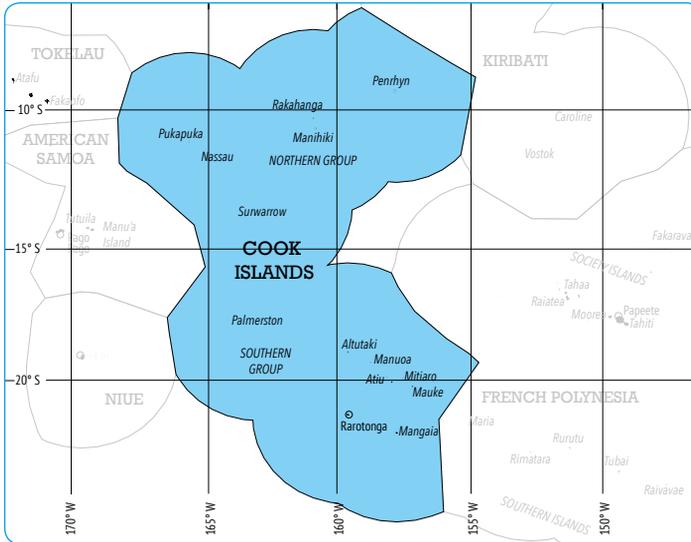


6 Cook Islands



6.1 Volumes and Values of Fish Harvests in Cook Islands

Coastal Commercial Catches in Cook Islands

The following describe the major historical attempts to consolidate information about coastal fisheries production in Cook Islands:

- Dalzell et al. (1996), using data sources from the late 1980s and early 1990s, estimated subsistence fisheries production of 858 mt, worth US\$3,047,683, and commercial coastal fisheries production of 124 mt, worth US\$314,761.
- Senior officials of the Ministry of Marine Resources (MMR) estimated the production for 2000 as follows: pearls, NZ\$18,400,000; small-scale commercial fishing (food fish 80 mt, NZ\$650,000; aquarium fish NZ\$252,000; and trochus NZ\$200,000); and subsistence production, 795 mt.

- MMR (2001) estimated the value of the subsistence fisheries to be NZ\$2 million annually.
- Gillett and Lightfoot (2001) considered the above studies and estimated production of 80 mt for coastal commercial fishing and pearl farming (worth NZ\$19.5 million), and coastal subsistence production of 795 mt (worth NZ\$2.2 million).

Gillett (2009) made catch estimates for all Pacific Island countries and territories, including Cook Islands. That study considered the previous estimates, described above, as well as additional information on coastal fisheries production in Cook Islands, from a study on the situation and outlook for Cook Islands Marine Resources 2007 (MMR 2008), and the Cook Islands household income and expenditure survey (HIES) that was carried out in 2005–06 (Statistics Office 2007).

The Situation and Outlook Report (MMR 2008) indicated the following:

- The catch from the Cook Islands FAD fishery, by subsistence and semi-commercial fishers, in recent years, has oscillated between 20 and 50 mt of fish annually. In 2007 the catch was estimated at 49.3 mt. The average price on the domestic market is estimated to be around NZ\$8 per kilogram of whole fish. Assuming that one-third of the 49.3 mt catch was sold, and applying the farm gate pricing to subsistence catches, the production can be estimated as 16.41 mt for commercial (worth NZ\$131,280) and 32.8 mt for subsistence (worth NZ\$183,680). The Secretary of Marine Resources cautions that, although the information given here is the best available, the data (especially the FAD catches) may not be particularly accurate (I. Bertram, per. com. January 2009).
- 300 to 500 mt of commercial and subsistence catches are harvested annually from inshore fisheries (i.e. reef fish and shellfish). In 2007 the main semi-commercial inshore fisheries of trochus, parrotfish and live reef fish had mixed returns. There was no trochus harvest in 2007, 18 mt parrotfish were marketed in Rarotonga, at an average price of NZ\$12 per kg, and 1500 to 1600 aquarium fish, worth NZ\$54,000, were exported. Assuming that one-third of the inshore catch is sold, that the market price is NZ\$9 per kg, and that farm gate pricing can be applied to subsistence production, commercial production would be about 133 mt (worth about NZ\$1.4 million) and subsistence production would be about 267 mt (worth NZ\$1.7 million).

The 2005–06 Cook Islands HIES showed that, with respect to fishery products, there was a total expenditure of NZ\$5,091,700 on “fish including shellfish”. Unpublished data supplied by SPC’s Statistics and Demography Programme provides considerable information on coastal commercial and subsistence production. The HIES survey (with adjustment for offshore fishing, aquarium fish and any trochus harvested) suggests that, in the period 2005 to 2006, commercial fisheries production was 139 mt and subsistence production was 239 mt.

A significant conclusion made from examining the HIES results is that the estimates of coastal fisheries production are reasonably close to those of the Situation and Outlook Report (MMR 2008). The studies give similar results for coastal commercial fisheries (variance within 7%) and for subsistence fisheries (variance within 20%).

The Gillett (2009) study considered the results of the HIES and the Situation and Outlook Report (MMR 2008), and some recent developments affecting coastal fisheries (population changes, ciguatera fish poisoning and reduced air and sea transport to the northern islands). The study concluded that the production from coastal commercial fisheries in Cook Islands in the mid-2000s was about 133 mt (worth about NZ\$1.4 million to fishers), and about 267 mt (NZ\$1.7 million) from coastal subsistence fisheries. Relative to the estimates of coastal fisheries production in other Pacific Island countries, the study’s assessment for Cook Islands is thought to be reasonably accurate.

There has not been a comprehensive attempt to re-estimate coastal fisheries production in Cook Islands in the last 10 years. However, some external factors can be identified that affect coastal fisheries production in the country.

The population structure of Cook Islands is changing. Between 2007 (the focus year for the Gillett (2009) survey) and 2014 (the focus year for the present survey) the population of the country has declined by 0.9% (SPC PRISM website data). In addition, Cook Island residents are gravitating to Rarotonga, where fish consumption rates are lower than in the outer islands. Other changes affecting coastal fisheries include the following:

- The number of public servants was significantly reduced in the period 2008/2009, but has been gradually increasing again in recent years.
- The FAD programme expanded, resulting in greater catches of pelagic species by small-scale fishing.
- The number of game fishing operators that sell their catch is increasing. Wichman (2012) reports that there are 17 game fishing/fishing charter operations in Cook Islands.

- Over the last few years the island councils relaxed bans on tridacna exports to Rarotonga, and the recent annual trade is significant.
- Harvests of trochus between 2011 and 2015 were around 19 mt annually.
- The number of flights from the northern islands to Rarotonga has decreased.

Exports are an important component of coastal commercial fisheries in Cook Islands. MFEM (2015) states that, in 2014, NZ\$91,000 worth of aquarium fish¹ were exported, and the annual average over the 2010–2014 period was NZ\$115,000. According to staff of the Ministry of Marine Resources, harvests of trochus between 2011 and 2015 were around 19 mt annually, with each harvest worth approximately NZ\$104,500 to fishers (all trochus are exported).

It is apparent from the above information that several sources of data were available to make a reasonably good estimate of coastal catches for 2007. Projecting that catch to 2014 involves more speculation, but it can be stated with some confidence that the coastal commercial catch for 2014 was around 150 mt. Considering price information from various documents, and from MMR staff, that catch was worth approximately NZ\$1.7 million to fishers.

Coastal Subsistence Catches

The information above suggests that the coastal subsistence catch in the country has not expanded in the previous decade. It is therefore estimated that the production from coastal subsistence fisheries in Cook Islands in 2014 was about 276 mt. Using the farm gate method for valuing subsistence production, this production would be worth around NZ\$2 million to fishers.

Locally Based Offshore Catches

In recent years a domestic commercial fishing company has carried out long-line fishing, with one or two Rarotonga-based longline vessels operating every year. In 2013 the one operating vessel offloaded 105 mt of fresh catch. In 2014 two longliners offloaded 194 mt of fresh catch (Brown 2015). At a dockside price of NZ\$15/kg, the 2013 production equates to NZ\$1.6 million, and the 2014 catch is worth NZ\$2.9 million.

¹ FOB value - this needs to be reduced by approximately 50% to give price to fishers (i.e. NZ\$45,500).

Foreign-Based Offshore Catches

The foreign-based offshore catch in Cook Islands is taken to be the total offshore catches minus the small amount of catches made by the Rarotonga-based longliners. OFD (2015) describes the two types of foreign-based vessels operating in the Cook Islands zone:

- Purse seiners: only purse seine vessels under the Treaty on Fisheries between the Governments of Certain Pacific Islands States and the Government of the United States of America (the US Tuna Treaty) were authorised to fish in Cook Islands waters in 2014.
- Longliners: fourteen Cook Islands-flagged longline vessels and 24 non-Cook Island-flagged vessels fished in the Cook Islands zone in 2014, the latter comprising Chinese- and FSM-flagged vessels that operate out of Pago Pago, American Samoa.

Estimates of the volumes and values of catches of the four main commercial species of tuna in the area of the Western and Central Pacific Fisheries Commission have been made by the Forum Fisheries Agency using data sourced from SPC's Oceanic Fisheries Programme. The volumes and values can be determined using the "catch by national fleet" and "value by national fleet" spreadsheets of FFA (2015). As the values given by FFA are based on prices at overseas destinations, Tables 6-1 and 6-2 adjust those prices to equate to values inside the EEZ of Cook Islands.

Table 6-1: The Volume/Value of the Foreign-Based Purse Seine Catch

	2010	2011	2012	2013	2014
Purse seine catch (mt)	262	1,387	13,160	8,338	12,765
Delivered value of catch (US\$)	338,034	2,353,968	28,287,451	17,460,308	19,110,458
In-zone value of catch (US\$)	321,132	2,236,270	26,873,078	16,587,292	18,154,935

Source: FFA (2015)

Table 6-2: The Volume/Value of the Foreign-Based Longline Catch

	2013	2014
Total volume longline catch in the zone (mt)	8,054	7,771
Volume local longline catch in the zone (mt)	105	194
Volume foreign-based longline catch in the zone (mt)	7,949	7,577
Value of the longline catch, adjusted for bycatch and delivery (US\$)	33,107,585	38,998,919

Source: FFA (2015)

From the above tables it can be seen that, in 2014, the offshore catches in Cook Islands waters made by foreign-based vessels were 20,342 mt, worth US\$57,153,854 (NZ\$73,156,933).

Freshwater Catches

The only readily available information relevant to estimating total freshwater fish production in Cook Based on limited data the national annual freshwater catch is estimated to be 5 mt for the purposes of the present study. As almost all of the freshwater catch is for subsistence purposes, a value is assigned on a similar basis as the coastal subsistence section, above, of NZ\$37,500.

Aquaculture Harvests

In Cook Islands the most significant type of aquaculture presently is pearl farming. Pearl production reached maximum production about 15 years ago. At its peak in 2000 there were 81 farms with 2 million shells in the water, providing a pearl yield reportedly worth NZ\$18 million annually, accounting for more than 90% of national exports and 20% of GDP (MMR 2012). Production has since declined, due to bacterial infection and declining prices in the global pearl market (Hambrey 2011). In 2014 there were about 10 active pearl farms, with a further 14 farms operating at a minimal level (Brown 2015).

According to the Cook Islands Pearl Authority (CIPA; T. McFadzien, per. com. September 2015) the annual benchmark surveys for pearl production were discontinued in 2010. Consequently, there is a wide range in current estimates of the number of saleable pearls produced annually, and the associated value. For 2014 these ranged from 37,169 pearls (Brown 2015) to 56,000 pearls (MMR staff and a large pearl retailer). Cited 2014 prices received by pearl farmers ranged from NZ\$16.60 (CIPA) to NZ\$20 (MMR staff). The official export statistics of Cook Islands show NZ\$364,000 worth of pearl exports,² but, as pointed out by several individuals associated with the pearl trade, only about half of the pearls are exported. The actual pearl export situation appears to be that most of those pearls that would be categorised as non-exported are informally exported (i.e. hand carried and undeclared) or sold to tourists who subsequently carry them out of the country. If 50,000 pearls, worth NZ\$20 per pearl to the farmers, were produced in 2014, that equates to a value of NZ\$1 million.

² At NZ\$20 per pearl this equates to 18,200 pearls exported.

There were other types of aquaculture production in 2014. According to MMR staff this consisted of the following:

- Tridacna clams: about 30,000 were produced during the year, of which 2,000 were exported³ (farm gate value NZ\$5/clam), with the non-exported clams being used for reef re-stocking.
- Milkfish: production is for both food (value as per subsistence catches) and bait (NZ\$2.50/kg). 2014 production is estimated to be 10 mt, worth NZ\$70,000.
- Tilapia: a small amount of tilapia is reportedly being produced at one farm. Details of production are not readily available. Production for the purpose of this study is deemed to be 2 mt, worth NZ\$15,000 to the farmer.

From the above, it appears that the 2014 Cook Islands aquaculture production was about 12 mt, plus 52,000 pieces, worth, in total, NZ\$1,095,000.

Summary of Harvests

From the above sections, a crude approximation of the annual volumes and values⁴ of the fishery and aquaculture harvests in 2014 can be made (Table 6-3).

Table 6-3: Fisheries and Aquaculture Harvest in Cook Islands in 2014

Harvest Sector	Volume (mt, and pcs)	Value (NZ\$)
Coastal Commercial	150	1,700,000
Coastal Subsistence	276	2,000,000
Offshore Locally based	194	2,900,000
Offshore Foreign-based	20,342	73,156,933
Freshwater	5	37,500
Aquaculture	52,000 pcs and 12 mt	1,095,000
Total	52,000 pcs and 20,979 mt	80,889,433

This value of production in 2014 is significantly larger than the NZ\$14 million fishery and aquaculture harvest in 2007 reported by Gillett (2009). In 2007 there was no authorised offshore foreign-based fishing in the zone. Conversely, in 2007 the aquaculture harvest was worth three-times that of the 2014 production.

³ The same staff stated that about 4,000 tridacna clams were exported in 2013, but CITES export records show only 603 live tridacna were exported that year from Cook Islands.

⁴ The values in the table are dockside, farm gate, or in-zone prices.

Figures 6-1 and 6-2 show the volumes and values of the 2014 Cook Islands fisheries production. Aquaculture is not shown in the volumes figure due to the use of mixed units (pieces and mt).

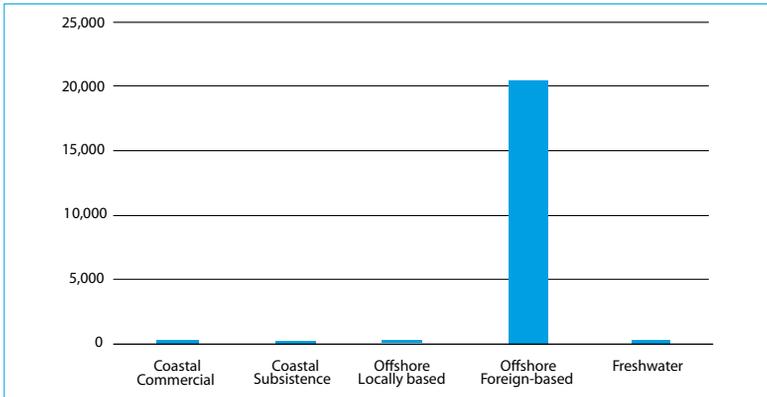


Figure 6-1: Cook Islands Fisheries Production 2014 by Volume (mt)

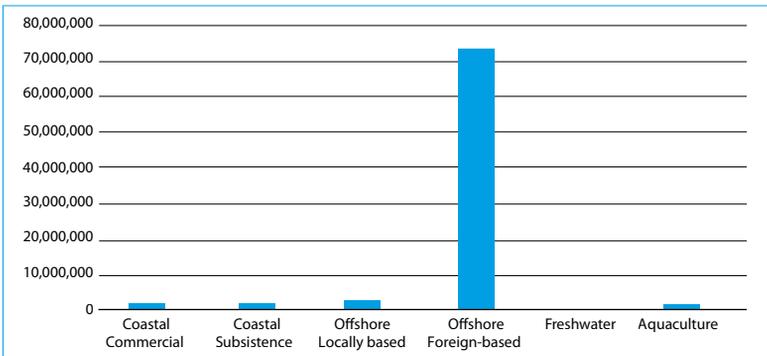


Figure 6-2: Cook Islands Fisheries Production 2014 by Value (US\$)

Past Estimates of Fishery Production Levels by the Benefish Studies

Similar studies of the benefits to Pacific Island countries and territories from fisheries (“Benefish” studies) have been carried out in the past. Gillett and Lightfoot (2001) focused on the year 1999, Gillett (2009) focused on 2007 and the present study focuses on 2014. The estimated fishery production levels for Cook Islands from those three studies are presented in Table 6-4.⁵

⁵ The earliest Benefish Study, Gillett and Lightfoot (2001), did not include aquaculture, freshwater fisheries or Pacific non-independent territories.

Table 6-4: Estimates by the Benefish Studies of Annual Fisheries/Aquaculture Harvests

Harvest Sector	Estimate Year	Volume (mt, and pcs where indicated)	Value (NZ\$)
Coastal Commercial	1999	80	19,500,000
	2007	133	1,400,000
	2014	150	1,700,000
Coastal Subsistence	1999	795	2,200,000
	2007	267	1,700,000
	2014	276	2,000,000
Offshore Locally based	1999	75	750,000
	2007	3,939	7,850,000
	2014	194	2,900,000
Offshore Foreign-based	1999	300	770,000
	2007	0	0
	2014	20,342	73,156,933
Freshwater	1999	n/a	n/a
	2007	5	50,000
	2014	5	37,500
Aquaculture	1999	n/a	n/a
	2007	190,000 pcs and 3 mt	3,040,000
	2014	52,000 pcs and 12 mt	1,095,000

Source: The present study, Gillett (2009), Gillett and Lightfoot (2001)

The apparent changes in production for the three years sometimes represents a real change in production, but it can also reflect a change in the methodology for how the production is measured (hopefully an improvement). In the table above, the production levels for coastal commercial, coastal subsistence, and freshwater, change significantly between the years, but most of that change is due to the way in which the production was estimated. For example, the drop in production of coastal subsistence fisheries between 2001 and 2007 is due to better information becoming available (i.e. the 2006 Cook Islands Household income and Expenditure Survey), rather than a decrease in the amount of fish being harvested. In contrast, changes in production figures in the table for the offshore fisheries and aquaculture (based on the availability of better quality data) are likely to reflect real changes in the amounts being harvested.

6.2 Contribution of Fishing to GDP

Current Official Contribution

The Statistics Office of the Ministry of Finance and Economic Management refers to the fishing sector as “fishing and pearl”. The official contribution of this sector to GDP is given in Table 6-5.

Table 6-5: The Official Contribution of Fishing and Pearl to GDP (NZ\$ millions)

	2010	2011	2012(r)	2013(r)	2014(p)
Fishing and pearl contribution to GDP	10.3	9.3	10.8	16.2	22.8
Total GDP of Cook Islands	354.1	362.4	372.9	367.7	382.8
Fishing and pearl as a % of GDP	2.9%	2.6%	2.9%	4.4%	6.0%

(r) = Revised figures; (p) = Provisional figures
Source: Statistics Office unpublished data

Method Used to Calculate the Official Fishing Contribution to GDP

MFEM (2015) provides some details on the GDP methodology:

The GDP compilation methodology included additional information such as the benchmark data from the 2001 Agriculture Census, 2005 Household Expenditure Survey, and the 2006 Census of Population and Dwellings. Other data include: annual financial statements for public enterprises; adjustment data on fishing from the Ministry of Marine Resources; and annual value added to output ratios based on VAT data. Improvements in coverage have recently been made for agriculture, forestry and hunting, fishing, food and beverages manufacturing, financial intermediation, and education services. There are three basic approaches used in the compilation of GDP, namely the Production, Expenditure and Income approach. Currently the Production Approach is being used for the compilation of the Cook Islands GDP. Generally the GDP in this approach is calculated as, the total Gross Output less Intermediate Consumption (IC).

The staff of the Statistics Office provided some additional details on the method used to calculate the fishing contribution to GDP, as follows:

- The “fishing and pearl sector” is divided into three components: commercial, unincorporated, and subsistence. The actual values added for

2014 for the three components is not readily available from the staff of the Statistics Office.

- VAT data is used to estimate the gross output and intermediate consumption for commercial and unincorporated components.
- The 2005 HIES is used to estimate the value added for the subsistence components. That HIES could have been distorted as a result of an outbreak of ciguatera fish poisoning that year.
- All pearl farms are registered for VAT and there are incentives to report properly.
- For pearl farming a value added ratio of 40% is assumed. FOB export values are used as a basis for valuing pearl production.

Alternative Estimate of Fishing Contribution to GDP

Table 6-6, below, represents an alternative to the official method of estimating fishing contribution to GDP in Cook Islands. It is a simplistic production approach that takes the values of five types of fishing/aquaculture activities for which production values were calculated in Section 6.1, above (summarised in Table 6-3), and determines the value added by using value added ratios (VARs) that are characteristic of the type of fishing concerned. Those VARs were determined through knowledge of the fisheries sector, and by using specialised studies (Appendix 3).

It is not intended that the approach in Table 6-6 replace the official methodology, but rather that the results obtained serve as a comparator to gain additional information on the appropriateness and accuracy of the official methodology, and to indicate any need for its modification.

Table 6-6: Fishing Contribution to GDP in 2014 Using an Alternative Approach

Harvest Sector	Gross Value of Production (NZ\$, from Table 6-3)	VAR	Value Added (NZ\$)
Coastal Commercial	1,700,000	0.65	1,105,000
Coastal Subsistence	2,000,000	0.80	1,600,000
Offshore Locally based	2,900,000	0.20	580,000
Freshwater	37,500	0.90	33,750
Aquaculture	1,095,000	0.45	492,750
Total (NZ\$)	7,732,500	---	3,811,500

Source: Production section of this chapter, and Appendix 3

The NZ\$3.8 million value added from the fishing sector represents 1% of the NZ\$382.8 million GDP of Cook Islands in 2014. The Gillett (2009) recalculation of the 2007 fishing contribution to GDP estimated a value added of NZ\$4 million.

The 2014 fishing contribution to GDP in Table 6-6 (NZ\$3.8 million) is considerably less than the official fishing contribution to GDP of NZ\$22.8 million given in Table 6-5. Given the lack of details available about the official methodology (i.e. not knowing the actual values added for the three components of fishing/pearl), it is difficult to speculate about the quantum of the difference. Two possibilities are: (a) the use of the gross value of production from a given type of fishing as the value added (i.e. not subtracting the intermediate consumption); and (b) inclusion of the activities of offshore fishing vessels that are not based in the country.

6.3 Exports of Fishery Production

The official overseas trade statistics of Cook Islands (MFEM 2015) provide the export figures of the country, including the fishery exports (Table 6-7).

Table 6-7: Value of Fishery Product Exports (NZ\$ thousands)

	2011	2012	2013	2014
Live fish	147	96	19	91
Fish fresh or chilled	2,390	5,312	259	105
Pearls	369	259	142	364
Pearl shells	213	105	49	0
All fishery exports	3,119	5,772	469	560
All exports	3,956	6,552	12,984	21,276
Fishery exports as a % of all exports	78.8%	88.1%	3.6%	2.6%

Source: MFEM (2015)

For comparison purposes, Statistics Office (2007) reported that fisheries exports represented 79.4% of all exports in 2007.

“Live fish” in the table are fish in the aquarium trade. “Pearl shells” appear to be “mother of pearl shells”, which includes trochus. There is confusion around the “Fish fresh or chilled” category. The amounts for this category do not correspond to what is offloaded and exported from Rarotonga-based longliners (Brown 2015), nor to catches in Cook Islands waters (above), nor to catches by Cook Islands-flagged vessels (MMR 2015). The cited amounts of “Fish fresh or chilled” are likely to include some (but not all) of the catch that is being transhipped by Cook Islands-flagged vessels in ports outside Cook Islands.

6.4 Government Revenue from Fisheries

Access Fees for Foreign Fishing

Brown (2015) states that the access fees for the financial year 2014/2015 collected for the purse seine fishery are NZ\$9.7 million, and NZ\$1.7 million for the longline fishery.⁶ Some of these fees appear to be for access by domestic vessels. All of the purse seining in that year was foreign, but in 2014 one-third of the longliners fishing in the zone were Cook Islands-flagged (OFD 2015). If it is assumed that one-third of the NZ\$1.7 million in access fees is for non-foreign fishing, then the access fees for foreign longlining in the Cook Island zone for 2014 was NZ\$1.1 million, making total access fees for foreign fishing (purse seining and longlining) NZ\$10.8 million.

According to the Cook Islands Government Quarterly Financial Report (MFEM 2015) in FY 2014/2015 government “operating revenue” was NZ\$94.9 million. Therefore, the NZ\$10.8 million of access fees for foreign fishing represents 11.4% of the operating revenue for FY 2014/2015.

For comparison purposes, Gillett (2009) reported that, in 2007, access fees for foreign vessels represented about 0.4% of “total crown receipts”.

Other Government Revenue from Fisheries

Other major sources of government revenue from fisheries are fees from fines for illegal fishing and licensing fees from Cook Islands-flagged offshore fishing vessels.

Brown (2015) indicates that, for FY 2014/2015, there were “NZ\$1.3 million for out-of-court settlements for fisheries infringements”. OFD (2015) states that, in 2014, 11 vessels were suspected of IUU fishing. Two were boarded in Cook Islands EEZ and shark fins were found on board. One purse seiner and seven longliners were detected fishing without a licence inside the Cook Islands EEZ. One Cook Islands-flagged vessel was found operating on the high seas with a non-functional VMS.

Figures for government revenue from licensing Cook Islands-flagged offshore fishing vessels are not readily available. In the section above this is assumed to be around NZ\$566,000.

⁶ The Cook Islands Government Quarterly Financial Report (MFEM 2015) gives a different amount for FY 2014/2015 (in NZ\$ thousands) *Fishing Licenses \$4,818; Fisheries Catch Rev \$1,777; Fisheries US Treaties \$1,046, or a total of NZ\$7,641,000.

6.5 Fisheries-Related Employment

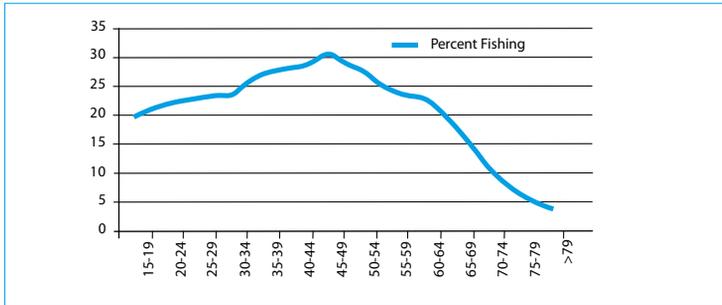
The Cook Islands 2011 Census of Population and Dwellings (Statistics Office 2011) contains a considerable amount of information on fisheries-related employment. Table 6-8 indicates the involvement of households in fishing and pearl farming. 42.4% of households in Cook Islands participate in fishing. However, involvement in fishing appears to be declining. In 2011 57.6% of households had not engaged in any level of fishing activity, whereas the figure in the previous census, in 2006, was 50.6%.

Table 6-8: Fishing and Pearl Farming Households by Island

Location of Household	Number of total households	Number involved in fishing	% involved in fishing	Number involved in pearl farming	% involved in pearl farming
RAROTONGA	3154	951	30.2%	17	0.5%
OTHER SOUTHERN	939	661	70.4%	-	-
Aitutaki	482	307	63.7%	-	-
Mangaia	170	140	82.4%	-	-
Atiu	137	92	67.2%	-	-
Mauke	92	73	79.3%	-	-
Mitiaro	58	49	84.5%	-	-
NORTHERN	279	243	87.1%	42	15.1%
Palmerston	13	11	84.6%	-	-
Pukapuka	101	88	87.1%	-	-
Nassau	13	13	100.0%	-	-
Manihiki	78	70	89.7%	38	48.7%
Rakahanga	21	18	85.7%	3	14.3%
Penrhyn	53	43	81.1%	1	1.9%
ALL COOK ISLANDS	4372	1855	42.4%	59	1.3%

Source: Statistics Office (2011)

The 2011 census also provides information about the age structure of fishers. Figure 6-3 shows that, for those residents that are engaged in gardening, tending livestock and fishing as an unpaid activity, the percentage participation is strongest in the mid-40s age group (about 30% of that age group participates in fishing), whereas there is weaker participation by teenagers (20%) and by the mid-20s age group (24%).



Source: Statistics Office (2011)

Figure 6-3 : Participation in Fishing by Age

The usefulness of the 2011 census for fisheries purposes is affected by “fishing” not being defined in the census reports (i.e. it is not clear whether engaging in “fishing” means someone who fishes at least once per week, once per month, and so on). Another drawback of the 2011 census is the use of the aggregated category “Agricultural & Fishery Workers”, meaning it is difficult to identify, for example, formal employment in fisheries.

The employment situation with respect to subsistence fishing is very different between Rarotonga and the outer islands:

- An SPC survey (Kronen and Solomona 2008a) on Mangaia indicated that almost all households (92%) were engaged in fisheries, with between 1 and 2 fishers in each. There were 309 fishers on Mangaia, including 148 women and 161 men fishers. One-third (111) of all fishers were exclusive men engaging in finfish fishing, and about one-third (101) were exclusively women engaged in invertebrate fishing. The remaining fishers were generally participating in both kinds of fishing.
- A similar SPC survey (Kronen and Solomona 2008b) on Rarotonga showed that less than half of all households (44%) were engaged in fisheries, with an average of one fisher per every second household. These figures also include sport fishers and households having a motorised boat used for weekend trolling outside the outer reef. About half (155) of all fishers were predominantly men targeting finfish, and very few women specialised in finfish fishing only. About one-quarter of fishers (69) were women involved exclusively in invertebrate fishing. The remaining fishers were generally participating in both kinds of fishing.

SPC (2013) indicates that, of fishers in Cook Islands that target both finfish and invertebrates, 62% are men and 38% are women.

Forum Fisheries Agency unpublished data on employment in Cook Islands related to the tuna industry indicate that, in 2014, there were no local crew working on tuna vessels, but seven people were employed in “processing and ancillary” activities. Five observers worked on tuna vessels under national and regional programmes.

Barclay and Cartwright (2007) provide some insight into tuna-related employment, indicating that Cook Islanders’ historical aspirations for the employment in the tuna industry (at their height in the 1990s) had deflated by the early to mid-1990s, particularly for employment on fishing vessels. Cook Islands has a labour shortage: there is not the same unemployment problem that exists in many other Pacific Island countries, such as Fiji, Papua New Guinea and Solomon Islands. Work on fishing vessels is physically hard, and the life can be very uncomfortable. Some of the vessels in the northern fishery stay out fishing for months at a time, and the pay is not high for ordinary crew. Some Cook Islanders have taken up employment opportunities on some of the small longline vessels operating from Rarotonga that do not stay out at sea for long periods, and in processing facilities. Others are employed in commercial sport fishing.

6.6 Levels of Fishery Resource Consumption

The following are some findings of older studies on fish consumption in Cook Islands:

- Preston (2000), using 1995 FAO data on production, imports and exports, estimates the annual per capita fish consumption to be 63.2 kg.
- MMR (2000) states that Cook Islanders consume, on average, 47.0 kg of seafood per person per year.
- Passfield (1997) gives the annual per capita consumption of fish on Tongareva Island as 219.0 kg.

Bell et al. (2008) use information from household income and expenditure surveys conducted between 2001 and 2006 to estimate patterns of fish consumption in Pacific Island countries. The HIES were designed to enumerate consumption based on both subsistence and cash acquisitions. Annual per capita fish consumption (whole weight equivalent) for the whole of Cook Islands was 34.9 kg, of which 81% was fresh fish. For rural areas the figure for per capita consumption of fish was 60.9 kg, and for urban areas it was 24.8 kg. Cook Islanders obtain about 35% of their animal protein from fish.

There has been a significant amount of work on fishery resource consumption on Rarotonga, as described below:

- Tuatai (2001) describes a survey of seafood consumption on Rarotonga. This University of the South Pacific project was intended as a follow-up to a similar survey carried out in 1989. The Tuatai study included finfish, invertebrates and canned fish. The results showed a decrease of total seafood consumption over the 1989 to 2001 period, from 317.7 g to 270.7 g per capita per day⁷ (which represents an annualised decrease from 116.0 kg to 98.8 kg per capita). It was thought that causes of the reduction included restrictions placed on fishing activities by marine protected areas (MPAs) and outbreaks of ciguatera fish poisoning.
- An investigation was undertaken in September 2006 into the consumption of seafood and meat in Rarotonga (Moore 2006). Ninety households in Rarotonga were surveyed (with a questionnaire) using a random sampling method. The results were analysed and compared with two previous surveys: a 1989 survey by Dorothy Munroe, and a 2001 survey by Teina Tuatai. The results of the 2006 survey indicated a constant decline in average daily per capita consumption rates since 1989, from 318 g in 1989 to 271 g in 2001, and 176g in 2006⁸ (on an annual basis: from 115.9 kg to 98.8 kg to 64.2 kg). Reasons for the decrease in finfish consumption were attributed to many factors, such as ciguatera, marine protected areas, changes in lifestyle, and the high cost of finfish compared to meat products. Where lagoon and reef species were consumed, they were generally received from the outer islands.

The above studies focused exclusively on Rarotonga. SPC carried out some studies in Cook Islands that compared seafood consumption in Rarotonga with consumption on other islands in the country. Box 6-1 gives the results from Rarotonga and Mangaia.

⁷ Discussions with the author indicate that the per capita consumption was a mixture of whole fish weight equivalent and food weight (T. Tuatai, per. com. October 2008).

⁸ In the text of the report it is not clear whether the per capita consumption is whole fish weight equivalent or food weight.

Box 6-1: Seafood Consumption on Two Islands**Rarotonga:**

Quantity fresh fish consumed (kg/capita/year)	31.66	(±4.62)
Frequency fresh fish consumed (times/week)	1.85	(±0.17)
Quantity fresh invertebrate consumed (kg/capita/year)	1.43	(±0.61)
Frequency fresh invertebrate consumed (times/week)	0.33	(±0.08)
Quantity canned fish consumed (kg/capita/year)	10.88	(±2.02)
Frequency canned fish consumed (times/week)	1.16	(±0.19)

Mangaia:

Quantity fresh fish consumed (kg/capita/year)	65.71	(±13.39)
Frequency fresh fish consumed (times/week)	3.16	(±0.26)
Quantity fresh invert. consumed (kg/capita/year)	7.54	(±2.05)
Frequency fresh invertebrate consumed (times/week)	0.72	(±0.11)
Quantity canned fish consumed (kg/capita/year)	15.05	(±3.22)
Frequency canned fish consumed (times/week)	1.13	(±0.19)

Source: Kronen and Solomona (2008a, 2008b)

Two significant aspects affecting fish consumption on Rarotonga have emerged in recent years: ciguatera and tuna from longliners:

- Several documents (e.g. Moore 2006, MMR 2008, MMR 2010) point to a decrease in fish consumption on Rarotonga. A study by Rongo and Van Woesik (2011) proposed that an increase in ciguatera fish poisoning occurrence over the past two decades has discouraged local fish consumption. They estimate that 52% of Rarotongans have experienced ciguatera at least once in their lives.
- A major change in fish consumption in Rarotonga since the early 2000s has been caused by the availability of fish from longliners. MMR (2008) estimated that the domestic market absorbs around 40 to 50 per cent of total catch from the longline vessels based in Rarotonga. In 2007 between 120 mt and 150 mt of whole fish equivalent was sold domestically to the hospitality industry and the local population on Rarotonga. Brown (2015) found that the domestic longliners were responsible for putting 90 mt and 171 mt of fish on the Rarotonga market, in 2013 and 2014, respectively.

6.7 Exchange Rates

Cook Islands uses the New Zealand dollar (NZ\$). The average yearly exchange rates (NZ\$ to the US dollar) used in this book are as follows:

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1.51	1.42	1.54	1.36	1.32	1.39	1.30	1.29	1.21	1.22	1.28