

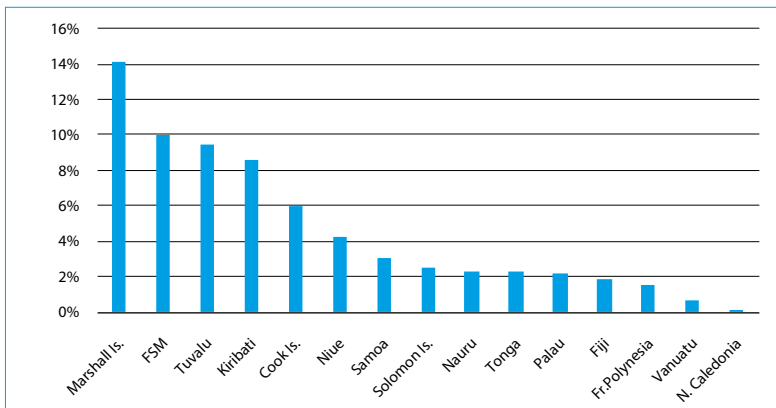
30 The Contribution of Fishing to GDP

30.1 The Official Contribution of Fishing to GDP

The official GDP and the official fishing contributions to GDP for the Pacific Island countries and territories are given in the country and territory chapters. Methods used in the calculation of the fishing contribution to GDP are also presented, and some comments are made on those methods. The official data from the chapters are summarised in Table 30-1.

Other relevant information includes general information on GDP in the introductory chapter, national accounting and the fisheries sector in Appendix 2, and guidelines for calculating the fishing contribution to GDP in Appendix 3.

The contribution of fishing to the official GDP is shown graphically in Figure 30-1.



Note: Not all countries calculate GDP (See Table 30-1)

Figure 30-1: The Percentage Contribution of Fishing to Official GDP

Table 30-1: Official Estimates of GDP and Fishing Contributions to GDP

Country	GDP (current market prices; local currency '000s)	Fishing GDP Contribution (local currency '000s)	GDP (US\$, '000s)	Fishing GDP Contribution (US\$ '000s)	Fishing as a % of GDP	Year (and Status) of GDP Estimate	Comment
Cook Islands	382,800	22,800	299,063	17,813	6.0%	2014 (provisional)	"Fishing and pearl" contribution to GDP
FSM	318,100	31,800	318,100	31,800	10.0%	FY 2014	GDP contribution excludes that of foreign-owned locally based fishing vessels, but includes all fish processing and the shore-based services of the vessel-operating companies
Fiji	7,129,800	130,200	3,600,909	65,758	1.8%	2014 (provisional)	
Kiribati	192,851	16,553	1,58,075	13,568	8.6%	2014 (provisional)	"Fishing and seaweed" contribution to GDP
Marshall Islands	186,700	26,300	186,700	26,300	14.1%	FY 2014	Excludes most of the locally based industrial fishing vessels but includes industrial processing operations
Nauru	142,100	3,200	1,16,475	2,623	2.3%	FY 2014	
Niue	31,273	1,337	24,432	1,045	4.3%	2014	
Palau	249,082	5,460	249,082	5,460	2.2%	FY 2014	Excludes foreign-owned locally based fishing vessels, but includes shore-based services of companies operating those vessels
PNG	43,200,000		16,809,339			2014	No official GDP estimate since 2006; IMF estimated GDP in 2014 to be K43.2 billion
Samoa	1,922,057	57,467	804,208	24,045	3.0%	2014	
Solomon Islands	7,819,541	194,251	1,024,842	25,459	2.5%	2014 (provisional)	

Table 30-1: continuation

Country	GDP (current market prices; local currency '000s)	Fishing GDP Contribution (local currency '000s)	GDP (US\$; '000s)	Fishing GDP Contribution (US\$ '000s)	Fishing as a % of GDP	Year (and Status) of GDP Estimate	Comment
Tonga	803,700	18,200	432,097	9,785	2.3%	FY 2013/2014	
Tuvalu	38,512	3,631	31,567	2,976	9.4%	2012	
Vanuatu	75,803,000	485,000	739,469	4,731	0.6%	2014 (provisional)	
Territory							
American Samoa	711,000		711,000			2013	Official fishing contribution to GDP (if any) not available
French Polynesia	531,861,000	8,138,000	5,771,061	88,303	1.5%	2011	
Guam	4,882,000		4,882,000			2013	Official fishing contribution to GDP (if any) not available
New Caledonia	842,913,000	1,363,000	9,337,687	15,099	0.2%	2010	
Northern Marianas	682,000		682,000			2013	Official fishing contribution to GDP (if any) not available
Pitcairn Islands							No official GDP estimates made
Tokelau							No official GDP estimates made
Wallis and Futuna	18,000,000		87,500			2005	Official fishing contribution to GDP (if any) not available

Source: Country and territory chapters of this book

PNG is not shown in the figure as the last official GDP estimates were done in 2006 and the contribution of fishing to the 2006 GDP is not readily available. The fishing contribution to GDP in Marshall Islands is large due to including in the fishing sector industrial fisheries processing (see the Marshall Islands chapter for a discussion of this issue). The contribution of fishing to GDP in New Caledonia is relatively small due to the size of its economy – the second largest in the region after PNG.

In some countries/territories the methods used to calculate the fishing component of GDP were well documented. In others, this information was obtained verbally for the present study, and it is likely that at least some of this information was inaccurate for various reasons, including the provider being unfamiliar with the subject. This should be taken into account in considering comments on in the relative rigour of the methodology used in a particular country.

During the process of investigating the contribution of fishing to GDP and associated methodologies it was found that, in many of the Pacific Island countries and territories, the individuals responsible for calculating the contribution of fishing to GDP appeared to be unfamiliar with the technical basis of the methods they were using for determining the fishing contribution (some of these individuals were responsible for all of the other sectors also). According to discussions with some of these individuals, methods being used were developed by colleagues who had since departed. A “recipe” was being followed, but the rationale for many components was apparently not understood sufficiently to enable them, to explain the methodology.

Other important observations and issues that emerged during the process are as follows:

- Almost without exception, there is a great deal of enthusiasm among the staff of the national statistics agencies for learning more about the fishing sector and improving the estimation of its contribution to GDP.
- In most countries and territories there are few or no people with fisheries expertise involved in the estimation of fishing’s contribution to GDP. On the other hand, in two countries where there was involvement of Fisheries Department staff, that involvement was taken as proof of the validity of the results irrespective of the skills and experience of those people.

- Many countries and territories have recently had, or are expecting to have in the near future, external technical assistance for their national accounts from the Suva-based Pacific Island Financial Technical Assistance Centre (PIFTAC).
- A surprising number of GDP calculations dealing with fishing were done using input from a “specialised survey” or “informal survey” almost none of which were available for examination, and some of which seemed to have highly variable and to produce questionable results (e.g. an extremely small value-added ratio for a type of fishing that uses low technology).
- Many countries and territories use the results of “business surveys”, tax records, or provident fund (social security) records to determine the value added of commercial fishing. While this may be appropriate for large enterprises, there is a question whether small-scale commercial fishing activity is captured by this methodology.
- Most countries and territories divide up the fishing sector into smaller components, which have similar characteristics with respect to value added. Problems occur when very dissimilar fisheries are aggregated into a single component (e.g. beche-de-mer diving and reef gleaning) or when important fisheries are overlooked.
- As discussed in the previous chapter, almost all countries and territories use the results of household income and expenditure surveys (HIES) in the process of estimating production from small-scale fisheries. The accuracy of the HIES for fisheries purposes therefore has a major impact on the fishing contribution to GDP across the region, as discussed elsewhere in this book.

30.2 Re-estimating the Fishing Contribution to GDP

The fishing sector is complex. It can include thousands of producers operating in many locations and using a wide variety of techniques. Crew are often paid in kind or receive a share of the catch rather than wages; and even when they do receive wages, collecting information on those wages can be difficult. In comparison to other sectors of Pacific Island economies such as government, manufacturing, or tourism, calculating the contribution of fishing to an economy is a particularly difficult task.

As part of the present study, a re-estimate was made of the fishing contribution to GDP in each country and territory. This represents an alternative to the official method of estimating fishing contribution to GDP. It is not intended that the re-estimate replace the official figure, 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.

The re-estimate for each country/territory and the associated methodology are given in the country and territory chapters. The results are summarised and compared to the official estimate (where available) in Table 30-2. The re-estimated percentage contribution of fishing is simply the new fishing contribution divided by the official GDP. No attempt is made (unless otherwise stated in the country/territory chapter) to adjust national GDP to account for any significant increase or decrease in GDP due to a re-estimated fishing contribution.

Table 30-2: Official Estimates and Re-estimates of Fishing Contributions to GDP

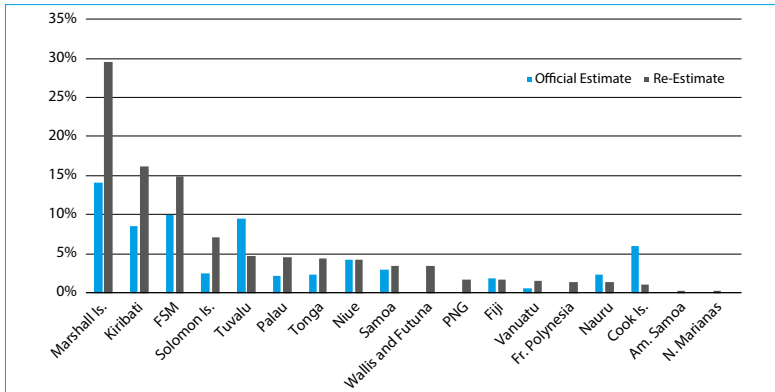
Country	Official Fishing Contribution to GDP (local currency '000s)	Re-estimate of Fishing Contribution to GDP (local currency '000s)	Official Fishing Contribution as % of Official GDP	Re-estimate of Fishing Contribution as % of Official GDP	Comments
Cook Islands	22,800	3,812	6.0%	1.0%	
FSM	31,800	47,244	10.0%	14.9%	
Fiji	130,200	117,461	1.8%	1.6%	
Kiribati	16,553	31,201	8.6%	16.2%	
Marshall Islands	26,300	55,093	14.1%	29.5%	
Nauru	3,200	1,844	2.3%	1.3%	
Niue	1,337	1,334	4.3%	4.3%	
Palau	5,460	11,505	2.2%	4.6%	
PNG		732,777		1.7%	No official GDP estimate since 2006; unofficial 2014 GDP used for comparison
Samoa	57,467	65,334	3.0%	3.4%	
Solomon Islands	194,251	559,352	2.5%	7.2%	

Table 30-2: continuation

Country	Official Fishing Contribution to GDP (local currency '000s)	Re-estimate of Fishing Contribution to GDP (local currency '000s)	Official Fishing Contribution as % of Official GDP	Re-estimate of Fishing Contribution as % of Official GDP	Comments
Tonga	18,200	35,759	2.3%	4.4%	
Tuvalu	3,631	1,803	9.4%	4.7%	2012 GDP used for comparison
Vanuatu	485,000	1,155,580	0.6%	1.5%	
Territory					
American Samoa		1,642		0.2%	2013 GDP used for comparison
French Polynesia	8,138,000	7,037,203	1.5%	1.3%	Unofficial 2014 GDP used for comparison
Guam		882		0.0%	2013 GDP used for comparison
New Caledonia	1,363,000	3,019,914	0.2%	0.4%	
Northern Marianas		2,121		0.3%	2013 GDP used for comparison
Pitcairn Islands		23			No official GDP estimates made
Tokelau		943			No official GDP estimates made
Wallis and Futuna		610,500			No official GDP estimate since 2005

Source: Country and territory chapters of this book

The official contributions of fishing to GDP are compared to the re-estimates in Figure 30-2 below.



Note: 2014 or latest year available

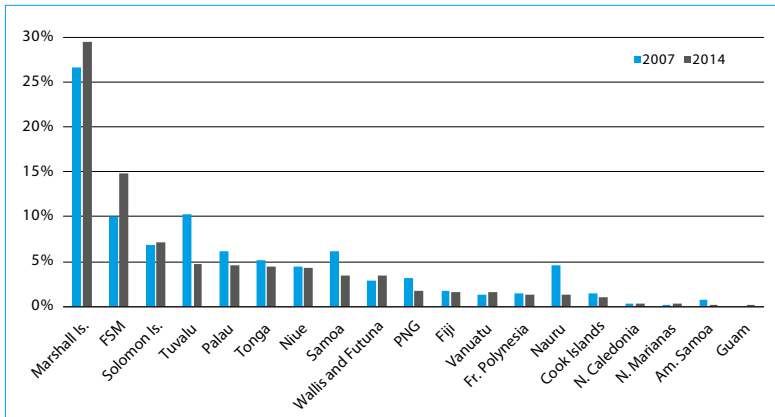
Figure 30-2: Official vs Re-estimated Fishing Contributions to GDP

The differences for the Marshall Islands and FSM involve intentional inclusions/exclusions of industrial fishing and processing as discussed in the country and territory chapters. It is likely that the large differences for Kiribati, Solomon Islands, Tuvalu, and Cook Islands are due to flaws in the official methodology.

Some of the reasons for the differences between the official and the re-estimated figures are as follows:

- The inclusion or exclusion of activities of locally based foreign fishing vessels.
- The official estimate omitting certain important fisheries.
- The value added from small-scale fishing (coastal commercial and subsistence fishing) is often quite different between the official and re-estimated figures. In some cases this is because estimates of production differ; in others it is due to the value added ratio being different.
- Production estimated from the “informal” and “specialised” studies of the fishing sector in the official method is often very different from that obtained in the present study.
- In some cases the compilers of national accounts do not appear to have consulted the relevant fishery agencies or the fishing industry when preparing their estimates.

The 2009 Benefish study (Gillett 2009) and the present study used similar methods to recalculate fishing contributions to GDP, and subsequently express them as a percentage of each country's or territory's GDP. The results of the two studies are therefore comparable and may give insight into the real changes over the 2007–2014 period (Figure 30-3).



Source: The present study, and Gillett (2009)

Figure 30-3: Percentage Fishing Contributions to GDP, 2007 vs 2014

In the figure the impacts of increased local basing of offshore fishing vessels in the Marshall Islands and FSM are quite apparent. The large difference for Tuvalu is due to having better price information to value subsistence production. The large difference for Samoa is mostly caused by a drop in the production of locally based longliners. In Nauru the nominal contribution of fishing to GDP increased over the 2007–2014 period (A\$1.3 million to A\$1.8 million), but the published GDP increased from A\$28.5 million to A\$142.1 over the same period, effectively causing the percentage contribution of fishing to fall.

30.3 Contribution by Fishery Category

In this study re-estimates of fishing contribution to GDP for each country/territory were done by uniform fishery categories. These are compiled and compared in Figures 30-4 and 30-5. PNG is not shown on the figures as its nominal contributions are very large and would obscure the details for most of the small countries/territories.¹

¹ The composition of the PNG fishing contribution to GDP is given in the PNG chapter.

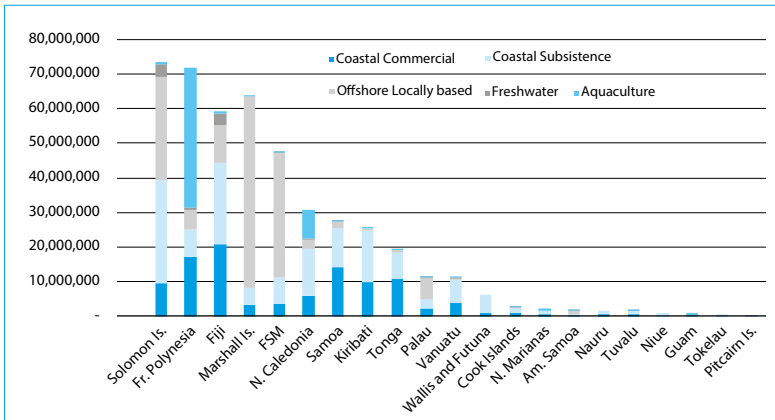


Figure 30-4: Fishing Contributions to GDP by Fishery Categories (US\$)
 Note: 2014 or latest year available

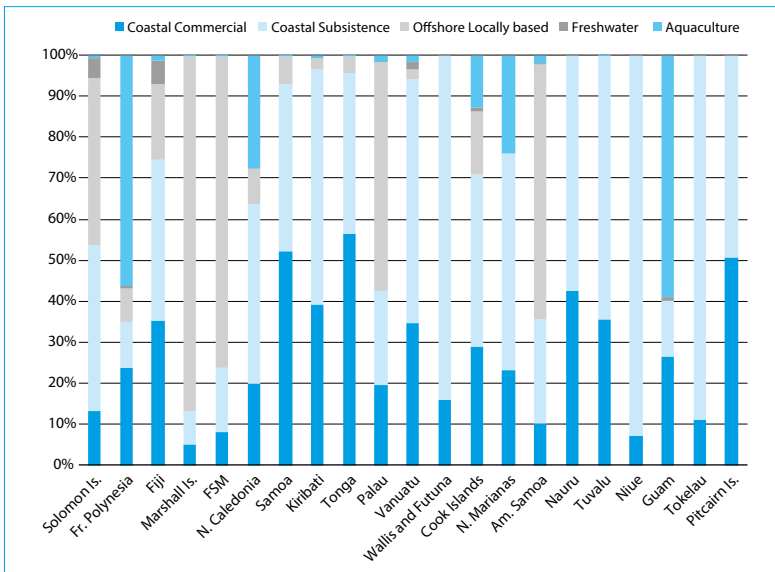


Figure 30-5: Fishing Contributions to GDP by Fishery Categories (%)
 Note: 2014 or latest year available

The composition by fishery category of the overall fishing contribution to the GDP of the region is shown in Figure 30-6.

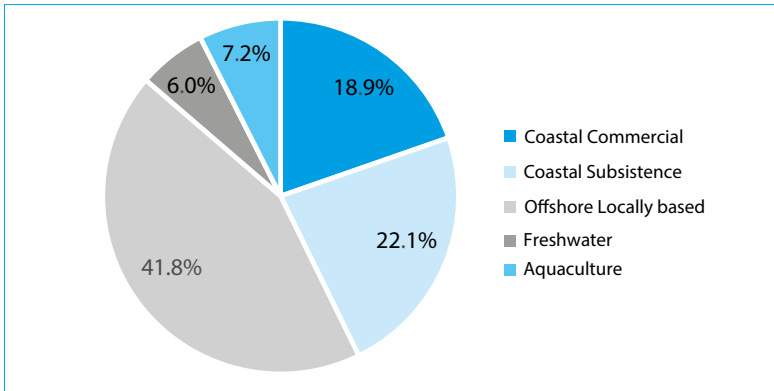
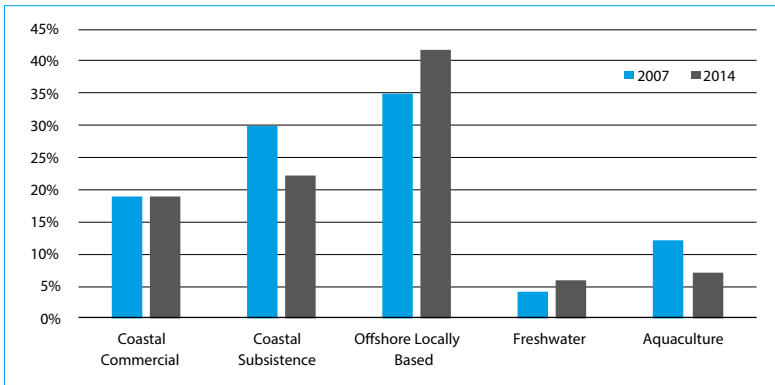


Figure 30-6: Fishing Contribution by Fishery Category to the Regional GDP in 2014

Some of the notable features of the above two figures are as follows:

- The locally based fleets in the Marshall Islands and FSM dominate the fishing contribution in these countries.
- The contributions to GDP of freshwater fisheries in the Solomon Islands and Fiji are significant – in addition to a large contribution from PNG (not shown).
- The very large contributions of aquaculture in French Polynesia and New Caledonia are apparent.
- Coastal subsistence fishing (because of its high value added ratio) assumes a greater relative importance in GDP contribution than its contribution to catch value.
- Offshore locally based fishing (because of its low value added ratio) assumes a lesser relative importance in GDP contribution than its contribution to catch value.
- The total regional contribution of aquaculture in 2014 (7.2% on the above pie chart) is smaller than its contribution in the 2009 Benefish study (12.0% in 2007) and much smaller than the contribution estimated in the Ponia (2010) study (22% in 2007).

The changes in the composition by fishery category of the fishing contribution to regional GDP over the period 2007–2014 are shown in Figure 30-7. The drop in aquaculture is mainly due to the decline in the French Polynesia pearl industry. The increase in freshwater fishing is mainly due to the use of more realistic prices in the present study for freshwater fish in PNG, by far the largest producer. The increase in offshore locally based fishing is mainly due to increased local basing of purse seiners.



Source: The present, and Gillett (2009)

Figure 30-7: Fishing Contribution by Fishery Category to Regional GDP, 2007 vs 2014

30.4 Improving the Official Estimates of Fishing Contribution to GDP

General improvements to estimating GDP are far beyond the scope of the present project. However, there are some simple and obvious ways to improve the accuracy of estimating the fishing contribution to GDP.

Statistics staff should seek technical fisheries expertise when devising methodology, collecting data, making the estimate, and reviewing the results. In addition to the government fisheries agencies, there is fisheries expertise in the private sector and the regional agencies.

Statistics staff should compare the re-estimated fishing value for their country or territory to the official estimate, and evaluate the differences and any need for modification to their current methodology.

When using the production approach for estimating the contribution of fishing to GDP the following are advised:

- Formulate logical fishery categories that group similar fisheries with similar value added ratios. The present study uses the categories of coastal commercial, coastal subsistence, offshore locally based, offshore foreign based, freshwater, and aquaculture. Other categories may be more appropriate in some countries/territories, while the smaller countries/territories may have fewer categories.
- In the absence of specialised economic studies for the country/territory, use the suggested value added ratios given in Appendix 3 of this book.

- For estimates of offshore fishery production, use the Western and Central Pacific Fisheries Commission (WCPFC) national fishery reports. All Pacific Island countries (and some territories) prepare these for the annual meeting of the Scientific Committee of the WCPFC (available at www.wcpfc.int). Staff of the government fisheries agency or the Forum Fisheries Agency (FFA) can place values on the tonnage of fishery production in the document.

In the longer term – and at the level of the institutions supporting Pacific Island fisheries – there is some assistance that would be of considerable value at the interface between the fishing sector and national accounts. It is suggested that three issues be addressed: value added ratios (VARs), the GDP status of locally based foreign fleets, and a “satellite account” for fisheries.

More work needs to be done on the VARs, particularly for industrial-scale offshore fishing. The simplified VARs used in this and past Benefish studies were the best available at the time, but new and improved information on the finances of individual fishing companies is now available through FFA studies and the work of statisticians/economists in Micronesia.

The GDP status of locally based offshore vessels is complex. There is a large range in the degree of integration of locally based offshore fishing operations into national economies, and the degree of integration of a single operation can evolve through time. The international standards for determining whether an entity should be included in a country’s GDP were not developed with fishing in mind, and the concepts in those standards do not offer clear guidance on dealing with offshore fishing. For practical reasons and to maintain consistency with the 2001 and 2009 Benefish studies, in the present study all locally based offshore fishing operations (whether locally or foreign owned) are uniformly considered part of the economy of the country where the fishing operations are based. It is understood that in the GDP work of the FFA, locally based fleets are treated similarly. Currently there is some debate amongst national account specialists on whether the value added of some locally based fleets should be included or excluded from the GDP of the country of basing. Some additional attention should be focused on this issue, and possibly regional guidelines should be formulated.

There may be considerable value in developing a “satellite account” for fisheries. The international guidance for national accounts (i.e. System of National Accounts (SNA) (2008), International Standard Industrial Classification of All Industrial Activities (ISIC)) recognises the fishing sector – but the “fishing sector” does not include post-harvest activities, which are

quite important in many Pacific Island countries and territories and likely to become more important in the future. To rectify this situation, a satellite account can be constructed. Within the framework of SNA, groups and subgroups of industries can be identified and aggregated to form a satellite that is linked to, but not actually a part of, the main national account. Satellite accounts have been constructed for many clusters of related industries, including information and communication technologies (Australia), ocean industries (Nova Scotia) and non-profit institutions (several countries). A tourism satellite account is the most widespread example, with over 70 countries having compiled one. Tourism is not an industry in the SNA/ISIC categorisation, but rather an amalgamation of activities in various sectors, such as transport, retail trade, etc. By constructing a tourism satellite account, the economic contribution of tourists can be measured. Thought should be given to constructing a satellite account for fisheries so that the value added of fishing, fish processing and related activities can be consolidated and trends can be monitored. For illustrative purposes, in the 2009 Benefish study a crude first-order satellite account was constructed (Box 30-1).

Box 30-1: A Satellite Account for Fisheries in Fiji

Fiji's fisheries can be defined in a variety of ways. In the absence of international the "fisheries sector" is defined as the SNA fishing sector plus the activities in the chain of custody of fish products. In national accounting terms, this would be considered a first-order satellite account. This includes:

- The value added from fishing operations (freshwater, coastal, offshore);
- Domestic marketing of the production of coastal fisheries;
- Post-harvest activities associated with export of the production of coastal fisheries, including beche-de-mer and trochus processing;
- Domestic marketing of the production of offshore fisheries; and
- Ground and air transport of the export of the production from offshore fisheries

Using the value added estimates from ADB (2005) for some of the subsectors of Fiji's fisheries sector in 2003 and making estimates of the remaining subsectors, the total value added can be estimated. Accordingly, the value added by the broad fisheries sector in Fiji in 2003 is estimated to have been about F\$104,375,000. Some comments can be made on this estimate. The figure is about 34% greater than the \$77.8 million that ADB (2005) estimated for the narrow SNA fishing sector. If Fiji's total GDP in 2003 was F\$4,390,551,000, then the contribution of the fisheries sector to GDP increases from 1.8% to 2.3%.

Source: Gillett (2009)