Aquaculture in the Agricultural Census

Outline

• Concepts and Definitions
• Importance of aquaculture statistics
• Items
• Country experiences
Concepts & Definitions

**Aquaculture** is the farming of aquatic organisms such as fish, crustaceans, molluscs, plants, crocodiles, alligators and amphibians.

**Farming** refers to some intervention in the rearing process to enhance production, such as regular stocking, feeding and protection.

A distinction must be made between aquaculture and other forms of aquatic exploitation, such as capture fisheries.

Aquaculture normally involves rearing of organisms from fry, spat or juveniles.

Aquaculture may be carried out in ponds, paddy fields, lagoons, estuaries, irrigation canals or the sea, using structures such as cages and tanks.

According to the International Standard Industrial Classification Rev.4 (ISIC-Rev.4), agriculture (ISIC groups 011-015) and aquaculture (group 032) are separate economic activities.
Importance of Aquaculture Statistics

1. Aqua cultural products supply much needed protein, contributing to improvement of nutritional status of under-nourished population.
2. Aquaculture is an important activity in many countries
3. Aquaculture is often integrated with agricultural production (e.g. rice-cum-fish culture).
4. Contributes cash income, employment and export earnings.
Aquaculture data collection in the context of the agricultural census

For the purpose of the agricultural census, presence of aquaculture refers to aquacultural production activities carried out in association with agricultural production. E.g. aquacultural activities are often integrated with agricultural production (rice-cum-fish culture), or aquaculture and agriculture sharing the same inputs, such as machinery and labour.

If aquaculture is important in a country, aquacultural census could be undertaken in conjunction with the agricultural census, to provide structural data on the type of production facility, type of water, sources of water, type of organism, and aquacultural machinery (see paragraphs 5.24-5.33 of WCA 2020, Vol.1).

In such a case, for a complete picture of aquaculture activities in a country, the frame used for an aquacultural census must include all aquaculture holdings at both household and non-household levels, and not just those associated with an agriculture holding.
Theme 12 comprises 6 items (for the holding):

1201 • Presence of aquaculture on the holding.
1202 • Area of aquaculture according to type of site.
1203 • Area of aquaculture according to type of production facility.
1204 • Type of water.
1205 • Sources of water for aquaculture.
1206 • Type of aquacultural organism cultivated
Item 1201: Presence of aquaculture on the holding

**Type:** Essential and Frame item.

**Reference period:** Census reference year

**Notes:**

- Capture fisheries (catching aquatic animals or gathering aquatic plants “in the wild”) are excluded. An important characteristic of capture fisheries is that the aquatic organisms being exploited are common property, as opposed to being owned by the holding as is the case for aquaculture.

- However, where fish are caught in the wild and fattened up for sale, the fattening process should be considered as aquaculture.
Item 1202: Area of aquaculture according to type of site (for the holding)

Type: Additional item.
Reference period: Census reference year

Concept: Area of aquaculture refers to the area under water used for aquaculture on the holding.

Notes:

• The area figure should include supporting structures such as pond banks and floating structures of cages.

• It should exclude area of land-based aquaculture-related facilities such as hatcheries, storage buildings, fish processing facilities, laboratories and offices.

• The area should include land owned by the holding as well as bodies of water rented from others for use for aquacultural purposes. Such bodies of water could include parts of rivers, lakes, reservoirs, dams, canals, lagoons/estuaries, bays/coves, or the open sea.
Item 1202: Area of aquaculture according to type of site (for the holding) (contd.)

Type of site:

1. **Land-based**: aquaculture practised in rice fields, ponds, tanks, raceways and other land areas on the holding. In the case of ponds, countries may need to develop criteria to distinguish between land-based and inland water aquaculture. It can be split into:
   - Arable land (for crop production);
   - Non-arable land (saline-alkaline lands and wetlands).

2. **Inland waters** includes dams, reservoirs, lakes and rivers.

3. **Coastal waters** include lagoons, estuaries, shallow and open seas, bays and coves, including inter-tidal mudflats.
Item 1203: Area of aquaculture according to type of production facility (for the holding)

**Type:** Additional item.

**Reference period:** Census reference year

**Type of production facility:**

1. **Rice-cum-fish culture** is the use of land for the culture of both rice and aquatic organisms in the form of:
   - introduction of broodstock or seed into (often modified) flooded paddy fields;
   - rice and fish raised on the same land in different seasons. Wild fish entering paddy fields during flooding is not included.

2. **Pond** culture is the breeding or rearing of aquatic plants or animals in natural or artificial enclosures. Sometimes, large ponds are used in association with cages or hapas. Often there is some integration between crops, livestock and pond culture, as in fish-cum-vegetable culture or fish-cum-animal husbandry.

3. **Pens, cages and hapas** are net enclosures used for rearing aquatic animals or plants in lakes, rivers, reservoirs or the open sea. Pens are fixed, cages are held by floating structures while hapas are simple net enclosures suspended by stakes.
**Item 1203:** Area of aquaculture according to type of production facility (for the holding) (contd.)

- **Pens** are fixed
- **Cages** are held by floating structures.
- **Hapas** are simple net enclosures suspended by stakes.
Item 1203: Area of aquaculture according to type of production facility (for the holding) (contd.)

Type of production facility (contd.):

4. **Tanks and raceways** are fixed structures used for raising aquatic animals or plants. They are normally built above ground and can be made of bricks, concrete or plastic. Tanks are small round or rectangular structures, whereas raceways are long, narrow structures.

5. **Floating rafts, lines, ropes, bags and stakes** refer to the aquacultural practice based on these facilities, commonly used for the cultivation of shellfish and seaweed.
Item 1203: Area of Aquaculture by Type of Production Facility (contd.)

Tanks

Raceways
Item 1203: Area of Aquaculture by Type of Production Facility (contd.)

Floating rafts, lines, ropes, bags and stakes are common in shellfish/seaweed cultivation.
Item 1204: Type of water

**Type:** Additional item.

**Reference period:** Census reference year

**Concept:** This refers to whether aquaculture is carried out on **Freshwater**, **Brackish water** and/or **Saltwater**. There may be more than one type of water used on a holding.

**Type of water:**

- **Freshwater** refers to reservoirs, rivers, lakes and canals, with consistently negligible salinity.

- **Brackish water** has more salinity than fresh water, but not as much as seawater. It may result from mixing of seawater with fresh water, as in estuaries, coves, bays and fjords.

- **Saltwater** (or marine water) refers to coastal and offshore waters where salinity is high and is not subject to significant daily or seasonal variation.
Item 1205: Sources of Water for Aquaculture (for the holding)

**Type:** Additional item.

**Reference period:** Census reference year

**Sources of water:** This refers to whether water for aquacultural production on the holding was obtained from:

- Rain-fed
- Groundwater
- Rivers/canals
- Lakes/reservoirs
- Dams
- Estuaries/lagoons
- Coves/bays/sea

**Notes:**

- There may be more than one source of water used for aquaculture on a holding. The source of water is usually closely related to the type of site.
- Countries may adapt these categories to suit local conditions.
Item 1206: Type of Aquacultural Organism cultivated (for the holding)

Type: Additional item.

Reference period: Census reference year

Types of organisms: It refers to which of the following types of aquatic organisms were cultivated on the holding:

- **Freshwater** fish (such as carps and tilapias)
- **Diadromous** fish (can live in both fresh and seawater, such as trout, salmon, eels and sturgeon)
- **Marine** fish (flounder, cod and tuna)
- **Crustaceans** (crabs, lobsters and shrimps)
- **Molluscs** (belonging to the phylum Mollusca, including abalones, oysters, mussels, scallops, clams and squids)
- **Other** aquatic animals (frogs, crocodiles, alligators, turtles, sea-squirts and sea urchins)
- **Aquatic plants** (seaweed and lotus).

Notes:

- More than one type of organism may be cultivated on a holding.
- The classification refers to the type of aquatic organism cultivated, not the type of product generated (e.g. pearl production is under “molluscs”).
Country experiences

China 2007: Second National Agricultural Census

In both types of questionnaires: Household questionnaire H2 (Questions H97 and H98): and Non-Household questionnaire NH3 (Questions D151 and D152), area of aquaculture was recorded as:

- Q. H97 and D151: Marine aquaculture.
- Q. H98 and D152: Freshwater aquaculture. This question was open as:
  - Area in ponds;
  - Area in reservoirs;
  - Area in lakes.
Country experiences: Saudi Arabia

Saudi Arabia: Agricultural Census 2010

The census questionnaires included Section X devoted to aquaculture. It comprised the following questions:

Q.N 1: Types of Fish:
   a) tilapias
   b) others

Q.N 2: No. of pounds

Q.N 3: Capacity of pounds

Q.N 4: No. of rotations

Q.N 5: Production (tons)
Country experiences


Module #4 of the census questionnaires is devoted to aquaculture. It comprises the following questions:

Q.N1: Does any household member practice aquaculture? If “yes” a question about the ownership of aquaculture tanks is asked: individual or collective.

QN2: How many tanks for aquaculture do you operate?

For each tank:

QN3: Area

QN4: Coordinates (Longitude and latitude);

QN5: Where are the tanks located?: Arable land; Non-arable land; Inland waters; Coastal waters.

QN6: Which are the types of infrastructure used?: Tanks on land; floating cages; Tanks of cement; Other.

QN7: Type of management: Monoculture; Polyculture; Both

QN8: Type of water used : Fresh, brackish, salt water.

QN9: Source of water for aquaculture: Fountain; Underground; River/Channel; Wells; Lakes/reservoirs; Taps; Estuaries/lagoons; Coves/bays; Sea.

QN10: and QN11: Type of organisms cultivated: Fishes; Crustaceous; Molluscs; Plants; Other.
MANY THANKS