosing, Strengthening and Monitoring Small-scale Fishery Resilience, WorldFish adopted an adaptive learning, train-the-trainer approach and developed tools that can be used throughout the country.

Here we outline the process that has been undertaken to strengthen the CBRM role that women can play in several Solomon Islands communities in three provinces. We highlight key components of the training from which we have identified lessons learned. These are intended to inform the ongoing work of improving gender equity in community-based management.

Sites

All the workshops were conducted with representatives from rural coastal communities that had either begun or were in the process of implementing CBRM. The first was conducted with the women of Kia district in Isabel Province in 2009. This was a pilot community from which lessons learned were incorporated into the development of training resources for other communities. Subsequently, three further workshops were held: (a) in Gizo township for Jorio and Dovele women on Vella Lavella Island; (b) in Toumoa village for women from Toumoa and Kariki on Fauro and Shortland Islands, and (c) on the artificial islands of Lau Lagoon for Lau Lagoon women in Malaita (Fig. 1).

Workshop methodology and process

Training-the-trainers and selection of participants

The workshop facilitators were scientifically trained female staff working in the field of CBRM in Solomon Islands. The Gizo and Lau workshops were

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Figure 1. Solomon Islands with the target communities indicated by a star

facilitated by female Solomon Islands staff from the WorldFish Center with, in the case of Lau, assistance from a Solomon Islands staff member from the Federation of the Peoples of the South Pacific International (FSPi). In all cases this ensured at least one facilitator had familiarity with the local language and all were familiar with explaining biological concepts in English and pidgin.

For budgetary and resource reasons, only a limited number of participants from each of the communities was invited to participate. Selection was based on the following criteria.

- active member in the community/ leader in church activities, based on the assumption that such women would already possess some level of confidence in public speaking and could carry out subsequent awareness activities with relative ease;
- able to read and write — ideally, in English as well as in pidgin, so that they could effectively translate new concepts into their local language for their community members.

In the Gizo workshop, 17 women were selected by their leaders from eight communities in the Jorio

and Dovele regions. In Kia district, a women's group affiliated with the local church, the Mothers Union, approached WorldFish requesting training for the women on marine resource management. The Mothers Union already had a local community awareness programme planned about other aspects of family life and they thought that information on marine resources would be a useful component to add to their topic of 'healthy families'. The group was already organised, so women from within the group were selected to attend the training. For the remaining workshops, the selection of women to participate in the training was made by community leaders and marine resource management committees.

Training location

Workshops were held either in a CBRM participating community or, in the case of the Vella Lavella communities, in the nearby town of Gizo. One of the advantages of holding the workshop outside the community was that accommodation was easy to arrange (especially as there was a large number of participants from different communities, and village accommodation may have been difficult to provide) and women were comfortable in a neutral environment away from household chores.

There were, however, many advantages to holding workshops within the community. Firstly, the number of women participants could be increased because of fewer budget constraints (transport, town accommodation) and, secondly, other women from interested neighbouring communities were able to attend. For example, for the workshops held in Toumoa, a community that is remote from urban centres and therefore costly to visit, women from a neighbouring community who were interested in considering CBRM were able to attend. In Lau lagoon, 20 women from a number of different artificial islands participated. In Kia, on the final day, the trainers invited interested women from the community to come and be a test audience. The participants presented everything they had learned in the local language and answered questions from their audience, with the trainers at hand to clarify any concepts that were not clear.

In the village, women were given small per diems as compensation for earning opportunity lost during the time they spent at the workshop, and lunches and teas were provided by hired village caterers. Catering activities and accommodation for the project team within the community provided an opportunity for women in the village to earn some cash.

Workshop topics

The workshop content was developed around six key messages derived from topics of interest to the women and related to the goals of community management plans. Topics included: health and family, community management plan rules, and general marine resource and resource management information.

The overriding goals of most CBRM plans are to maintain or increase marine resources to provide for community needs into the future. Socio-economic surveys conducted by WorldFish (Boso and Schwarz 2009; Paul et al. 2010) show that women tend to have an understanding that resources need to be looked after and managed but that they often lack knowledge and information about the reasons behind management decisions and what needs to be done in order to achieve successful management. Often, women report that they are the last ones to hear current information about resource management in their communities as men do not always pass on information received from awareness meetings or workshops. The participants were, therefore, strongly focused on wanting to understand basic marine biology facts, such as the life and reproductive cycles of key marine resources and how these interact with marine resource management goals and activities.

Every attempt was made to sequence messages in a cohesive way so that each message led on from the

previous one and participants could easily follow the logic. The key messages around which the training was developed are given below.

1. Marine resources are important for a healthy family and a healthy community.
2. Healthy habitats are important for our marine resources.
3. Coral is an animal. A healthy reef is made of live coral.
4. Marine animals have a life cycle
5. If there is overfishing, there will not be enough food or money from marine resources in the future
6. Management of marine resources is important for community well being

Modes of delivery

The training was designed to cover the six messages over three or four days. Before starting each message, the women were given an exercise to do that explored their own knowledge. For example, for the 'Healthy habitats are important for our marine resources' message, before the trainers undertook to explain what habitats were, the women were asked to break into small groups and draw a map of all the places where they collected marine resources or knew that marine resources were to be found. After presenting their map to the whole group, the trainer gave a presentation on habitats, and the technical information was matched with the information the women had collected. The key message about habitats (in this example) was then distilled in a group discussion and the related printed materials distributed.

Important words and concepts were emphasised through repetition, and ample time was given for questions and general discussion, which was a useful way to evaluate the understanding of each message. Women who understood the concepts well were encouraged to use the local language to explain to other women who did not understand the concepts so easily. Finally, the participants worked in groups on each of the messages and prepared a presentation, which, on the final day, they presented back to the group (and any invited guests) in a local language or pidgin as they preferred. They were allowed to use the supplied posters and printed materials, as well as songs and drama, in their presentations.

In order to cater for the different learning modalities within the group, a variety of media approaches were used, including: discussions, group activities, video segments, singing and presentations. Local staff designed six A4 pages, each illustrating a key message. They were printed and laminated and

used as resource material (Fig. 2). Pictures and diagrams proved to be the preferred media for a range of learning styles and were used liberally. Power point presentations and videos were used opportunistically when a generator or power source was available, and posters from other sources (e.g. FSPI) were also used in the training. Printed and video materials were provided for women to take back to use in their village to facilitate the sharing of information with other women.

Resources and materials

The printed message materials were originally constructed in English and pidgin. Most text was translated into local language either during discussions or after each workshop. Participants requested that texts be made available in English as well as local languages, to ensure accurate understanding of local translations.

The idea was to provide key women from the community with the information and resources to go back to their community and explain what they had learned, particularly to other women and children. As funds would not necessarily be available for ongoing support of awareness-raising activities, this had to be achieved on an opportunistic basis.

Participants were encouraged to spread the messages and knowledge to their community at **any forum** where they felt comfortable conducting such informal training. Considering that women may not have time in their busy lives to fit in targeted training, the suggestion was to use any church gathering or women's meeting as an opportunity.

After the workshops, follow up assessments show that awareness conducted by the participants has ranged from informal discussions in the evenings as people gather together on the artificial islands of Lau, to funded and planned awareness tours by the women of Kia, where the Kia District Marine Resource Management Committee has registered as a community-based organisation and obtained a small grant from the Global Environment Facility to fund a number of activities, including this awareness raising. The participants from the Jorio region of Vella Lavella reported that they had been able to conduct awareness activities for women during church meetings and community gatherings. On Fauro Island, as a result of the participants from a non-project site (Kariki) attending the workshop, a marine resource management committee was formed and subsequently development of management plan got under way.

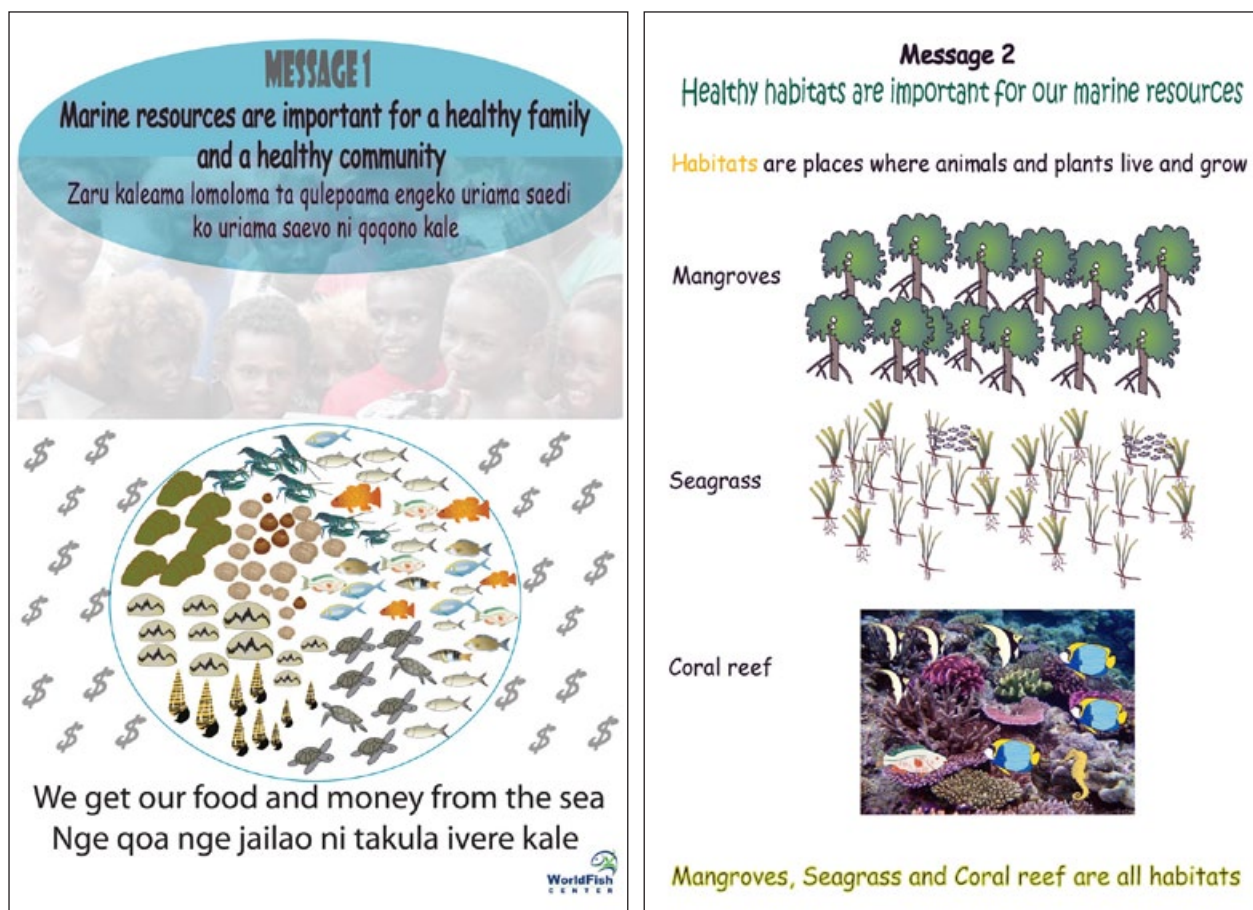


Figure 2. Message 1 (in English and Vella Lavella language) and Message 2 (in English)

Workshop evaluation

The women who participated in the workshops were asked to respond to a few questions before and after the workshops to evaluate their level of knowledge about marine resource management and their level of confidence in discussing this topic.

Eighty-one per cent of respondents indicated that they had never participated in a marine resource management workshop before. However, 23% of the respondents from both Vella Lavella and Toumoa had participated in a land resource conservation or management workshop. Twenty-one per cent had previously been involved in community discussions on marine or land resources, and 18% said that the reason for participating in community discussions was to contribute thoughts to the resource management in their area.

Prior to the workshop, participants expected to learn about marine resource management (48%) and marine resources in general (31%) and there was also some mention (14%) of learning about marine and land resources (Fig. 3). A minority of 7% had no expectation, as this was the first workshop they had attended.

At the end of the workshop, all the participants indicated that the most important topics learnt at the workshop were marine resources and habitats (74%), management (17%) and general marine awareness (9%).

Participants were also asked to identify subjects they had found difficult to understand (Fig. 4). These were marine resources, specifically biology (46%) and life cycles (27%). For example, additional time was required to understand the relationship between polyps and zooxanthellae, the fact that a clam is hermaphroditic but cannot fertilise its own gametes, and the fact that coral reefs are made of living animals. While these are neither straightforward nor easy to grasp in a short time and needed to be described in the various languages, they were nevertheless of great interest

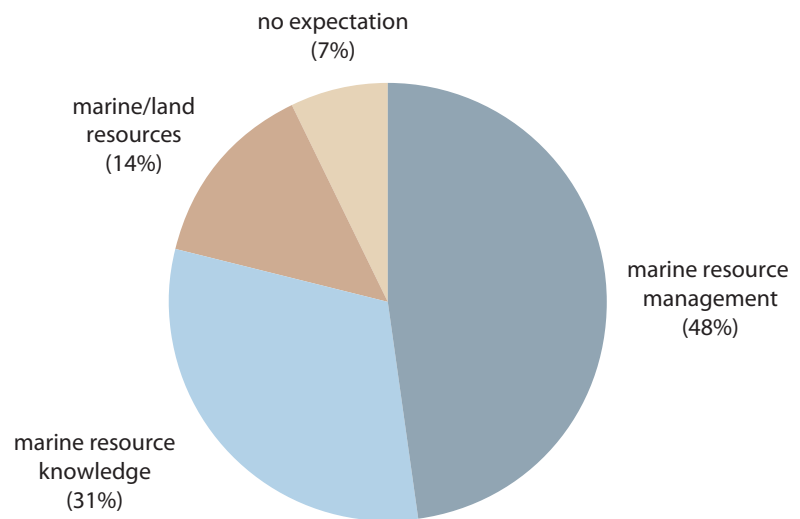


Figure 3. New things participants hoped to learn from the workshop. Some respondents gave individual responses before the workshop and group responses after it. Group responses have been treated as an individual response. (n = 31)

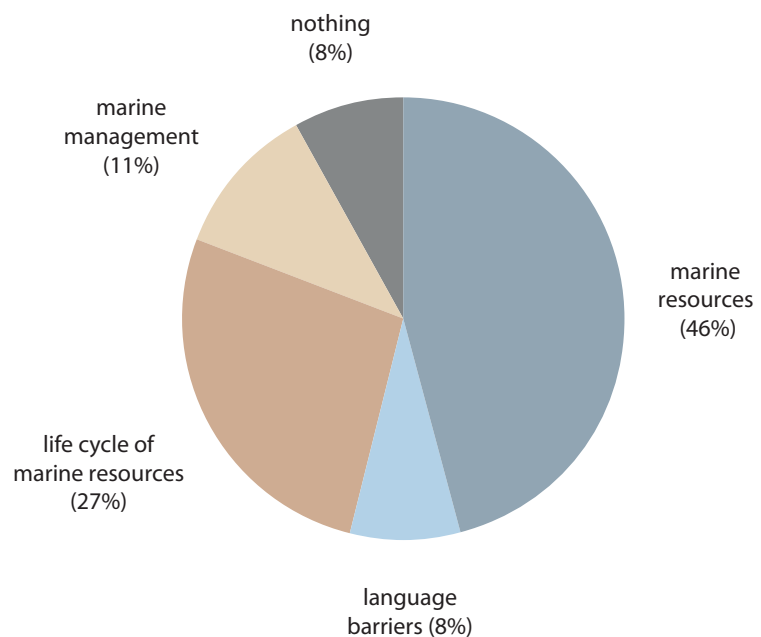


Figure 4. Subjects that participants found difficult to understand in the workshop

to the participants, particularly if they contrasted with common local understanding — that corals are dead stones, for example, and that different coloured clams of one species represent males and females.

In addition to marine biology and life cycles, a further 11% indicated that marine management was a difficult subject and 8% of participants (all from the Lau workshop) reported that language barriers

made things difficult during the workshop. Eight per cent of the participants felt that they had understood all the subjects dealt with in the workshop.

Before the workshop, the participants were asked about their confidence in speaking on marine resource management issues; first on the community level, which would include men in the audience, and, second, to a targeted group of just women and children. All the women said they were very confident or confident in speaking to a full community, and more than half (67%) said they were very confident and 33% said they were confident about speaking to a targeted group. When asked how they felt after having completed the workshop, 92% said they felt more confident, while 8% said they felt the same as at the start of the workshop.

Participants identified additional topics that they would like to have included, such as marine resource and life cycle information on specific animals (60%); aquaculture and fishing methods (20%) and economic issues (10%). Having completed the training, the women expressed their desire to see changes in their community as a result of their feedback and contributions after the workshop. Changes include: improvements in marine resource management (53%), more cooperation in management of resources (20%), replenished marine resources (20%) and protection of marine resources (7%).

Discussion

A number of lessons have been learned from the experiences of the Solomon Islands trainers in conducting the workshops.

1. *Selection criteria.* The selection criteria were necessary as there was rapidly increasing interest when word about the workshops spread. In the latter workshops where the group size was increased, it was necessary to tailor training further to effectively address different levels and styles of learning in the group. To retain the intention of the train-the-trainer's approach, it is important not to turn these workshops into a general awareness programme, which should be handled separately.
2. *Training location.* Although there are benefits to conducting the training in a nearby urban centre, facilitating workshops for women within the community is our preferred approach, as the number of women can be increased and money can be spent in the community to support cash flow. To date we have experienced a high degree of support among other community members for the workshops, such that the attendees were well supported in terms of childcare and other daily tasks. Moreover, cash-compensation for lost opportunities to go to the garden, for

example, also made it easier for the women to concentrate on the training.

3. *Workshop topics.* Having short key messages helps participants remember the main points when spreading these messages to other women and children at a later time, whether through informal story-telling or facilitating a village workshop. Short messages that cover basic concepts are suitable for participants with different learning skills and educational backgrounds. Messages developed around subject areas that were known to be of interest to women proved to encourage effective engagement.
4. *Modes of delivery.* The more time spent on getting the women to explore their own knowledge rather than trainers giving lectures or presentations, the greater their confidence was in their own understanding and ability to pass on the right message. The participants in these workshops preferred diagrams and pictures, finding them easier to understand than having to interpret meanings in a lot of words. Language translations of key points by participants (or trainers when possible) were well received. Group activities promoted more constructive discussions than individual work and enabled participants with better writing skills to assist others in the group. Group activities also utilised the various skills of the talkers and the non-talkers. Mixing the women to balance these characteristics encouraged the quiet and shy women to contribute to discussions.

Summary

The women's train-the-trainer workshops that specifically targeted the role that women can play in supporting their communities' marine resource management initiatives have been very well received by the participants and in general have received support from the wider community resource management committees. This is evidenced by some of the women joining men who represent the committees or technical teams in conducting awareness activities in neighbouring communities, and/ or being supported to undertake such initiatives. Although all the women had relatively high levels of confidence at the start of the workshops, they felt still more confident after the workshop about discussing marine resource management concepts in their communities. Each group has made some effort to talk about what they learned in formal and informal settings. Useful feedback from the participants on materials and techniques used; and lessons learned on effective candidate selection, methods of delivery and location of workshops will be incorporated into recommended training materials and protocols for CBRM in Solomon Islands.

Acknowledgements

We are very grateful to the women who participated in the workshops for their enthusiasm to learn more about marine resource management and for their feedback, which will improve future delivery of this programme. We thank Joanne Pita (FSPI) for being a co-facilitator at the Lau workshop and for providing useful insights; WorldFish Center team members from Gizo and Honiara for logistical support in getting the team and participants to and from workshops, and Ministry of Fisheries and Marine Resources and provincial fisheries officers for providing logistical support and staff on field trips.

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References

- Boso D., C. Paul and Z. Hilly. 2010. Lessons learned from community-based adaptive marine resource management in Solomon Islands. Honiara, Solomon Islands: WorldFish Center.
- Boso D. and A. Schwarz. 2009. Livelihoods and resilience analysis in two community clusters; the Funa'afou and Foueda artificial island communities. WorldFish Center Report to ACIAR, project FIZ/2007/116.
- Govan H. et al. 2009. Status and potential of locally-managed marine areas in the South Pacific: meeting nature conservation and sustainable livelihood targets through widespread implementation of LMMAs. SPREP/WWF/WorldFish-Reefbase/CRISP. 95 p. + 5 annexes.
- Kronen M. and A. Vunisea. 2009. Fishing impact and food security – Gender differences in finfisheries across Pacific Island countries and cultural groups. SPC Women in Fisheries Information Bulletin 19:3–11.
- Paul C., Hilly Z., Bennett G. and Schwarz A. 2010. Livelihoods and resilience analysis in Dovele, Western Province Solomon Islands. WorldFish Center Report to ACIAR, project FIS/2007/116.
- Solomon Islands Government. Report on the 1999 housing and population census. Statistics office.
- Vunisea A. 2008. The 'culture of silence' and fisheries management. SPC Women in Fisheries Bulletin 18:42–43.
- Weiant P. and S. Aswani. 2006. Early effects of a community-based marine protected area on the food security of participating households. SPC Women in Fisheries Information Bulletin 19:16–31.

The seaweed harvesters of Alao

Irene Novaczek¹

Source: SAMUDRA, Issue #47. 2007.

While archaeological evidence confirms that inhabitants of the Chiloe archipelago used sea plants for food and medicine, today's islanders sell off all the harvest. A fun workshop brings back to the island its ancient practices

In February 2011, I travelled from Prince Edward Island, Canada, where I live, to the archipelago of Chiloe, off the southern coast of Chile. As the Director of the Institute of Island Studies at the University of Prince Edward Island (<http://www.islandstudies.com>), my purpose was to meet with representatives of the ARCIS Patagonia University as well as an indigenous tribal council, the Williche Council of Chiefs, who have been our partners in research projects since 2005. I was taken to the Quinchao group of islands, which lie along the eastern flank of Chiloe, to visit the tiny island of Alao. Alao is home to only a few hundred people, many of whom are considered to be poor; they often rely on harvesting seaweeds for cash income.

On arrival at the wharf in Alao we were greeted by the sight of a local farmer-fisherman driving a pair of oxen. Pigs and chickens and an assortment of dogs roamed through the hamlet next to the wharf where the island's school, the medical clinic, a dilapidated church and a small number of houses were located. Our boat had brought to Alao its paramedic, who looks after the clinic. From the wharf where we had alighted, a ferryboat transports the people of Alao to other islands nearby.

There is only one tiny shop on the island selling a few basic supplies such as cooking oil, rice and sugar, but a wider selection is available on the other islands.

The dominant sea plant harvested on Alao is the large, fleshy, red *luga* (*Gigartina skottsbergii*). *Luga* is dried on the beach, stuffed into bags and transported to the mainland to be sold to factories that extract carrageenan. Carrageenan is used in a wide variety of food processing and pharmaceutical applications. It is the natural gum that, among other things, holds the chocolate in suspension in chocolate milk and keeps the medicine together in pills. It also makes ice cream creamy and factory chickens juicy. Another sea plant cultivated for commercial sale on Alao is *pelillo* (*Gracilaria chilensis*). This

plant is valued for its agar content and is also sold to factories that extract the agar for use in a variety of industries.

Seaweed harvesting was not always such a dominant feature of Alao's local economy. Twenty years ago a visitor would have seen many small fishing boats actively catching a wide variety of fish. But then, say the locals, dragger boats came from the mainland, tore up the bottom and caught all sorts of fish indiscriminately and in large quantities. Today, fishers report that there is no fish stock left that is worth the effort of fishing commercially. A few boats still go out to sea, but only to catch a few fish to feed their families, and only when there is nothing else to do.

On Alao, it seems there is always something important to do to support a family. There are vegetable gardens to tend, which produce the small red, white, yellow and blue native potatoes and the giant bulbs of garlic for which Chiloe is famous. There are pastures with livestock, especially beef cattle and the oxen and ponies that are called on to transport goods from place to place — there being only one truck and no cars on the island. And of course there is seaweed to pick, especially on the rocky north shore where *luga* is abundant. On this shore, there are also ancient *corrales de pesca*, or fish traps built of stone, which the aboriginal people used for fishing thousands of years ago.

Because I have expertise in marine botany and run a small business making and selling sea-plant products on Prince Edward Island, I was asked to provide a training workshop for the people of Alao on how to use seaweeds for food and medicine. This is something I have done on many small islands of the world where people are engaged in harvesting sea plants for sale to international corporations, because often the harvesters do not recognise that these same plants can be used in other ways to support the health, nutrition and income of their families. The harvesting, drying and transporting

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The training workshop for the people of Alao demonstrated the use of seaweeds for food and medicine.

of seaweeds is backbreaking labour, which usually earns very little money. The fishing families involved often suffer from poor health and food insecurity because of their marginal incomes, so it is important for them to understand how to maximise the benefits from the seaweeds they harvest.

On Alao, as in Chiloe generally, people commonly eat only two seaweeds. *Cochayuyo* (*Durvillea antarctica*) is a large, brown, leathery sea plant harvested from the cold waters of the Pacific coast, and can be found in many traditional soups and stews. *Luche* (*Porphyra columbina*) appears as small, translucent blades in shallow, sheltered waters and is a common feature in shellfish soup. Many rural people also remember how some other species were used by their ancestors. For example, the green sea lettuce called *lamilla* (*Ulva lactuca*) was traditionally used as fertiliser for growing potatoes but is now a neglected resource since most farmers have shifted from organic to chemical methods. *Llapin* (*Nothogenia fastigiata*), another red algae containing carrageenan, is still sometimes used by farmers to feed young pigs who are not growing well. Finally, there is a kelp called *sargazo* (*Macrocystis pyrifera*) that the aboriginal Williche people would use to heal broken

bones. Modern science and the rapidly growing health food movement recognise that all these species and many more that can be seen on the shores of Alao are edible and/or medicinal, yet most of these resources are either entirely ignored or used in a very limited way. Recent research on Chiloe suggests that the tradition of using sea plants is a cultural asset that is in danger of fading away.

I found that on Alao the use of sea plants for food or agriculture is rare, and medicinal uses are non-existent. No one makes any use of the *luga* and *pellilo* that they harvest for sale. This is a pattern I have noted among seaweed harvesters in many small islands of the world, but it is perhaps more surprising in the Chiloe archipelago when one considers the archaeological evidence of seaweed use over thousands of years. In 2008 it was reported that nine species of marine algae were recovered from hearths and storage spaces of ancient homes unearthed at Monte Verde II, on the mainland of Chile close to the Chiloe archipelago. These remains were dated to be from between 14,220 and 13,980 years old, indicating the use of seaweeds by the people who lived at the site at that time. The seaweeds were mixed together with medicinal herbs in

half chewed cuds, leading the archaeologists to conclude that they were used for both food and medicine. It is most likely that the original occupants of the Chiloe archipelago shared the sea-plant knowledge and practices in evidence at nearby Monte Verde. Yet today, people are unaware that many of those species found at Monte Verde, including *luga*, have any potential use as food or medicine.

We started our work on Alao by walking around meeting women and inviting them to a workshop to be held the following day. When we learned that there was already a workshop on how to build a greenhouse scheduled for the afternoon, we decided to start our workshop mid-morning with the intention of preparing a lunch featuring a variety of seaweed dishes for all of the workshop participants. Participants were invited to show up at 10 am and bring some food to share — some vegetables, shellfish or smoked fish. Then we went out to the beach to harvest some of the most commonly available edible and medicinal sea plants. In no time we had bags of *luga*, *llapin*, *lamilla*, *luche* and *sargazo*, which we carefully washed to remove all sand and bits of debris, and then laid out to dry. The larger plants were pegged onto clotheslines, to the bemusement of the locals. The smaller ones were spread on clean newspapers on top of chairs and tables in the clinic, where we were to spend the night. That evening we perched our teacups in the small spaces between fronds of seaweed on the desk we were using as a dining table.

The next morning we took over the kitchen of the school, which opened into a dining room with long wooden tables perfect for displaying our marine treasures. As participants filtered in, they were set to work washing, peeling and chopping vegetables and seafood, and preparing bread dough. Once the room was full, we started talking about the different seaweeds, how they could be used, their nutritional value and their medicinal properties. Recipes for the day were written on craft paper and hung on the

wall so that everyone could make their own copies. I told stories about seaweeds from other islands, including the one about Jamaica where young men believe that the seaweeds containing jelly have aphrodisiac properties. That's always a good one for breaking the ice!

First we oven dried three different sea plants — one red, one green and one brown — to make them crispy, after which some of our child participants gleefully crumbled them into small flakes using a rolling pin. These flakes were sprinkled into the bread dough to make vitamin-and mineral-enriched rolls. Then we tossed *luga* and *llapin* into pots of hot milk and cooked them until they disappeared and the milk became very thick. Half of the milk jelly was mixed with honey and vanilla and poured into a pan to cool into a delicious pudding. The other pot of thickened milk was mixed with smoked fish, smoked mussels, sautéed onion and garlic and a handful of crushed smoked chillies. This was also poured into a pan to cool and set into a jelly. Finally, we boiled up a huge pot of fish and vegetables and tossed in every sort of seaweed available. The results were delicious and we were especially happy to hear the women asking if they could use milk from their cows to make the pudding. Of course they can, and we hope they will, because at this point no one on Alao milks their cows. They claim that the children don't like milk so they get very sugary tea or Nescafe instead, together with white bread — the standard meal on Alao. But the kids at our workshop certainly did not object to the *luga* pudding!

One mother had a child with a nasty case of herpes on his face. Because carrageenan has anti-viral properties, we took time to whip up a *luga*-based skin cream, which everyone enjoyed slathering themselves with. All in all, it was a wonderfully fun and productive day. Thanks, Alao!

Traditional fishing methods, *raui* and gender roles in Arorangi village, Rarotonga, Cook Islands

Dorothy Munro Solomona¹ and Veikila Curu Vuki²

Introduction

In this paper, we discuss the traditional fishing methods used by the people of Arorangi village in Cook Islands, their management of the fisheries (*raui*) and gender roles in fishing.

The village of Arorangi is located on the main island of Rarotonga in the southern Cook Islands.



Figure 1. Satellite view of Rarotonga, Cook Islands, showing coral reefs and coastal villages (Source: <http://earth.google.com>).



Figure 2. Districts of Rarotonga, and the *raui* areas around the island.

Rarotonga is a high volcanic island and has a round rectangular shape (Figs. 1 and 2). Arorangi is located on the western side of the island.

During the pre-European contact period, the people of Arorangi lived inland near the mountains. But later they moved closer to the coast for easier trading of goods and access to the sea. Arorangi was formerly known as Puaikura, and the current village settlement forms a ribbon-like shape along the coast with only a few people living closer to the mountains.

The central part of the island is mountainous, with a maximum height of 2,000 ft. (approximately 600 metres). Rarotonga lies in the area covered by the southeast trade winds and is also influenced by winds from the east to northeast and to a lesser extent northwesterly winds.

Traditional fishing methods

The three different habitats in which people fish are the lagoons, reef flats and open sea or offshore areas. In the lagoon and reef flats, families tended to fish in groups in the past but now fishers go in pairs or alone.

Kikarau (coconut frond fishing)

This method of fishing is similar to gillnet fishing. Traditionally, the whole village prepared for this communal fishing activity. The coconut frond is prepared by splitting it into halves and tying the ends together until about 10 coconut fronds are tied together in one or two sets.

During fishing, men and women hold the *kikarau* to form a semi-circle in the lagoon. The rest of the fishing group beat the surface of the water with sticks to frighten the fish into the *kikarau*. When schools of fish reach

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the *kikarau*, the fishers move closer together and finally close the circle.

Once the *kikarau* is closed, the men with spears spear the larger fish and throw them into the canoe for storage. Children and women catch the smaller fish by hand and place them in the canoes or fishing baskets. When enough fish have been caught everyone returns to the beach and the catch is shared equally according to the number of people in the fishing households.

Today, this type of fishing is being replaced by gillnetting. Gillnetting is carried out by about four people. This type of communal fishing is normally done during Christmas and New Year holidays when most families have time to fish. Gillnets are usually set overnight or during the day.

Pa ika

Pa ika are also used in the lagoon. Stones are piled high, forming walls that create a trap (fish fence). At high tide, the fish swim over the walls of stone to feed or hide. When the tide recedes, the top of the walls emerges from the water and fish are trapped within the *Pa*. Fishers usually check the *Pa* at low tide. Fish caught are then placed in fishing baskets and taken home.

The building of the *Pa* is done by men, but men, women or children can collect fish from the *Pa*. This method is hardly used now because it is time consuming to build the *Pa*. Overfishing has also caused a reduction of stock in the lagoon and therefore fewer fish are likely to be trapped in the *Pa ika*.

Pokipoki

This is a V-shaped hand net that is dipped into the surge channel so that fish swimming past get entangled. The fish are then scooped up using hand nets. The *pokipoki* is made of wild hibiscus bark or coconut fiber.

Only two people are required to conduct this type of fishing: one has to hold the *pokipoki* and the other has to scoop the fish out. This method is usually used by men because this type of fishing is done near the surge channels where there is a high risk.

Netting

This fishing method is used by men at the deeper side of the reef channels during ebb tide in the morning and at midday. The net is about 100 metres long and 3–4 m deep. Two or three men paddle an outrigger canoe outside the reef. When they reach the breaking waves, they wait patiently until there is a break in the waves crashing onto the reef, then set the net parallel to the reef. Men on the reef then form a semi-circle and begin to beat the water

surface and poke reef crevices with sticks. This is repeated several times until enough fish are caught in the net. This method of fishing has been replaced with scuba diving or spear fishing.

Matau toko

Matau toko is used for deep-sea fishing in about 120 fathoms of water. A stone is used to take the line down and the line is marked to give an indication of the depth to which the hook and bait are dropped. Bait is wrapped around the hook and a leaf is wrapped around the bait and this is held by a copper wire or bark.

When the hook reaches the desired depth, the line is firmly pulled to release the stone and the line is jerked up and down to attract the fish.

Notes on fishing methods and daily fishing

Although some fishers still retain traditional fishing methods and knowledge of fishing, many have welcomed the changes from traditional fishing methods to modern methods. Fishing methods that are common in Aorangi are gillnet fishing, spear fishing, night time lantern fishing and gleaning on the reef. Because of paid employment, very little fishing is occurring in Aorangi. Most villagers will only go out fishing when they want to eat fish or on weekends and holidays when they can fish and also have recreation at the beach. The majority of the people in the village are restricted to fishing from shore and in the lagoon because there are very few canoes available for fishing. Most of the time, fish are bought or received from families who fish as a source of income.

Traditional knowledge

Fishing is usually done according to seasons, phases of the moon, tides, the lightening and darkening of the sky and wind directions. With a good knowledge of these elements, a fisher can predict the type of fish that will be caught and how good the fishing should be.

When it is the season for a certain species of fish, master fishers will survey paths usually followed by this species. Once a school of fish is sighted, a fisher signals a group, which organises the catching of the fish, usually by surrounding them.

Fisheries management – *raui*

In Arorangi, fisheries management is known as *raui*. *Raui* is usually put in place by a person of high birth rank. *Raui* is enforced when an important occasion is planned, especially when anticipating weddings and feasts or when the fish stock is being depleted. When the *raui* is planned, the whole village is informed of the area, the purpose

of the closure and the period of closure. Breaching of *raui* is severely punished.

Today, traditional fisheries management (*raui*) has been revived because of conservation efforts. About 20 years ago, there was limited traditional management taking place because chiefs had very little authority except in land matters. But with the revival of *raui*, chiefs are taking an active role in fisheries management. Fisheries management within the lagoon is vital as these areas are heavily fished for invertebrate and finfish (Ponia et. al 1999; MMR 1998).

Roles of men and women

There is a distinct difference in the types of fishing women and men do and also where they fish. Usually, collecting and gathering are exclusively done by women, while men fish by using handlines, spears and diving at night.

Women tend to use very little gear and mainly have a basket and a sharp stick to poke and kill the catch. Women gather sea cucumber gonads and sea urchins from the lagoon. On the reef top, they usually collect shellfish, crustaceans and octopus.

Women and girls are also actively involved in torch fishing at night. At night, they grab sleeping fish using their hands and also place their hands in holes and crevices to catch octopus. Traditionally, women do not use canoes, hooks, lines or nets. But younger women are participating in fish drives and net fishing more often today.

Men usually go out in canoes for trolling and fishing using nets, spears and handlines. Traditionally, these were exclusively men's fishing methods. Men tend to look down on women's fishing because women glean and their catch is usually just enough for a day's meal (which is a more sustainable way of fishing). Women tend to collect delicacies such as sea cucumber gonads, sea urchins, shell fish and octopus. Men tend to fish in the lagoon and offshore and women fish in the lagoon and on the reef flat.

Today, the types of fishing reserved for men and women are not as distinct as they were 20 years ago because of modernisation. Women use nets, spears and paddle canoes just like men do. Nowadays, men also gather and collect invertebrates just like women do. Most women can now buy modern fishing gear and are not restricted to gleaning and collecting of invertebrates.

Modern fishing methods

The close relationship between the people of New Zealand and Cook Islands and the influence of modern equipment and techniques have made a great impact on traditional fishing methods. Nearly

all traditional fishing methods we describe in this paper are no longer used today in Arorangi. Modern fishing methods are similar to traditional fishing methods in terms of the fishing skills and techniques they require, but they are more efficient and the equipment lasts longer.

An example of modern fishing method is trolling using high-powered outboards. Gillnets are also a good example of modern fishing method and are quite common. They are made of monofilament nylon, lead weights and plastic floats. They are set overnight and can lead to a lot of wastage because if the nets are not retrieved in time, the fish will rot.

Another modern fishing method is spear fishing using scuba. This enables the fishers to stay longer in the deep water. Spear fishers can also dive using torches to fish at night. It is a very efficient method as sleeping fish are easy to catch. Modern fishing techniques are less time consuming and more efficient. But there are problems caused by the introduction of modern technology, including the disappearance of traditional methods and over-exploitation of the limited resources of the lagoon.

Conclusion

As fishing technology advances, traditional methods are being forgotten. In Arorangi, women gather invertebrates while men do spear fishing, rod fishing and netting. Now there is an increasing tendency for both genders to be involved in all fishing methods because of easier access to modern fishing gear.

Nowadays, fewer and fewer people are involved in fishing because paid employment limits the time they can devote to fishing. Therefore, the local catch can't satisfy the marine seafood demand of Arorangi people, nor can it meet the demand of Rarotonga people in general. Marine products are therefore imported from New Zealand and from the outer islands of Cook Islands.

References

- Ponia B.K., Raumea K. and Turua T. 1999. 1st monitoring survey of the Rarotonga rau'i: November 1998. Miscellaneous Report: 99/18. Avarua, Cook Islands: Ministry of Marine Resources of the Cook Islands. Ministry of
- Ministry of Marine Resources, Cook Islands. 1998. Basic information on the marine resources of the Cook Islands. Avarua, Cook Islands: Ministry of Marine Resources of the Cook Islands. 54 p.
- Solomona D.M., Tuatai T., Vuki V. and Koroa M. 2009. Decadal changes in subsistence fishing and seafood consumption patterns on Rarotonga, Cook Islands. SPC Women In Fisheries Information Bulletin 19:19–27.

The people of the artificial island of Foueda, Lau Lagoon, Malaita, Solomon Islands: Traditional fishing methods, fisheries management and the roles of men and women in fishing

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Introduction

Fishing has long been part of the lives of the people of Foueda, an artificial island in the Lau Lagoon, Malaita, Solomon Islands. Like neighbouring villages, fish caught are for family consumption or to barter for vegetables and crops with the people of the main island Malaita. These crops include taro, yam, and bananas, which flourish on Malaita. Bartering and food exchange bring closer kinship ties between the people living on artificial islands and those living on the main island of Malaita.

The artificial island of Foueda is located on the barrier reef of the Lau Lagoon (Fig. 1). The reef is almost like a vegetable garden and to manage the reef resources, certain management regimes have been implemented. These deal with the rate of harvesting of the fisheries resources. The different sections of the reef, which can cover several kilometres, are protected by different tribes in the village. Most fishing is done near the shore, though occasionally some men will venture offshore to catch fish such as tuna and other pelagic species. Fishing is classified as a man's occupation on Foueda. Women tend to collect shellfish for the evening meal.

Foueda village is located on the artificial island of Foueda, Malaita, Solomon Islands (Fig. 1). It is built on a barrier reef about one mile from land. The history of the artificial islands in the Lau lagoon is described briefly by Molea and Vuki (2008) and goes back to the ancient days of gathering and hunting. People migrated from the main island of Malaita to the artificial island because it was easier for them to see and fight any attacking enemies. Foueda village has about 60 houses and a population of about 300 people.

About 70% of the village's young people move to Honiara either to find jobs in town or to live with relatives while attending school. This means that most people living in the village are 35 to 70 years old. Children who are too young to attend school or those attending the nearby primary school (2 miles

away) also live on the island. The young people only return home at the end of the year to spend their Christmas holidays with their families.

The village is organised into several very distinct areas. There are separate common areas for men and women, and these are separated by a stone wall. There is also a common area for both men and women. In this paper, we describe the traditional fishing methods utilised by the people of Foueda Island. We also briefly describe the gender roles in fishing and the traditional fisheries management.

Fishing methods

Most fishing activities are done on the reef flat at high tide or in the lagoon. But occasionally people go out into deeper waters to fish for tuna, dolphins or other pelagic fish. Some common fishing techniques used by the people of Foueda are spear fishing, rope fishing, kite fishing, fish poisoning, netting and night diving.

Spear fishing

This is one of the most common methods of fishing. Spears are made by attaching sharpened stainless steel rods attached to a suitable bamboo or a piece of rounded palm wood. When using this method, a fisher dives and searches for fish under rocks, spearing any that come out. Sometimes a fisher will paddle a canoe into the lagoon and throw the spear at a school of fish. Rarely will a skilled fisher miss a school of fish. This method of fishing is also used to catch rock lobster at the edge of a reef on moonlit nights.

Rope fishing

The target species for this fishing method is rabbit fish. A long rope made from bush materials is pulled sideways by two people across the water. During the process, the vibrations made by the rope scare the fish, causing them to lay flat on the reef substratum. The rest of the fishermen can then wade behind the rope and spear the fish.

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Figure 1. The artificial island of Foueda, in the Lau Lagoon, on the northeast coast of Malaita, Solomon Islands (Source: <http://earth.google.com>).

Kite fishing

This method of fishing uses the principles of trolling. The largest fish caught using this method are the garfish and barracuda. A kite is made from sago palm leaves. Attached to the edge of the kite is a string made of braided bush strings or from modern nylon strings. At the end of the string is a lure made of spider web with no hooks attached to it. The kite is then flown by paddling across the water.

The spider web lure drags on the water's surface and when the fish see it they attack it. Their teeth stick to the wet, sticky spider web. The fisher knows a fish is caught when the line is tight and the kite falls into the water.

Fish poisoning

Although several different types of plants are used to poison fish, the most commonly one is *uka*, *Derris derris*. This plant has a dark green colour and is usually found in coastal areas or swamps. The leaves are pounded with sand and are often wrapped in bark cloth and placed under rocks where fish are hiding. Once the fish have taken in the poison, they float to the surface and the fisher can pick them up.

Netting

Before the introduction of modern fishing methods, nets were made from braided tree trunk fibres. These types of nets are mainly used as surrounding nets. The floats are usually made of wood and cowrie shells. When a fisher sees a school of fish, the net is lowered to surround the fish. The two sides of the

net are pulled to close it and the net is finally pulled up into the canoe. There are special canoes made specifically for net fishing.

Modern gillnets are used now instead of ropes. These are much stronger and easier to work with. Modern gillnets also last longer, require less maintenance, are more effective in catching fish. In addition, fishing with them requires fewer people than fishing with traditional nets.

Night diving

Night diving in Foueda is found to be the easiest and most efficient method of fishing. The introduction of waterproof battery-powered torches has really helped night divers. Fishers dive with a torch and search for sleeping fish, spearing them and throwing them inside the canoe. Although several cases of pneumonia have been associated with night diving, it is the easiest way of catching fish and for most fishers its efficiency outweighs the risk.

Roles of men and women in fishing

The residents of Foueda see fishing as a man's occupation. Traditionally, fishing is seen as a secret art, which is associated with religious rituals. The fishing gear, canoes and fishermen need to be blessed before they can venture out on a fishing trip. Women are not allowed to carry out the kinds of fishing that men do and are not allowed to touch men's fishing gear. The taboo is associated with the belief that if women touch the gear the fisherman will not have good catches.

Women do still have a role in fishing, although their role is very distinct from men's. At low tide women glean edible shellfish, crabs and octopus from the reefs. They also collect shells to sell them to shell collectors in Honiara. Sometimes they even find golden cowry, which is then sold at a very high price to shell collectors.

Traditionally, women's fishing was very distinct from men's fishing, but with the arrival of missionaries and Christian teachings, women are now able to fish with men. Women can also use trolling and hand-line gear, as well as gillnets, as these are available in the shops.

Traditional fisheries management

The barrier reef, which covers about 10 square kilometres, is owned by different people in the village. The different tribes own different sections of the reef, the boundaries of which are marked by rocks, lagoon passages or deep pools. In order to manage the reef sustainably and to provide food security for the people, past generations put in place regulations governing the utilisation of reefs.

From mid-July to September, a deeper area of the barrier reef is banned to all fishers. It is said that a killer shark often visits this area and can kill people, although the story could also be a way to ensure that people respect the fishing ban.

If there is going to be a feast, the owners of the different reef sections usually ban fishing in their areas. The ban may begin 5–6 months before the feast, to ensure that there will be fish when the feast takes place. Fishers are occasionally caught night diving at these areas, and are either warned not to re-offend or are made to pay compensation. During the taboo period, people fish in the lagoon and offshore.

The different tribes also have totems that are sea creatures such as sharks, giant clams, sting-rays and moray eels. The totem of the people of Foueda is the octopus. The Foueda people believe that octopus was a favourite food of their ancestors, who were brave warriors and gained victory over their enemies. It is believed that when these ancestors died they turned into octopuses. Octopuses have special protection on Foueda reefs, and because of these ancient beliefs the people will not eat octopus. Because of these restrictions, there is an abundance of octopus on reefs around the artificial island of Foueda.

The owners of reefs on Foueda have ultimate authority over the reef and its surrounding waters. The owners decide who may fish in the area and what types of fishing gear and methods may be used. When people fish in the area with nets, the owners of the reef sections check the nets to ensure that the fishers only catch enough for themselves. If the owner of the reef finds that a fisher has caught too many fish, the owner will lift the bottom of the net to free the fish trapped in it.

References

- Akimichi T. 1978. The ecological aspect of Lau ethnology. National Museum of Ethnology.
- Molea T. and Vuki V. 2008. Subsistence fishing and fish consumption patterns of the saltwater people of Lau Lagoon, Malaita, Solomon Islands: A case study of Funaafou and Niu-leni Islands. SPC Women in Fisheries Bulletin 18:30–38.

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