

Interim Report: Improving methodology for data collection of small scale fishery and aquaculture

Backgrounds:

Small scale operators of aquaculture and capture fisheries are known to make substantial contribution to food security (especially in protein and trace nutrients), poverty alleviation and livelihoods and enhanced adaptation against climate change impacts in many countries in especially in local communities. However, it has been a real challenge to accurately estimate the extent of activities and their contribution to social, economic and food security of small scale fisheries and aquaculture. Main causes of difficulty include lack of frame data, since operators generally scattering in broad geographical range, often engaging also in other activities (e.g. agriculture, tourism, paid workers in suburban area etc), and their products often traded outside commercial marketing systems.

The research intends to establish a strategy to use effectively the opportunity of agriculture census mainly in collecting frame information on small-scale operations/ operators of fishery and aquaculture and to improve regular data collection system based on the census output. The research specifically targets to develop i) the first draft of capture fishery module questionnaires and guidance for World Census of Agriculture (WCA), ii) harmonization of concept in statistical data collection with other agriculture sector for better integration of fishery and aquaculture with national statistical system, and iii) the strategy to link census information with regular data collection system.

Activities (Mar – June, 2013):

Main activities carried out during March and June 2013 included:

- Initial review and analysis of historical WCA questionnaires
- Development of overall concept and strategy
- Coordination and harmonization with WCA team and SEEA-Agri
- Consultation with possible partners

Initial review and analysis of historical WCA questionnaires:

Questionnaires and census reports of 84 countries conducted the 2010 WCA were reviewed specifically focusing on the questions related with aquaculture engagements, the linkage between main frame and aquaculture survey module and other social and economic data collected. The questionnaires and reports were all extracted from <http://www.fao.org/economic/ess/ess-wca/en/>. The consultant report is in Annex 1.

Of the 84 countries 56 requested information about engagement in aquaculture activities at the household level. Regionally, North and Central America and Oceania were the highest in the proportion of countries requesting this information, while South America was the lowest. There was no clear relation between the level of total aquaculture production, or per capita aquaculture production, and whether the country requesting the information on aquaculture engagement.

It is expected that small-scale aquaculture operations were in many cases conducted as part-time or supplementary activities in addition to agriculture. Therefore, it is important to collect the level of engagement, not only a simple binary yes/no reply, in order to grasp the importance of aquaculture at the household level. In fact, 34 countries, corresponding to about 40% out of all countries examined, and about 60% of those with aquaculture engagement question, asked about the level of engagement. By the regions, North and Central America had the lowest with only 2 countries requesting this information.

The aquaculture engagement data was not necessarily reflected in the final or summary report. Total 21 countries included aquaculture engagement information in their final or summary reports. However, some countries indicated the availability of such information at their websites, e.g. Uganda: <http://www.fao.org/economic/ess/ess-wca/wca-2010/countryinfo/en/>.

Questions to identify gender disaggregation in aquaculture engagement were absent except two countries, one in Africa and the other in North, Central America. Most of questionnaires requested household composition by ages and by genders at the highest resolution. However, by asking aquaculture engagement (as well as to the engagement to other subsidiary activities) at household level, it is not possible to link engagement information to the age and gender details of relevant individual household members.

This exercise identified the following points for further improvement in capturing frame information of non-agriculture activities in WCA including fishery and aquaculture:

- Collect engagement information for individual members of household, not as an aggregate in a household,
- Collect the extent of engagement, not by yes/no response,
- Need to develop a clear guidance to support decision making whether aquaculture and fishery data collection would be essential or not, and
- Separate aquaculture and capture fishery in both engagement and other frame information as well as survey modules.

Development of overall concept and strategy

Overall strategy toward establishing a pragmatic data collection framework for small-scale fishery and aquaculture was developed in a direction to integrate the WCAs and supplementary survey results with regular fishery and aquaculture data collection by utilizing based on SEEA relevant tables (including aquatic resources asset table, water supply and use table, land asset table) and their expansion.

First, establish a common data collection platform by expanding and adjusting the concept of SEEA. The SEEA framework already covers majority of information needs for management, i.e. the impact of fishery and aquaculture operations on natural environments including fish resources, land and water, as well as those to monitor economic performance of the sector. On-going development SEEA-Agri envisages enhancing the SEEA specifically in supplementing tables regarding social contribution and utilization for food. The combined SEEA and SEEA-Agri then would provide a good basis to develop a core data collection framework covering all fishery and aquaculture data needs.

One of advantages of accounting system is flexibility in defining a compilation unit, i.e. one can choose to compile SEEA at any level, either at national, sub-regional level, or even at individual farm level, and that as long as the compilation unit clearly defined and following a common classification structures, the compiled results could be aggregate to obtain the estimates at higher levels. Taking this advantage, secondly develop standard compilation guidance together with corresponding questionnaires, specifically designed to cover several typical use cases. Main use cases in mind are two census survey modules, regular landing surveys, and regular aquaculture production surveys. When and where the data collection guidelines and standard questionnaires already exist, the new framework would be implemented in a way to minimize modifications and to ensure data and procedural continuity as much as possible. Here, capture fisheries and aquaculture census survey modules need to be newly developed. Substantial enhancement would require for the frame for the standard regular aquaculture data collection, though the revision of standard guideline of global aquaculture statistics was agreed in 2013 in a way to accommodate the SEEA concept to some extent.

Intensive actual utilization is always the best way to keep improving data quality. In order to secure long-time sustainable use of invisible fish resources, fishery sector has accumulated many experiences in applying the management procedures based on best available information. The concept of management based on the best available data is broadly accepted and utilized as the basic principle of the Code of Conduct of Responsible Fisheries and now integrated into Ecosystem Approach of Fishery and Aquaculture management (EAF/EAA). The EAF/EAA is an adoptive management approach that would require a wide variety of monitoring indicators, covering both the status of target fish resources and also social, economic aspects of community as well as ecosystem services, according to the management plan developed and agreed at local level. As the third step, expand and adjust the core data collection framework in a way to support directly the implementation of EAF/EAA. Since the EAF/EAA has already accumulated many supporting tools, this step in the other words indicates to transform those tools in a format matching with the core data collection framework. This standardization of EAF/EAA data needs will further facilitate and standardize the EAF/EAA implementation, while the information collected through EAF/EAA could be integrated into national statistics without additional cost. The feedbacks obtained through utilization in actual management scene also provide continuous opportunity to review and improve the core framework. This component is less urgent to establish and envisaged to complete in 2014.

Lastly, develop a simple data compilation template to be fulfilled by field studies, projects and case studies that would collect information related with small scale operations and local fishery and aquaculture communities. Currently, although a lot of information have been collected through field researches, it is difficult to utilize such information in comparable and/or integrated way. This template would facilitate comparison among research results from different time and locations. By designing the template in accordance with those established for census surveys, this would also provide an additional opportunity to bridge between census periods even scattered way.

Though specific formats and level of details of information to be collected would vary according to the use cases, all the information collected could be fed into national statistics and national SEEA compilation by sharing a common data collection framework and common hierarchical classifications. There is no need to develop additional methodologies to link census survey results with the regular data collection.

This would not provide regular full monitoring of small-scale fishery and aquaculture operations but at least could give much more holistic view than currently available, either as a snapshot or one-point detailed view, a pragmatic solution with minimum additional cost.

In summary, the development of improved methodology for data collection of small scale fishery and aquaculture would follow the following steps:

- i) Development of a core data collection framework in accordance with SEEA and SEEA-Agri;
- ii) Development of compilation guidance and questionnaires for census survey modules and regular data collection both for capture fisheries and aquaculture;
- iii) Transforming EAF/EAA indicators related tools in a comparative format with the core data collection framework; and
- iv) Developing a template to be used by field researches and case studies for ad-hoc data collection.

Coordination and harmonization with WCA team and SEEA-Agri

Land use classification:

Water use related part of the FAO land use and irrigation questionnaire was critically reviewed and revised in a view of direct integration into the SEEA and fishery and aquaculture core data collection frame in coordination with ESS/FAO. Though the revision of the FAO land use and irrigation

questionnaire originally intended to achieve harmonization with the SEEA land use classification, this review exercise identified several problems in the SEEA land use classification from fishery and aquaculture viewpoint and sought interim solutions for the FAO land use and irrigation questionnaire as follows:

- i) Although both land and water areas have classifications for areas used “for maintenance and restoration of environmental functions”, “enhanced area”, i.e. stocking, fertilizations, engineering, predator control, habitat modifications and/or limit, was added in the definition in the case of water bodies. The list of activities defined “enhanced” corresponds to management actions commonly utilized and as a result, this category in water bodies contains both the areas protected for environmental conservation and the areas under vigorous commercial utilization with management. As an interim solution, the FAO questionnaire inserted sub-classification for “enhanced area” to separate those two different uses.
- ii) There seems to be some confusion in utilization of terms “internal water”, “coastal water”, territorial water, and EEZ. Though this would need further clarification, as an interim solution, it was agreed for the FAO questionnaires to ask information on territorial water and EEZ.
- iii) While the water bodies were defined by the bank for the historical purpose of the land use and irrigation questionnaires, for the purpose of monitoring water bodies accessible for fishery and aquaculture, seasonal water bodies including flooded areas, rice fields, and coastal lagoon, also play important roles. As an interim solution, the supplementary questions were added on seasonal waters (maximum and minimum extent of water surface area) and rice field in water.

The structure and explanatory note of the relevant parts of the FAO land use and irrigation questionnaire are in Annex 2.

Consultation with WCA team:

The first round consultation with the WCA team identified the items to be integrated into overall WCA designs in order to support data needs for fishery and aquaculture sectors. The fishery and aquaculture team stressed the importance to collect frame information either at population census or agriculture census and it was explained that FAO has already approached UNSD with proposition of including agriculture-related items (crops, livestock, aquaculture) in population and housing censuses which led to adoption of this approach in recommendations for population censuses. The consultation noted that some items such as shared ownership and access right to water bodies would be better fit in survey questionnaires at the community level. It was noted that currently neither agricultural nor fishery statistics cover the production of aquatic plants except algae and agreed to utilize WCA-2010 as an initial step to cover this component. The consultation affirmed the intention that FIPS would develop new survey module of capture fisheries as well as substantially revise the aquaculture module that was disseminated in 1997. Minutes of the consultation is in Annex 3.

Coordination with SEEA-Agri:

In the process of developing SEEA-Agri, the team contributed to integrate information need from fishery and aquaculture prospects. Main contribution included: i) request of including summary table to show utilization of natural resources by different sectors in a comparable way, ii) proposed modifications to make Fish Supply and Utilization Table in a consistent way as those currently processed, and iii) developing a draft proposal of pragmatic compilation procedure with existing data for fish resource asset table that is available in Annex 4.

Consultation with possible partners

The partnership was developed with the Project of Memorial University of Newfoundland to establish Information Network to support Small Scale fisheries and agreed to collaborate in i) testing and reviewing the drafts and concepts developed in this project, ii) advocating the methodologies when established, and iii) developing a framework to collect data and information in accordance with fields projects and case studies that could bridge data gaps between WCAs.

The consultation was made with the Bay of Bengal Large Marine Ecosystem project (BOBLME) on possible collaboration specifically in capacity enhancement in fishery and aquaculture data collection with an emphasis on sustainable use of natural ecosystem. It was agreed to maintain close communication.

Next steps till the end of 2013

Activities expected to complete before the end of 2013 included:

- Complete draft guidance of WCA capture fishery module and revised aquaculture module, and seeking feedbacks, including a presentation at ICAS and AFCAS;
- Further brainstorm for extending SEEA concepts into a core data collection framework and develop the standard compilation guidance and corresponding questionnaires for regular data collection;
- Maintain communication with EAF/EAA implementation team to identify relevant tables and data structure to cover general monitoring needs underneath the ecosystem approach of fishery and aquaculture management and Code of Conducts of Responsible Fisheries (EAF/EAA/CCRF) in order to develop a standard template supporting EAF/EAA/CCRF; and
- Further elaborate a conceptual framework to enable an integration of information collected by various surveys to provide continuous monitoring on small scale fishery and aquaculture with least cost.

Annex 1. The report on review of WCA-2010 questionnaires

Summary

To date, 84 countries in 5 regions (Africa; America, South; America Central and North; Europe; Oceania) have complete their 2010 World Census of Agriculture (WCA). These questionnaires and reports (when available) were surveyed for the inclusion of questions around engagement in aquaculture. Of the 84 questionnaires and reports surveyed 67% had included aquaculture engagement questions. Data reporting on aquaculture engagement in final or summary reports was infrequent (about 38% of countries that requested information), but that does not take into account data available from the national statistics departments. Most worrisome was a very low inclusion of questions that address gendered engagement in aquaculture rather than just overall gender engagement at the household level. A simple form for inclusion in future surveys is proposed that would correct both a lack of gendered engagement and relative (time) engagement around aquaculture (and fisheries).

Activities

Between May 1-July 16, 20 working days were spent working both remotely and from the FAO Rome offices on the below activities. When available, both census questionnaires and reports for the 2010 World Census of Agriculture (WCA) were surveyed for the inclusion of questions on engagement in all types of aquaculture. The questionnaires and reports were all extracted from <http://www.fao.org/economic/ess/ess-wca/en/>.

- review of background documents
- locate questionnaires; review background documents; make preliminary outline of spreadsheets for data collection and progress tracking
- review of documents for incorporation of aquaculture and fisheries into WCA census questionnaires and other background materials
- downloading questionnaires/reports
- data compilation from country reports / questionnaires
- meet with colleague to confirm Spanish, French and Portuguese search terms / basic translation;
- summary of findings and preparation of report

Outcomes

In total, 84 countries are currently included as having completed their round of the 2010 World Census of Agriculture (WCA). Of these 84 countries 56 requested information around engagement in aquaculture activities at the household level. There is not a correlation between production, or per capita aquaculture production, and requests for information on engagement. Regionally, South America had the lowest number of requests in the census for aquaculture engagement.

To convey and identify the importance of aquaculture at the household level the question of engagement needs to reach deeper than a simple binary reply of yes or no. Unfortunately, a smaller number of the census questions requested more detail around

levels of engagement. Only about 40% (34/84) requested this information. At the regional reporting level North and Central America had the lowest inclusion levels with only 2 countries requesting degree of engagement information.

Across all regions very few countries (between 3-5 per region) included aquaculture figures in their final or summary reports for their 2010 WCA Census finding. A selected sampling of information available from the national statistics websites for the countries revealed that the aquaculture engagement data was available. For example, Uganda provided engagement figures on the Uganda Bureau of Statistics website: <http://www.fao.org/economic/ess/ess-wca/wca-2010/countryinfo/en/>

Finally, questions to identify gendered engagement in aquaculture were absent in all regions except 1 country in Africa and 1 in North, Central America. Engagement by gender (as well as age) was clearly requested at the highest resolution in the WCA surveys for household composition, but not at the specific activity of aquaculture (or other 'subsidiary activities' as aquaculture was often identified).

Table 1. Summary of WCA 2010 Census Questionnaires and Reporting on Aquaculture Engagement. Results are shown by region and for the total number of countries included in the 2010 WCA.

	Total # Countries	Request Aquaculture Engagement	Final Report with Aquaculture Reporting	Relative Engagement Questions	Gendered Engagement
Africa					
	12	8	3	5	1
America, North and Central					
	14	10	5	3	1
America, South					
	9	5	3	2	0
Asia					
	9	6	3	3	0
Europe					
	30	20	3	18	0
Oceania					
	10	7	4	3	0
TOTALS	Total # Countries	Request Aquaculture Engagement	Final Report with Aquaculture Reporting	Relative Engagement Questions	Gendered Engagement

	84	56	21	34	2
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Conclusions and Recommendations

- Aquaculture was often specified as a secondary or ‘other’ form of agricultural activity and, therefore, was reported more as ‘presence/absence’ without questioning engagement level by either gender or time
 - Reporting included the overall gender ratio for agricultural households, but not reported at the level of activities such as aquaculture or fisheries. Engagement by women (and children) in aquaculture is often significant and represents a different engagement in activities than what is reported at the overall household level. It is very important that gendered engagement be captured at this level of data collection, not only at the household level.
 - Reporting on degree of engagement with aquaculture (or fisheries) is a critical component of the information and should be included in every survey rather than simple binary yes/no replies.
- Overall, around 67% of the countries that have completed their WCA 2010 surveys included questions around engagement in aquaculture. This does not seem to be linked in any way to total or per capita production volumes for the countries. It is possible that the lack of aquaculture engagement questions is a reflection of national governance structures where aquaculture (and / or fisheries) is considered activities outside the scope of agriculture. It is suggested that the request for information include wording that identifies the need for data collection on aquaculture and fishery engagement even if it falls outside that particular country’s institutional framework.
- In some country census questionnaires fishery and aquaculture activities are aggregated together. I would suggest the information for each is requested separately to allow for greater data resolution on activity.
- Suggest that very basic queries be added in the request for data collection on aquaculture and fishery activity as shown in Table 2, below. Although the potential depth of information available from questions such as the detailed engagement questions for the overall agricultural operation is appealing; any basic information beyond presence/ absence would be an improvement over the current reporting detail.

Table 2. Sample of simplified activity engagement request. Please note “aquaculture” alone is used for clarity, but can be replaced with “fisheries” in a separate table.

Engaged in aquaculture? (Y/N)			
Revenue Generation? (Y/N)			
Household members engaged in aquaculture	<i>Gender</i>	<i>Indicate if under age of majority</i>	<i>Time (1 = Full time or 2= less than full time 0 = not involved)</i>
Operator			
Family Member 1			
Family Member ...			

Annex 2. Structure and explanatory note of water related parts of the FAO land use and irrigation questionnaire.

MAIN TABLE:

Inland water:

Inland water covers the areas corresponding to natural or artificial water courses, serving to drain natural or artificial bodies of water, including lakes, reservoirs, rivers, brooks, streams, ponds, inland canals, dams, and other land-locked waters. The banks constitute limits whether the water is present or not.

This category includes all permanent water resources (freshwater and brackish) located in the landwards interior part of the country land boundary. Actual surface area of waters should be recorded under the category of "Seasonal water" below.

-- Inland waters used for aquaculture or holding facilities:

Inland waters used for aquaculture or holding facilities covers inland water areas which are used for aquaculture facilities including supporting facilities. Aquaculture refers to the farming of aquatic organisms: fish, molluscs, crustaceans, aquatic plants, crocodiles, alligators, turtles, and amphibians.

Aquaculture facilities include enclosures and pens (water areas confined by net, mesh and other barriers allowing uncontrolled water interchange), cages (open or covered enclosed structure constructed with net, mesh or any porous materials allowing natural water interchange), barrages (semi-permanent or seasonal enclosures formed by impervious man-made barriers and appropriate natural features), and rafts, ropes, stakes (raft, long lines or stakes used to culture shellfish and seaweeds).

The area should include a maximum extent of water area that is required to hold aquaculture facilities, i.e. a whole area enclosed with holding mechanisms such as poles and anchors.

-- Inland waters used for maintenance and restoration of environmental functions:

Inland waters used for maintenance and restoration of environmental functions covers protected inland water areas as defined in "Land used for maintenance and restoration of environmental functions". This class includes enhanced areas (areas with enhancement including stocking, fertilization, engineering, predator control, habitat modifications, and/or access limits.)

---- Inland waters used for maintenance and restoration of environmental functions:

Inland waters used for maintenance and restoration of environmental functions covers protected inland water areas as defined in "Land used for maintenance and restoration of environmental functions" and not used for commercial activities such as fishing and aquaculture.

---- Enhanced inland waters:

Enhanced inland waters covers areas with enhancements including stocking, fertilization, engineering, predator control, habitat modifications, and access limits, under utilization by fishing and aquaculture. This sub-component should be considered as a part of protected area.

-- Other uses of inland waters n.e.c.:

Other uses of inland waters n.e.c. covers inland water areas used for uses not elsewhere classified.

-- Inland waters not in use:

Inland waters not in use covers inland water areas not used for human activities or for the maintenance and restoration of environmental functions.

Coastal waters and Exclusive Economic Zone (EEZ):

Coastal waters and EEZ areas covers Internal waters, Territorial sea and Exclusive Economic Zone as defined by the UN Convention on the Law of the Sea (UNCLOS, 1982).

This category includes:

- Water surfaces in estuaries (the wide portion of rivers at their mouths subject to the influence of the sea into which the water course flows;
- Lagoons (cut off from the sea by coastal banks or other forms of relief with, however, certain possible openings);
- Exclusive Economic Zone Internal waters as defined by Part V of the UN Convention on the Law of the Sea (UNCLOS, 1982).

It excludes: ports and marinas (which are covered under "Built up and related areas")

-- Coastal waters and EEZ areas used for aquaculture or holding facilities:

Coastal waters and EEZ areas used for aquaculture or holding facilities covers coastal waters which are used for marine aquaculture facilities including supporting facilities. Aquaculture refers to the farming of aquatic organisms: fish, molluscs, crustaceans, aquatic plants, crocodiles, alligators, turtles, and amphibians. Aquaculture facilities include enclosures and pens (water areas confined by net, mesh and other barriers allowing uncontrolled water interchange), cages (open or covered enclosed structure constructed with net, mesh or any porous materials allowing natural water interchange), barrages (semi-permanent or seasonal enclosures formed by impervious man-made barriers and appropriate natural features), and rafts, ropes, stakes (raft, long lines or stakes used to culture shellfish and seaweeds).

This category includes:

- Oyster beds and other types of shellfish (mussels, clams, abalones, scallops);
- Bodies of water used for seaweed production;
- Bodies of water used for fish rearing;
- Bodies of water used for rearing of any other aquatic animals and algae.

The area should include a maximum extent of water area that is required to hold aquaculture facilities, i.e. a whole area enclosed with holding mechanisms such as poles and anchors.

-- Coastal waters and EEZ areas used for maintenance and restoration of environmental functions:

Coastal waters and EEZ areas used for maintenance and restoration of environmental functions covers protected marine areas defined in "Land used for maintenance and restoration of environmental functions". This class includes enhanced areas (areas with enhancement including stocking, fertilization, engineering, predator control, habitat modifications, and/or access limits.)

---- Coastal waters and EEZ areas used for maintenance and restoration of environmental functions:

Coastal waters and EEZ areas used for maintenance and restoration of environmental functions covers protected inland water areas as defined in "Land used for maintenance and restoration of environmental functions" and not used for commercial activities such as fishing and aquaculture.

---- Enhanced coastal waters and EEZ areas:

Enhanced coastal waters and EEZ areas covers areas with enhancements including stocking, fertilization, engineering, predator control, habitat modifications, and access limits, under utilization by fishing and aquaculture. This sub-component should be considered as a part of protected area.

-- Other uses of coastal waters and EEZ areas n.e.c.:

Other uses of coastal waters and EEZ areas n.e.c. covers coastal waters used for uses not elsewhere classified.

Specifically for agricultural context, it includes coastal waters and EEZ areas that are used by capture fishing and other harvesting of aquatic animals and plants.

-- Coastal waters and EEZ areas not in use:

Coastal waters and EEZ areas not in use covers coastal waters not used for human activities or for the maintenance and restoration of environmental functions.

SUPPLEMENTARY TABLE:

Permanent water:

-- Surface of lakes and reservoirs:

Surface of lakes and reservoirs - covers water surface area of all landlocked water bodies in the country. It includes natural lakes, upland lakes, floodplain lakes, artificial reservoirs, barrages, water storages, ponds etc. These water bodies can be either in freshwater or brackish water, but they are not connected to the ocean.

-- Rivers and swamps:

Rivers and swamps - covers surface water area of rivers and any associated swamps located along the river system which are saturated with and covered by water all year-round. The surface of rivers should be computed as actual surface of open waters and not as surface of the entire watershed.

-- Coastal lagoons:

Coastal lagoons - covers water surface area of coastal water bodies that are connected at least intermittently to the ocean by one or more inlets.

Seasonal water:

-- Maximum extent of inland surface water area:

Maximum extent of inland surface water area - is the largest water surface area recorded, including seasonal flooding, in a year, in general during high-water season. Whether it is fresh, brackish or salt water, it includes seasonal overflowing of water from river banks and seasonal fluctuations of surfaces of lakes, swamps or water holdings that are located in the landwards interior part of the country boundary. If no seasonal fluctuation of water level is recorded in the country, the same figure as permanent inland waters categories should be filled.

-- Minimum extent of inland surface water area:

Minimum extent of inland surface water area - is the minimum water surface area recorded in a year, in general during low-water season. Whether it is fresh, brackish or salt water, it includes seasonal drainage of water and seasonal shrinkages of water surfaces of lakes, swamps or water holdings that are located in the landwards part of the country boundary. If no seasonal fluctuation of water level is recorded in the country, the same figure as permanent inland waters categories should be filled.

-- Rice fields with water:

Rice fields with water -- is a maximum extent of rice field area fulfilled with waters during the high-water season of the year. It includes both rain-fed and deep rice cultivations as well as irrigated rice areas. The measurement refers to the area physically covered by water. If the area is fulfilled with water more than once a year, it is counted only once.

Annex 3. Minutes of consultation with WCA team

**Statistics Division (ESS)
Agricultural Censuses and Surveys Team**

Technical Meeting on WCA 2020 Programme with Fishery Division

12 June 2013

11:00- 12:30 ESS-SIRC Room

Present: Mukesh Srivastava (Team Leader), Giorgi Kvinikadze, Adriana Neciu, Olga Moraru, Tsuji Sachiko (FIPS), Zhou, Xiaowei (FIPS).

Absent: Nancy Chin (mission)

Agenda

1. Team H introduction in WCA 2020 Programme
 2. Feedbacks and free discussion from/with fishery and aquaculture team on the following points:
 - Main data gaps experienced in technical work area.
 - Data gaps: (1) reasons: differences in methodology and/or concepts or non-availability (2) Frequency of requirement (3) span of data gaps: global, regional or specific countries.
 - Alternative sources for the data
 - Proposals for improving the situation, through a framework of agricultural census and surveys.
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1. Team H introduction in WCA 2020 Programme

Mukesh K. Srivastava, the team leader of the Agricultural Census and Surveys team, introduced the status of the work on the review of implementation of the WCA 2010 round and preparation for WCA 2020, including foreseen activities.

Mr. Srivastava also informed about the seminar on the WCA 2020 that will take place in June 26, 2013. All the Divisions involved in the consultation process are invited to attend.
 2. Feedbacks and the points discussed with FIPS team
 - a) **Frames for aquaculture and fishery:** The fishery and aquaculture teams expressed their strong interest including both fishery and aquaculture components into the census programme. This is especially important for small-scale producers (including the subsistence producers who occasionally involved a certain degree of sales). While small-scale producers play important role in local food security and livelihood, the statistics on them, both production and frame information, is generally in poor quality partially due to quite scattered distribution and low contribution in economics. The census is viewed as the only way of getting frame information about them. Linkage with population and housing censuses would be ideal for this purpose, including, e.g. questions like:

Is any member of this household engaged in the following?

 - a) *Crop growing*
 - b) *Livestock rearing*
 - c) *Fishing*
 - d) *Aquaculture*

This type of frame can be created during a separate agricultural census as well, provided it is based on visiting all households in all or sampled enumeration areas. The separation of fishing and aquaculture engagement from agriculture in the census questionnaires was already recommended at the previous AFCAS and APCAS.

Based upon the frame for fishery that can be provided from census, various fishery sampling surveys can be designed. The Fishery Division has committed at the previous APCAS to develop a methodology according this line and the countries are very much in favor.

Mukesh Srivastava noted that FAO has already approached UNSD with proposition of including agriculture-related items (crops, livestock, aquaculture) in population and housing censuses which led to adoption of this approach in recommendations for population censuses. He suggested to fishery team to come up with the proposal at IDWG. After IDWG endorsement FAO can approach again to UNSD for advocating an inclusion of fisheries as well.

- b) **Holding concept:** It was noted that holding concept works likewise well for aquaculture as it works for agriculture because aquaculture activity is based on resources which are owned by (belong to) the operator. Fishery activity, however, cannot be directly associated with a holding because the resources do not belong to the producer. Nevertheless, many of fishing activities are controlled through privileged access rights to common resources, either to locations or specific resources. Maybe some appropriate concept should be elaborated.

In some countries there are community ponds in which fish are grown jointly and community people then harvest them. Such type of information can be captured from community surveys. It was noted, however, that in some cases such ponds are leased to households which operate them for aquaculture with payment of rent to the community. In this case, the information should be collected from holding survey, while community surveys identify lease relationship.

- c) **Big enterprises/companies:** In aquaculture, like in agriculture, big enterprises/companies also fall within definition of the holdings and should also be enumerated during the census. For fisheries, however, big fishing companies should be kept out of purview of current work, because of associated operational complication.
- d) **Aquatic plants:** Aquatic plants are quite important food source in many countries but their production is not covered by FAO statistics. Fishery only covers algae in its statistics and does not include any other plants in both aquaculture and wild production. Those plants are not covered by crops and/or vegetable because their production areas are partly covered by water. The attribute of these plants should be somewhere decided. It would be good to have their classification in the WCA 2020 Programme to be included in the current list of crops. [AP1. The first draft list of aquatic plants to be provided or consideration of their incorporation in the new WCA Programme. \(FIPS\)](#)
- e) **Land use:** In order to incorporate fishing and aquaculture components, the existing land use need to expand to include inland water bodies and coastal areas. Also boundary areas between water and land (inter-tidal areas, flooded areas, seasonal water bodies) play an important role for fishing and aquaculture but at the same time are used also for agriculture. SEEA has already expanded the **land and water use** classification which was further modified to accommodate the needs from fishing and aquaculture in the FAO land and water use questionnaire. The classification for WCA 2010 should be more in line with those of SEEA.

[AP2](#). FIPS to provide comments on land and water use classification given in the FAO land and water use questionnaire.

- f) **Items to be collected:** (i) Aquaculture team is especially keen to collect data on aquaculture facilities, in particular whether they are active or idle. (ii) data on aquaculture inputs (feed machinery) are important. The census team noted that such data should be collected during special surveys using a relatively small sample rather than during censuses. These types of surveys need to be integrated in overall survey programme. FIPS indicated its intention to develop the separate survey guide for fishing and to revise the existing survey guide for aquaculture reflecting the recently revised standard of aquaculture statistics.

[AP. 3](#) FIPS provide the new CWP Handbook of aquaculture statistics.

- g) **Linkage of aquaculture and fishery with other activities** Quite a number of households which are engaged in aquaculture and fishery are also engaged in other activities like fish processing, marketing, inn-keeping or restaurants. Quite often the aquaculture and fishing production utilized in these other activities are not covered by statistics. It would be good to include “non-agricultural activities” in the list of engagement in order to capture an extent of other gainful economic activities of holder’s household.

- h) **Documents being prepared by FIPS** Under the framework of the Global Strategy, FIPS is developing a conceptual document how to incorporate fishery and aquaculture into the national Statistics framework, and how to link the census results with regular surveys. The first draft document will be ready by the end of 2013. All the progress on this will be shared with census team.

Annex 4. Draft proposal of pragmatic compilation of fish resource asset table with existing data

<u>Cultivated fixed resources</u>	Freshwater fish	Diadromous fish	Demersal fish	Pelagic fish	Marine fish, other	Crustaceans	excl. Cephalopods	Cephalopods	Aquatic animals, others
<p>Opening stock</p> <p>Additions to stock Natural growth Reclassifications from Wild from cultivated inventories Import (e.g. brodstock) TOTAL</p> <p>Reductions in stock Natural losses Catastrophic losses Diseases Other catastrophic losses Reclassifications to cultivated inventories (e.g. eggs produced) Export (e.g. brodstock) Other reductions TOTAL</p> <p>Closing stock</p>									
<p>Supplementary information Land area used for cultivation facilities Water surface used for cultivation facilities</p>									
<u>Cultivated inventory resources</u>	Freshwater fish	Diadromous fish	Demersal fish	Pelagic fish	Marine fish, other	Crustaceans	excl. Cephalopods	Cephalopods	Aquatic animals, others

<p>Opening stock</p> <p>Additions to stock Natural growth Reclassifications from Wild Import (e.g. seeds) TOTAL</p> <p>Intermediate supply and use Supply (e.g. production of seeds, intermediate products) Use (e.g. introduction of seeds and intermediate products produced)</p> <p>Reductions in stock Gross harvest Harvest loss Reclassifications to wild to cultivated fixed stock Natural losses Catastrophic losses Diseases Other catastrophic losses Other reductions TOTAL</p> <p>Closing stock</p>									
<p>Supplementary information Land area used for cultivation facilities Water surface used for cultivation facilities Export in live in fresh, chilled, or frozen TOTAL</p>									
<p><u>Natural aquatic resources</u></p>	<p>Freshwater fish</p>	<p>Diadromous fish</p>	<p>Demersal fish</p>	<p>Pelagic fish</p>	<p>Marine fish, other</p>	<p>Crustaceans</p>	<p>excl. Cephalopods</p>	<p>Cephalopods</p>	<p>Aquatic animals, others</p>
<p>Additions to stock Reclassification from cultivated stock</p>									

Upwards reappraisals									
Reductions in stock									
Gross harvest (excluding those known to be reclassified to cultivated stocks):									
Discards									
Nominal catch									
Reclassifications									
to cultivated fixed stock									
to cultivated inventory stock									
TOTAL									
Assessment of abundance indicators									
Harest efforts (e.g. days fishing, engine power)									
Gross harvest / harvest effort in the current time frame (1)									
Gross harvest / harvest effort in the previous time frame (2)									
Abundance change index: $R=(1)/(2)$									
Average sustainable yields: $X = a*[historical\ maximum\ catch]$ ("a" to be determined from theory, e.g. 0.67)									
Opening stock: B0*									
Closing stock: B1									
$B1 = (B0*exp(-m/2) - C) * exp(-m/2)$									
Supplementary information									
Water surface used for fishing									
Export									
in live									
in fresh, chilled, or frozen									
TOTAL									

Below is a temporary idea as a starting point to estimate absolute abundance indicators

* if $(R \geq 1)$, then $B0 = C * exp(m/2) / (R - 1)$: this will give minimum abundance to support catch without reducing stock, i.e. in sustainable condition, m to be natural mortality, determined later based on general knowledge

if $(R < 1)$, then $B0 = (X - C * exp(m/2)) / (R - 1)$: this will give abundance assuming the surplus equal to historical average