

Pacific invertebrate fisheries and gender – Key results from PROCFish

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Just as women's roles and contributions in fisheries are often under-recognised, so too is the importance of invertebrate fisheries. In the Pacific and other regions, these two aspects of fisheries — women and invertebrates — are related. In this note, I highlight some of the findings on gender and invertebrate fishing in Pacific Island countries and territories that deserve to be better known and explored in more detail. These findings include 1) men glean just as much as women in all Pacific Island cultures, but women are more likely to be exclusively engaged in gleaning and not also in finfishing; and 2) women are not engaged in dive fishing for high-value invertebrates.

Gender and fishery type are often closely related. In many countries, women do little finfishing, but can be equally active or even more active than men in fishing for invertebrates. This is an important structural issue that bedevils the quest for better sex-disaggregated fisheries data and assessments. Both women's fishing and invertebrate harvests are under-reported relative to men's fishing and finfish harvests. Not surprisingly, therefore, invertebrate fisheries receive much less policy and management attention than do finfish fisheries (Kleiber et al. 2014a; Fig. 1).

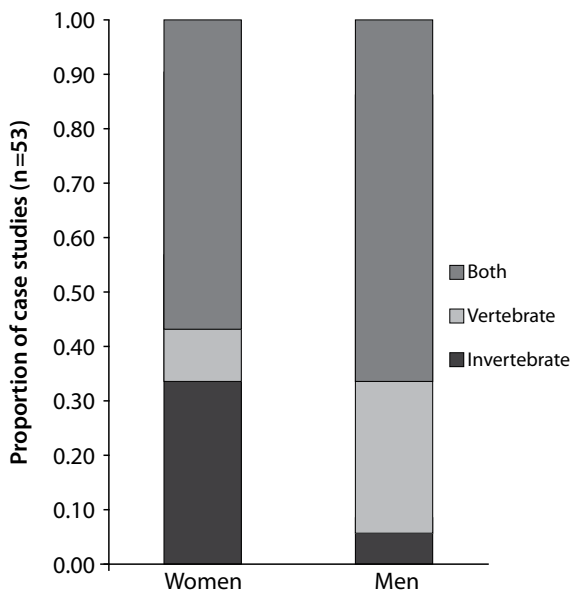


Figure 1. Gender and type of catch. Fisheries divided into vertebrate only (almost entirely fish, but in some cases including mammals and reptiles), invertebrate only (including shells, arthropods, cephalopods and echinoderms), or participation in fishing that targets all animal types. Only gender analysis case studies were included (from 53 case studies examined).

Source: Figure 3 in Kleiber et al. 2014b.

From 2002 to 2009, under the Pacific Regional Oceanic and Coastal Fisheries Development Programme (PROCFish), the Secretariat of the Pacific Community and its member countries conducted a major series of coastal fisheries assessments — biological, social and economic — through fieldwork at 63 sites in 17 Pacific Island countries and territories (Pinca et al. 2010). Thanks to the gender-aware design of the assessments, good sex-disaggregated data were collected (Kronen et al. 2007). At each site, and then in the cultural subregions of Melanesia, Micronesia and Polynesia, the assessment divided much of its work into finfisheries, invertebrate fisheries and socioeconomics. In the socioeconomics section, a short summary was also given of the gender dimension.

A very comprehensive technical report of the results of PROCFish is available (Pinca et al. 2010) and, in the refereed literature, papers have been published on finfisheries (Kronen et al. 2010a), fish community biology (Pinca et al. 2012), and socio-economic results (Kronen et al. 2010b). In addition, Kronen and Vunisea extracted the gendered results for the finfisheries for the *Women in Fisheries Information Bulletin* (Kronen and Vunisea 2009). In publishing the results of PROCFish for wider audiences, greater attention has been given to finfisheries. Pinca et al. (2010:122), however, indicated that invertebrate fisheries are also important:

Invertebrate fisheries are substantial in PICTs; however, they vary significantly among sites and countries studied. The importance of invertebrate fisheries for food security is supported by the average time spent fishing across all sites studied. The highest share of time spent invertebrate fishing is dedicated to gleaning (60%) rather than commercial diving activities (40%). [See also Table 4.5.]

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However, unlike finfisheries, there is a lack of gendered accounts of invertebrate fisheries from the PROCFish project. The full 512 page PROCFish technical report (Pinca et al. 2010), does, however contain some material that I will highlight, especially as these results are very different from those for finfishing.

Key results

The first point to make is that at any location, women were much more likely than men to be exclusively engaged in invertebrate fishing, regardless of cultural grouping (Table 1), and men were rather unlikely to be exclusively engaged in invertebrate fishing.

This leads to a major conclusion:

(r)egionally and within cultural groups, total harvesting time and total annual catch of major invertebrate species groups are generally equally shared by males and females. Today, the major gender difference in invertebrate fisheries is the fact that females do not — or rarely — participate in free-diving fishing activities, resulting in gender-biased access to, participation in, and benefit from commercial export fisheries. (Pinca et al. 2010:188).

This gendered difference between participation in gleaning and diving is made in Figure 2.

Table 1. Percentages of sites having gender participation in any of the fishery groups.

Fishery	Melanesia (n = 24)		Micronesia (n = 17)		Polynesia (n = 22)	
	Men	Women	Men	Women	Men	Women
Exclusive finfish fishing	92	50	100	41	100	55
Exclusive invertebrate fishing	38	88	35	88	36	91
Finfish fishing and invertebrate fishing	100	100	100	65	100	77

Source: Table 1 in Kronen and Vunisea 2010.

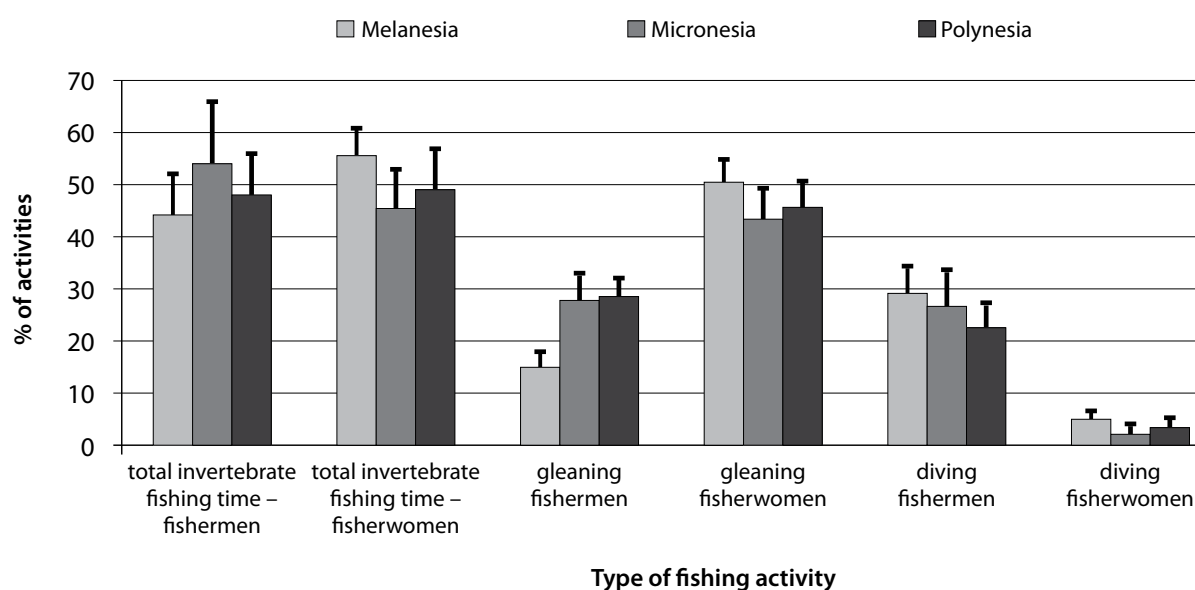


Figure 2. Average proportions (%) of total fishing time spent invertebrate collecting, gleaning and free-diving by gender and cultural groups. Source: Figure 2 in Kronen and Vunisea 2010.

Providing finer detail, by fisheries ecosystem, the gleaning and diving gender divide was demonstrated in all cultural groups by the greater focus by women on fishing for invertebrates in soft benthos ecosystems, mangroves, intertidal, and reeftop habitats; whereas men dominated fishing for beche-de-mer, lobster and trochus (Table 2).

Kronen and Vunisea (2010) reported that, based on computer modelling, whereas women and men had different finfish fishing strategies, women's and men's gleaning strategies were very similar, except in Melanesia where women annually more time gleaning than men. As a result, and again in contrast to the results for finfishing, women's and men's catch rates were very similar and differed little across cultures.

Use of invertebrate catches differed by gender and culture. In Melanesia, women were more likely than men to sell their catches from gleaning locally, and less likely than men to market their catches from commercial fisheries for export (Table 3).

In keeping with the quantitative analysis approach of the whole PROCFish research approach, Kronen and Vunisea (2009) also conducted multivariate quantitative gender analysis by exploring the major "drivers" for fishing, including examining differences among the three cultural groups. With respect to invertebrate fisheries, the exploratory findings included the following points, noting in the analysis an alternative classification of fishing into commercial and subsistence or artisanal. Also, in the following summary, I refer to associations and linkages rather than causation because the data are essentially exploratory rather than inferential or predictive.

- Fishermen's commercial activities were more closely related to national scale socioeconomic factors, but fishermen's and fisherwomen's subsistence and complementary income activities were more closely related to the socioeconomic conditions at the community, and household level.

Table 2: Percentage of fishing times (standard error) spent by gender group for invertebrate fisheries across three cultural groups (n = total number of communities applicable per fishery and cultural group).

Fishery	Melanesia			Micronesia			Polynesia		
	Men	Women	n	Men	Women	n	Men	Women	n
Soft benthos	16.9 (6.0)	83.1 (6.0)	16	40.6 (7.1)	59.4 (7.1)	12	43.8 (10.3)	56.2 (10.3)	12
Mangrove	25.9 (5.5)	74.1 (5.5)	18	43.1 (18.7)	56.9 (18.7)	6	47.8 (18.8)	52.2 (18.8)	6
Intertidal	18.2 (6.1)	81.8 (6.1)	19	28.9 (11.2)	71.1 (11.2)	10	14.6 (5.9)	85.4 (5.9)	11
Reeftop	20.5 (4.2)	79.5 (4.2)	24	50.0 (8.4)	50.0 (8.4)	14	48.2 (6.0)	51.8 (6.0)	22
Beche-de-mer	78.1 (6.1)	21.9 (6.1)	11	100.0 (0.0)	0.0 (0.0)	2	42.1 (n/a)	57.9 (n/a)	1
Lobster	100.0 (0.0)	0.0 (n/a)	17	100.0 (0.0)	0.0 (n/a)	10	100.0 (0.0)	0.0 (n/a)	15
Trochus	100.0 (0.0)	0.0 (n/a)	19	100.0 (0.0)	0.0 (n/a)	2	100.0 (0.0)	0.0 (n/a)	2
Other	86.3 (3.5)	13.7 (3.5)	18	90.7 (6.0)	9.3 (6.0)	10	93.3 (4.5)	6.7 (4.5)	16

Source: Table 5 (condensed) in Kronen and Vunisea 2010.

Table 3. Participation in marketing of invertebrate catches from gleaning and commercial fishery activities by gender in percent of total invertebrate fishermen and fisherwomen.

Culture		Marketing catch from gleaning (SE)	Marketing catch from commercial fisheries (SE)
Melanesia	Fisherwomen	27.99 (±6.29)	6.43 (±1.97)
	Fishermen	12.31 (±3.54)	47.10 (±14.41)
Micronesia	Fisherwomen	6.65 (±3.30)	0
	Fishermen	8.42 (±5.31)	2.13 (±1.13)
Polynesia	Fisherwomen	7.40 (±2.04)	0.34 (±0.34)
	Fishermen	8.36 (±3.07)	2.91 (±0.90)

Source: Table 13 in Kronen and Vunisea 2010.

- Demography and financial factors were related to the size of artisanal fisheries, and access to alternative income.
 - o Melanesia: Fishermen's involvement in artisanal fisheries, especially finfish fishing, was linked to poor national economic conditions and few alternative opportunities. Women's fisheries were linked to a high dependency on marine resources and limited alternative income opportunities.
 - o Polynesia: Men's fishing was mainly associated with population density and the number of boats relative to available reef area; fisherwomen by population density and by dependency on remittances, suggesting that fisherwomen were more active in fishing when they could not cover their living costs from local income.
 - o Micronesia: Fishing communities were very diverse. Artisanal fishing, particularly finfish fishing done by men in rural coastal communities, was associated with national urban population density. Fisherwomen's activities increased with average household size and per capita invertebrate consumption.
- In Melanesia, the highest percentage of fishermen and fisherwomen targeted both finfish and invertebrates; in Micronesia and Polynesia, communities had the highest proportion of fishermen exclusively finfishing and fisherwomen harvesting invertebrates.
- Invertebrate collection is almost equally women's and men's work. Total annual catch for most invertebrate species groups were almost equal for women and men. The whole study revealed a much greater involvement of men in gleaning than was indicated in previous more limited studies, such as those on one or a few sites. Women did not take part in dive invertebrate fisheries, thus missing out on access to more lucrative export products.
- The studies found that women mainly exploited invertebrate resources in readily accessible ecosystems. Also, as they usually had heavy duties in the household, they did not participate in dive fisheries for high value invertebrates, and had less access than men to boats for transport and fishing, the women's opportunities to improve their fishing productivity and income were quite limited.

Some parting remarks

The above efforts to highlight some of the key findings on gender and invertebrate fisheries in Pacific Island countries and territories are based on looking at only the "tip of the iceberg" data collected and results reported. Hopefully, more detail may

be published one day. All PROCFish work used a highly quantitative approach, likely due to the emphasis on biophysical assessments and the desire to match this with the socioeconomic, including gender, work. This meant that important qualitative research, especially on gender, was not highlighted in the overall report. Fortunately, a certain amount of qualitative information is available in some of the *Women in Fisheries Information Bulletin* papers over the course of the PROCFish project (see Annex), and these more theme- and site-specific accounts (e.g. fishing by children) add life to the rather academic overview. I urge researchers to give more attention to qualitative research in social science in similar future endeavours, and recommend reading Marilyn Porter's recent paper as a good introduction (Porter 2014).

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- Kronen M., Magron F., McArdle B. and Vunisea A. 2010a. Reef finfishing pressure risk model for Pacific Island countries and territories. *Fisheries Research* 101:1–10.

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- Porter M. 2014. What does feminist methodology contribute to gender and fisheries science? *Asian Fisheries Science Special Issue* 27S:119–133.

Annex:

Selection of theme- and case-specific *Women in Fisheries Information Bulletin* articles

The following selection of PROCFish-related studies have an emphasis on qualitative studies and invertebrate fisheries. It does not include many other studies from the Bulletin, but readers are encouraged to use the Bulletin's rich resources.

- Kronen M. 2004. Alu toutai – Na laki qoli – Fun or duty: School children's involvement in subsistence fisheries in Tonga and Fiji. *SPC Women in Fisheries Information Bulletin* 14:9–17.
- Kronen M. 2007. Chasing land crabs on Christmas Island. *SPC Women in Fisheries Information Bulletin* 16:21.
- Kronen M. 2008. Combining traditional and new fishing techniques: Fisherwomen in Niue, Papua New Guinea and Wallis and Futuna. *SPC Women in Fisheries Information Bulletin* 18:11–15.
- Kronen M. and Tafileichig A. 2008. Traditional rights and management of Yap's coastal fisheries and the role of fisherwomen. *SPC Women in Fisheries Information Bulletin* 18:21–25.
- Kronen M. and Malimali S. 2009. The octopus fishery on Lofanga, Kingdom of Tonga. *SPC Women in Fisheries Information Bulletin* 19:11–16.
- Lasi F. and Kronen M. 2008. 'Ungakoa' – Fishing for a rare delicacy in the South Pacific. *SPC Women in Fisheries Information Bulletin* 18:16–20.
- Vunisea A. 2004a. The challenges of seafood marketing in Fiji. *SPC Women in Fisheries Information Bulletin* 14:3–8.
- Vunisea A. 2004b. Communal fishing in Tokelau: The *inati*. *SPC Women in Fisheries Information Bulletin* 14:18–20.
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