

# Federated States of Micronesia 2013/2014 HIES

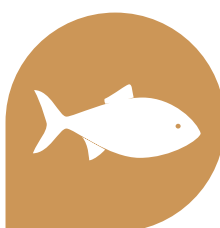
## Household fishing (coastal)

Michael K. Sharp<sup>1</sup>

### Executive summary

**47%**

of households  
conduct fishing  
activities

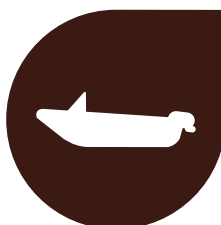


**23%**

of household food  
expenditure is  
spent on fish and  
shellfish

**6%**

of **total household income**  
comes from fisheries and  
accounts for **28%** (e.g.  
USD 462) of the value of  
**subsistence consumption**



**67%**

of households  
practice  
spearfishing on  
coastal reefs

### Introduction

The Federated States of Micronesia's (FSM) most recent Household Income and Expenditure Survey (HIES) was conducted from July 2013 to July 2014. Around 10% of all households (1,664) were surveyed, covering all four states: Yap, Chuuk, Pohnpei and Kosrae.

This fact sheet presents the results of the HIES in a fisheries<sup>2</sup> context and covers participation in fisheries, fishing catch and effort, household (HH) income from fisheries and HH consumption expenditure on fish and shellfish.

A summary table (Table 3) is provided on page 41.

### Fisheries participation

Participation in fisheries was measured using two methods: labour force participation and HH participation. Labour force participation refers to individuals aged 15 years and older who undertook fishing activities as their main or secondary activity. HH participation refers to

HHs that undertook fishing activities in the previous three months, irrespective of whether the activity was on a one-off or regular basis.

#### Labour force participation rate

**1 out of 5**

of the labour force has  
a fisheries-related occupation



Around one-fifth (21%) of FSM's labour force<sup>3</sup> has a fisheries-related occupation<sup>4</sup> as their main (9%) or secondary activity (12%) (Fig. 1). Chuuk has the highest fisheries participation rate of all states, with 35% of the labour force participating, followed by Yap (25%), Pohnpei (11%) and Kosrae (9%).

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<sup>2</sup> In the context of this fact sheet, fisheries refer to capture-based marine or freshwater fishing activities, including gleaning, but excluding aquaculture

<sup>3</sup> "Labour force" is defined as the population aged 15 years and over who undertake an economic activity as the main or secondary activity. 66% of FSM's population is aged 15 years and over and has a labour force participation rate of 52% (Yap – 71%; Chuuk – 39%; Pohnpei – 64%; Kosrae – 44%).

<sup>4</sup> International Standard Classification of Occupations (ISCO) codes: 6221, 6222, 6223, 6340, 7511, 9216 (recoded).

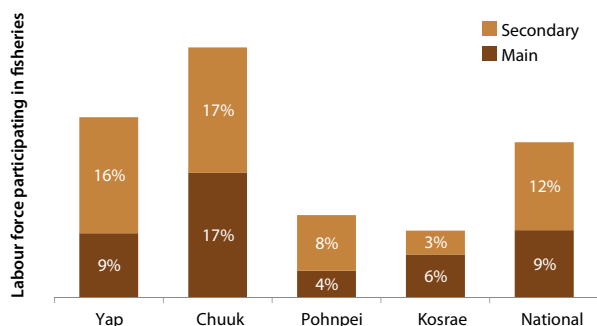


Figure 1. Labour force participation in fisheries as the main or secondary activity, by state.

### HH participation in fisheries



47% of HHs in FSM engage in fishing activities. This high fisheries participation rate is common across all states of FSM, with 66% of HHs in Yap conducting fishing activities, followed by Chuuk (49%), Kosrae (48%) and Pohnpei (37%) (Fig. 2). Fisheries participation is mainly for subsistence purposes, with only 13% of fishing HHs selling part of their catch.

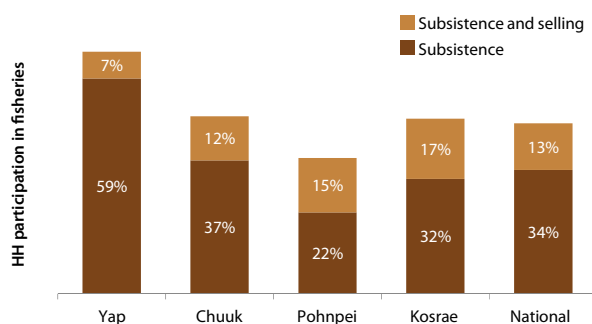


Figure 2. Participation by HH in fisheries, by state.

### Fisheries participation by gender

Most of the fisheries labour force (92%) is male (main and secondary activity). Pohnpei has the highest rate of female participation in the fisheries labour force (21%), whereas Yap has the lowest rate (1%).

Similarly, 85% of people engaged in HH fishing activities are male. In Pohnpei, 20% of HH members participating in fishing are female, followed by Kosrae (16%), Chuuk (14%) and Yap (9%).

### Fisheries participation by age

Around three-quarters of FSM's fisheries labour force is aged<sup>5</sup> from 15 to 44 years, and over 90% is aged less than 55 years. Likewise, 90% of the population participating in fisheries at the HH level are under 55 years.

2% of FSM's HH member participation in fisheries are aged 13–14.

### Fisheries participation by wealth group

There is slightly greater participation in fisheries in lower income quintiles (quintiles 1–3 account for 71% of fisheries labour force participation and 67% for HH participation) [Fig. 3]). Despite the fairly even distribution of fisheries participation among income quintiles, fisheries is nevertheless an important means of income substitution and food security for HHs with relatively low levels of cash income in FSM.

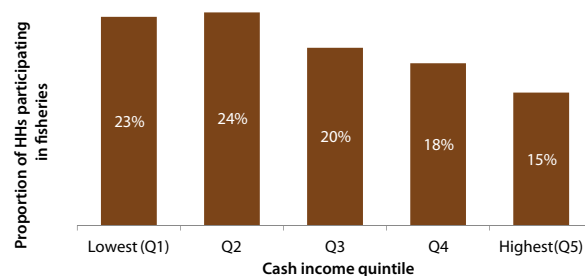


Figure 3. Distribution of HHs that participate in fisheries, by cash income quintile.

In Yap and Kosrae, the participation in fisheries among income quintiles is almost perfectly equal, however, this is not the case for Chuuk and Pohnpei (Fig. 4). In Chuuk, for example, 85% of HHs participating in fisheries are in income quintiles 1–3, which is indicative that participation is for the purpose of income substitution and/or food security. Conversely, Pohnpeian HH participation in fishing increases proportionally with income quintiles, with quintiles 4 and 5 accounting for 50% of total fishing activity, indicating that HH participation in fisheries may be more recreationally oriented (Fig. 4).

<sup>5</sup> Noting that labour force data is limited to persons aged 15+ years old

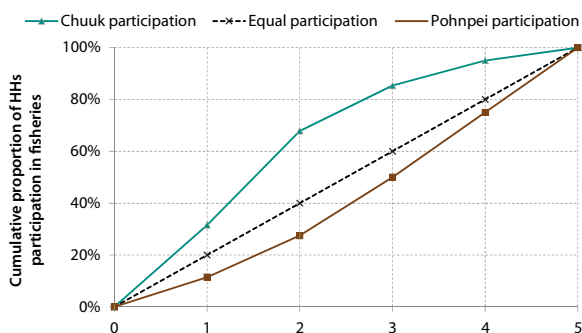


Figure 4. Cumulative distribution of HHs participation in fisheries in Chuuk and Pohnpei, by cash income quintile.

## Fishing effort

### Methods

The most commonly practiced fishing method in FSM is spear/harpoon (Fig. 5), which is practiced by 67% of fishing HHs (77% in Yap, 69% in Chuuk, 65% in Pohnpei and 28% in Kosrae). Following this is net fishing (51%), bottom fishing (34%), casting (28%), gathering (25%) and trolling (22%). Similar trends exist for each state, with the exception of Kosrae, where net fishing is the most commonly practiced fishing method, with 34% of HHs using it.

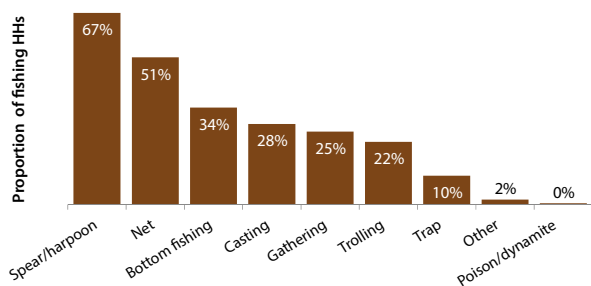


Figure 5. Proportion of fishing HHs practicing fishing methods.

### Locations

Across FSM, 70% of fishing HHs conduct fishing activities on coastal reefs (Fig. 6). Other common locations where HHs conduct fishing activities are lagoons (53%), outer reefs (47%), open ocean (35%) and submerged reefs (32%). The locations of fishing are similar in each state, except Kosrae where a higher proportion of HHs fish in the river and a much lower proportion of HHs fish on submerged reefs and in a lagoon.

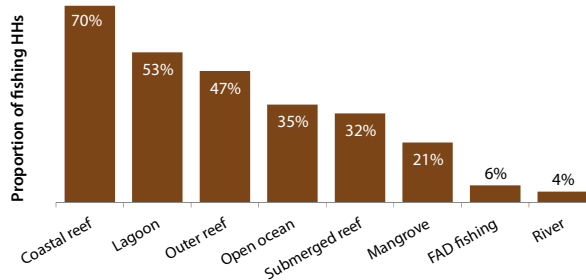


Figure 6. Proportion of fishing HHs, by fishing location

### Fishing trips per month

Nearly half of all fishing HHs in FSM undertake 2–5 fishing trips per month. In Yap, Pohnpei and Kosrae, this frequency of fishing occurs in 58%, 57% and 69% of fishing HHs respectively. However in Chuuk, the frequency of fishing is greater, where 24% of fishing HHs conduct 10–12 trips per month and another 10% conduct 20 trips per month. The total number of fishing trips per month in FSM is estimated to be 59,000.

### Trip fishing time

87% of HHs in FSM fish for 2–8 hours per fishing trip, with 5-hour fishing trips being the most common.

### Total fishing effort

The most frequent amount of time spent fishing per HH per month is 10–19 hours, however, this frequency differs among states. In Yap and Kosrae, HHs most commonly fish for less than 9 hours per month, whereas HHs in Pohnpei fish between 10 and 19 hours per month. About half of HHs in Chuuk spend 10–19 hours, while the other half spend 40–49 hours fishing per month. Total HH fishing effort in FSM is estimated to be 341,000 hours per month.

## Transport and inputs for fishing

The main modes of transport to fishing sites in FSM are motorised boat (31%), non-motorised boat (26%), walking (29%) and swimming (14%). This trend is quite similar in each state, however, Yap and Kosrae have a higher number of HHs that walk (40% and 55%, respectively), whereas 37% of HHs in Pohnpei use non-motorised boats.

Fuel and oil account for 71% of the cost of inputs for HHs that sell part of their catch. Expenditure on ice (14%), transportation (5%), labour (3%), maintenance and repairs (3%), and other (4%) make up the remainder of costs.

## Fish and shellfish catch

### Types of seafood caught

In line with HH fishing locations and methods, 91% of HHs participating in fisheries in FSM catch reef fish, while only 27% catch oceanic fish (Table 1). Two-thirds of HHs participating in fisheries in FSM catch crustaceans and other invertebrates. These figures are fairly consistent across all states. In Chuuk, 76% of HHs catch octopus, while in Yap, 67% catch crab.

### Types of seafood sold

Of the fishing HHs that sell fish and shellfish, 80% sell reef fish, 29% oceanic fish, 36% crustaceans and 42% molluscs and other invertebrates (Table 2). In terms of oceanic fish being sold, tuna (skipjack, yellowfin and bigeye) is the most common. For crustaceans, 26% of HHs sell crab, 17% octopus and 17% sea cucumber.

## HH income from fisheries

HH income from fisheries comes in three forms (Fig. 7): salaries and wages; subsistence (the value of home-caught and -consumed fish and shellfish); and reserve of small-scale HH fisheries businesses that sell fish and shellfish.

### Wages and salaries (cash)

It is estimated that USD 1.9 million in salaries and wages (0.18% of total HH cash income from salaries and wages) is paid to 273 fisheries-related business owners and employees, resulting in an average wage of USD 7,090 per person per annum.<sup>6</sup>

### HH sale of fish and shellfish (cash)

The sale of fish and shellfish accounts for an average of 1.4% of total HH cash income in FSM, and 2.7% in Chuuk. In terms of species sold, the sale of reef fish accounts for 56% of total HH income from the sale of fisheries products in

Table 1: Proportion of HHs that catch different categories of fish and shellfish, by state.

	Yap	Chuuk	Pohnpei	Kosrae	National
Oceanic fish	34%	25%	24%	28%	27%
Coastal fish	92%	90%	93%	91%	91%
Crustaceans	72%	66%	50%	25%	60%
Molluscs and invertebrates	48%	83%	48%	22%	61%

Table 2: Proportion of HHs selling different categories of fish and shellfish, by state.

	Yap	Chuuk	Pohnpei	Kosrae	National
Oceanic fish	8%	31%	29%	36%	29%
Coastal fish	82%	75%	87%	70%	80%
Crustaceans	18%	25%	50%	30%	36%
Molluscs and invertebrates	24%	53%	41%	15%	42%

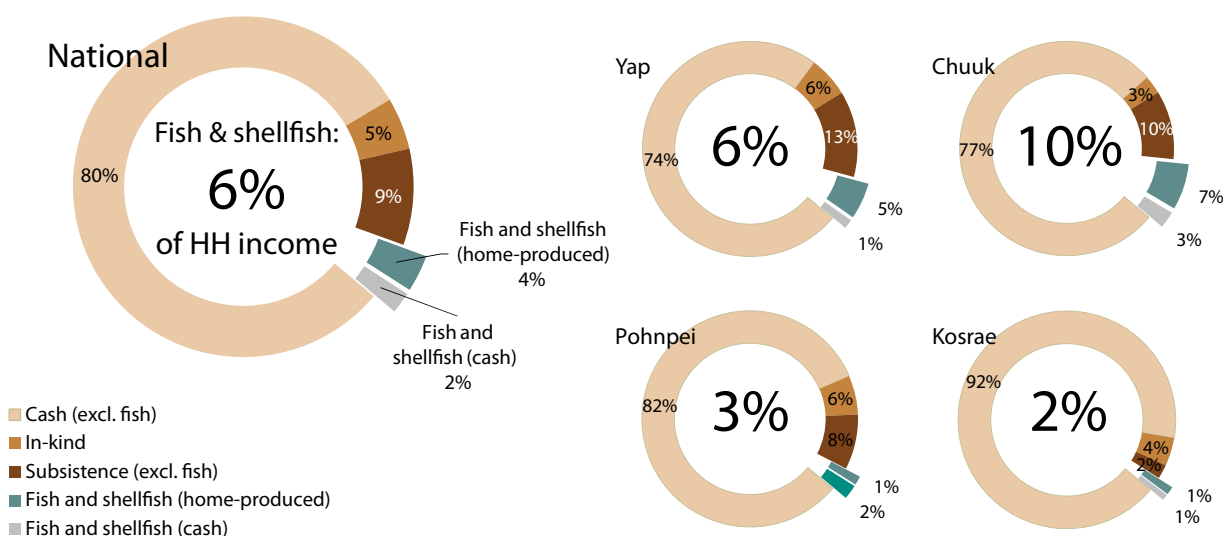


Figure 7. The contribution of fisheries to total HH income (excl. imputed rents), by income type.

<sup>6</sup> In-kind income refers to gifts received from another HH (cash purchased or home-produced) and in-kind income received from an employer. It is likely that a component of in-kind income is in the form of fish received as gifts.

FSM; oceanic fish account for 25%; and shellfish account for the remainder. In Yap, reef fish are of particular importance to HH fisheries income, accounting for 81%.

### Subsistence income

Subsistence income is derived from the value of home-produced and -consumed fish and shellfish. Fisheries subsistence accounts for 28% of the total value of subsistence income in FSM. In Chuuk, it makes up 40% of total HH subsistence income, whereas in Pohnpei it makes up 14%. Reef fish account for 71% of the value of subsistence income derived from fisheries.

### HH consumption expenditure

HH consumption expenditure occurs in two forms: cash purchases and the value of home-produced and -consumed fish and shellfish.

In FSM, total HH expenditure (cash and the value of subsistence consumption) on fish and shellfish accounts for 10% of total HH expenditure (Fig. 8).

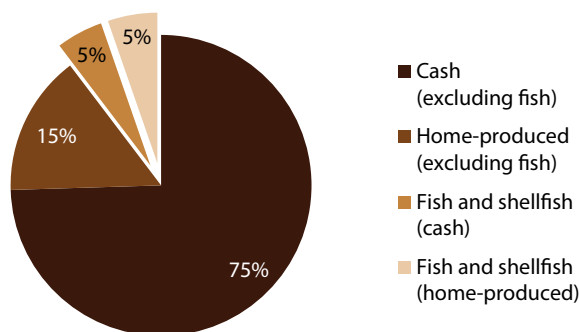


Figure 8. Contribution of fish and shellfish expenditure to total HH expenditure (excl. imputed rents), by expenditure type.

This figure ranges from 6% in Pohnpei to 17% in Chuuk. In terms of total HH expenditure on food, fish and shellfish account for 23% – nearly one-quarter – of total HH food expenditure (Fig. 9). This figure ranges from 16% in Pohnpei and Kosrae to 28% and 29% in Yap and Chuuk, respectively.

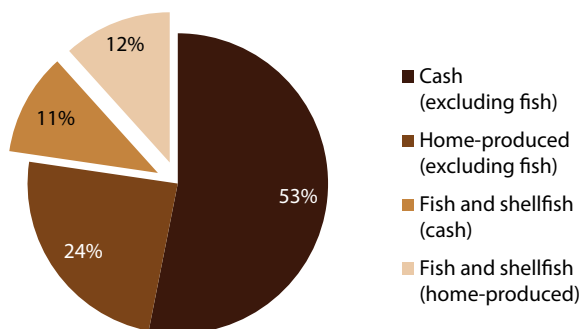


Figure 9. Contribution of fish and shellfish expenditure to total HH food expenditure, by expenditure type.



Pohnpei, FSM (image: Colette Wabnitz).

Reef fish account for 11% of total HH expenditure on food, with canned fish, oceanic fish and shellfish amounting to 5%, 4% and 2%, respectively.

HH expenditure on fish and shellfish consists mainly of reef fish (50%), canned fish (23%), oceanic fish (19%) and crustaceans molluscs and other invertebrates (9%). These figures are similar across all the states, however Kosrae has a higher proportion of expenditure on oceanic fish (39%) than reef fish (38%).

Half of the value of HH fish and shellfish consumption expenditure is cash-purchased and the other half is home-produced. In Yap, 72% of expenditure on fish and shellfish is home-produced, while in Chuuk, Pohnpei and Kosrae home production accounts for 53%, 38% and 32% of HH spending on fish and shellfish, respectively.

### Cash expenditure on fish and shellfish

Canned fish account for 42% of total HH cash expenditure on fish and shellfish, while reef and oceanic fish account for 29% and 27%, respectively (Fig. 10). In Kosrae, oceanic fish account for 53% of cash expenditure on all seafood, while in Pohnpei reef fish account for 45%. In Yap and Chuuk, canned fish account for 53% of total cash expenditure on seafood.

Canned fish account for 7% of total cash expenditure on food with both reef and oceanic fish accounting for 5% each. Overall, 17% of HH food cash expenditure is on seafood.

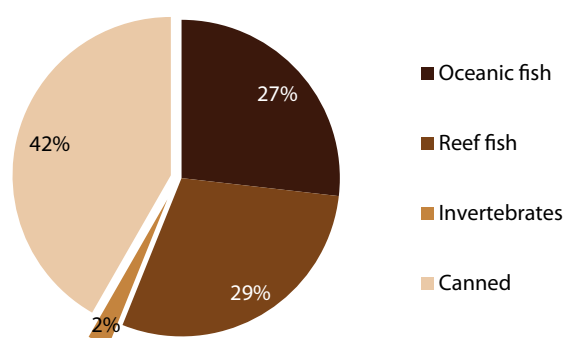


Figure 10. Composition of cash expenditure on fish and shellfish, by type.

### Home-produced expenditure on fish and shellfish

70% of total HH home production expenditure on fish and shellfish is through the consumption of home-produced reef fish. Crustaceans, molluscs and other invertebrates amount to 15% of the value of all home-produced seafood, followed by oceanic fish (11%) (Fig. 11).

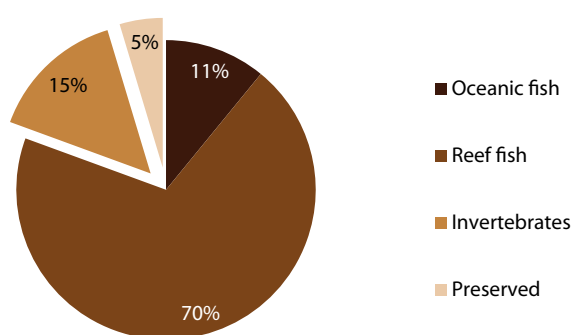


Figure 11. Composition of the produced expenditure on fish and shellfish, by broad type.

Fish and shellfish make up 33% of the value of home-produced food in FSM. 23% is attributable to reef fish, 5% to shellfish and 4% to oceanic fish. In Chuuk, fish and shellfish account for 42% of the total value of home-produced food, however, in Pohnpei this figure falls to 19%.

Table 3. Summary of FSM 2014 HIES fisheries-related data.

	Yap	Chuuk	Pohnpei	Kosrae	National
<b>Fisheries labour force participation (persons)</b>					
Main activity	517	2,130	596	99	3,341
Secondary activity	931	2,144	1,234	55	4,363
Main and/or secondary activity	1,439	4,246	1,780	153	7,618
<b>Fisheries participation (HHs)</b>					
HH participation in fishing activities	1,571	3,338	2,403	525	7,837
HHs selling fish	174	829	965	181	2,149
Persons participating in HH fishing (>12 years old)	2,592	6,512	4,694	723	14,520
<b>HH fishing effort</b>					
Total trips per month	8,538	33,017	14,919	2,513	58,987
Total hours per month	47,161	196,282	82,351	15,152	340,946
<b>Net annual HH income (USD)</b>					
Average total income (excl. imputed rents)	15,843	8,415	16,708	15,141	13,093
Average cash income	11,962	6,727	14,128	14,001	10,788
Average subsistence income	2,919	1,460	1,602	508	1,659
Average in-kind income	962	229	977	632	646
<b>Net annual HH fisheries income (USD)</b>					
Average fisheries wages & salaries (cash)	151	35	198	67	116
Average fisheries business (cash)	74	179	163	71	151
Average fisheries subsistence (non-cash)	870	588	225	186	462
% of total HH income	7%	10%	4%	2%	6%
% of HH cash income	2%	3%	3%	1%	2%
% of HH subsistence income	30%	40%	14%	37%	28%
<b>Annual HH expenditure (USD)</b>					
Average total expenditure (excl. imputed rents)	11,876	7,376	12,574	12,752	10,361
Average cash expenditure	7,972	5,670	9,959	11,660	8,036
Average subsistence expenditure*	2,961	1,502	1,769	542	1,748
Average food expenditure (food only)	5,369	4,329	4,771	5,502	4,722
Average food subsistence expenditure (food only)	2,370	1,501	1,177	534	1,436
<b>Annual HH fish and shellfish expenditure (USD)</b>					
Average expenditure on fish and shellfish	1,492	1,261	749	868	1,071
Average cash expenditure on fish and shellfish	416	595	466	586	519
Average subsistence expenditure on fish and shellfish	910	622	243	197	489
% of total expenditure	13%	17%	6%	7%	10%
% of cash expenditure	5%	10%	5%	5%	6%
% of subsistence expenditure	31%	41%	14%	36%	28%
% of food expenditure	28%	29%	16%	16%	23%
% of subsistence food expenditure	38%	41%	21%	37%	34%

\*The value of home-produced and consumed goods

## Discussion

With half of HHs and one-fifth of the labour force in FSM participating in fisheries, the HIES demonstrates that fisheries are of significant social and economic importance in FSM. Fisheries provide HHs with income, food, and help in supplementing income, especially in the case of low-cash earning HHs. In particular, fish and shellfish in FSM are crucial to national food security, accounting for almost one-quarter of HH food expenditure, derived from subsistence fishing, half of which is home-produced.

The importance of reef fish and shellfish in HH expenditure demonstrates a high degree of dependency on reef resources as a mainstay of dietary protein. There may be cause for concern about high levels of coastal resource exploitation, but this cannot be determined until expenditures are converted to production volumes. Oceanic fish, such as tuna and canned fish, also play an important role in providing protein to the population of FSM, however, more so through cash purchases.

Given the importance of coastal marine resources for food and income in FSM, there is a need for sustainable coastal resource management. The results of this analysis provide evidence for the need for FSM to implement the goals, practices and policies articulated in “A new song for coastal fisheries” (SPC 2015), and the new “Regional Roadmap for Sustainable Pacific Fisheries” (FFA and SPC 2015).

## References

- FFA and SPC. 2015. Future of fisheries: A regional roadmap for sustainable Pacific fisheries [Leaflet]. Noumea, New Caledonia: Secretariat of the Pacific Community. 4 p.
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