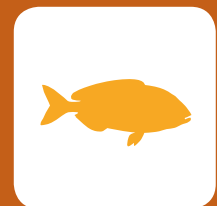




Small-Scale Fisheries and aquaculture statistics

**Producing cost-efficient and reliable statistics for
small-scale operators**



Why are Small-Scale Fisheries (SSF) and aquaculture statistics important?

Small-scale operators make a fundamental contribution to local food security, the alleviation of poverty and the provision of livelihoods in the field of fisheries and aquaculture. The importance of the collection of statistics from the fishery sector to answer data users' needs is emphasized by the Global Strategy to improve Agricultural and Rural Statistics (GSARS), the **Blue Growth Initiative**, international agreements such as the **UN Fish Stock Agreement, Code of Conduct for Responsible Fisheries** and the **2030 Agenda on Sustainable Development (SDGs)**. SSF interrelate with several SDGs, notably those relating to ending hunger, achieving food security and improved nutrition (SDG2), and conserving and sustainably using the oceans, seas and marine resources (SDG 14).

SSF statistics are crucial elements in the SDG information system and are required to support the sustainable harvesting of fishery resources, towards realizing the right to adequate food. This mainly occurs in developing countries, where SSF and aquaculture are key to local food security and nutrition.

National statistical systems are encouraged to develop their statistical capacity to generate data on fishery in sea and inland waters. In particular, data are required on aspects including fish biological diversity and stocks, harvested quantities, and the socio-economic characteristics of households and fishing communities, including their activities of cultivating fishery resources.

Better data
on small-scale
fisheries and
aquaculture
support
sustainable
fishing, food
security and
economic well-
being of fishing
households and
communities

Fishery and aquaculture statistics

What data and for which purposes?

Knowledge of the status and trends of capture fisheries, including their socio-economic aspects, is key to sound policy development, better decision-making and responsible fisheries management. With an increasing number of countries adopting decentralized management of fisheries, more accurate and timely information is required to support efforts to manage fisheries and aquatic resources in a responsible manner.

WHAT DATA?
<ul style="list-style-type: none"> • FISHING AND OPERATIONAL INDICATORS • BIOLOGICAL INDICATORS • ECONOMIC INDICATORS • SOCIOCULTURAL INDICATORS

INDICATORS			
Fishing and Operational	Biological	Economic	Sociocultural
Yield	Stock size	Prices & costs	Household & community demography
Effort	Stock structure	Employment	Communal rules, properties, etc.
Fishing controls	Environment factors	Incomes	Communal benefits & distribution

WHY?
<ul style="list-style-type: none"> • MANAGE FISH STOCKS • MEASURE CONTRIBUTION TO DEVELOPMENT • MEET INTERNATIONAL DATA COMMITMENTS

MANAGE FISH STOCKS	MEASURE CONTRIBUTION TO DEVELOPMENT	MEET INTERNATIONAL DATA COMMITMENTS
Stock assessment	Food security	1995 UN Fish Stocks Agreement, Article 8; Code of Conduct for Responsible Fisheries Article 7.4.4
Overfishing detection	Poverty alleviation	
Conservation assessment	GDP contribution	States' obligation to report fishery statistics to FAO (FAO Constitution, Article XI)

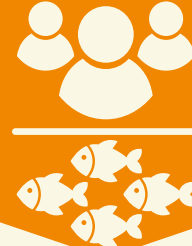


Producing fishery and aquaculture statistics – type of data



PRODUCER-LEVEL DATA

- ▶ **Fishery-level data**
 - Total catch by species
 - Catch Per Unit of Effort (CPUE)
 - Fishing operations: vessels, gear types, boat days, etc.
 - Prevailing producer prices, production costs
- ▶ **Aquaculture-level data**
 - Household-cultivated fishery production
 - Type and scale of operations
 - Stock structure and size
 - Prevailing producer prices, production costs



HOUSEHOLD & COMMUNITY DATA

- ▶ **Data from SSF/Aquaculture module added to population or agricultural censuses**
 - Sociodemographic data
 - Employment
 - Income and costs
 - Type and scale of operations
- ▶ **Communal data**
 - Rules and norms
 - Conservation and fishing operations
 - Communal property
 - Access to market
- ▶ **Household-level nutrition information**
 - Household fish consumption
 - Nutrients per capita

Policy relevant data:

Fishery and aquaculture statistics focus on producer-level, household and community data

Main data sources for small-scale fisheries and aquaculture statistics



Complete enumerations

Complete enumerations are often conducted to obtain a list of operational units or sampling units that compose the population of interest. In the context of fisheries, **frame surveys, as well as fishery and aquaculture censuses**, are often used to collect structural information such as landing sites, vessels, fishery infrastructures and aquaculture facilities necessary for survey design and calibration of survey estimates.



Sample-based surveys

Landing and effort **surveys are the most common** sample-based surveys used to monitor SSF. They are conducted on a regular basis at landing sites, with the purpose of collecting sample data on total catch and species composition, associated efforts, and other secondary data such as prices and fish size. Their primary objective is to estimate the overall Catch per Unit of Effort (CPUE; average catch of a fishing unit by unit of time) and species proportions for each minor stratum. **Aquaculture surveys and household surveys** are other types of surveys commonly used to collection information on fisheries and aquaculture.



Enhanced census and household survey framework

Existing censuses and surveys can also be used to collect fishery and aquaculture data on small-scale operators. The Global Strategy has proposed guidelines to design core sample frame questionnaires to strengthen regular sampling schemes and census frameworks. The set of questionnaire surveys can be implemented within a census framework, that is, within agricultural, population, or rural censuses, or specialized community and household surveys.



Other data sources

In some countries, **administrative data** (such as registers and licenses for fishing vessels or aquaculture operations) and **reporting systems** (such as catches logbooks) can be used for fishery and aquaculture statistics or for survey frame design.

How to improve the production of SSF and aquaculture statistics?

Establishing an MSF improves the coverage and reliability of data while reducing their data production cost



Technology facilitates timely and cheaper routine data collection and submission



Build a Master Sampling Frame for fishery and aquaculture

A **Master Sampling Frame (MSF)** provides the basis for all data collections through sample surveys and census over time. It is a structure, or collection of structures, that covers populations of interest, along with a set of procedures for using these structures. The structure may be a list (list frame), such as a list of vessel licenses or landing sites, or a spatiotemporal description of a target population (area frame).

The development and use of an MSF for fishery statistics enables the following: avoiding duplication of efforts, expanding survey coverage, reducing discrepancies in statistics, connecting various aspects of the sector, allowing for analysis of the sampling units from various viewpoints, and having a better understanding of the sector.

Use technology to improve the data collection process

- **Computer-Assisted Personal Interview (CAPI)** is a process that uses software on mobile devices and internet networks designed to assist interviewers in the field, collect data and transmit finished interviews for real-time quality checking and analysis through automatic survey progress reports. CAPI replaces Paper-Assisted Personal Interview (PAPI) methods and offers solutions for lower-cost, faster and higher-quality survey data collection.
- **Open ArtFish** stands for Open Approaches, Rules and Techniques for Fisheries and is a statistical monitoring tool. It consists of the OpenArtfish software application and its backbone database. The software is designed to estimate total catch and value by species for sampling schemes of SSF. A free-of charge mobile phone application is made available to facilitate collection and prompt submission of surveys data to the database.

Capacity development for producing SSF and aquaculture statistics

Cost-effective and sustainable routine data collection systems for fisheries are an important source of data development. However, in several developing (low- and middle-income) countries, limited human and financial resources may constitute a major constraint.

The Global Strategy is actively helping to build statistical capacity in many countries, to:

- Establish routine data collection systems tailored to the needs of users, to produce timely and reliable statistics while taking into consideration existing operational costs
- Set up sustainable surveys that have minimal dependence on external technical assistance and are robust against changes in the fisheries being monitored and staff turnover
- Enable statistical practitioners and data producers to use state-of-the-art methods and tools for data collection, analysis and interpretation, such as CAPI and OpenArtFish
- Contribute to the development of statistical infrastructure and human resources in statistics production as well as in statistical education and research

Where do I start?

- The Global Strategy website <http://gsars.org/en/resource-center/>
- Access and download free online guidelines, workshop training materials and advocacy material related to SSF and aquaculture statistics
- Online training course on the CAPI software Survey Solutions <http://www.gsars.org/e-learning/index.html>
- Manual of OpenArtfish toolkit; installation and implementation of the software application, its generic database, and the mobile phone application <http://www.fao.org/3/a-i7680e.pdf>

WHO SHOULD BE TRAINED?

- **Statistical practitioners involved in fishery and aquaculture statistics:** Officers in relevant ministries and statistical institutions, survey designers, managers and data analysts
- **Lecturers, instructors and students in statistical training centers and universities**



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**Guidelines to Enhance
Small-Scale Fisheries and
Aquaculture Statistics through
a Household Approach**



**International training course
in fisheries statistics and data
collection**



**Training Course to enhance
Fishery and Aquaculture
Statistics**

**Technical Report on the development
of Master Sampling Frames for fishery SSF
and Aquaculture Statistics (UPCOMING)**

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