

National Accounts and Associated Issues

To those involved in fisheries, the importance of the industry to the economy is obvious: (i) exports of fish and fish products earn foreign exchange which helps provide the resources needed to pay for crucial imports; (ii) it provides employment for a substantial number of people; (iii) the catch of commercial and artisanal fishers provide an important source of food for the community; and (iv) the fish, shellfish, seaweed and other aquatic resources collected by families are a crucial part of their livelihood.

While the importance of fisheries is self-evident to those involved in the industry, it is far less obvious to many others. The boats that catch fish for export are often at sea or moored at wharves that are away from the public gaze; fishes are purchased in markets and retail stores where there is little to link them to the fishing industry; and the collection of marine and other aquatic products for home consumption is often taken for granted.

Of itself, this lack of awareness need not be a problem. It is not necessary for everyone to fully appreciate the significance of any activity in the economy. However, when that lack of appreciation extends to policymakers, planners, and development agencies, it can mean that fisheries development receives a lower priority than it deserves. One of the keys to ensuring that the fisheries sector receives the level of support warranted is to make certain that the sector's contribution to the economy is accurately portrayed in a country's national accounts.

National Accounts

What are they?

National accounts are an accounting framework used to measure the current economic activity in a country.¹ Most of the countries in

¹ Those readers who would like a more comprehensive description of national accounting will find it well covered in most macroeconomic textbooks. In addition, the supporting documentation to the System of National Accounts (SNA) 1993 provides a comprehensive description of the procedures and conventions used in preparing national accounts.

the Pacific publish national accounts. The method used in each country is based on a standardized System of National Accounts (SNA) that was originally introduced by the United Nations in 1953. The SNA has since been revised, refined, and was republished in 1993 (SNA 1993).

What are they used for?

Typically, governments, international agencies, and private corporations use national accounts to monitor developments within an economy. In particular, they are used to:

- (i) Monitor changes in economic activity;
- (ii) Make cross-country comparisons;
- (iii) Prepare time-series analysis;
- (iv) Identify functional relationships; and
- (v) Determine aid eligibility/requirements.

National accounts are compiled for a succession of time periods, thus providing a continuing flow of information that is indispensable for the monitoring, analysis and evaluation of the performance of an economy and its components over time. They usually provide information not only about economic activities but also about the levels of an economy's productive assets and the wealth of its inhabitants at particular points of time.

In practice, while the methods used to construct national accounts are based upon a standardized system, there are different approaches that can be used and the quality of the data available can vary significantly. There may be substantial differences in the methods used by each country, so care should be exercised when making cross-country comparisons. In a few cases, the methods used within a country have changed; hence, inter-temporal comparisons for those countries should also be approached with caution.

What do they show?

While national accounts provide several measures of activity, the two indicators that are most commonly quoted are **GDP** and **gross national income (GNI)**.² GDP measures the level of domestic

² Prior to the 1993 revision of the System of National Accounts, Gross National Income was known as Gross National Product (GNP).

economic activity—i.e., economic activity that took place within a country during a specified period of time. GNI is the measure of national economic activity, which includes domestic activity (GDP) plus the net return to the country from overseas investments and remittances. In the case of fishing, these returns from overseas include income from fishing access fees from nonresident fishing by foreign operators. This income is classified as “rental income.”

Typically, a comprehensive set of national accounts will show the contribution to GDP by each of the major sectors in the economy, plus the distribution of income and expenditure between the various classes of enterprise in the economy. For example, GDP is normally divided between major sectors including manufacturing, transport, wholesale and retail, agriculture and other primary industries, etc. Similarly, GDP can also be divided among various classes of enterprises including government, private nonprofit, corporations, etc.

It is important to note that, although a sector’s contribution to national GDP may seem small, it can be crucially important to the national economy. The country of Iceland provides a good example. Iceland’s economy is highly dependent on fish and fishing. Fishery products make up 70% of exports. Despite this importance, the fishing sector contributes only 13% to GDP. This is because many fishing-related activities are accounted for in other sectors such as manufacturing. Moreover, much of the economic activity generated by fishing, such as retail trade, is counted as value-added in other sectors.

How are national accounts constructed?

The three different approaches to computing the national accounts of a country are: *production approach*, *income approach*, and *expenditure approach*.

- The **production approach** views the economy from the perspective of production. The approach measures the gross output of each producer then deducts the value of the goods and services purchased from other producers and used in the production process.
- The **income approach** measures the major components of value-added: employee compensation (wages and other remuneration), operating surplus (company profits), and indirect taxes

net of subsidies. The sum of these components is the value-added to GDP.

- The **expenditure approach** is based on the final use of the output produced. It sums the expenditures of the main participants in the economy: government final consumption, private final consumption, gross capital formation, and net exports.

Given that all three approaches are derived from the same data, by definition, the GDP calculated by each should be identical. In practice, it is often difficult to measure everything with equal reliability. This means that there may be differences between the results generated by each approach. However, these differences are seldom significant.

Definitions and Conventions

As with any system, a set of procedures and conventions is used in compiling national accounts. The nature and application of these procedures and conventions must be taken into account when interpreting national accounts.

Productive Activity

One of the most basic issues in the preparation of national accounts is the nature of activities that are included in the estimation of domestic product. In particular, any goods or services that are produced by a resident of a country *for sale* are included. Goods and services that are for sale are known as **market production**.

Service activities that are for personal or households' *own consumption* are not included in the calculation of national accounts. For example, house cleaning is not included if carried out by the family. These goods and services are known as **nonmarket production** or **subsistence production**. However, if goods produced for own consumption could reasonably be sold, they are included in the national accounts. Subsistence fishing is an example. While the fish may have been caught for a family's own consumption, the convention assumes that the fish could have been sold and, therefore, it should be treated as adding value to the economy. Clearly, this can be a significant issue in fisheries in the Pacific Island countries where

large numbers of households rely on the harvest of aquatic resources for food and other uses.³

Goods and Services

Goods are physical products such as machinery, food, housing, and infrastructure. Services include activities like medical advice, hairdressing, policing, and consultancy.

Residency

The nature and extent of residency is a core concept of the SNA. It defines what shall be counted as domestic product. For goods and services to be included in the domestic product of a particular country, a resident of that country must produce them. A resident is an individual or enterprise whose “center of economic interest” is within the country. The “center of economic interest” is determined by the following tests:

- (i) Do residents of the country, in whose area the fishing activity occurs, get significant factor payments (i.e., wage or operating surplus) from the activity?
- (ii) Does the government of the country or the individual or the business entity located in the country, in whose area the fishing activity occurs, have a day-to-day influence on the way the fishing is carried out?
- (iii) Is the fishing based in the economic territory and/or employing local staff?
- (iv) Is the fishing an integral part of the domestic economy?

It is important to note that a resident need not be a citizen. The production of foreign nationals is treated as domestic product provided the country is the “center of economic interest” for the enterprise/individual. This concept is particularly important in the case of fishing where many of the enterprises are mobile, and it is common

³ It has been estimated that about 75% of people in the Pacific Island countries live in rural areas and that most of these households produce or collect all or some of their food and household items (*Population Statistics*, Statistical Bulletin No. 42, South Pacific Commission, 1995).

for vessels to be staffed by nationals from different countries. In effect, this means that the product of locally-based offshore foreign vessels is treated as domestic product of the country from which they are operating regardless of the nationality of the crew.

Under the SNA, the standard convention is to treat activities by a foreign operator that take place in a country for less than 12 months as being foreign activities. In the case of fishing, it is common for offshore foreign vessels to fish for only part of the year in local waters. In these circumstances, a strict interpretation of the SNA convention on "time in country" would treat these activities as foreign and only include the license fees as part of the national accounts. However, where the activities are seasonal and the main activity of the vessels is based locally, it would be more appropriate to follow the "center of economic activity" convention and count their production as domestic product.

A related issue, which is particularly important in fishing, is the geographic extent of the "center of economic interest." The SNA convention is to treat any activity as domestic provided it takes place within the "economic territory" of the country. The SNA boundary for domestic activity is not limited to the political boundary. It extends to include the "economic territory." This convention has particular importance for fishing, especially offshore fishing, which can take place a considerable distance from the land and political boundaries of a country. For example, the political boundary is usually confined to the territorial seas, which extend out to 12 miles from the high water level. In practice, most countries use their exclusive economic zone (EEZ) when defining the geographic limits of their "economic territory"; and in the circumstances, this practice is the most appropriate.

Two other "geographic" issues that must be addressed in fishing are (i) how to treat fishing activities that take place in other jurisdictions, and (ii) how to treat those that take place in international waters.

When the fishing occurs in the waters of another country, the determination of how to treat that activity in the national accounts depends upon the duration of the activity and its "center of economic activity." The SNA indicates that temporary work in a foreign country should be treated as domestic product in the home country (the center of economic activity) of the entity carrying out the job. For example, the income earned by a consultant who

normally resides in the Fiji Islands and undertakes a short-term contract in Samoa would be treated as Fiji domestic product, i.e. it is tantamount to an export (of services). SNA, Section 6.239 states:

It should be noted, however, that GDP is not intended to measure the production taking place within the geographical boundary of the economic territory. Some of the production of a resident producer may take place abroad, while some of the production taking place within the geographical boundary of the economy may be carried out by non-resident producer units. For example, a resident producer may have teams of employees working abroad temporarily on the installation, repair or servicing of equipment. This output is an export of a resident producer and the productive activity does not contribute to the GDP of the country in which it takes place. Thus, the distinction between resident and non-resident institutional units is crucial to the definition and coverage of GDP.

This being the case and in the absence of any indication to the contrary such as the formal relocation of the operation, fishing activity of less than 12 months in foreign waters should be treated as domestic product in the home country of the vessel owner/operator.

Following the same convention, fishing that takes place in international waters may be domestic product of a country provided the operation is carried out by a resident and is temporary in nature. In some circumstances, fishing carried out in international waters could become a particularly perplexing problem for the compilers of national accounts. Where a fleet operates in international waters most of the time, including transshipping and re-supply, the question of whether to allocate the production as domestic or national product becomes an issue.

It is difficult to set strict rules since each situation is different. In practice, the compilers of national accounts will make judgments about where to allocate production of fleets that occurs on the "boundaries" of countries and nationality.

Valuation

In all cases, national accounts are reported in monetary terms. Usually the local currency is used and, almost always, the accounts are presented in current market (nominal) values and constant (real) values. Current market values use the value of the currency at the

time of measurement. Constant values are indexed to the price levels of a specified year so as to remove the effects of price inflation and thereby allow the comparison of real changes over time. It is also common for the international agencies such as ADB, International Monetary Fund (IMF), United Nations (UN), and World Bank to produce national accounts using the equivalent value of a convertible currency, usually the United States dollar (US\$). This practice makes it easier to do cross-country comparisons and to track the changes in each country's international competitiveness.

An important valuation convention that is particularly relevant for fishing is the treatment of nonmarket household production (subsistence). Since by definition these items are not sold and the quantity produced is seldom recorded, it is necessary to make assumptions about their value. It is common practice to value nonmarket household production conservatively and, in some cases, production for own consumption is not even included in the national accounts.

Assets

In the SNA, assets are restricted to things that are produced by an economic activity. This distinction is particularly important for natural resources and is a contentious issue, especially in relation to the overexploitation of natural resources.

Naturally occurring assets such as marine resources, minerals, and forests do not enter the national accounts until they are being exploited and then only to the extent that they are being exploited. Unlike changes in inventories of produced assets, changes in the quantum of natural assets are not reflected in the national accounts. This convention ignores the very real impact that changes in abundance of natural assets have on the "wealth" of an economy. This can result in misleading values being reported on fisheries and other sectors that rely on natural resources. For example, the income generated from the exploitation of fish is included in the national accounts, while the changes in abundance are not. In these circumstances, the short-term gain from the overexploitation of a fish stock shows up as a positive gain for the economy. If the changes in abundance were also taken into account as happens with inventories of "produced assets," the apparent benefits for the exploitation of natural assets would be substantially reduced.

Fishing vs. Fisheries

For the purpose of clarity, it is useful to distinguish between the terms “Fishing” and “Fisheries.” “Fishing” is commonly used to describe the various activities involved in the harvest of aquatic resources, whereas “Fisheries” is usually used to describe a broader range from capture through postharvest handling, transport, processing, and marketing.

The conventions used in the SNA and those followed in this report are somewhat different. The categories of economic activities recognized by the SNA are those of the International Standard Industrial Classification of All Industrial Activities (ISIC). In this system, the category relevant to fisheries is ISIC 0500: “Fishing, operations of fish hatcheries and fish farms, service activities incidental to fishing.” It is important to note the following:

- (i) Postharvest activities, including fish processing, are not included in the fishing sector, but rather they are generally counted in manufacturing and other sectors.
- (ii) Aquaculture is included in the sector.
- (iii) Subsistence fishing is a legitimate component of the fishing category.
- (iv) For convenience, the sector is usually referred to as “fishing.”

A useful guide to the classification of an activity as “Fishing” is provided in the definitions of “fish” and “fishing” as contained in the fisheries acts of Pacific Island countries. In each case, the definitions are very similar. The following extract is taken from the Tonga Fisheries Law:

“Fish” means any aquatic animal, whether piscine or not, and includes any cetacean, mollusk, crustacean, coral (living or dead), and other coelenterates, sponge, aquatic plants, holothurian (beche-de-mer) or other echinoderm, and turtle, and their young and eggs.

“Fishing” means –

- (a) searching for, catching, taking or harvesting fish;
- (b) attempting to search for, catch, take or harvest fish;
- (c) engaging in any other activity which can reasonably be expected to result in the locating, catching, taking or harvesting of fish;

- (d) placing, searching for or recovering fish aggregating device or associated electronic equipment including radio beacons;
- (e) any operation at sea directly in support of, or in preparation for any activity described in this paragraph; or
- (f) the use of any other vehicle, air or sea borne, including aircraft or helicopter use, in relation to any activity described in this paragraph except for emergencies involving the health or safety of crew members or the safety of the vessel.

Sport Fishing/Whale Watching/Diving

As in any system that divides a continuous range of activities into discrete categories, the construction of national accounts requires some fairly arbitrary dividing line to be drawn between categories. For example, the activities (or part thereof) of sport fishing, whale watching, and sport diving involve the use and enjoyment of aquatic resources. The SNA provides little direct guidance on how these activities should be classified. Since in most cases these activities are forms of entertainment or tourism, the value-added by each activity is generally attributed to other categories in the national accounts.

Other Considerations

While it is well beyond the scope of this report to provide a comprehensive analysis of national accounting, there are a few issues that bear directly on fishing and therefore warrant some discussion. These include (i) how to measure an activity, (ii) how to calculate the value-added by an activity, (iii) the nature of the organization to be treated as an economic entity, (iv) what was the period in which the activity occurred, (v) was the activity domestic or foreign, and (vi) whether the activity was commercial or for subsistence.

Since the level of information available is usually less than perfect and occasionally nonexistent, the compilation of national accounts usually involves a number of assumptions, judgments, and estimates. In some circumstances, these assumptions and judgments may be incorrect.

It must be kept in mind that GDP is an *estimate* of economic activity; it is seldom a precise calculation. Even though the SNA sets

out fairly straightforward procedures, in practice, the analyst is usually confronted with many uncertainties. Data are often unavailable, incomplete or suspect; hence, the analyst is forced to make judgments about what data to use and how those data should be treated. Some people may find this apparent lack of rigor disturbing, but it is usually unavoidable, especially in "messy" sectors like fishing. To make matters worse, the fishing sector is often only a small part of GDP, which means that only a limited amount of the analyst's time and effort can be expended for collecting data to update the estimate.

Typically, the sources of data an analyst would use to estimate the contribution of fishing include income and expenditure data from commercial operations, fisheries production and marketing information, and household income and expenditure data. Sometimes, secondary data like social security records, air-cargo records, international market reports, and various reports that bear on aspects of the industry might be used. The choice of which data set to use depends upon the analyst's judgment about the accuracy of the data, its coverage, and the ease of accessing the information.

Multiplier Effects

GDP and its component parts provide an important and very useful guide to the structure of an economy, but they do not show the impact of any activity on the economy. For example, the fishing contribution to GDP is limited to the value-added to the economy by the activity of fishing, but the flow effects from the activity of fishing appear as value-added by other sectors of the economy. The difference between "contribution" and "impact" can be illustrated by considering the consequences of an increase in fishing activity. If the amount of fishing activity increases by \$1.0 million and the intermediate costs used in this activity are \$0.4 million, then GDP will increase by \$0.6 million. At the same time, the \$0.4 million spent on the intermediate costs will directly increase the level of activity elsewhere in the economy. If \$0.1 million of the \$0.4 million were spent on provisions, the contribution by the "Wholesale and Retail" sectors to GDP would increase by \$0.1 million less any intermediate costs. In addition, the \$0.6 million that has now been added to the fishing contribution to GDP is principally wages and profits, most of

which will be spent by the recipients on goods and services. This, in turn, will increase the level of activity in other sectors of the economy.

The people who benefit from the sale of goods and services from "Fishing" will in turn purchase goods and services from others, and thereby stimulate further activity. The cycle of activity thus generated by the initial production will have ripple effects throughout the economy. The aggregate impact will depend upon the extent to which the goods and services purchased are produced domestically and the proportion of their income that people spend or save. The net effect on economic activity will almost certainly be far greater than the contribution to GDP. This cycle of impact is known as the multiplier effect.

In practice, the multiplier effects can be fairly difficult to calculate. The dynamic nature of economies means that every action will be followed by a reaction. Changes in a sector will be at least partly offset by changes in the structure of the economy. This was illustrated by the response of households in Samoa to the impact of taro blight on their primary subsistence crop. Most households responded by switching their food production efforts to alternative crops, notably plantains. So while the level of economic activity committed to taro production contracted, in terms of the overall level of economic activity in the economy, this contraction was largely offset by the increase in the level of activity in plantain production. The net effect was a reduction in economic activity but by a far lesser amount than the reduction in taro production activity.

While it was beyond the scope of this study to identify the multiplier effects of fishing, it remains an important issue. In the absence of this understanding, the impact of policy changes, management strategies and investment can be seriously underestimated.

Valuing Subsistence Production

There are several methods that could be used to value subsistence production including (i) the "farm gate" pricing (used in this report), (ii) the "value of calories" produced, (iii) the "opportunity cost of labor," or (iv) the "reservation price of labor."

The "farm gate" pricing method uses the market price of the product less the cost of getting that product to market. In effect, it is saying that the value of own consumption is equivalent to the price the product could be sold for in the market less the cost of getting

the product to market. This approach implies that the volume of subsistence production would have little or no effect on the market price if it were to be marketed. Where the volume of subsistence far outweighs the volume marketed, this assumption may be too generous.

The “value of calories” approach estimates the calorific value of home consumption and the cost of purchasing those calories in alternative foods. The value of home consumption then becomes the volume of calories consumed multiplied by the cost per calorie. This approach does not adequately account for the nonfood items for own consumption. It also implies that the “quality” of own production is the same as the “quality” of purchased foods. This may not be the case, especially where a household is willing to pay a premium for purchased goods that are seen as prestige food items. If the value of production for own consumption is imputed from premium goods, it will be over-valued.

The “opportunity cost of labor” approach requires data on the amount of time spent producing the product for own consumption and the income that could be earned if the labor was used in another way. There may, however, be instances when alternative uses of labor are few, if not lacking. In such case, the “opportunity cost of labor” would be zero; hence, the implied value of own production is also zero. This is obviously not a true representation of the value of production for own consumption.

The “reservation price of labor” is a variation of the “opportunity cost of labor.” It also requires information on the time spent producing the product for own consumption. But instead of using the income that could be earned if the labor was used in another way, the “reservation price of labor” uses the minimum return that is necessary to make a person work. In effect, it is the minimum acceptable wage rate, which, it should be noted, may be considerably less than any statutory minimum wage rate. This method would probably give the best estimate of the value of subsistence production. But since the data necessary to make the calculation is seldom, if ever, available, it is rarely used.

While each of the above methods has its advantages and disadvantages, there are practical issues that determine which method is best used. In this report, the consultants have used the “farm gate” pricing method as recommended by SPC in the publication, *A Guide to Estimating the Value of Household Non-Market Production in the Pacific Island Developing Countries* (Bain 1996).