

Key issues in the “Global Strategy to Improve Agricultural Statistics” for fisheries and aquaculture sector.

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In 2006, capture fisheries and aquaculture supplied the world with about 110 million tonnes of food fish. Overall, fish provided more than 2.9 billion people with at least 15 percent of their average per capita animal protein intake. Notwithstanding the contribution of fish to total animal protein intake in low-income-food-deficit countries was significant, at 18.5 percent in 2005, and is probably higher in view of the under-recorded contribution of small scale and subsistence fisheries. An estimated 43.5 million people were directly engaged in fisheries and aquaculture productions and a further 4 million people were engaged on an occasional basis. Taking account of employment in the secondary sector (including fish processing, marketing and service industries) and dependants, over 500 million people could be dependent on the sector.

Regardless of such a significant contribution to food security and poverty alleviation, the fisheries and aquaculture domains have been in general placed outside the scope of national statistics and agricultural statistics. It is often the case that the specialized agencies separate from the national statistical offices collect, collate and disseminate statistics and other relevant information required for policy making, independent from national statistics office.

Part of the reason for this may be the specific requirement for data in detail about catch composition and fishing activities that are generally used to evaluate status of fishery resources. Transparency in fishing operations as well as precautionary approach supported with adequate monitoring capability also serves as a basis of responsible fisheries and fishery management defined through the Code of Conducts of Responsible Fisheries and other related International and National Plans of Action. Thanks to these efforts, the quantity and quality of statistics on capture fishery production has indicated a steady improvement both in developed and developing countries. This is particularly true for those species and/or areas with high commercial importance where fisheries are collaboratively managed under Regional Fisheries Management Organizations (RFMOs) and other inter-governmental mechanisms. Recent pressure from consumers towards environmentally-responsible products spurs this trend. Some countries have even moved into full enumeration and real time monitoring of daily fishing activities and production to enhance their monitoring, surveillance and control.

This high level of monitoring capability is however mainly limited to marine activities, especially in open sea areas. Data and statistics on coastal operations often lack adequate detail on the contribution of small scale and subsistence operations as well as that of inland capture fisheries, both of which are considered to be well under-reported.

Social and economic aspects of the fishery and aquaculture domains are another area of relatively weak monitoring, despite the increasing importance of such information for the move towards the ecosystem approach of fishery and aquaculture management. The ecosystem approach pursues the long-time sustainability of fishing communities themselves

together with the natural environments (including fishery resources) supporting communities as one whole ecosystem.

In relation to efforts to enhance adaptability to climate change impacts, the importance of a holistic view has been repeatedly recognized. Nevertheless, collaboration and communication amongst different sectors in the relevant areas as well as the inter-comparability of information gathered among them always provide big challenges.

The draft Global Strategy to Improve Agricultural Statistics contains two important aspects: i) to broaden the “Agriculture” boundary to incorporate fishery, aquaculture, forestry, as well as land and water management, and ii) to secure data comparability among statistics in different domains (not only within “Agriculture” frame) by sharing master sample frame data based on population censuses data and geo-references. As a whole, both concepts seem to provide useful guidance to improve existing weakness in monitoring capability in the fishery and aquaculture sectors. However, how successful it can be in the context of fishery and aquaculture may depend on whether several implementation difficulties can be resolved.

Some of such concerns are described briefly corresponding to each agenda item, seeking for further modifications or flexibility to be incorporated. Priority targets from the fisheries and aquaculture prospective are to ensure applicability of the Strategy especially to capture fishery domain without compromising already-established high level standards in monitoring catch and operational aspects. Resolving concerns from aquaculture and fishery domains will make the Strategy more globally acceptable, including those heavily relying on fish production such as small island nations, which in turn should facilitate the establishment of more globally comparable statistics systems.

Policy Issues in the Global Economy and Strategic Plan for Agricultural Statistics

The draft Global Strategy is expected to serve as a basis for developing a statistical framework in the broader sense of “Agriculture” which covers whole activities relying on natural production.. Since the Strategy originated from the Agricultural domain in narrow sense, it still reflects a strongly land-based view.

Although people’s lives may be bound to land, a certain domain of agricultural activities (i.e. fisheries and some of aquaculture) occurs outside land-area and is supported by the aquatic natural environment and water bodies. The importance of a holistic view in the ecosystem based approach has been repeatedly stressed. There is general agreement that fisheries should be included in national accounts. If so, it is not pragmatic to draw a line between land and water, which easily pushes water-based activities to be marginalized in policy and management considerations. Water bodies are owned, used and managed in the similar way as land, even though the extent of private ownership is much less important. It should be noted that boundary areas between land and water bodies (e.g. flood land, inter-tidal zones, river banks etc) provide key production areas not only for fisheries and aquaculture, but also for other domains. Establishing standard concepts and codes covering both land and water bodies in a consistent way is the essential first step which may also help to develop a more consolidated view to cover whole communities. In the same context, the concept of national territory should be also expanded to include marine waters at least up to the areas within the Exclusive Economic Zone, for national accounting purpose.

Data Requirements and Conceptual Framework for Agricultural Statistics

Several emerging data needs are identified in addition to those listed in the draft Strategy. It should be noted that the list is not exclusive, for many of which no clear definition nor monitoring system has been identified yet.

There are many different levels of monitoring and assessment needs in the context of early warning from fishery and aquaculture perspectives, especially under the increasing impact of climate change. This includes:

- 1) warning of natural disasters (e.g. storms, high tide, tsunami, etc): though this is generally outside the responsibility of the agricultural sector, more specific warnings on the potential impacts on agricultural production and possible mitigations can be useful;
- 2) warning on potential bio-hazards (e.g. diseases, pest, red tide, jellyfish outburst etc);
- 3) shifts of ecosystems and fish stocks (such as already occurred in hakes off Namibia), the occurrences of reference species, acidification, increase of salinity of waters etc); and
- 4) warning on fish stock devastation, recruitment failures etc (in principle, general role of stock management).

In the event of 1) and 2) above, timely assessments of the impacts of events on food security and livelihoods together with guidance to mitigate and prevent further expansion of impacts will be equally or even more important. The events mentioned in 3) and 4) above are relatively slow processes in the medium time span. Since those events are hard to detect beforehand, becoming too obvious and often too late to take adaptive actions, the importance of early warning is no less important than for the drastic events such as 1) and 2).

Recent aquaculture often heavily relies on the international supply of seeds and to lesser extent of feeds. Also, releases of cultivated young fish into open water bodies either as launching or as stock enhancement have increasingly become common. Neither of these has been systematically monitored. Due to potential significance in bio-diversity issues, monitoring mechanisms should be placed as the earliest as possible.

Other information currently not well monitored in fishery and aquaculture domains includes the contribution to secondary engagements such as processing, marketing, boat builders etc; subsidies and non-food production of aquatic living organisms, especially with the ornamental fish.

Determining the Menu of Indicators and a Core Set

Although aquaculture and capture fishery domains are classified into one category in the context of agricultural statistical systems, those two domains are quite different in their nature of activities and accordingly require different tactics for monitoring.

Aquaculture indicates the “farming” of aquatic living organisms, e.g. fish, mollusks, crustaceans, aquatic plants, crocodiles, alligators, turtles, and amphibians. “Farming” implies some form of intervention in the rearing process to enhance production, with individual or corporate ownership of organisms being cultivated. Though taking variety forms (e.g. using

land-based facilities; artificial ponds and raceways; cages rafts, ropes etc set in open and/or running waters; enclosures of water bodies with artificial and/or natural features; keeping fish in rice paddies/backyard ponds etc), aquaculture is considered as the equivalent of livestock or poultry domain in many ways. Therefore, most of the strategy appropriate for the livestock or poultry domain can be applied to aquaculture without too much difficulty, when standard concepts and codes for “land use” and “land cover” to be expand and modified to accommodate to utilization by aquaculture both land and water bodies.

On the other hand, capture fisheries is a hunting activity which directly harvests natural living resources. One of main roles of fisheries management is to maintain the impact of fishing pressure (i.e. measured by number of fishers, number of boats, number of days fishing etc – this can be referred as “fishing effort”) within a level to allow the stock to reproduce next generations in sustainable way. Since each species reacts to fishing pressure differently, some very sensitive and some relatively robust, data requirements in catch and effort statistics (a measure of fishing pressure) for monitoring purpose is generally at individual species level.

This level of details is essential to monitor the impacts of fishing activities on relevant ecosystems and is accepted as a minimum standard by many of inter-governmental Regional Fishing Bodies. It is important to ensure that this minimum standard will not be compromised by implementing the Global Strategy of Agriculture. The draft Strategy is to assist improving inter-comparability among statistics collected by different domains, not to override existing standards and strategies with something superior. In this context, the strategy should clearly indicate its respect to such standards if they are accepted to accommodate specific need for individual domain (i.e. in this case, fishery resource management).

It should be noted that the Coordinating Working Party on Fishery Statistics (CWP), the FAO Statutory Body under Article VI-2, takes a role to undertake continuously review of the statistical requirements and setting standard concepts, definitions, classifications and methodologies for the collection and collation of fishery statistics. The participating organizations of the CWP, currently 19 of them, cover most of major RFMOs in the world, regional bodies handling statistics (e.g. Eurostat, SPC, SEAFDEC), and other specialized organizations (ICES, IWC, OECD).

In the case of social and economic aspects of the capture fisheries domain, the Strategy is expected to provide useful guidance, especially in improving monitoring on small scale and/or subsistence operations as well as those in inland waters.

Integration of Agricultural Statistics into National Statistics System

The Strategy to utilize population census as a basis to develop master sample frame seems to be an effective way of identifying small scale and subsistent fishers and aquaculture farmers as well as their operations in inland waters which are largely under-recorded in the current system. Whether this will work in the fishery and aquaculture context may largely depend on how much the domain-specific information can be collected through population or agriculture censuses. It should be noted that in the current situation, forestry and fisheries are often outside the scope of agricultural censuses and that population census usually does not provide adequate breakdown in occupations to separate fisheries and aquaculture domains out.

FAO has promoted the inclusion of aquaculture related questions into the Census of Agriculture (e.g. A system of integrated agricultural censuses and surveys – Volume 1 World Program for the Census of Agriculture 2010). One possible solution may be to expand this to also cover the capture fishery domain. However, agricultural censuses in many countries apply minimum land size to select target households for the survey which may be essential in securing survey efficiencies. If this is the case, it seems unrealistic to assume the agriculture census as potential tool to gather basic data on landless activities – fishery domain.

The Strategy proposes to use of rural household surveys to fulfill gaps in agriculture census. However, distribution of fishers spreads both rural and urban areas and a substantial part of fishers will be left out uncovered with rural household surveys, too.

In addition, aquaculture and fishery domains in general are not based on household but based on boat/gears/aquaculture facilities holding units that can vary in size, though in many cases, households and boat/gear holdings do match especially in small scale operations along coastal and inland waters. Even such cases, fishing and aquaculture activities are often conducted in conjunction with other agricultural activities as a household (e.g. gender differentiated roles such as males being fishers and females farming backyard for subsistence or fish processing purposes, aquaculture-agriculture combined activities such as cultivation using rice-pad, etc).

Taking on this complexity, personal-based rather than household-based characteristics and land-less nature into account, the utilization of population census seems to be the best option in collecting basic frame information of the domain. In the other words, a full population census to enable engagement in capture fishery domain regardless scale of activities, whether part-time or full-time, employed or in own-account, rural or urban or land-based or landless could be essential prerequisite in effectively applying the draft Strategy to the fishery domain.

Many countries require licensing or a register in order to own boats, to establish aquaculture facilities, and/or to engage a certain type of fishing operations. Though these tend to focus on middle to large scale operations, this information when combined with census data may provide a good basis in developing a sampling framework.

Survey Framework

As mentioned above, one of key objectives of capture fishery production data is to monitor and manage natural aquatic living resources which support capture fisheries. Because of this, capture fisheries require far more detailed information on their production and fishing operations. Those are usually collected through sampling at landing sites by specialized enumerators, often together with reporting from fishers. The Strategy for Improving Information on Status and Trends of Capture Fisheries (Strategy-STF) was developed and adopted at the FAO Committee on Fishery in 2003 and since then capacity building efforts have specifically focused on small scale fisheries have been vigorously pursued.

The practice of sample-based surveys at landing sites is a well established technique that was proven to be effective in grasping the dynamic nature of capture fisheries at a required level of detail for catch composition and fishing activities with relatively limited resources. We strongly believe that this part of the sampling scheme should not be altered even within the new framework under the draft Global Strategy.

The Global Strategy identifies (land-based) geographic reference as one of key axes to formulate master sampling frame. This sampling frame, even not appropriate for monitoring of fishery production and activities, may be useful in social and economic statistics surveys within the capture fishery domain. Relatively rich administrative data including boat registers and fishing licenses, and/or full records of holdings sampled for catch and effort survey could provide a basis to develop a link between two sample frames, i.e. more specifically, a connection between person related to a holding, and holdings to landing sites. All of this process may require careful handling of personal information in accordance with any applicable confidentiality policy.

Again, the aquaculture domain should not cause any particular difficulty in applying the same master sample frame as appropriate to the livestock domain.

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Summary points:

- In order to incorporate fishery and aquaculture domains into the draft Strategy frame, the expansion of land-based concepts to include water bodies will be prerequisite, which includes a modification of existing concepts and codes on “land use”, “land cover”, “water use” and “water cover” to accommodate needs from aquaculture and capture fishery domains.
- It is not appropriate to consider the aquaculture and capture fisheries domains as one category.
- The aquaculture domain is similar to the livestock or poultry domain and most of concepts developed under the draft Strategy can be applied without major problems.
- Survey frame and data requirements on production and fishing activities of capture fisheries domain which mainly focus on monitoring of fishing impacts on aquatic living resources should not be altered even within the frame of the draft Strategy. It is important to establish a link between the survey frame used in capture production monitoring and the master sample frame under the draft Strategy.
- Scientific assessment on stock status is not appropriate as core indicators due to ambiguity and subjectivity to assumptions.