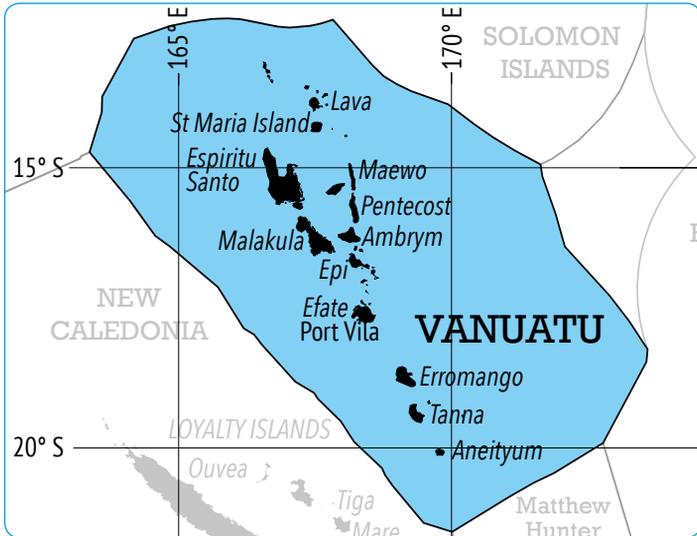


19 Vanuatu



19.1 Volumes and Values of Fish Harvests in Vanuatu

Coastal Commercial Catches in Vanuatu

The following are the major historical attempts to consolidate information on coastal commercial fisheries production in Vanuatu:

- Dalzell et al. (1996), using reference material from the late 1980s and early 1990s, estimated that production from the commercial fisheries was 467 mt, worth US\$1,514,364.
- Wright (2000) commented on small-scale commercial fishing. Deep-water snapper fisheries provide 80 tonnes annually to domestic markets, with relatively minor amounts exported. These domestic markets

absorb an additional 40 tonnes of shallow water reef fish and coastal pelagics each year. On the basis that coastal fishers receive an average price of VT 400 (Vanuatu vatu) per kg for these fish, the value of these small fisheries to coastal populations throughout the country probably exceeds VT 48 million annually. On the assumption that collectors of trochus receive an average of VT 250 per kg for the raw shell, and that an average of 100 tonnes of shell has been harvested annually in each of the last 14 years, coastal communities have received an injection of approximately VT 25 million annually from the trochus fishery alone. It is estimated that other smaller fisheries – principally beche-de-mer, and to a lesser extent aquarium, green snail and crustacean fisheries – contribute at least an additional VT 15 million to local economies annually.

- Gillett and Lightfoot (2001) considered the above studies, and ventured an estimate for coastal commercial fisheries production of 230 mt, worth VT 88 million annually.
- Gillett (2009) considered the above studies, plus some additional information: (a) the results of the 2006 household income and expenditure survey, (b) recent export data, (c) estimates of production from specialised studies, (d) the results of the 2006/2007 agriculture census, and (e) opinions of fisheries specialists. The findings indicated: (1) the household income and expenditure survey (HIES) results show that 336 mt of local fisheries products (worth VT 75.4 million) were purchased in 2006 for domestic consumption; (2) deepwater and pelagic fish catches of 150 mt (worth VT 60 million) should be added to the domestic consumption of the HIES; and (3) Fisheries Department documentation indicates that, in recent years, there have been exports of fishery product of 52 mt and 152,000 pieces (worth VT 91 million). This equates to a coastal commercial fisheries production of 538 mt, plus 152,000 pieces, worth VT 226.4 million.

In order to make a new estimate of coastal fisheries production, the present study considers the results of a new study that included Vanuatu's coastal fisheries, along with other information on coastal fisheries production in recent years.

An IUCN study that has considerable relevance to valuing the benefits from coastal fisheries in Vanuatu was recently carried out under the MacBio programme. This work is described in Box 19-1.

Box 19-1: Economic Assessment and Valuation of Marine Ecosystem Services

The MacBio project has undertaken national economic assessments of marine and coastal ecosystems in the five Pacific Island countries: Solomon Islands, Kiribati, Fiji, Tonga, and Vanuatu. The principal objective of the economic component of MacBio was to help countries to identify, quantify and, as far as possible, value in monetary units the most relevant marine and coastal ecosystem services in each MacBio country. In Vanuatu the MacBio work focused on determining the economic value of seven marine and coastal ecosystem services in Vanuatu:

- Subsistence fishing, corresponding to the non-commercial fishery where all catch is consumed, given or exchanged but no monetary transaction takes place.
- Commercial fishing, including professional and non-professional inshore fishers well as pelagic fisheries and sport fishing. This fishery corresponds to all capture of pelagic, deep sea, nearshore and inshore reef and mangrove fish and invertebrates sold for food or for shells.
- Mineral and aggregates extraction.
- Tourism, covering all activities linked to coastal ecosystems such as underwater tourism, day tours and recreational boating in Vanuatu.
- Protection against coastal flooding.
- Carbon sequestration. Seagrass and mangrove ecosystems store carbon in living biomass and soil. Based on available habitat data, we quantified and valued the stock of carbon sequestered.
- Research, education and management.

Source: Pascal et al. (2015)

The MacBio study used, as a main source of information, the Vanuatu 2010 HIES. The survey was complemented with information on per capita fish consumption, reports from the Fisheries Department and specialised fisheries work.

The MacBio study and the present study have different objectives and, accordingly, the way the data are treated and presented are sometimes different. Some of these differences are described below:

- The MacBio study values subsistence fisheries production by protein equivalent, whereas the present study uses the farm gate method.
- To account for the value of some non-dietary benefits of subsistence fishing (e.g. social cohesion) the MacBio study applies a factor of 1.3 to the value added.

- The MacBio study presents the value added of the subsistence and commercial production, whereas the present study presents the imputed farm gate values (for subsistence) and value to fishers (for commercial).
- The focal year for the MacBio study is 2013, while the focal year for the present study is 2014.

Table 19-1, below, is based on the MacBio results. The offshore fisheries production and ranges of values were removed from a table of MacBio results so that the presented figures would be more comparable with the present study.

Table 19-1: Coastal Fishery Production in Vanuatu as Estimated by the MacBio Study

		Catch volume (mt)	Annual value-added (US\$)
Coastal Subsistence	Rural subsistence	2,600	6,050,000
	Urban subsistence	200	440,000
	Total subsistence	2,800	6,490,000
Coastal Commercial	Reef fish, deep slope fish, crabs and lobster	1,720	3,300,000
	Trochus and similar	28	100,000
	Bêche-de-mer	40	50,000
	Aquarium trading	0	150,000
	Game fishing	70	1,600,000
	Total commercial	1,858	5,200,000

Source: Pascal et al. (2015)

The above table exhibits a prominent feature: the production in the category “reef fish, deep slope fish, crabs and lobster”, is very large compared to all of the historical studies cited above (e.g. more than three times as large as that of the Gillett (2009) study), and is also very large relative to the production from subsistence fisheries. Fisheries Department staff consider that the ratio of subsistence to commercial coastal fisheries production in Vanuatu is about 3:1 (P. James, G. Nimoho, per. com. August 2015), and that the ratio in the MacBio study is about 1.5:1.

Based on knowledge of the historical studies cited at the beginning of this section, it can be stated that the MacBio approach is the more methodical in approach to estimating coastal fisheries production than the present study. However, it relies heavily on the results of the 2010 HIES.

Some additional information that may be useful for estimating coastal fisheries production in Vanuatu is provided below:

- Discussion with fishery stakeholders in Port Vila and an outer islands economic survey (Treasury Division 2015) indicate that 2014 prices paid to fishers in Port Vila for finfish ranged from VT 350 to 800 per kg. Prices in Malekula, Tanna, and Ambae ranged from VT 250 to 500 per kg.
- Unpublished data from the Fisheries Department shows, for 2014, production of 50 mt of trochus and 1.7 mt of beche-de-mer, and an FOB export value of VT 801,772 for aquarium products.
- The annual catch from game-fishing boats catch in recent years has ranged from 48 mt to 64 mt (McCoy 2013).
- About 60% of the fish consumed on Efate comes from other islands (G. Nimoho, per. com. August 2015).

In view of the information presented above, the volumes of the production of subsistence fishing given by the MacBio study (2,800 mt) are accepted as being accurate. Valuing that production by the farm gate method results in a total value of VT 761.6 million.

The following are estimates for coastal commercial fisheries production: finfish/crustaceans, 1,000 mt (worth VT 450 million to fishers), trochus, 50 mt (VT 12.5 million), beche-de-mer, 1.7 mt (VT 6 million), aquarium products (VT 65 million), and game fishing, 55 mt (VT 39 million). The total 2014 estimated coastal commercial production in Vanuatu is therefore 1,106 mt, worth VT 572.5 million to fishers.

Coastal Subsistence Catches

The Gillett (2009) study commented on earlier attempts to estimate coastal fisheries production in Vanuatu:

In a report for FAO, Preston (1996) estimates subsistence fisheries production in Vanuatu of 2,000 mt. This appears to have become institutionalized (F.Hickey, personal comm., September 2008) and is quoted in documents, (e.g. the 2007 annual report of the

Fisheries Department). The Preston study credited the estimate to Dalzell et al. (1996) which was based largely on an agriculture survey in 1984. A 2008 Vanuatu trade study (Gay 2008) places a value on subsistence production (US\$1,953,360) which is precisely that given by Dalzell et al. (1996). The reality is that no original field research focused on estimating subsistence fisheries production in Vanuatu has been carried out in almost a quarter century.

As mentioned above, the volumes of the production of subsistence fishing given in the MacBio study (2,800 mt) are accepted as being accurate, and, based on the farm gate method, is valued at VT 761.6 million.

Locally Based Offshore Catches

The paper delivered by the Vanuatu delegation to the 2014 Scientific Committee meeting of the Western and Central Pacific Fisheries Commission (WCPFC) deals mainly with the activities of Vanuatu-flagged vessels, the vast majority of which are not based in Vanuatu. It indicates that 82 longliners and 3 purse seiners were active in the WCPFC area in 2014 (Fisheries Department 2015), but it is not possible to determine from the paper the number that are actually based in Vanuatu. It does state: “The processing plant (Tuna Fishing Vanuatu Limited) in Port Vila harbor ceased operations in February 2014 due to movement of the fleet to the Solomon Islands.”

An official of the Fisheries Department stated that, in 2013, three longliners were based in Port Vila, but they departed in early 2014 (W. Obed, per. com. August 2015) – presumably as a result of the closing of the processing plant, mentioned above.

FFA (2015) indicates that catches of tuna by “domestic vessels and locally based foreign vessels” in the Vanuatu zone in 2014 were 437 mt in 2014, worth US\$1,834,345 at the destination markets. For that 437 mt to be the tuna catches by Vanuatu-based offshore vessels it must be assumed that all such vessels made all of their catch in the Vanuatu zone. Taking the FFA-estimated tuna catches, and correcting for the volume of the likely bycatch, the value of that bycatch, adjusted for transport of the catch to destination markets, results in a 2014 locally based offshore catch of 568 mt, with an in-zone value of US\$1,474,000 (VT 151,100,636).

Foreign-Based Offshore Catches

The foreign-based offshore catch in the Vanuatu zone is assumed to be the total offshore catch in the zone minus the locally based offshore catch in the zone (as above).

Estimates of the volumes and values of catches of the four main commercial species of tuna in the area of the WCPFC for the years 1997–2014 have been made by the Forum Fisheries Agency (FFA 2015), using data sourced from the Oceanic Fisheries Programme of the Pacific Community.

The FFA data shows that the total tuna catch in the Vanuatu zone in 2014 was 8,854 mt, with a destination market value of US\$34,512,714. It is stated above that the 2014 tuna catches by locally based offshore vessels were 437 mt, with a destination market value of US\$1,834,345. The foreign-based tuna catches were therefore 8,417 mt, with a value of US\$32,678,369.

Correcting for the volume of the likely bycatch, the value of that bycatch, and transport of the catch to destination markets results in a 2014 foreign-based offshore catch of 10,942 mt, with an in-zone value of US\$26,402,601 (VT 2,706,530,705).

Freshwater Catches

The Vanuatu Fishery Resource Profiles (Amos 2007) contain extensive information on the country's freshwater fish and invertebrate resources. It is reported that the distribution of the various freshwater ecosystems is patchy throughout the Vanuatu archipelago, covering only 1.0% of the total land area of approximately 14,763 km². Freshwater ecosystems on Vanuatu's larger islands (e.g. the Jordan River on Santo, Cooks River on Erromango Island, and Pankumo River on Malekula Island) have discharges, which form cascades, rockfaces, pools and tidal reaches, and are often characterised as having extensive flood plains. Smaller island ecosystems, on the other hand, only have streams, which are often ephemeral.

The profiles cover 18 families of local freshwater fish, three families of introduced fish and several species of shrimps and crabs. According to the profiles, the most important taxa for fishery purposes are described below:

- Local species of fish: five genera of fish (*Khulia*, *Lutjanus*, *Gerres*, *Monoactylus* and *Scatophagus*), four species of mullets and several species of freshwater eels.
- Introduced species of fish: *Cyprinus* and two species of tilapia.
- Invertebrates: several species of *Macrobrachium*.

An individual with a long historical involvement in Vanuatu fisheries examined the available freshwater fisheries data and discussed the issue of freshwater fishing with other local fisheries specialists, and estimated that recent annual production from freshwater fisheries in the country is about 88 mt per year (F. Hickey, per. com. August 2015).

The price for subsistence fish, of VT 272/kg (determined in the subsistence section above), can be applied to over 95% of the freshwater production. *Macrobrachium* is currently sold by fishers in Port Vila for VT 800/kg. The recent annual production from freshwater fishing, of 88 mt, is estimated to be worth VT 23,872,000.

Table 19-2: Aquaculture Production in Vanuatu in 2014

Commodity	Type production	Current estimated annual production	Farm gate price	Annual production value (VT)	Comment
Tilapia	Commercial farm	30 mt	550 VT per kg	16,500,000	One commercial farmer; some barramundi produced (VT 1200 per kg); farm destroyed by cyclone Pam in early 2015
Tilapia	Village ponds	1 mt	400 VT per kg	400,000	About 50 village farms; 70% of production is on Santo
Prawns	Commercial farm	13 mt	1,700 VT per kg	22,100,000	One commercial farmer; P. vanamei is produced; most is for domestic market; exports "piggyback" on beef exports
<i>Macrobrachium</i>	Village ponds	120 kg	1,500 VT per kg	180,000	3 village ponds; started production in late 2014
Coral culture	One company	-----	-----	-----	No production since destruction caused by cyclone in 2008
Giant clam	Government operation	300 pieces	300-500 VT per piece	120,000	Most given to communities at about 3 cm in size; lost all standing production in cyclone Pam
Trochus	Government operation	25,000 pieces	-----	-----	For restocking purposes; lost all standing production in cyclone Pam
Green snail	Government operation	2,000 pieces	-----	-----	For restocking purposes; lost all standing production in cyclone Pam

Source: S. Rena, G. Norton and R. Jimmy (per. com. August 2015)

Aquaculture Harvests

Using information obtained in discussions with staff of the Fisheries Department, commercial producers and SPC personnel, aquaculture production in Vanuatu in 2014 was estimated, and is presented in Table 19-2.

The above equates to 43 mt and 27,300 pieces, with a farm gate value of VT 39.3 million.

Summary of Harvests

A crude approximation of the annual volumes and values of the fishery and aquaculture harvests in 2014 can be made from the above sections (Table 19-3).

Table 19-3: Annual Fisheries and Aquaculture Harvest in Vanuatu, 2014

Harvest Sector	Volume (mt, and pcs where indicated)	Value (VT)
Coastal Commercial	1,106	572,500,000
Coastal Subsistence	2,800	761,600,000
Offshore Locally based	568	151,100,636
Offshore Foreign-based	10,942	2,706,530,705
Freshwater	80	23,872,000
Aquaculture	27,300 pcs and 43 mt	39,300,000
Total	27,300 pcs and 15,539 mt	4,254,903,341

The very weak factual basis for the estimate of the coastal and freshwater catches is acknowledged.

Figures 19-1 and 19-2 show the volumes and values of the 2014 Vanuatu fisheries production. Aquaculture is not shown on the volumes figure due to the use of mixed units (pieces and mt).

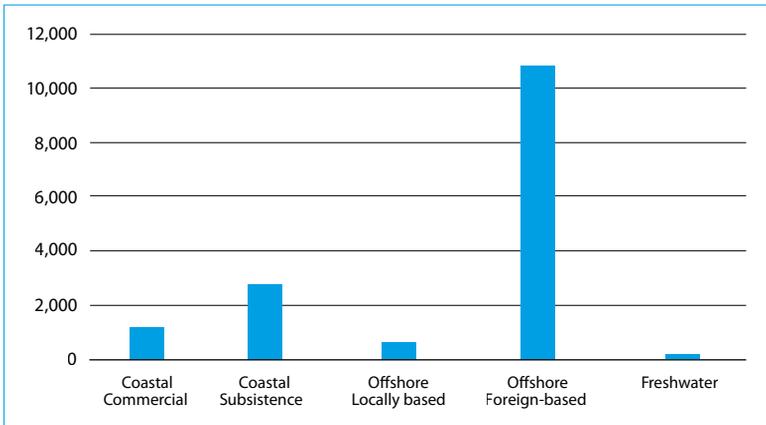


Figure 19-1: Vanuatu Fisheries Production by Volume (mt), 2014

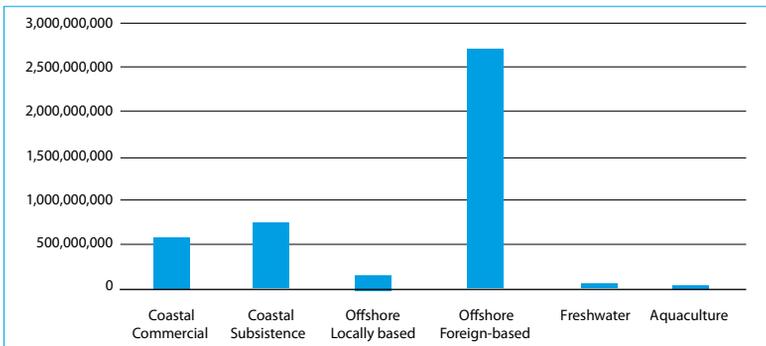


Figure 19-2: Vanuatu Fisheries Production by Value (VT), 2014

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 Vanuatu from those three studies are provided in Table 19-4.¹

¹ The earliest Benefish Study, Gillett and Lightfoot (2001), did not include aquaculture, freshwater fisheries or the non-independent territories.

Table 19-4: Estimates by the Benefish Studies of Annual Fisheries/Aquaculture Harvests

Harvest Sector	Estimate Year	Volume (mt, and pcs where indicated)	Nominal Value (VT)
Coastal Commercial	1999	230	88,000,000
	2007	538	226,400,000
	2014	1,106	572,500,000
Coastal Subsistence	1999	2,700	513,000,000
	2007	2,830	597,000,000
	2014	2,800	761,600,000
Offshore Locally based	1999	0	0
	2007	0	0
	2014	568	151,100,636
Offshore Foreign-based	1999	118	32,666,000
	2007	12,858	2,704,380,286
	2014	10,942	2,706,530,705
Freshwater	1999	n/a	n/a
	2007	80	18,000,000
	2014	80	23,872,000
Aquaculture	1999	n/a	n/a
	2007	2,500 pcs and 34 mt	31,600,000
	2014	27,300 pcs and 43 mt	39,300,000

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 the coastal fisheries change significantly between the years, but some of that change is due to the way in which the production was estimated – for example, the 2014 estimate of production of the coastal commercial fisheries used the MacBio results. 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.

19.2 Contribution of Fishing to GDP

Current Official Contribution

The national accounts are compiled and published by the Vanuatu National Statistics Office (VNSO). VNSO considers commercial fishing as a component of “commercial agriculture”, and subsistence fishing as a component of “subsistence custom/traditional agriculture”. The nominal and relative contributions of the two categories of fishing are given in Table 19-5.

Table 19-5: Fishing Contribution to GDP (VT millions)

	2011	2013	2014
Contribution of commercial fishing	138	121	109
Contribution of subsistence fishing	344	367	376
Total fishing contribution	482	488	485
GDP of Vanuatu	70,873	72,415	75,803
Fishing share of GDP	0.68%	0.67%	0.64%

Notes: Current prices; 2014 information is provisional
Source: VNSO (2014), VNSO (unpublished data)

Method Used to Calculate the Official Fishing Contribution to GDP

Limited information on the methodology was obtained from the VNSO. According to VNSO staff, export data from the Customs Department and production information from the Fisheries Department are used to estimate the gross output of fishing. VNSO staff acknowledge that the information on fisheries production is old and very limited. The value added ratios used are 0.679 for commercial fishing and 0.90 for subsistence fishing (B. Tokal, per. com. August 2015).

The following are additional comments on the methods used to calculate the fishing contribution to GDP:

- The Fisheries Department has few data on subsistence fisheries production, so the accuracy of any subsistence production information passed to VNSO is likely to be very low.
- The Gillett (2009) study contained a comment that the value added ratio used in the official calculations for 2007 for subsistence fishing (0.7437) appeared very low. The value added ratios used by VNSO in 2014 for subsistence fishing (0.90) appears to be much more appropriate.

Alternative Estimate of Fishing Contribution to GDP

Table 19-6, below, represents an alternative to the official method of estimating fishing contribution to GDP in Vanuatu. 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 19.1, above (summarised in Table 19-3), 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 19-6 replace the official methodology, but rather that the results obtained serve as comparator to gain additional information about the appropriateness and accuracy of the official methodology, and to indicate any need for its modification.

Table 19-6: Fishing Contribution to GDP in 2015 Using an Alternative Approach

Harvest Sector	Gross Value of Production (VT, from Table 19-3)	VAR	Value Added (VT)
Coastal Commercial	572,500,000	0.70	400,750,000
Coastal Subsistence	761,600,000	0.90	685,440,000
Offshore Locally based	151,100,636	0.20	30,220,127
Freshwater	23,872,000	0.90	21,484,800
Aquaculture	39,300,000	0.45	17,685,000
Total (VT)	1,548,372,636	--	1,155,579,927

The fishing contribution to GDP from Table 19-7 (VT 1,155,579,927) represents about 1.5% of Vanuatu's 2014 GDP of VT 75,803,000,000. This is more than twice the official estimate of 0.63%.

The sub-sectors are examined, below, to determine where the major differences between the official and alternative estimates of fishing contribution occur:

- In the official calculations the value added from subsistence fishing is VT 376 million and the value added ratio is .90, so the gross value of production is VT 417.8 million. This is much less than the gross value of subsistence production of VT 761.6 million, estimated in a section above.
- In the official calculations the value added from commercial fishing is VT 109 million and the value added ratio is .679, so the gross value of

production is VT 160.5 million. This is much less than the gross value of commercial production (coastal commercial and offshore locally based) of VT 723.6 million, estimated in a section above.

- It is concluded that the gross values of production of subsistence and commercial fishing are significantly under-valued in the official estimates.

19.3 Exports of Fishery Production

The Merchandise Trade Statistics (VNSO 2015) give the principal exports of Vanuatu. The fisheries-relevant parts are extracted, and given in Table 19-7.

Table 19-7: Value of Fishery Product Exports (VT millions)

	2012	2013	2014
Shell	27	30	44
Live fish	136	88	142
Fish	185	139	10
Total fisheries exports	348	257	196
Total exports	5,072	3,651	6,100
Fisheries exports as a % of total exports	6.9%	7.0%	3.2%

Source: VNSO (2015)

Other aspects of the fishery exports of Vanuatu are described below:

- Beche-de-mer is a major export commodity, but does not appear as a separate item in the above table. In 2008 the fishery was closed for a five-year period, 2008–2013. At the completion of that ban, the ban was extended to 2018, although it was opened between 1 September and 31 December to compensate for the large negative economic impacts of tropical cyclone Pam.
- Fisheries Department unpublished data shows no beche-de-mer exports between 2009 and 2013. There was US\$77,731 (VT 7,968,205) of exports in 2014.
- The “shell” category in the table is presumably mostly trochus shell. The export of unprocessed trochus is banned, so the values listed are presumably for trochus button blanks. There have been reports that the single button blanks factory in operation has, in recent years, imported raw trochus from Indonesia, due to insufficient domestic supplies (F. Hickey, per. com. August 2015).

- The large decline in “fish” exports in 2014 is presumably due to the closure of the tuna processing plant, in February 2014.
- The “live fish” category in the table is presumably aquarium products. The Fisheries Department 2012 Annual Report (Fisheries Department 2013) states: “Aquarium fisheries exports include live fish, live corals, live clams and live rock. Live fish continues to dominate the aquarium export production with 86 percent in 2012 followed by live coral with 11 percent and 3 percent live clams.”

19.4 Government Revenue from Fisheries

Access Fees for Foreign Fishing

Vanuatu receives payments for two types of foreign fishing in its zone, purse seine fishing and longline fishing as follows:

- Purse seine fishing: Under the terms of the US multilateral tuna treaty, Vanuatu and other Pacific Island countries receive payments from the US government and the US tuna industry that are associated with fishing access by US purse seine vessels. Some Pacific Island countries consider that all payments under the US treaty are for fishing access, while others treat some components as aid.² Fishing by the US purse seiners has not occurred in Vanuatu waters since the 2003/04 licensing period, when 217 mt of tuna was caught (US/NMFS unpublished public domain data). According to unpublished data from the US government and the Forum Fisheries Agency, in 2014 Vanuatu received US\$555,815 (VT 56,976,596) by way of treaty payment.
- Longline fishing: Fisheries Department (2015) states that foreign longline fleets from Fiji (3 vessels), China (49), Taiwan (5), and Vanuatu³ (7) fished in Vanuatu waters, in 2014, for tuna and tuna-like species under bilateral access agreements. According to the Fisheries Department’s Principal Surveillance Officer, Vanuatu received VT 280 million for fishing licences. Of this amount, 10% is for domestic licences (i.e. game fishing and deep-slope fishing) and 90% is for fishing access to the Vanuatu zone and authorisations to fish (ATFs) (W. Obed, per. com. August 2015). ATFs are for Vanuatu-flagged fishing vessels to fish outside Vanuatu waters and are not for fishing access to the Vanuatu zone.

² In the total access fees given below the amounts listed assume all fees are for access.

³ As the Vanuatu vessels are in a table labelled “Annual Catch and Effort Estimates for Each Foreign Fleet”, it is assumed that those Vanuatu-flagged vessels are treated as foreign vessels with respect to access to the Vanuatu zone.

Unpublished Fisheries Department data shows that, in 2014, 241 fishing ATFs were issued, generating payments of US\$1,255,000 (VT128,650,050). Considering this amount, the VT 280 million above for fishing licences, and the amount for domestic licences (VT 28 million), it is estimated that VT 123,349,950 was paid for access by foreign longline fishing vessels to the Vanuatu zone in 2014.

Total purse seine and longline access fees in 2014 are therefore estimated to have been VT 180,326,546. With total revenue for the Vanuatu government of VT 18.4 billion (IMF 2015), the access fees represent about 1.0% of the Vanuatu government's total revenue.

Other Government Revenue from Fisheries

Government revenue from fisheries other than foreign vessel access fees consist primarily in the ATFs mentioned above (VT128.6 million in 2014) and domestic licences (VT 28 million in 2014). The 2015 Vanuatu government budget (Anon. 2014) lists other estimated income, as follows:

- Product sales – VT 100,000
- Compliance and licensing permit recoveries – VT 3,000,000
- Repair fees – VT 1,500,000
- Seafood verification permit recoveries – VT 2,000,000.

There is at least one type of subsidy in the fisheries sector. McCoy (2014) states that the Fisheries Department operates a fuel tax rebate system in association with the six Provincial Fisheries Centres. Fishers can qualify for a 5% customs duty rebate on fuel (gasoline and diesel) by adhering to certain conditions, including carrying the necessary safety equipment.

19.5 Fisheries-Related Employment

The Vanuatu Socio-Economic Atlas (World Bank 2014) uses information from both the 2009 census and the 2010 household income and expenditure survey (HIES). It shows the following:

- The percentage of households that are involved in any fishing activity: Torba (76.8%), Sanma (48.7%), Penama (36.1%), Malampa (46.1%), Shefa (43.3%), Tafea (43.1%), Port Vila (9.6%) and Luganville (17.6%).

- The percentage of households that report sale of fish/crops/handicrafts as a main source of income: Torba (61.2%), Sanma (67.3%), Penama (67.9%), Malampa (60.0%), Shefa (46.1%), Tafea (60.2%), Port Vila (2.2%) and Luganville (4.4%).
- Areas with especially high involvement in fishing: Northwest Santo, South Maewo, South Malekula, North Erromongo, South Erromongo and Aneityum.

The Vanuatu 2010 HIES found that more than 75% of the adult population practise at least one form of fishing, whether subsistence or commercial. The survey showed that 2% of urban households and 12% of rural households had income from the sale of fishery products. The HIES estimates for the total income from the sale of fish and seafood was VT 36 million annually – an average of VT 7,100 per household per month. The provinces of Tafea, Shefa (rural) and Torba had the highest proportion of income from the sale of fish and seafood, representing almost two-thirds (64%) of total income from the sale of fish and seafood in Vanuatu. Finfish sales amounted to just over VT 20 million, and all other seafood combined about represented another VT 15 million.

The Malvatumauri National Council of Chiefs carried out pilot study on wellbeing, which measures happiness, and considers variables that reflect Melanesian values (VNSO 2012). The traditional skills that relate to fishing were extracted, and these are given in Table 19-8. The percentages of respondents with particular skills are listed.

Table 19-8: Possession of Skills Related to Fishing (% of respondents)

	Carve canoe	Paddle canoe	Spear fish
Urban	18.6	76.9	42.7
Rural	38.6	75.8	53.8
National	44.4	76.0	51.1

Source: VNSO (2012)

The report of the MacBio study (Pascal et al. 2015) states that tens of thousands of people in Vanuatu depend directly on one or more coastal and marine ecosystem services in Vanuatu. The study identified the following groups that receive significant benefits:

- Participation in the commercial artisanal fishery: more than 5,200 households, representing approximately 10% of the households in Vanuatu.

- Local families for whom fishing on the reef and in the mangroves is a source of regular protein: 15,500 households, representing approximately 30% of households in Vanuatu, which involves more than 74,000 individuals.

SPC's ProcFish programme surveyed four sites in Vanuatu (Friedman et al. 2008). Table 19-9 is an extract from the report of the survey, showing the importance of both reef fisheries and the sale of fish.

Table 19-9: Involvement with Fisheries at the ProcFish Sites

Site	% Households involved in reef fisheries	% Households with fisheries as most important source of income
Paunangisu	87	28.9
Moso	100	15.0
Uri-Uripiv	100	38.0
Maskelyne Archipelago	100	3.0
Average across the 4 sites	96	21.8

Source: Friedman et al. (2008)

Govan (2015) contains information on employment in Pacific Island government fisheries agencies. It is indicated that the Vanuatu Fisheries Department has 54 employed positions.

Data on the gender aspects of fishing in Vanuatu is not plentiful. Readily available information includes the following:

- SPC (2013) uses ProcFish data to examine the ratio of men to women fishers across the Pacific. For the Vanuatu sites examined, about 52% of fishers are men and 48% are women.
- A report on the Millennium Development Goals (Prime Minister's Office 2010) states that a large number of women are engaged in the fisheries sector. Their main activities involve gathering fish and shellfish for home consumption, which is barely identified as "fishing" by the male community. Since "fishing" as an activity is usually identified where selling is involved, and women selling fish is not the norm in Vanuatu, women's activities in the sector remain largely invisible.

The role of Vanuatu fisheries is explained in an article on coastal fisheries and human development in Vanuatu (Hickey 2008):

Most rural-based women fishers use their catches primarily to ensure household food security. Since no cash is involved, these

fisheries are viewed by policy-makers and donors as less important than commercial fisheries. However, women are becoming increasingly involved with commercial fisheries, including for trochus, as well as in adding value to their catches. Many women with access to markets in Vanuatu, collect fish, octopus and shellfish, including giant clams, for preparation with traditional puddings covered in coconut cream to produce a value-added product for sale in municipal markets or other popular outlets, such as kava bars. Alternatively, some women in the urban areas simply purchase reef fish from urban outlets for preparation in puddings for sale at various outlets, thereby adding value to these catches.

The Forum Fisheries Agency has a programme – Economic Indicators Project – that collects data on tuna-related employment in standardised form. FFA (2015) contains information on the employment of people from Vanuatu in the tuna industry (Table 19-10). A total of 92 Ni-Vanuatu were employed in the tuna industry in Vanuatu in 2014. Vanuatu also provides crew for tuna vessels based outside Vanuatu. An officer of the Fisheries Department indicated that about 300 Ni-Vanuatu are employed in this way (W. Obed, per. com. August 2015). Across the Pacific in 2014, a total of 17,663 people were employed as crew on tuna vessels or in tuna processing and ancillary work (FFA 2015). Tuna-related employment in Vanuatu (about 390 people) therefore represents 2.2% of the regional tuna-related employment.

Table 19-10: Tuna-Related Employment in Vanuatu (number of people employed)

	2009	2010	2011	2012	2013	2014
Processing and ancillary	132	37	20	9	46	46
Local crew	132	37	20	9	46	46
Total	264	74	40	18	92	92

Source: FFA (2015)

19.6 Levels of Fishery Resource Consumption

Earlier studies of fishery resource consumption in Vanuatu are described below:

- Preston (1996) estimates annual per capita fish supply from coastal fisheries in Vanuatu of 15.9 kg.
- Preston (2000), using 1995 FAO data, and considering production, imports and exports, estimates annual per capita supply of fishery products of 21.0 kg.
- Gillett and Lightfoot (2001) considered Vanuatu fishery production, imports, exports and population, and estimated that annual per capita consumption of fishery products in 2000 was about 25.7 kg.

Bell et al. (2009) use information from HIES 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 the whole of Vanuatu the annual per capita fish consumption (whole weight equivalent) was 20.3 kg, of which 60% was fresh fish. For rural areas the per capita consumption of fish was 20.6 kg, and for urban areas it was 19.3 kg.

The MacBio project examined a number of studies on fish consumption in Vanuatu. The report of the study (Pascal et al. 2015) stated that recent studies have found that annual per capita consumption of fresh seafood in Vanuatu varies between 16 and 26 kg.

SPC's ProcFish programme carried out survey work at four sites in Vanuatu (Friedman et al. 2008). That work included estimations of per capita fish consumption. The results (Table 19-11) show very high consumption of fresh fish at the four sites. However, the sites were not chosen to be representative of Vanuatu, but rather to be representative of sites in the country having active reef fisheries.

Table 19-11: Fishery Product Consumption at ProcFish Sites (kg/person/year)

Village	Fresh fish consumption	Invertebrate consumption	Canned fish consumption
Paunangisu	16.37	n/a	12.10
Moso	18.50	n/a	18.49
Uri-Uripiv	9.90	n/a	4.53
Maskelyne Archipelago	22.16	n/a	1.58
Average across the 4 sites	16.79	n/a	9.04

Source: Friedman et al. (2008)

19.7 Exchange Rates

Vanuatu uses the vatu. The average yearly exchange rates (VT to the US dollar) used in this book are as follows:

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
109.00	110.00	104.00	96.77	99.72	95.24	95.43	93.51	96.02	102.51