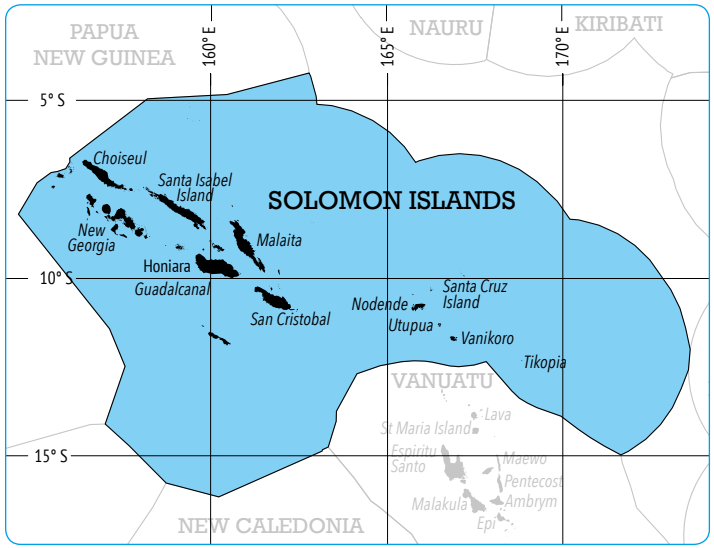
16 Solomon Islands



16.1 Volumes and Values of Fish Harvests in Solomon Islands

Coastal Commercial Catches in Solomon Islands

The following summarise the main historical attempts to estimate coastal fisheries production in Solomon Islands:

- Dalzell et al. (1996), using information from three sources from the early 1990s, estimated annual volumes (and values) of coastal commercial production as 1,150 mt (US$4,343,811), and coastal subsistence production as 10,000 mt (US$8,405,660).
- Gillett and Lightfoot (2001) considered six sources of information on coastal commercial fisheries production in the period 1988 to 2000,

and ventured an annual estimate of 3,200 mt (worth SI$9,200,000 [Solomon Islands dollars]). They estimated coastal subsistence production of 13,000 mt (worth SI$39,000).

- Gillett (2009) considered the above estimates, and partitioned coastal commercial fishing in the country into three components: (1) local sales for domestic consumption: about 1,500 mt, worth about SI$12 million annually to fishers for the years 2005 to 2007; (2) baitfish: about 800 mt, worth SI$0.8 million annually to the recipient communities for 2005 to 2007; and (3) exports: about 950 mt, worth SI$12.5 million annually to fishers for the years 2005 to 2007. Total production and value for coastal commercial fishing for 2007 was estimated to be 3,250 mt, worth SI$25,300,000.

In an IUCN study (Arena et al. 2015) commercial inshore fisheries were valued at SI$70 million/year (approx. US$9.32 million/year). These results are based on the 2009 Census (SINSO 2009) and data from SPC's ProcFish programme. (Pinca et al. 2009) The commercial production estimated by this study is almost three times higher than that of the Gillett (2009) study.

Green et al. (2006) summarise the structure of coastal commercial fisheries in Solomon Islands, as follows:

> The small-scale commercial fisheries are mainly located near the main urban area of Honiara, and to a much lesser extent, around the towns of Auki on Malaita Island and Gizo in the west. These fisheries are oriented to providing primarily finfish to wage-earning residents. The other common form of small-scale commercial fishing is that for non-perishable fishery products for export. The most important of these items are trochus shells, beche-de-mer, and shark fins. These commodities are an important source of cash for Solomon Islanders, especially in the isolated villages since the demise of the copra industry.

Honiara is the nation's main market, and therefore receives fish; however it is not the main fishing area, due to overfishing in the direct area and neighbouring islands and improved shipping from other areas. The Auki area is starting to develop into a main market area, due to major population increases, but it is not nearly as big a market as Honiara. (S. Lindsay, per. com. January 2016).

In addition to the above types of coastal commercial fishing, there is an inshore fishery for baitfish for Soltai pole-and-line tuna vessels.

In this section attempts are made to estimate the three components of coastal commercial fishing.

Inshore baitfishery: About 32.5 mt of bait would have been caught in coastal areas to produce the 650 mt of tuna caught by pole-and-line vessels in 2014. At SI$1 per kg (F. Wickham, per. com. August 2015) that would be worth SI$32,500 to fishers.

The exported coastal fishery products are provided in the export section, below, and summarised in Table 16-1. About 1,435 mt of products (worth SI$15.9 million) were exported during 2014. Those prices are presumably free-on-board (FOB) prices, which should be discounted to give prices paid to fishers. A discount of 50% is applied (based on a general understanding of associated costs), to give a value of SI$8 million to fishers. However: (1) fishery exports are taxed, giving an incentive to under-report (especially values); and (2) there is some inconsistency between the Ministry of Fisheries and Marine Resources (MFMR) data given in the export section and other sources of information on fishery exports.[1] These features detract from the credibility of the estimate of the volumes/values of exported coastal fishery products.

Table 16-1: Exports of Coastal Fishery Products

	2012	2013	2014
Kg	1,176,737	1,739,405	1,434,627
SI$	15,972,246	32,420,862	15,868,698

Source: Table 16-9, below

Estimating domestically consumed coastal commercial fishery products is difficult. In the Gillett (2009) study a heterogeneous array of (often conflicting) observations and results from several studies were selectively used to make an educated "guess" of fish sales for domestic consumption: about 1,500 mt, worth about SI$12 million annually to fishers for the years 2005 to 2007. Since that study some conditions have changed and some additional sources of information have become available, including the following:

- Growth of the "salt fish" trade in Honiara. This consists of selling, from tuna transshipment operations in Honiara, non-target bycatch, and damaged target tuna that are otherwise unmarketable. McCoy (2013) indicates that this trade puts about 440 to 500 mt of fish annually on the Honiara market. This is likely to reduce, to some extent, demand in Honiara for coastal fish.

1 For example, Pakoa (2014) states that 305 mt of beche-de-mer was exported from Solomon Islands in 2013, at a total export value of SI$33 million. The 2013 BDM exports given in the export section, below, indicate 160 mt, valued at SI$16.2 million.

- Increased over-exploitation of fishery resources targeted by coastal commercial fishing. There are many studies that point to this problem: Aswani and Sabetian (2009), Brewer et al. (2009) and Albert et al. (2015). This phenomenon is likely to reduce the flow of fish to domestic markets.
- Perceptions by Honiara fish sellers of the change in domestic fish trade. Nearly half of respondents (47%) indicated that they noticed a decrease in the amount of fish landed during the last five years, with Western Province (29.8%) and Malaita Province (25.5%) the two provinces where this has been most pronounced. Conversely, 45% of respondents noticed an increase in the amount of fish landed during the last five years, and this was most pronounced on Central Island. (Pomeroy and Di Yang 2014)
- Estimates of market sizes. Honiara Central Market (the largest market in Solomon Islands) represented 70.5% of all Honiara fish sales. (Pomeroy and Di Yang, 2014) Based on the Lindley (2007) estimate of 245 mt sold annually in the Honiara Central Market,[2] this equates to annual sales of 348 mt in all Honiara markets.
- Increasing national population. The number of people in Solomon Islands has expanded by 19.1% between 2007 and 2014 (Table 3-1).
- Increasing population of the major centres, especially Honiara, Gizo, and Auki. This would tend to increase the demand for commercial fish in those areas. The 2009 census shows that the urban areas are growing at an annual rate of 4%, while the population growth rate in rural areas is 1.8%. (NSO 2010)
- Additional information that could elucidate domestic sales of coastal fishery products has become available, including the ProcFish results from four villages and the 2009 national census.

The IUCN study mentioned above (Arena et al. 2015) represents an advance in estimating coastal fisheries production (both commercial and subsistence) in Solomon Islands. The study uses ProcFish data at four villages in Solomon Islands (Pinca et al. 2006) to produce estimates of annual household catches by frequency of fishing (e.g. a household that fishes once a week catches, in total, 363 kg/year). As the 2009 census has the number of households catching fish by frequency and by province, the IUCN study used the census data to produce estimates of coastal fisheries production by province. ProcFish data are used to partition the catches between subsistence (59% of all the catch) and commercial (41%). The major implication of the study is that

2 The Honiara market does not allow the sale of "salt fish" (McCoy 2013).

coastal fisheries in the country are producing substantially more fish than previous studies have suggested.

The methodology used by the IUCN census appears to be more rigorous than that of the previous studies, and its use should be encouraged. That approach, however, is highly dependent on the four ProcFish villages being representative of the entire country, and the assumption that the annual fish catches per category of household fishing frequency (e.g. that a household that fishes more than once a week catches 1,270 kg/year) is applicable to the entire country. Through closely examining the report of the ProcFish study, considering how representative the four villages are of the national situation, and corresponding with former ProcFish staff, it appears that the fish production rate from the four villages is higher than the national average. Other relevant considerations include the following:

- The annual fish consumption at each of those villages (all around 100 kg/person) is much greater than reported in the eight previous national fish consumption surveys, discussed in the fish consumption section below. In fact the 106.78 kg/person/yr average of those four villages ranges from two to four times the consumption given in those studies.
- One of the reasons the ProcFish villages were chosen was that "they had active reef fisheries" (Pinca et al. 2009), which is unlikely be representative of the entire country.
- The assumption that annual production of fish per category of household fishing frequency (e.g. fishing once per week) from those four villages is generally applicable across the country is unlikely to hold. In this regard, about 20% of the population of Solomon Islands lives in urban areas, and larger islands have inland communities. Fishing near urban areas and in streams and lakes is not likely to be as productive as fishing in the vicinities of the four ProcFish villages.

The report of the IUCN study does acknowledge that the sample villages may result in an overestimate of the national average catch, and that the actual catch lies somewhere between the results of the Gillett (2009) study and the IUCN study, "most likely closer to the upper end of this range." The present study is in general agreement with the range of that statement and, as indicated above, the use of the IUCN approach should be encouraged, with additional attention given to obtaining data from a larger number of villages that are representative of the national situation.

The Gillett (2009) study gives annual coastal commercial catch for the mid-2000s in Solomon Islands of 3,250 mt, worth SI$25.3 million to fishers. This includes 1,500 mt of coastal fishery products for domestic consumption, worth SI$12 million to fishers. The IUCN study estimates, for 2013, the commercial reef finfish and invertebrate catch (22,369 mt annually), and the values of the beche-de-mer, trochus and aquarium trade. The values are not directly comparable, as the Gillett (2009) study uses prices paid to fishers in the range around the mid-SI$200s, while the IUCN study uses net annual values (added value for the domestic fish trade, and gross value for the export trade). As both studies use MFMR data for the volumes of exported coastal fishery products (albeit using some different amounts), the substantive obvious difference between the studies is in the volumes of the coastal fishery products for domestic consumption.

Currently, there is insufficient information available to make a definitive statement on the likely level of catches, in 2014, of coastal products for domestic consumption, other than to indicate they are likely to be between 1,800 mt (the Gillett (2009) estimate expanded by population increase) and 22,369 mt (IUCN study). Based on the reasoning given in this section, the present study suggests that the actual catches are most likely to be closer to the lower end of this range.

Prices paid to fishers in the villages and in various markets were derived from the literature (e.g. Brewer 2011; Pomeroy and Yang 2014) and from discussions with staff of the MFMR (B. Buga, S. Lindsay, per. com. August 2015). It was decided that an appropriate price for this study would be SI$18 per kg.

For the purpose of this book the 2014 coastal commercial catch in Solomon Islands is taken to be 6,468 mt, worth SI$98,032,500 to fishers. This consists of the following components:

- Baitfish: 32.5 mt, worth SI$32,500
- Exported coastal fishery products: 1,435 mt, worth SI$8 million[3]
- Domestically consumed coastal commercial fishery products: 5,000 mt, worth SI$90 million

Coastal Subsistence Catches

Many of the estimates of coastal subsistence fisheries production in Solomon Islands can be traced to one of two statements:

3 The annual value of exported coastal fishery products is greatly influenced by beche-de-mer. In contrast with 2013, in 2014 little, if any, beche-de-mer was legally exported.

- Cook (1988) states: "Virtually no data have been collected on the artisanal and subsistence fisheries in the past, apart from the irregular reports of fish purchases and sales through the fisheries centers and sub-stations. Current estimates of the artisanal and subsistence production are based on a 1983 estimate of 40.0 kg per capita consumption, giving a national production of 6,000 to 12,000 tonnes."
- Skewes (1990) states: "A survey conducted by the National Statistics Office in 1983 indicated an average per capita fish consumption of 25.7 kg/year. A subsequent survey in 1988 (unpublished) indicated total seafood consumption of 34.4 kg/person/year, comprising 22.4 kg of marine fish and 12kg of shellfish. Shellfish consumption appeared to be concentrated in the Western Provinces. Using these figures, the national total subsistence catch is probably of the order of 10,000 tonnes/year in 1990."

The World Bank (2000) estimates that subsistence fishery production in Solomon Islands consists of 8,817 mt of finfish and 4,747 mt of shellfish, for a total production of 13,564 mt. Gillett and Lightfoot (2001) venture an estimate of 13,000 mt, worth SI$39 million. Gillett (2009) estimates, for 2007, a catch of 15,000 mt, worth SI$84 million. The IUCN study (Arena et al. 2015) gives a total subsistence catch for the country of 33,561 mt.

If the Gillett (2009) catch estimate is expanded by population growth in the period 2007– 2014, the result is 17,865 mt. Accordingly, recent estimates for the subsistence catch in the country range from 17,865 to 33,561 mt. For reasons advanced in the section on coastal commercial catches, above, the present study considers that the actual catches are likely to fall in the lower end of this range. However, these estimates are necessarily based on informed guesswork.

For the purpose of this study the 2014 coastal subsistence catch in Solomon Islands in 2014 is taken to be 20,000 mt. Using the "farm gate" system of valuing subsistence production (Bain 1996), which discounts the average fish price in the market by 30% as an allowance for getting the product to market, this production of 20,000 mt in 2014 can be valued by using the average rural buying price of SI$18 per kg, given above. This results in a value of SI$252 million.

Locally Based Offshore Catches

The domestic fleet in 2014 consisted of purse seine vessels and pole-and-line vessels (MFMR 2015; E. Honiwala, per. com. August 2015).

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 the Oceanic Fisheries Programme of the Pacific Community. The volumes and values[4] can be determined using the "catch by national fleet" and "value by national fleet" spreadsheets of FFA (2015) (Table 16-2).

Table 16-2: Volumes and Values of the Tuna Catch by the Solomon Islands Domestic Fleet

	2010	2011	2012	2013	2014
Volume of national purse seine catch (mt)	12,965	25,561	26,500	24,769	40,874
Value of national purse seine catch (US$)	14,764,414	39,666,717	49,987,179	45,308,815	56,538,410
Volume of national pole-and-line catch (mt)	-	871	2,135	1,666	649
Value of national pole-and-line catch (US$)	-	1,303,927	3,908,932	2,988,541	834,575

For 2014 the combined purse seine and pole-and-line catch of 41,523 mt was worth US$57,520,263 (SI$438,879,607).

Foreign-Based Offshore Catches

FFA (2015) can be used to estimate the volumes and values of the foreign tuna fleet catches in Solomon Islands waters (Table 16-3).

Table 16-3: Volumes and Values of the Catch by Foreign Tuna Fleets

	2010	2011	2012	2013	2014
Total volume in national waters (mt)	195,995	173,482	95,523	127,993	107,999
National fleet volume in national waters (mt)	26,907	28,192	28,635	26,418	71,425
Foreign fleet volume in national waters (mt)	169,088	145,289	66,888	101,574	36,573
Total value in National waters (US$)	388,656,357	377,391,745	291,167,750	309,980,334	322,210,525
National fleet value in national waters (US$)	80,265,435	57,113,221	63,407,189	56,785,179	229,000,668
Foreign fleet value in national waters (US$)	308,390,921	320,278,524	227,760,561	253,195,155	93,209,856
Foreign fleet value in national waters adjusted for bycatch sales and transshipment costs (US$)	262,132,283	272,236,745	193,596,477	215,215,882	79,228,378

4 The values from the FFA (2015) spreadsheet have been reduced by 15% to adjust the Bangkok price to a Solomon Islands dockside price.

In 2014 the volume of catches by foreign tuna vessels in Solomon Islands waters was 36,573 mt, with a Solomon Islands dockside value of US$79,228,378 (SI$604,512,524).

2014 does not appear to be a typical year for foreign-based offshore fishing in the Solomon Islands zone. 2014 was a strong El Niño year, and in El Niño periods purse seine catches characteristically move eastwards from PNG and Solomon Islands, towards Kiribati, Tuvalu and Tokelau.

Freshwater Catches

The many large islands in the country result in a relatively large inland population having no direct access to marine food resources, and for this reason Solomon Islands has a significant subsistence freshwater fishery. Although some of the freshwater catch may be sold, the vast majority is for subsistence purposes. The main fishing and landing areas are small streams near villages and the banks of larger rivers, mainly on the larger islands. The smaller islands and atolls generally have no sizeable freshwater bodies, and consequently no freshwater fishing activity. Information is scarce on the resources that support the inland fisheries, and no comprehensive survey has been carried out. Anecdotal information and survey reports that focus on single islands suggest that flagtails, gobies, eels and freshwater shrimps are important native species. Mozambique tilapia presently inhabits many rivers, streams and swamps in Solomon Islands. Many people have become accustomed to eating it and enjoy its taste. On Rennell Island communities have come to depend heavily on the tilapia in Lake Tegano as their main source of dietary protein. (Coates 1996; MFMR 2010; Govan et al. 2013)

Limited by the information scarcity described above, freshwater fishery production in Solomon Islands in 2014 is deemed to be 2,300 mt, with a farm gate value of SI$29 million.

Aquaculture Harvests

At present, aquaculture is limited to mariculture activities in seaweed and some culture for the marine ornamental trade. There was a small amount of prawn (*Macrobrachium* and penaeid prawn) production in the 1980s and 1990s, but farms have since been inactive.

The production of seaweed is given in Table 16-4. Values given are farm gate prices.

Table 16-4: Solomon Islands Seaweed Production

Year	Weight (Ton)	Value (SI$)	Year	Weight (Ton)	Value (SI$)
2004	213.9	106,947.75	2010	888.0	3,244,032.00
2005	326.1	306,900.30	2011	902.2	2,323,763.63
2006	169.2	156,995.05	2012	873.8	3,191,128.40
2007	108.2	138,892.75	2013	1476.5	5,167,868.50
2008	144.9	419,107.50	2014	1520.3	5,611,457.96
2009	503.6	1,643,787.80			

Source: MFMR (unpublished data)

The CITES export database contains some information on the export of live (presumably cultured) coral.[5] It indicates that there were 20,947 pieces of live coral exported in 2013. Arena et al. (2015) shows that the annual value of live coral exports in the period 2007–2011 ranged from about SI$180,000 to SI$400,000. For the purpose of this study it is assumed that, in 2014, 20,000 pieces of cultured coral were harvested, worth SI$176,000 at the farm gate.

There are reports of minor amounts of other types of aquaculture activities in 2014, including tilapia, milkfish, giant clams and freshwater prawns.

It is estimated that aquaculture production of Solomon Islands in 2014 was 1,530 mt, plus 20,000 pieces, worth SI$5.9 million at the farm gate.

Summary of Harvests

A crude approximation of the annual volumes and values of fishery and aquaculture production in 2014 can be advanced (Table 16-5).

Table 16-5: Annual Fisheries and Aquaculture Harvest in Solomon Islands, 2014

Harvest Sector	Volume (mt, and pcs where indicated)	Value (SI$)
Coastal Commercial	6,468	98,032,500
Coastal Subsistence	20,000	252,000,000
Offshore Locally based	41,523	438,879,607
Offshore Foreign-based	36,573	604,512,524
Freshwater	2,300	29,000,000
Aquaculture	20,000 pieces and 1,530 mt	5,900,000
Total	**20,000 pieces and 108,394**	**1,428,324,631**

5 It is possible that a substantial proportion of this is actually wild-harvested coral (S. Lindsay, per. com. January 2016).

The extremely weak factual basis for the estimates of coastal commercial, coastal subsistence and freshwater catches is acknowledged.

Figures 16-1 and 16-2 show the volumes and values of the 2014 Solomon Islands fisheries production. Aquaculture is not shown on the volumes figure due to the use of mixed units (pieces and mt).

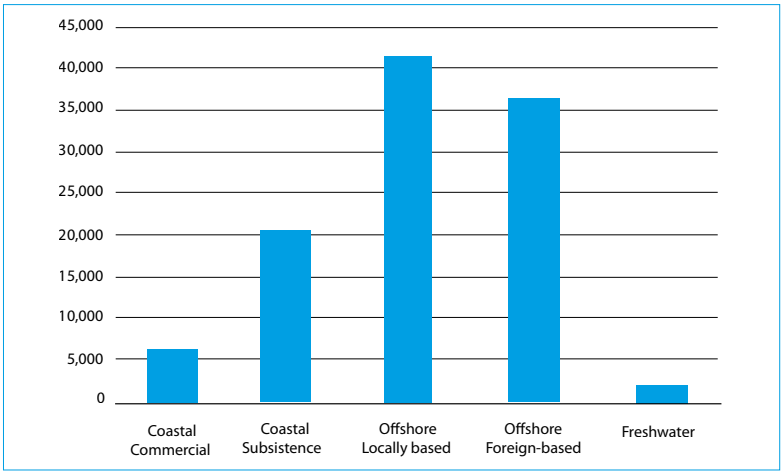


Figure 16-1 : Solomon Islands Fisheries Production by Volume (mt), 2014

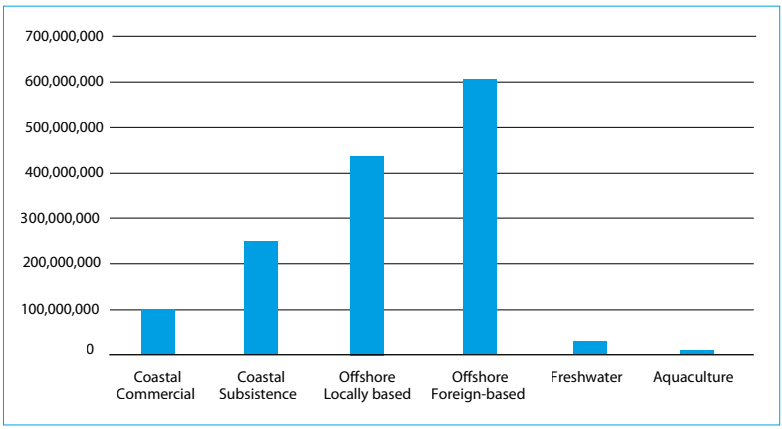


Figure 16-2 : Solomon Islands Fisheries Production by Value (SI$), 2014

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 fishery production levels for Solomon Islands from those three studies are provided in Table 16-6.[6]

Table 16-6: Estimates by the Benefish Studies of Annual Fisheries/Aquaculture Harvests

Harvest Sector	Estimate Year	Volume (mt, and pcs where indicated)	Nominal Value (SI$)
Coastal Commercial	1999	3,200	9,200,000
	2007	3,250	25,300,000
	2014	6,468	98,032,500
Coastal Subsistence	1999	13,000	39,000,000
	2007	15,000	84,000,000
	2014	20,000	252,000,000
Offshore Locally based	1999	73,328	335,000,000
	2007	23,619	249,864,889
	2014	41,523	438,879,607
Offshore Foreign-based	1999	948	4,000,000
	2007	98,023	1,174,648,841
	2014	36,573	604,512,524
Freshwater	1999	n/a	n/a
	2007	2,000	11,200,000
	2014	2,300	29,000,000
Aquaculture	1999	n/a	n/a
	2007	8,202 pcs and 165 mt	311,000
	2014	20,000 pcs and 1,530 mt	5,900,000

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 between the years, but some of that change is due to the way in which the production was estimated. For example, the IUCN study considered new data and made new estimates of coastal fisheries production that are partially reflected in the estimates in the table above. 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 The earliest Benefish Study, Gillett and Lightfoot (2001), did not include aquaculture, freshwater fisheries or the non-independent territories.

16.2 Contribution of Fishing to GDP

Current Official Contribution

The Statistics Division of the Ministry of Finance and Treasury calculates the official GDP of Solomon Islands. Estimates of fishing contribution to GDP for recent years appear in Table 16-7:

Table 16-7: Official Estimate of Fishing Contribution to GDP

	2012	2103	2014
Contribution of formal fishing	169,581	129,997	111,453
Contribution of informal fishing	78,678	82,777	80,784
Total fishing contribution	250,271	214,877	194,251
Total Solomon GDP	6,709,869	7,323,447	7,819,541
Fishing share of GDP	3.7%	2.9%	2.4%

Notes: Current prices (SI$ thousands); figures for 2014 are provisional
Source: Statistics Division (unpublished data)

According to an official of the Central Bank of Solomon Islands (CBSI), that institution also calculates the GDP of Solomon Islands for internal purposes, in order to have figures available early in the year for planning purposes. CBSI recognises that not all fishing sub-sectors are covered in its calculations. (M. Kikiolo, per. com. August 2015)

Method Used to Calculate the Official Fishing Contribution to GDP

In the methodology used by the Statistics Division the fishing sector comprises several components. These are:

- the formal sector; and
- the informal sector, comprising monetary fishing (outboard motor fishing; and other marine products) and subsistence fishing.

According to staff of the Statistics Division (A. Kakate, per. com. August 2015) the contribution of formal sector fishing to GDP is calculated by taking gross output (GO) minus intermediate consumption (IC) to give the value added (VA), which is equivalent to the contribution of the sub-sector to GDP (i.e. GO-IC=VA). For 2014:

- the GO of formal sector fishing was SI$296,036k and IC was SI$184,582k, for a value added of $111,453k;

- the GO of informal sector fishing was SI$236,267k and IC was SI$155,483k, for a value added of SI$80,784k. The value added from monetary fishing was SI$30,225k; and the value added from subsistence fishing was SI$50,559k.

The staff of the Statistics Division indicate that gross output and intermediate consumption for the formal sector are determined from replies to a questionnaire sent to the major fishing companies. The contribution of the various components of the informal sector are calculated using information from the most recent household income and expenditure survey (HIES, 2012/2013). For the calculations, SI$13.94 was used as the local market price of fish in 2014.

Alternative Estimate of Fishing Contribution to GDP

Table 16-8, below, represents an alternative to the official method of estimating fishing contribution to GDP in Solomon Islands. It is a simplistic production approach that takes the values of five types of fishing/aquaculture activities for which production values were determined in Section 16.1, above, (summarised in Table 16-5), 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 16-8 replace the official methodology, but rather that the results obtained serve as a comparator to gain additional information about the appropriateness and accuracy of the official methodology, and to indicate any need for its modification.

Table 16-8: Fishing Contribution to GDP in 2014 Using an Alternative Approach

Harvest Sector	Value (SI$) (From Table 16-5)	VAR	Value Added
Coastal Commercial	98,032,500	0.75	73,524,375
Coastal Subsistence	252,000,000	0.90	226,800,000
Offshore Locally based	438,879,607	0.52	228,217,395
Freshwater	29,000,000	0.92	26,680,000
Aquaculture	5,900,000	0.70	4,130,000
Total	**823,812,107**		**559,351,770**

The total value added in Table 16-8 (SI$559.4 million) is much higher than the official value added of SI$194.2 million (Table 16-7). This results in a fishing contribution to Solomon Islands GDP of 7.2%, which compares with the official contribution of 2.4%. The following considerations are relevant to this difference between the two estimates:

- The gross output for formal fishing in 2014 in the official methodology is given above as SI$296 million, whereas in a previous section of this book the dockside value of the catch of locally based offshore fishing vessels in 2014 (which should be the same) is given as SI$438.9 million.
- The gross output of the informal sector in 2014 in the official methodology is given above as SI$236 million, whereas the combined amount of money paid to coastal commercial fishers and coastal subsistence fishers in 2014 (which should be the same) is SI$350 million.
- From the GDP table, above, it is apparent that the value added ratios for 2014 are 37.6% for formal sector fishing and 34% for informal sector fishing. The VAR for the formal sector appears to be low, and that for informal fishing appears to be very low.

The recalculated percentage fishing contribution to the GDP of Solomon Islands (7.1% for 2014) is slightly higher than the 6.8% recalculated percentage fishing contribution for 2007 given in the Gillett (2009) study.

16.3 Exports of Fishery Production

According to staff of the MFMR all fishery exports of Solomon Islands require a permit. Each export consignment is inspected, and the volume and value is recorded. Information on annual non-tunwa exports from the MFMR database is given in Table 16-9.

Table 16-9: Volume and Value of Fishery Product Exports

PRODUCT		2012	2013	2014
Beche-de-mer[7]	(kg)		160,397	
	(SI$)		16,215,793	
Trochus Shell	(kg)	101,600	78,080	103,820
	(SI$)	2,032,000	156,600	1,685,720
Coral	(kg)	75,920	75,958	72,650
	(SI$)	2,589,865	2,195,373	222,618
Sea weed	(kg)	921,070	1,343,348	1,112,868
	(SI$)	7,060,700	10,746,784	8,902,946
Other Shell	(kg)	841 pc	1436 pc	135 pc
	(SI$)	2,264	7,102	551
Blank Button	(kg)	20,072	40,290	74,124
	(SI$)	3,023,535	2,491,163	4,178,674
Clam Shell (live)	(kg)		1,108	528
	(SI$)		1,108	528
Crayfish	(kg)			265
	(SI$)			4,300
Mollusc	(kg)	250 pc		
	(SI$)	8,698		
Marine shell	(kg)	1763 pc		
	(SI$)	205,938		
Shark fin	(kg)	15,087	3,367	27,851
	(SI$)	900,758	428,545	638,808
Abalone	(kg)			249
	(SI$)			4,986
Reef fish/fillet	(kg)	68	404	2,829
	(SI$)	954	6,972	28,898
Black lip	(kg)	250pc	5 pc	12 pc
	(SI$)	8,696	343	627
Aquarium fish	(kg)	24667 pc	31389 pc	37734 pc
	(SI$)	126,685	158,926	183,780
Invertebrate	(kg)	15,149	3623 pc	1562 pc
	(SI$)	12,153	12,153	16,262
Coastal Fishery Exports	(kg)	1,176,737	1,739,405	1,434,627
	(SI$)	15,972,246	32,420,862	15,868,698

Source: MFMR (unpublished data)

7 Unpublished data from SPC show that Solomon Islands averaged 64.7 mt of beche-de-mer exports per year during the eight-year period 2005–2012, when the beche-de-mer fishery was nominally closed.

MFMR data indicates that the 2014 tuna exports of Solomon Islands (canned fish, loins and fish meal) were SI$370 million. Combining this figure with the coastal exports in the above table gives total fishery exports of the country in 2014 of SI$386 million.

Data provided by SPC's Statistics for Development Division are quite different. They show SI$418 million of fishery exports in 2014 (this data is presumably from the Customs Department). The SPC data includes frozen whole tuna, while MFMR tuna export data includes only canned fish, loins and fish meal. World Bank data[8] shows total exports of Solomon Islands in 2014 of SI$3,502 million. Therefore, in 2014 the fishery exports of the country represented about 11.9 % of the value of all exports. In Gillett (2009) fishery exports of the country were about 12% of all exports for 2007.

16.4 Government Revenue from Fisheries

Access Fees for Foreign Fishing

MFMR staff kindly provided unpublished data on access fees for foreign fishing (Table 16-10). In the table "FFA receipts" are the proceeds from the US Tuna Treaty (not including the project development fund component).

Table 16-10: Access Fees for Foreign Fishing (SI$)

	2012	2013	2014
Fisheries license fees (overseas)	134,608,885	148,800,853	192,542,509
FFA receipts	12,687,657	6,692,326	20,819,435
Total	**147,296,542**	**155,493,179**	**213,361,944**

Source: MFMR (unpublished data)

Staff of MFMR indicated that, in 2014, SI$8.8 million came from longliners, with the balance (SI$204.6 million) coming from purse seiners.

Ministry of Finance (unpublished data) gives similar amounts for access fee receipts. For 2014 the "FFA receipts" are identical, and for "Fisheries license fees (overseas)", SI$193,202,687 is recorded.

The relative contribution of access fees to government revenue is calculated in Table 16-11.

8 http://wits.worldbank.org/countrysnapshot/en/SLB/textview

Table 16-11: Access Fees for Foreign Fishing (SI$)

	2012	2013	2014
Total access fees (from above table)	147,296,542	155,493,179	213,361,944
Total government revenue (Ministry of Finance, unpublished data)	2,515,000,000	2,751,000,000	2,825,000,000
Access fees as a % of government revenue	5.9%	5.7%	7.6%

Source: Table 16-10, Ministry of Finance (unpublished data)

The 2014 budget documents contain the statement: "The Ministry of Fisheries and Marine Resources continues to be the largest domestic source of non-tax revenue."

In Gillett (2009) access fees for foreign fishing represented about 4.4% of total government revenue for 2007.

Other Government Revenue from Fisheries

Unpublished data from MFMR and the Ministry of Finance (identical figures) show the other government revenue from fisheries in 2014 (Table 16-12).

Table 16-12: Other Government Revenue from Fisheries (2014)

Source of Revenue	SI$
Fisheries License Fees (Local)	144,228.32
Export Permit Fees	234,837.95
Fish Processing Licence Fees	479,173.34
Port Entry Fees	47,800.00
Fish and Miscellaneous Sales	635,100.00
Sale of Public Assets	0
Transshipment Levies	1,095,033.87
Observer and Services Fees	550,221.40
Total	**3,186,394.88**

The above table omits the duty obtained from the export of marine products from Solomon Islands. A flat rate of 10% is charged on the declared value of all such exports (Section 1 of Chapter 3 of the 2007 Customs Schedule). Unpublished data from the Ministry of Finance shows that, in 2014, a total of SI$1,661,357 was obtained by the government from taxing fishery exports (under the categories of "fish" and "shells").

16.5 Fisheries-Related Employment

Three types of fisheries-related employment information in Solomon Islands are presented here: data on formal employment, informal employment and gender aspects of fisheries work.

An IUCN study (Arena et al., 2015) states that the 2009 HIES reported that the number of workers in fisheries and aquaculture was 5,756 (12% female and 88% male). This figure has not changed significantly since 2001 and 2004, when there were 5,179 and 5,114 formal jobs in the fishery sector, respectively.

There were two recent national censuses: 1999 and 2009. The report of the 2009 census (NSO 2010) shows "changes in paid employment" in the 10-year period between the two surveys, as follows:

- 1999: total jobs in fishing were 3,367 (2,935 males and 432 females)
- 2009: total jobs in fishing were 5,736 (5,076 males and 660 females)
- Changes during the period: 70.4% increase in paid employment in fishing (72.9% increase for males and 52.8% increase for females)

A report by the Asian Development Bank (ADB 2010) states that reliable, comprehensive employment data for the formal sector is currently unavailable, but it appears that formal sector employment numbers increased from 50,890 in 2002 to 59,161 in 2006. The services sector accounts for 6 in every 10 jobs, the industry sector accounts for 1 in every 10 jobs, and the primary sector accounts for 3 in 10 jobs.

Data from an earlier period (IMF 2005) gives some insight into the relative importance of fishing jobs in the country (Table 16-13).

Table 16-13: Formal Employment in Solomon Islands

	2001	2002	2003	2004
Formal fishing jobs	5,179	5,030	5,015	5,114
Total formal jobs	42,631	41,067	41,723	42,297
Fishing jobs as % of all formal jobs	12.1%	12.2%	12.0%	12.1%

Source: IMF (2005)

The Forum Fisheries Agency tracks tuna-related employment in the region, including for Solomon Islands. Unpublished FFA data shows the jobs relating to the major tuna fishing and processing companies in early 2015 (Table 16-14).

Table 16-14: Tuna Related Jobs in 2015

Type of Job	Number
Local crew	274
Foreign crew	21
Processing / packing	1,470
Other	448
Total	**2,213**

2015 tuna-related employment is compared to earlier periods in Table 16-15. Much of the change in crew jobs relates to the variation in the number of pole-and-line vessels, which are labour intensive.

Table16-15: Locals Employed in the Solomon Islands Tuna Industry

Type of Job	2002	2006	2008
Local Jobs on Vessels	464	66	107
Local Jobs in Shore Facilities	422	330	827
Total	**2,888**	**2,402**	**2,942**

Source: Gillett (2008)

"Local jobs on vessels" refers to vessels that are based in Solomon Islands. Many Solomon Islanders are employed on industrial fishing vessels that are based outside of the country. An earlier study (Gillett and McCoy 1998) showed that 138 crew from Solomon Islands were employed on Korean longliners, Korean purse seiners, Taiwanese longliners, Taiwanese purse seiners, Japanese longliners and US purse seiners. Although the current number of Solomon Island crew on those vessels is unknown, it is likely to have increased significantly, especially on purse seine vessels, due to Honiara emerging as a major tuna transshipment point.

Another aspect of fisheries-related employment in Solomon Islands is jobs in the Ministry of Fisheries and Marine Resources (MFMR). In the 2014 national government budget 76 positions are indicated for MFMR.

A general feature of the information on formal employment related to fisheries in Solomon Islands is that the definition of the "number of jobs" is vague. It is not known whether it is the total number of people to have worked during a year, the number at a point in time, or the number of full-time equivalent jobs (or a mixture of the three). This issue makes it difficult to track fisheries-related employment over time and across countries.

Informal employment in the fisheries sector is extremely important in Solomon Islands but the available data is fragmented. One of the most comprehensive statements is contained in a report by the Asian Development Bank:

> The number of subsistence fishers in Solomon Islands can be crudely estimated by looking at the total population – about 570,000 in 2012 – and assuming 82% as the rural population. By dividing this by the average number of household members in rural households (5.2 persons) the minimum number of subsistence fishers can be derived. A minimum of 88,000 people are estimated to be engaged in fishing, assuming one household member is a fisher. This, however, is a conservative estimate. If the inputs of women and other adult men are considered in the estimate, the number of subsistence fishers would double to 175,000. (ADB 2014)

The 2009 census states that most households in Solomon Islands produce at least some of the food they consume. Eighty-nine percent of all households grew some of their own food, and 60% of households caught fish for their own consumption over the year preceding the census. These proportions were even higher in rural areas, averaging 96% for food and 69% for fishing, but even in urban areas significant proportions of households participated in subsistence food production. For example, in Honiara 42% of households said they had produced food, although only about 8% had caught fish. (NSO 2010)

The following summarises further relevant information on informal fisheries-related employment in Solomon Islands:

- Weeratunge et al. (2011) estimated that nearly half of all women and 90% of men fish.
- The 2005/2006 HIES (Statistics Office, 2006) reports that, of households that are involved in self-employed commercial activity, 16% are engaged in the sale of fish and other seafood.
- An ADB study (Berdach and Llegu 2005) found that, in addition to subsistence harvesting, semi-commercial or artisanal fisheries activities are practised by an estimated 30,000 people, mainly in nearshore areas.
- A 2006 SPC Solomon Islands poverty assessment (Legu 2007) found that 50% of females and 90% of males participated in fishing activities.

Men and women have very different roles in the various activities related to the fisheries sector. Citing numerous references, Weeratunge et al. (2011) provide information on the gender aspects of fisheries-related employment in the country (Box 16-1).

Box 16-1: Gender Aspects of Fisheries-Related Employment in Solomon Islands

Fishing is a predominantly male activity (90 percent of men) with at least one female household member (50 percent of women) engaged in fishing. However, there can be significant variations among provinces and villages. Women are engaged in trading of garden and fish products, including cooked food, as well as weaving, production of shell money, and employment in industrial fish processing plants. In the main fish canning factory in Noro, 80 percent of the 500 workers are women. In many fishing communities men are involved in logging, fish trading, and stone and wood carving as well as other employment such as running small businesses (such as grocery stores, fuel depots, copra mills) and pastors. Home-based tasks, such as household chores, child care, gathering firewood and fetching water are largely women's work while house repair and maintenance, canoe building and repair, and cutting firewood (except firewood collection from mangroves) are predominantly male tasks. In rural Solomon Islands the gender division of labour in fisheries is bounded to some extent by space — men fish in the reefs and offshore, while women and children predominantly fish the nearshore zone on reefs close to villages, lagoons, and mangroves. Men are also engaged in diving and spear fishing; women glean for invertebrates and harvest mangrove fruit and seaweed Mariculture activities conducted by both men and women in some Western Province villages include farming giant clams and corals and both women and men can be engaged in the cultivation of seaweed. In terms of fishing assets, a qualitative assessment in the Western Province showed that men predominate in canoe ownership; however, some women own canoes and others access canoes of kin. Both men and women own their fishing lines and hooks, although men tend to own a larger number of lines. Ownership of fishing spears, engines, nets, boats, sails, and diving gear (masks and fins) is largely confined to men. Some women own swimming goggles and use these for gleaning.

Source: Weeratunge et al. (2011)

SPC (2013) provides some insight into the gender aspects of a "fisher" in Solomon Islands. At the village level across the country, 58% of fishers are men and 42% are women. Analysis of data generated by the "Hapi Fis" project shows that fish vending in Honiara is male-dominated (74%), with a vendor having an average age of 33 years and 9 years of vending experience. (Pomeroy and Yang 2014)

16.6 Levels of Fishery Resource Consumption

Bell et al. (2009) 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. For Solomon

Islands the per capita fish consumption for the period (whole weight equivalent) was 45.5 kg per year in urban areas (fresh fish comprised 80% of this amount), and 31.2 kg per year in rural areas (90% fresh fish). The national fish consumption rate was 33.0 kg per capita per year.

The following summarise other estimates of annual per capita consumption of fish in Solomon Islands:

- Skewes (1990) found that 31% of households consumed fresh fish each day, and that 82.4% of meals containing animal protein were fish based. The consumption of fish was estimated to be 45.5 kg.
- A Japan-sponsored study in 1994 (Jica, undated) found that Honiara households consumed 47.9 kg of fresh fish per day, and that the figure for households in provinces was 65 kg.
- Preston (2000) estimated that household consumption, country-wide, for 1995, was 32.7 kg.
- The FAO Food Balance sheet for 1999 estimated that household consumption, country-wide, was 32.2 kg.

There is considerable variation in per capita fish consumption across the country. This is demonstrated by SPC's ProcFish survey, which aimed to survey typical fishing villages. The annual fish consumption at each of the four villages chosen was around 100 kg/person, which is three times the national consumption figure cited by Bell et al. (2009), above.

A survey of two villages in the Western Province, as well as Gizo and Honiara, in March 2010 provides insight into perceived changes in fish consumption. The report of the study (WFQA 2010) states:

> The vast majority of respondents reported that they ate more fish 10 years ago than now. Reasons included depletion of fish resources, population increase, the impact of the tsunami, lack of a fisher in the household, and increase in vegetable intake. The minority who saw no change in fish consumption pointed out that, as in the past, one family member always managed to supply fish for the household. The few who indicated that they ate more fish now than 10 years ago attributed this to changes in technology such as ability to dive in the night, access to fish aggregation devices, health promotion campaigns on the radio, or ease of availability in the market.

The vast majority of fish consumed in Solomon Islands comes from the country's coastal fisheries. Some information is available on fish supplies that originate elsewhere, as follows:

- Based on the 2005/2006 HIES, both in urban and in rural areas, processed fish, particularly Second Grade Taiyo, represents almost 50% of all expenditure on fish. (Weeratunge et al. 2011)
- The salt fish trade in Honiara consists of selling, from tuna transshipment operations, the non-target bycatch and damaged target tuna that are otherwise unmarketable. McCoy (2013) indicates that this trade puts about 440 to 500 mt of fish onto the Honiara market annually. This is approximately equivalent to each of the 70,000 residents of Honiara consuming 6.7 kg of salt fish per year.

16.7 Exchange Rates

The average yearly exchange rates (Solomon Islands dollar (SI$) to the US dollar) used in this book are as follows:

2002	2003	2004	2005	2006	2007	2008
6.75	7.51	7.48	7.53	7.61	7.65	7.67
2009	**2010**	**2011**	**2012**	**2013**	**2014**	
7.88	7.85	7.24	7.07	7.19	7.63	