

# MANUAL OF OPERATIONS

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## **QUARTERLY AQUACULTURE SURVEY**

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**Republic of the Philippines**  
**PHILIPPINE STATISTICS AUTHORITY**  
**Quezon City**

## **FOREWORD**

The Quarterly Aquaculture Survey (QAqS) is one of the activities of the Philippine Statistics Authority (PSA) conducted every quarter. This activity generates estimates of volume and value of production for aquaculture at the provincial, regional and national levels.

The outputs form part of the estimation for the performance of agriculture and eventually, of the National Accounts for the generation of GVA, GNP and GDP. The data sets generated out of this activity serve as basis for researches and policy formulation.

Results of the survey are disseminated mainly in the PSA CountryStat website through regular publications on Fisheries Situation Report (quarterly), Fisheries Statistics of the Philippines (annually) and Selected Statistics on Agriculture (annually).

This Manual of Operations will serve as guide and reference for the Statistical Researchers and Field Supervisors in the conduct of the survey.

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## TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION .....	1
2.0 METHODOLOGY .....	2
3.0 ESTIMATION PROCEDURE .....	2
4.0 FIELD OPERATIONS PROCEDURES .....	3
5.0 INSTRUCTIONS ON HOW TO ACCOMPLISH THE QUESTIONNAIRE	
5.1 General Instructions .....	4
5.2 QUARTERLY AQUACULTURE SURVEYS Forms 1 - 5. ....	5
5.3 QAqS – List of Sample .....	9
5.4 QAqS – Narrative Report .....	9
6.0 DATA PROCESSING .....	10
7.0 SUBMISSION .....	10

## **I.0 INTRODUCTION**

### **1.1 RATIONALE**

Fisheries sector has three subsectors, namely: commercial fisheries, municipal fisheries and aquaculture. Aquaculture remains an important source of fish food amid the depleting marine resources. The subsector is often the target beneficiary of programs and policies because it operates under controlled conditions. The Quarterly Aquaculture Survey (QAqS) is a quarterly survey that generates estimates of volume and value of production for the subsector. Fisheries outputs form part of the estimation for the performance of agriculture and eventually, of the National Accounts for the generation of GVA, GNP and GDP. The data sets generated out of this activity serve as basis for researches and policy formulation.

There is a continuous effort to improve the data system for aquaculture. However, the current design assures sustainability on a quarterly basis, in terms of time, budgetary and manpower resources.

### **1.2 OBJECTIVES**

The Quarterly Aquaculture Surveys (QAqS) aims to generate accurate and timely information on quarterly volume and value of production aquafarm type and species at the provincial level.

### **1.3 SCOPE, COVERAGE AND FREQUENCY**

The domain of the survey is the province. It covers aquaculture operations in 81 provinces of 17 aquaculture species in 13 aquafarm types/environments. The following are the aquafarm types and environments covered, however, it depends on which is available in the province:

- a. Brackishwater and freshwater fishpond
- b. Brackishwater, freshwater and marine pen and cage
- c. Oyster, mussel and seaweed
- d. Other freshwater aquafarms like rice fish, SFR, etc.

QAqS is conducted on a quarterly basis.

### **1.4 CONCEPT AND DEFINITION OF AQUACULTURE**

By definition, aquaculture is fishery operation involving all forms of raising and culturing of fish and other fishery species in fresh, brackish and marine water areas. The operation is comprised of activities from stocking to harvesting of species under controlled conditions in farming facility called aquafarm.

Aquaculture production refers to the volume harvested from the aquafarm. It includes those species harvested in marketable/matured size and in fresh form. The species harvested that are utilized as input to another operation like planting materials, are not included in the estimates of volume produced.

## 2.0 SAMPLING METHODOLOGY

The Quarterly Aquaculture Surveys (QAqS) is a non-probability survey. Sampling is done for each aquafarm type in the province.

By aquafarm type, top producing municipalities are those with cumulative share of at least 80% to total area based on Aquaculture Farms Inventory (AqFI).

For each municipality, eight (8) sample aquafarms are selected if the number of aquafarms in the municipality is more than 25. If the number of aquafarms is less than 25, five (5) sample aquafarms are selected.

## 3.0 ESTIMATION PROCEDURE

The provincial estimate of production/area for the reference quarter is computed using the following formula:

$$P_{TQ} = P_{SQLY} \times (1 + \% \Delta / 100)$$

Where:

- $P_{TQ}$  - the provincial estimate this quarter
- $P_{SQLY}$  - the provincial estimate same quarter last year
- $\% \Delta$  - percent change

The following is the formula for percent change of aquaculture production/area:

$$\% \Delta = \left[ \frac{TQ}{SQLY} - 1 \right] \times 100$$

Where:

- $\% \Delta$  - percent change
- TQ - sum of the production/area all samples from all municipalities this quarter
- SQLY - sum of the production/area all samples from all municipalities same quarter last year

## **4.0 FIELD OPERATIONS PROCEDURES**

### **4.1 SAMPLE MANAGEMENT**

The QAqS implements a panel survey. Thus, the same sets of sample aquafarms are maintained quarterly.

During the selection of samples, the Fisheries Statistics Division (FSD) identified the top producing municipalities based from the latest updating of Aquaculture Farms Inventory (AqFI). The lists of top producing municipalities were sent to the provincial offices for the selection of sample aquafarms that satisfy the following conditions:

1. All species produced in the municipality were represented
2. Aquafarms were more or less regular in operation with varying culture period, i.e., usual harvesting period is not the same
3. Sample aquafarms were spread across the barangays in the sample municipality.

On a quarterly basis, the status of interview for each of the samples is being monitored through the Fisheries Data Generation System (DataGen). Replacement of samples are allowed on the following cases: 1. Permanently stopped operations; 2. Temporarily stopped operations for two (2) consecutive years, 3. Respondent cannot be contacted, 4. Others, on a case to case basis. Any changes in samples shall be coordinated with the FSD.

### **4.2 DATA COLLECTION**

For this activity, the owner, operator, technician and/or caretaker of all sample aquafarms in the province listed in QAqS Form 6, List of Samples serve as the respondent to the survey. The field staff shall conduct the interview during the third week of the last month of the quarter. The same sets of sample aquafarms shall be interviewed quarterly and inquired about their production, area and price using the appropriate form. The following are the survey forms:

QAqS FORM 1. Quarterly Aquaculture Survey – *FISHPOND*

QAqS FORM 2. Quarterly Aquaculture Survey – *PEN AND CAGE*

QAqS FORM 3. Quarterly Aquaculture Survey– *OYSTER, MUSSEL AND SEAWEED*

QAqS FORM 5. Quarterly Aquaculture Survey – *OTHER FRESHWATER FARMS*

## **5.0 INSTRUCTIONS ON HOW TO ACCOMPLISH THE SURVEY FORMS**

### **5.1 General Instructions**

- a. Fill up the survey forms properly and neatly. Use soft lead pencil in recording and checking boxes. Write legibly in big letters or numbers.
- b. Write the entry in the appropriate answer space. Wrong entries shall be erased neatly and not crossed out.
- c. For quantitative answers, observe strictly the instructions for recording numerical entries such as those in number, weight and/or percentage. Enter required number of decimal places on the space provided.
- d. Do not leave an answer space blank. A blank answer space may mean that the question was not asked. If the answer to a question is “not applicable”, enter a dash (-) in the corresponding answer space.
- e. Before ending the interview, go over the entire questionnaire to make sure that not a single item has been missed.
- f. Finally, make an initial editing before submitting the accomplished questionnaire to the supervisor.

- 5.2 **QUARTERLY AQUACULTURE SURVEY – FISHPOND (QAqS FORM 1)**  
**QUARTERLY AQUACULTURE SURVEY – PEN AND CAGE (QAqS FORM 2)**  
**QUARTERLY AQUACULTURE SURVEY – OYSTER, MUSSEL & SEAWEED (QAqS FORM 3)**  
**QUARTERLY AQUACULTURE SURVEY – OTHER FRESHWATER FARM (QAqS FORM 5)**

There are four (4) data collection forms designed for each aquafarm type. The owner/operator of all sample aquafarms shall be interviewed using the appropriate form. The QAqS forms can accommodate up to five (5) respondents. Accomplish the survey form by municipality. Depending on the number of respondents in the municipality, use additional forms, if necessary.

The forms have the following major items:

A	Geographic identification
B	% Share of production
C	Aquafarm type
D	Environment
I Col 1	Species/Item
I Cols 2-6	TQ by respondent
I Col 7	TQ total
I Cols 8-12	SQLY by respondent
I Col 13	SQLY total
I Col 14	Percent change TQ/SQLY
I Col 15	Reasons for change
II Cols 8-12	Comparison with other aquafarms

The top portion of the survey form is composed of the following:

- The agency undertaking the survey operation, the Bureau.
- Title of the survey **QUARTERLY AQUACULTURE SURVEYS**
- Reference quarter  **QUARTER,** 
  - *Enter the reference quarter and year*
- Survey form identification **QAqS FORM 1**
- Page sequence **Page**  **of**  **pages**
  - *This portion is intended to keep track of the number of forms utilized. Fill out this portion by aquafarm type. Enter on the first blank the sequence number of the form. Enter on the second blank the total number of forms used for the aquafarm type.*

#### A. GEOGRAPHICAL IDENTIFICATION

This block identifies the sample municipality being covered

- **Region**
- **Province**
- **Municipality**

*Write the region, province, municipality on the space provided. These information are available from the list of samples.*



## B. % SHARE OF PRODUCTION

*Enter the % share of the municipality to the area of the province. This information is not processed. However, it will help a lot during data review. Percent share is available from the list of samples.*

## C. AQUAFARM TYPE

*Cross out (X) the box corresponding to the type of aquafarm operation.*

- **Fishpond**

A land-based type of aquafarm; a body of water (artificial or natural) where fish and other aquatic products are cultured, raised or cultivated under controlled conditions.

- **Pen**

An artificial enclosure constructed within a body of water for culturing fish, fishery/aquatic resources made up of bamboo poles closely arranged in an enclosure with wooden material, screen or nylon netting to prevent escape of fish.

- **Cage**

A stationary or floating fish enclosure made of synthetic net wire/bamboo screen or other materials set in the form of inverted mosquito net ("hapa" type) with or without cover with all sides either tied to poles staked to the water bottom or with anchored floats for aquaculture purposes.

- **Oyster**

An aquafarm involved in the cultivation of oyster in shallow brackish or marine areas by any method for production purposes.

- **Mussel**

An aquafarm involved in the cultivation of mussel in shallow brackish or marine areas by any method for production purposes.

- **Seaweed**

An aquafarm involved in the cultivation of seaweed in suitable water areas by any methods with appropriate intensive care for production in commercial quantities.

- **Rice Fish**

An integrated farming system involving raising of fish in rice paddies.

- **Small water body (Small Farm Reservoir)**

Small water bodies include reservoirs and lakes with an area of less than 10 km<sup>2</sup>, small ponds, canals, irrigation canals, swamps and small, seasonal, inland floodplains. They may be permanent or temporary and can be separated into natural waters or constructed ones.

## D. ENVIRONMENT

*Environment is the water condition under which the aquafarm operates and species are reared and cultured. Cross out (X) the box corresponding to the aquafarm environment.*

- **Freshwater environment**

Refers to water without salt or marine origin. It is pure fresh water. Examples of no mixture of seawater (Laguna de Bay, Taal Lake, Candaba Swamps, Liguasan Marsh and rivers, canals, dams and paddy fields and rice fields.

- **Brackishwater environment**

Refers to mixed seawater and freshwater and salinity varies with the tide. Examples are estuaries, mangroves, and mouth of rivers where seawater enters during high tide.

- **Marinewater/Seawater environment**

Inshore, open waters and inland seas in which the salinity generally exceeds 20‰.

## I. LEVELS OF PRODUCTION, AREA AND PRICE

This block aims to gather the levels of production, area and price of species cultured in the aquafarm during the quarter for the current and the previous years.

### COL 1 SPECIES/ITEM

*For purposes of this survey, only species harvested in marketable size shall be considered. For each species cultured in the aquafarm, including natural entry, fill out completely each row on production (Kg.), area (Ha.) and price (P/Kg). Write "NE" if species is natural entry*

#### Production

*Enter the volume harvested/to be harvested during the reference quarter in whole number, kilogram unit.*

#### Area

*Enter area harvested in four decimal places, hectare unit. Do not indicate area if the species is natural entry. If the culture system is monoculture, enter the area corresponding to the species stocked. If polyculture, allocate the area harvested among the species stocked according to stocking proportion.*

#### CULTURE SYSTEM

- **Monoculture** refers to the culture of single species in one compartment.
- **Polyculture** is culture of two or more species in one compartment

#### Price

*Enter price per kilogram in two decimal, peso unit. For hatchery (QAqS FORM 4) entry should be in price per piece, peso unit. Price is the amount received from the first point of sale.*

#### Size (for Hatchery – QAqS FORM 4 only)

*For hatchery farm, record the size of the fry/post larvae of fingerlings harvested in centimeter unit. Entry should be in whole number.*

**COLS 2 – 6 THIS QUARTER (TQ)**

*By respondent, ask the levels of production, area and price during the reference quarter. Respondents are coded accordingly from A – D. Enter the responses of in the appropriate column.*

**COL 7 TQ TOTAL**

TQ TOTAL provides the sum of production, sum of area and weighted average price of all the respondents during the reference quarter.

$$\begin{aligned}\text{TOTAL PROD} &= \sum_{i=A}^D \text{PROD}_i & \text{TOTAL AREA} &= \sum_{i=A}^D \text{AREA}_i \\ \text{WEIGHTED AVE PRICE} &= \frac{\sum_{i=A}^D (\text{PROD}_i)(\text{PRICE}_i)}{\sum_{i=A}^D \text{PROD}_i}\end{aligned}$$

**COLS 8 – 12 SAME QUARTER LAST YEAR (SQLY)**

*During the initial year of implementation, inquire from the respondents the levels of production, area and price during the same quarter of the previous year. However, for the succeeding years, these sets of information are available from the survey forms of the previous year (TQ of the previous year).*

**COL 13 SQLY TOTAL**

SQLY TOTAL provides the sum of production, sum of area and weighted average price of all the respondents during the same quarter of the previous year. Same formula used in Col 7.

**COL 14 PERCENT CHANGE**

Percent change is the percentage increase or decrease from the level of production, area and price from SQLY to TQ. The formula for percent change is presented in 3.0 Estimation Procedure.

**COL 15 REASONS FOR CHANGE**

*Inquire from the respondents the reason/s for the reported change.*

In the Aquaculture Data Generation System developed for purposes of this survey, Columns 7, 13 and 14 are computed automatically upon entry of the required information. Thus, the said columns may not be computed during data collection or editing of returns. However, the formula is presented in case it will be helpful to do so during the survey operations.

**II COMPARISON WITH OPERATORS IN THE MUNICIPALITY**

Part II of the survey form aims to get an idea on how the responses about the aquafarm compared with the rest of the operators in the municipality. This is a form of validation or an indicator whether or not the change in the operations of the sample aquafarm represents the entire municipality. This may be asked to the respondent himself or to other key informant in the municipality.

*Probe the respondent or key informant to compare the response with that of the entire municipality. Ask how many percent is higher, the same or lower than the production and area of the sample aquafarm. Record the answer in percent terms and whole number. The sum of the three percentages should be less than or equal to 100 percent.*

On the lower right hand corner of the survey forms, fill up the following information at the end of the interview:

#### **Remarks**

Indicate on this portion some important notes about the aquafarm operations in the municipality that will help in the data validation and analysis.

#### **Prepared by and Date**

Indicate the name and signature of the interviewer and the date the survey form was accomplished.

#### **Reviewed by and Date**

Indicate the name and signature of the supervisor and/or editor for the survey form and the date the survey form was edited.

### **5.3 QUARTERLY AQUACULTURE SURVEY – LIST OF SAMPLES (QAqS FORM 6)**

The list of samples is necessary in monitoring the completeness and reliability of results of QAqS. This form contains all the sample aquafarms identified. One form shall be used for each aquafarm type in the province. This form shall be filled out and submitted upon selection of samples, right after the sampling activity. However, updated copy should be submitted to Central Office if there's a need to replace or change the sample.

- *Enter the **Region** and **Province***
- *Cross out the box corresponding to the **Aquafarm type** and **Environment***
- *List down the identified five/three top producing **Municipality** by block*
- *For each municipality, enter the **Percent share** of the municipality to the total aquafarm production in the province*
- *In one block, list down the **Name of Operator** of sample aquafarms in the municipality. Operators shall be listed according to order as listed in the survey form, i.e, operator 1 in this list should be respondent A in the data collection form, etc.*
- *Enter the **Address** of the operator by indicating the sitio or barangay of his residence*

### **5.4 QUARTERLY AQUACULTURE SURVEY – NARRATIVE REPORT (QAqS FORM 9)**

A narrative report completes the entire survey because not all things can be explained by numbers, percent change and reasons for change. Also, the Central Office staff needs valuable inputs for data analysis and survey monitoring and evaluation. The narrative report may contain the following:

- A very brief discussion on the aquaculture performance of the province during the quarter. Highlight may be given to an important aquafarm type.
- Some other factors or situation in the province that influence the changes in the levels of production, area and price aside from those mentioned in the reasons for change.
- Indicators that were not captured or measured by the samples, which may affect the level of provincial estimates. Example, more operators in the province shifted to culture of new species but not on the sample aquafarms.

- Existence of new technology, marketing practices, local government regulations, etc that greatly influence the over-all level of productivity of the province. Example, development of mariculture park
- Comments and suggestions on the survey design, instrument, field operations and data processing of QAqS

## **6.0 DATA PROCESSING**

To facilitate timely and efficient delivery of results, systems for automation of some processes were developed.

### **6.1 AQUACULTURE QUARTERLY DATA GENERATION SYSTEM (AquaDataGen)**

AquaDataGen is a provincial-based system developed to process QAqS Forms 1 – 3 and 5. The said system (DGAppppp.XLS) also facilitates the generation of QAqS Form 7 – Provincial Summary and QAqS Form 8 – Validation Form. Specific instructions on the system are contained on a separate manual.

## **7.0 SUBMISSION**

After the Provincial Data Review (PDR), the following shall be submitted to the regional office as input to the Regional Data Review (RDR) and to FSD to form part of advanced estimates:

1. Updated/processed soft copy of aquaculture data generation worksheet (DGAppppp.XLS)
2. Soft copy of narrative report