I.0   INTRODUCTION

1.1   RATIONALE

The non-probability survey on Aquaculture is a quarterly activity that generates production and area estimates. In line with the continuous effort to improve the said survey, revisions were made. What is then known as the "Aquaculture monitoring" is now the Quarterly Aquaculture Surveys (QAqS). For the meantime that an appropriate design for a quarterly aquaculture probability survey is being studied, QAqS is adapting the current methodology. This asks for the actual level of production, area harvested and price for each species in the reference quarter of the current and previous years from the sample operator from top producing municipalities. A revised customized data generation system is developed to facilitate data processing and validation.

1.2   OBJECTIVES

The Quarterly Aquaculture Surveys (QAqS) aims to generate accurate and timely information on quarterly production, area and price by aquafarm type and species at the provincial level. Value of production and yield can also be derived.

1.3   SCOPE, COVERAGE AND FREQUENCY

The domain of the survey is the province. It covers aquaculture operations in 81 provinces. 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. Hatchery
d. Oyster, mussel and seaweed
e. Other freshwater aquafarms like rice fish, SFR, etc.

QAqS is conducted on a quarterly basis.

2.0   SAMPLING METHODOLOGY

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

The provinces are classified into three (3) categories according to the production. The categories are; major producing province, minor producing province and very minor provinces.

For major provinces, top five (5) producing municipalities are chosen. From each top producing municipalities, five (5) sample aquafarms are selected. Thus, there are 25 sample aquafarms allocated for each major producing province.

For minor producing provinces, 3 X 3 design applies. That is, three (3) sample aquafarms are chosen from each of the three (3) top producing municipalities. A total of nine (9) sample aquafarms is allocated for each minor producing province.

For very minor provinces, one (1) sample aquafarm is selected from each of the three (3) top producing municipalities. There are three (3) sample aquafarms from each very minor province.

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 quarter
$\%\Delta$ - 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 OPERATION PROCEDURES

4.1   SAMPLING

Initially, the sample aquafarms are determined at the POC, based on the sampling methodology presented in Section 2.0.

The Central Office, in consultation with the PASO, determines the sampling category of the province. On the other hand, the PASO and field staff identify the five/three top producing municipalities and also select the required number of sample aquafarms. In the selection of sample aquafarms, as much as possible, all the species cultured within the municipality should be represented to ensure completeness.

Sampling is done only once. The sample aquafarms remain, until there is sufficient reason to replace them such as, permanently stopped operation, abandonment of aquafarm, etc. In this case, sample aquafarm may be replaced from within the same municipality. Any changes in samples shall be coordinated with the Central Office.

4.2   DATA COLLECTION

For this activity, the owner, operator, technician and/or caretaker of all sample aquafarms in the province shall be interviewed using the appropriate survey form.   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 in 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 Surveys – *FISHPOND*
QAqS FORM 2.   Quarterly Aquaculture Surveys – *PEN AND CAGE*
QAqS FORM 3. Quarterly Aquaculture Surveys– *OYSTER, MUSSEL AND SEAWEED*
QAqS FORM 4. Quarterly Aquaculture Surveys – *HATCHERY*
QAqS FROM 5. Quarterly Aquaculture Surveys – *OTHER FRESHWATER FARMS*

For the first four (4) quarters of the survey implementation, the sample aquafarm operator shall be asked about their production, area and price both for the current and the previous year. For the succeeding quarters, this quarter (TQ) data of the previous year becomes the same quarter last year (SQLY) data for the succeeding year. With that, the sample aquafarm operator shall be asked about the TQ information for the current year only.

5.0   INSTRUCTIONS ON HOW TO ACCOPLISH 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 SURVEYS – *FISHPOND* (QAqS FORM 1)**
QUARTERLY AQUACULTURE SURVEYS – *PEN AND CAGE* (QAqS FORM 2)
QUARTERLY AQUACULTURE SURVEYS –*OYSTER, MUSSEL & SEAWEED (QAqS* FORM 3)
QUARTERLY AQUACULTURE SURVEYS – *HATCHERY (QAqS* FORM 4)
QUARTERLY AQUACULTURE SURVEYS – *OTHER FRESHWATER FARM* (QAqS FORM 5)

There are five (5) data collection forms designed for each aquafarm type. All sample aquafarms shall be interviewed using the appropriate form. One survey form shall be used for each municipality.

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 total production of the province. This information is not processed at all. However, it will help a lot during data validation. 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 of 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^2, 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 production in whole number, kilogram unit. For hatchery (QAqS FORM 4), entry should be in '000 pcs

Area

Enter area 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

6

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.

$$\text{TOTAL PROD} = \sum_{i=A}^{D} \text{PROD}_i \qquad \text{TOTAL AREA} = \sum_{i=A}^{D} \text{AREA}_i$$

$$\text{WEIGHTED AVE PRICE} = \frac{\sum_{i=A}^{D} (\text{PROD}_i)(\text{PRICE}_i)}{\sum_{i=A}^{D} \text{PROD}_i}$$

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 operation.

II   COMPARISON WITH OPERATORS IN THE MUNICIPALITY

Part II of the questionnaire 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 SURVEYS – 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 up and submitted once only, 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 SURVEYS – PROVINCIAL SUMMARY (QAqS FORM 7)**

Provincial Summary Form summarizes the responses from all the sample municipalities. It computes the provincial level percent change. The computed percent change is applied to provincial validated production and area estimate of the same quarter of the previous year. The result is the estimate of production and area of the reference quarter of the current year.

- *Enter the **Region** and **Province***
- *Cross out the box corresponding to the **Aquafarm type** and **Environment***
- *On **Cols 2 – 6**, enter the total production, total area and weighted average price, TQ, by municipality*
- ***Col 7** contains the sum of production, sum of area and average price of all the sample municipalities, TQ*
- *On **Cols 8 – 12**, enter the total production, total area and weighted average price, SQLY, by municipality*
- ***Col 13** contains the sum of production, sum of area and average price of all the sample municipalities, SQLY*
- *Col 14 contains the provincial level **percent change** of production and area from SQLY to TQ.*
- *Col 15 contains the **validated production and area estimate SQLY**.*
- *Col 16 contains the **estimate of production and area TQ**. The formula for computation is provided in 3.0 Estimation Procedure*
- *Write in Col 17 the **reasons for change** in the provincial level.*

Provincial Summary Form is generated and readily available in the Aqua DataGen System.

5.5   **QUARTERLY AQUACULTURE SURVEYS – VALIDATION FORM (QAqS FORM 8)**

The Validation Form contains the validated estimate SQLY, estimate TQ, POC validated estimate, adjusted percent change, price, value of production and yield. This gives the POC a hand to validate the computed estimate based on their sound judgment and keen observation, and incorporate other indicators not captured by the estimate.

- *Enter the **Region** and **Province***
- *Col 2 contains the **last quarter estimate** while in Col 3 the **validated estimate SQLY***
- *Col 6 contains the **estimate of production TQ**. It is actually Col 16 of Provincial Summary.*
- *Enter the **POC validated estimate** in Col 7. If the estimate in Col 6 is acceptable, copy it to Col 7. However, if the estimate is not acceptable for some valid reasons, enter the estimate which you are more confident with. It may be helpful to look at the percent share of municipality (Item B – QAqS Forms 1-5) and comparison of operation within the municipality (Block II – QAqS Forms 1-5). Changes in the level of production in municipality with higher percent share tend to have more influence on the provincial estimate. Within the municipality, if more aquafarm operations are higher than the sample, the municipal estimate is rather conservative thus, may be a basis for adjustment. Other indicators lie on the familiarity of the POC of their locality.*
- *Col 5 contains the **adjusted percent change**. It is the percent change from SQLY and POC validated estimate.*
- *For production validation sheet, Col 8 contains the **price** and Col 9 the derived **value of production**, i.e., Col 7 * Col 8.*
- *For area validation sheet, Col 8 contains the POC validated production estimate and Col 9 the derived **yield**, i.e., Col 8 / Col 7.*
- *Write in Col 10 the **reasons for change** at the provincial level.*

5.6 QUARTERLY AQUACULTURE SURVEYS – 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 QAS

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.

6.2 LIST OF SAMPLES (QAqS FORM 6)

A file (QASSample*ppppp.XLS)* is contained in the provincial disk. All identified top producing municipalities with respective sample aquafarms shall be encoded in the said file by aquafarm type, as discussed in Section 5.3.

6.3 NARRATIVE REPORT (QAqS FORM 9)

An electronic copy of sample format for narrative report is also included in the provincial disk. The narrative report may also be encoded in the file (QASNarrativeReport*ppppp*.DOC).

7.0 SUBMISSION

After each quarter, after the Regional Data Review (RDR), the following shall be submitted:

Updated/Processed soft copy	Print-out/Hard copy
• DGAppppp.XLS • QASSample*ppppp*.XLS (to be submitted only when sample was first selected • QASNarrativeReport*ppppp*.DOC	• QAqS Forms 1 - 5 • QAqS Form 6 • QAqS Form 7 • QAqS Form 8 – Validation for Production and Area • QAqS Form 9 – Narrative Report