



REPUBLIC OF THE PHILIPPINES
PHILIPPINE STATISTICS AUTHORITY



Fisheries Situation Report for Major Species

January to March 2024^P





REPUBLIC OF THE PHILIPPINES

**HIS EXCELLENCY
PRESIDENT FERDINAND ROMUALDEZ MARCOS, JR.**



PHILIPPINE STATISTICS AUTHORITY

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FOREWORD

The **Fisheries Situation Report for Major Species, January to March 2024** is a quarterly statistical report on fisheries. It contains data on volume and value of fish production, and farmgate prices by major species.

This publication is a compilation of survey results for the four fisheries subsectors, namely, commercial, municipal and inland fisheries, and aquaculture. The volume and value of production of different fish species are generated through the conduct of Quarterly Commercial Fisheries Survey, Quarterly Municipal Fisheries Survey, Quarterly Inland Fisheries Survey, and Quarterly Aquaculture Survey. Administrative-based data sourced from the Philippine Fisheries Development Authority, Local Government Units, and private landing centers are also part of the compilation.

As in other publications released by the Philippine Statistics Authority, we invite our readers and data users to give comments and suggestions for further improvement of this report.



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Quezon City, Philippines
June 2024

TABLE OF CONTENTS

FOREWORD.....	1
LIST OF TABLES.....	3
HIGHLIGHTS	4
Production of Major Species	6
1. Milkfish (Bangus).....	6
2. Tilapia.....	6
3. Tiger prawn (Sugpo).....	7
4. Skipjack (Gulyasan).....	8
5. Roundscad (Galunggong)	8
6. Seaweed	9
7. Yellowfin tuna (Tambakol/Bariles)	10
8. Mudcrab (Alimango)	10
9. Frigate tuna (Tulingan)	11
10. Big-eyed scad (Matangbaka).....	12
11. Bali sardinella (Tamban).....	12
12. Squid (Pusit).....	13
13. Blue crab (Alimasag)	14
14. Bigeye tuna (Tambakol/Bariles)	14
15. Grouper (Lapu-lapu).....	15
16. Indian mackerel (Alumahan).....	16
17. Threadfin bream (Bisugo).....	16
18. Slipmouth (Sapsap)	17
19. Cavalla (Talakitok).....	18
20. Fimbriated sardines (Tunsoy).....	18
21. P. Vannamei.....	19
TECHNICAL NOTES.....	20

LIST OF TABLES

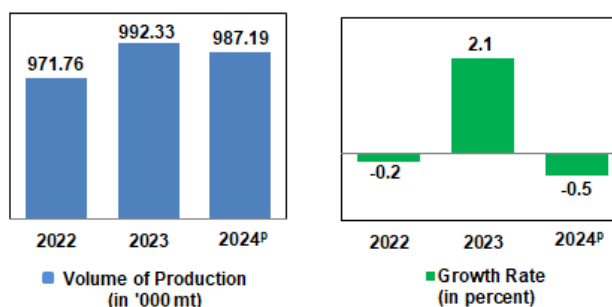
Table No.		Page
1	Volume of Fisheries Production by Subsector Philippines, January to March 2022 – 2024 ^P	51
2	Volume of Fisheries Production by Species Philippines, January to March 2022 – 2024 ^P	52
3	Value of Fisheries Production at Current Prices by Species Philippines, January to March 2022 – 2024 ^P	53
4	Average Farmgate Price by Species: Philippines January to March 2022 – 2024 ^P	54
5	Volume of Fisheries Production with Measures of Precision by Subsector, Philippines January to March 2022 – 2024 ^P	55

HIGHLIGHTS

Volume of Production by Subsector and Species January to March 2024

The total volume of fisheries production in the first quarter of 2024 was registered at 987.19 thousand metric tons. It declined by 0.5 percent from the 992.33 thousand metric tons output in the same quarter of the previous year. The decrease in production was noted in marine municipal fisheries, while commercial, inland municipal fisheries, and aquaculture reported increments in production during the period. (Figure 1 and Table 1)

Figure 1. Volume and Annual Growth Rate of Fisheries Production, Philippines: January to March 2022 to 2024^P

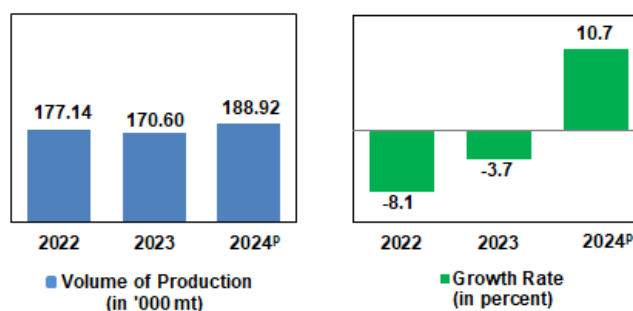


p - preliminary
mt - metric ton

Sources: Philippine Statistics Authority, Quarterly Commercial Fisheries Survey (QCFS), Quarterly Municipal Fisheries Survey (QMFS), Quarterly Inland Fisheries Survey (QIFS), and Quarterly Aquaculture Survey (QAqS)

The commercial fisheries production at 188.92 thousand metric tons posted 10.7 percent increment from the previous year's same quarter output of 170.60 thousand metric tons. The subsector comprised 19.1 percent of the total fisheries production. (Figure 2 and Table 1)

Figure 2. Volume and Annual Growth Rate of Commercial Fisheries Production, Philippines: January to March 2022 to 2024^P

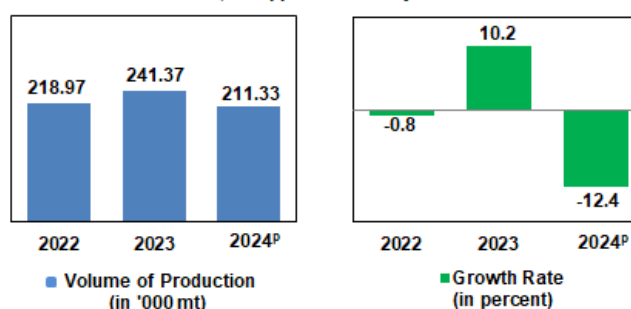


p - preliminary
mt - metric ton

Source: Philippine Statistics Authority, QCFS

On marine municipal fisheries, the total volume of production was estimated at 211.33 thousand metric tons in the first quarter of 2024. This was 12.4 percent lower than the previous year's same quarter level of 241.37 thousand metric tons. The subsector's share to the total fisheries production in the first quarter of 2024 was 21.4 percent. (Figure 3 and Table 1)

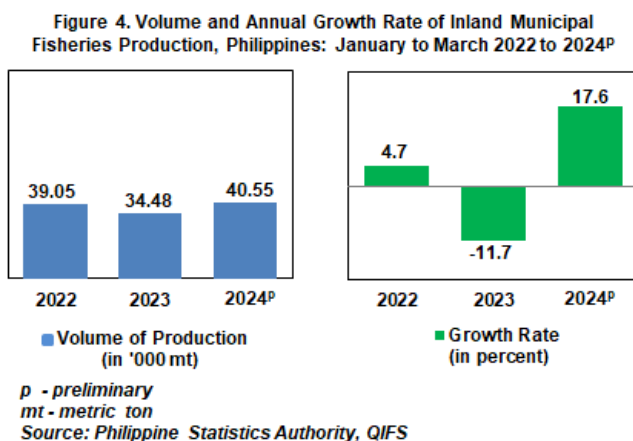
Figure 3. Volume and Annual Growth Rate of Marine Municipal Fisheries Production, Philippines: January to March 2022 to 2024^P



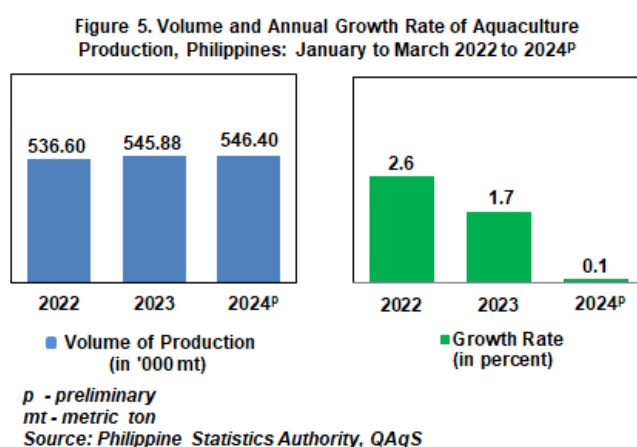
p - preliminary
mt - metric ton

Source: Philippine Statistics Authority, QMFS

During the quarter, inland municipal fisheries production was recorded at 40.55 thousand metric tons. It increased by 17.6 percent from the previous year's same quarter estimate of 34.48 thousand metric tons. The subsector contributed 4.1 percent to the total fisheries production in the first quarter of 2024. (Figure 4 and Table 1)



Aquaculture production was registered at 546.40 thousand metric tons in the first quarter of 2024. This was 0.1 percent higher than the 545.88 thousand metric tons output in the same period of 2023. The aquaculture subsector constituted the highest share of 55.3 percent to the total fisheries production during the quarter. (Figure 5 and Table 1)



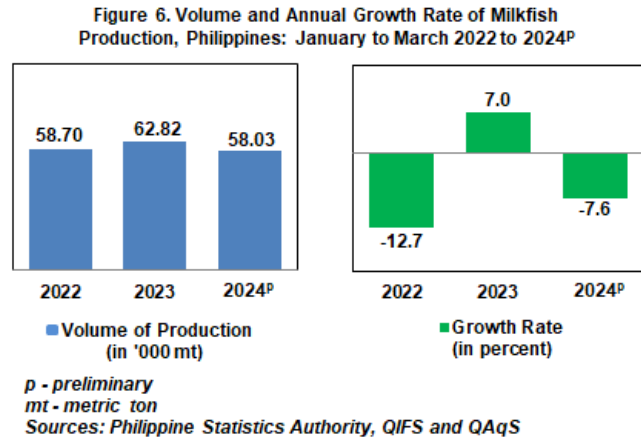
Of the 20 major species, output reductions were primarily noted in bali sardinella (tamban, -29.9%), milkfish (bangus, -7.6%), threadfin bream (bisugo, -37.2%), blue crab (alimasag, -29.5%), and seaweed (-0.4%). (Table 2)

On the other hand, increments were mainly reported in skipjack (gulyasan, 28.3%), tilapia (8.8%), frigate tuna (tulingan, 29.6%), fimbriated sardines (tunsoy, 45.1%), and yellowfin tuna (tambakol/bariles, 13.3%). (Table 2)

Production of Major Species

1. Milkfish (Bangus)

a. From January to March 2024, milkfish production reached 58.03 thousand metric tons. This represents a decline of 7.6 percent from the 62.82 thousand metric tons level in the same period of 2023. (Figure 6 and Table 2)



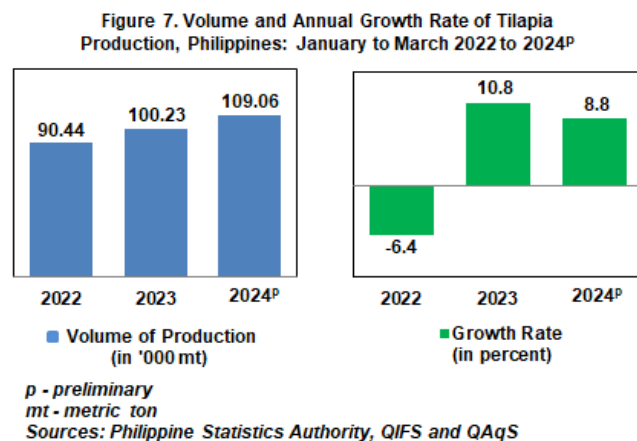
b. Of the total fisheries output, milkfish production comprised 5.9 percent during the quarter. (Table 2)

c. The first quarter of 2024 gross value of milkfish production amounted to PhP 7.59 billion at current prices. This indicates an 11.6 percent decline from the same quarter of the previous year's value of PhP 8.58 billion. (Table 3)

d. On the average, the farmgate price per kilogram of milkfish was quoted at PhP 130.78, which shows a 4.3 percent drop from the 2023 same quarter average farmgate price of PhP 136.63 per kilogram. (Table 4)

2. Tilapia

a. The total volume of tilapia production for January to March 2024 was recorded at 109.06 thousand metric tons. This indicates an increase of 8.8 percent from the previous year's same period output of 100.23 thousand metric tons. (Figure 7 and Table 2)

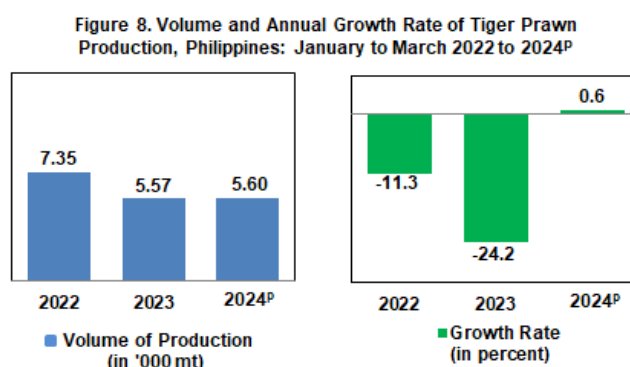


b. During the quarter, tilapia harvests shared 11.0 percent to the total fisheries production. (Table 2)

- c. The value of tilapia production during the quarter was reported at PhP 10.39 billion at current prices. It grew by 8.3 percent from its value of PhP 9.60 billion in the same period of 2023. (Table 3)
- d. The national average farmgate price per kilogram of tilapia was PhP 95.28. It went down by 0.5 percent from the same period of the previous year's average farmgate price per kilogram of PhP 95.75. (Table 4)

3. Tiger prawn (Sugpo)

- a. A total of 5.60 thousand metric tons of tiger prawn were produced this quarter of 2024. This indicates a 0.6 percent increase from the same quarter of the previous year's production of 5.57 thousand metric tons. (Figure 8 and Table 2)

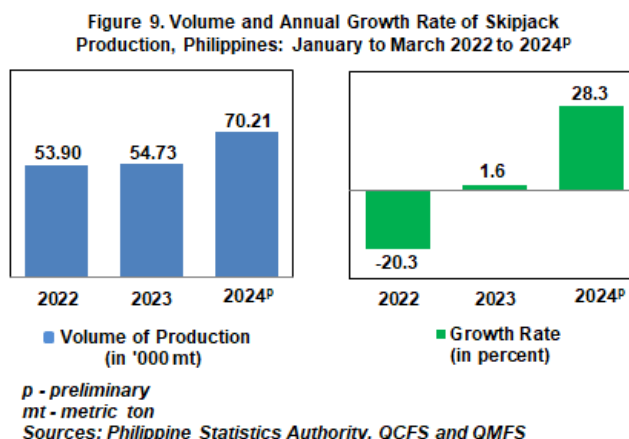


p - preliminary
mt - metric ton
 Sources: Philippine Statistics Authority, QIFS and QAqS

- b. Tiger prawn caught this quarter contributed 0.6 percent to the total fisheries production. (Table 2)
- c. The gross value of production for tiger prawn amounted to PhP 3.59 billion at current prices in the first quarter of 2024. It went down by 7.5 percent from the PhP 3.88 billion value in the same quarter of 2023. (Table 3)
- d. The average farmgate price of tiger prawn at the national level in the first quarter of 2024 was quoted at PhP 640.50 per kilogram. This indicates a decrease of 8.0 percent from the same period of the previous year's average farmgate price of PhP 696.21 per kilogram. (Table 4)

4. Skipjack (Gulyasan)

a. Skipjack production was estimated at 70.21 thousand metric tons in the first quarter of 2024. This reflects an increase of 28.3 percent from the 2023 same period output of 54.73 thousand metric tons. (Figure 9 and Table 2)



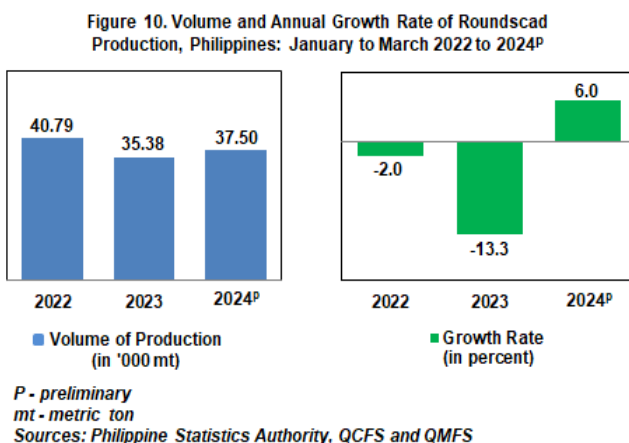
b. Skipjack output accounted for 7.1 percent of the total fisheries production during the quarter. (Table 2)

c. At current prices, the gross value of skipjack production was registered at PhP 6.35 billion during the period. It decreased by 0.5 percent from its value of PhP 6.38 billion in the same quarter of the previous year. (Table 3)

d. During the quarter, the average farmgate price of skipjack was recorded at PhP 90.39 per kilogram. It posted a decrement of 22.5 percent from the same quarter of the previous year's average farmgate price quotation of PhP 116.57 per kilogram. (Table 4)

5. Roundscad (Galunggong)

a. Roundscad production reached 37.50 thousand metric tons. It increased by 6.0 percent from the 2023 same period production of 35.38 thousand metric tons. (Figure 10 and Table 2)



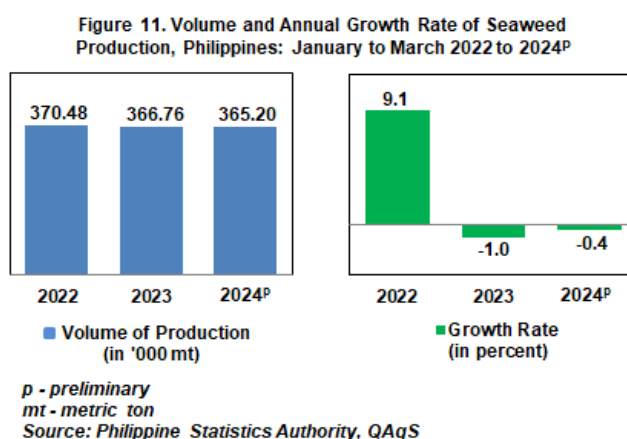
b. Roundscad production shared 3.8 percent to the total volume of fisheries production. (Table 2)

c. During the quarter, the gross value of roundscad production was posted at PhP 3.93 billion at current prices. It exhibited a decrease of 2.1 percent from the same quarter of the previous year's value of PhP 4.02 billion. (Table 3)

- d. The average farmgate price of roundscad was quoted at PhP 104.85 per kilogram in the first quarter of 2024. This represents a decrease of 7.6 percent from its average farmgate price of PhP 113.49 per kilogram in the same period of 2023. (Table 4)

6. Seaweed

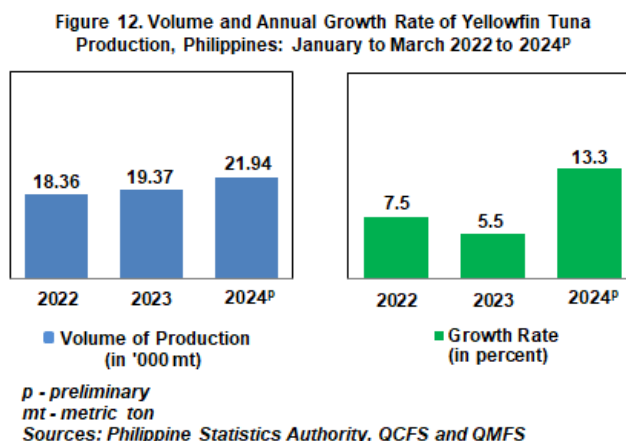
- a. The total volume of seaweed during the quarter was registered at 365.20 thousand metric tons, which was 0.4 percent lower from its output of 366.76 thousand metric tons in the same period of 2023. (Figure 11 and Table 2)



- b. Around 37.0 percent of the total fisheries production was contributed by the seaweed output during the quarter. (Table 2)
- c. At current prices, the gross value of seaweed production amounted to PhP 2.41 billion. It decreased by 34.9 percent from its previous year's same quarter record of PhP 3.70 billion. (Table 3)
- d. At the national level, the average farmgate price of seaweed in the first quarter of 2024 was quoted at PhP 6.59 per kilogram. It posted a 34.7 percent decrement from PhP 10.09 per kilogram average farmgate price in the same quarter of 2023. (Table 4)

7. Yellowfin tuna (Tambakol/Bariles)

a. The estimated production of yellowfin tuna in the first quarter of 2024 was 21.94 thousand metric tons, representing a 13.3 percent growth from the same quarter of the previous year's output of 19.37 thousand metric tons. (Figure 12 and Table 2)



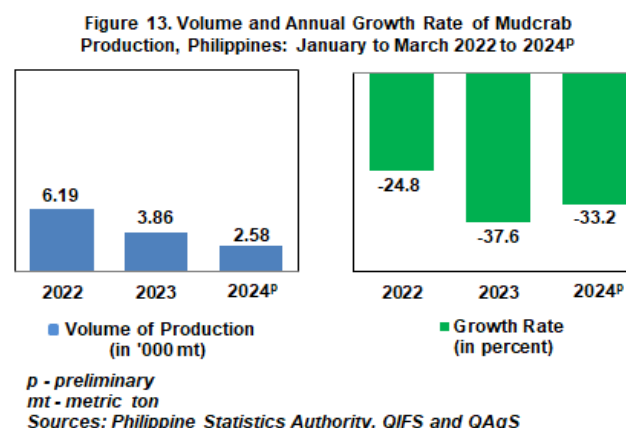
b. During the quarter, yellowfin tuna accounted for 2.2 percent of the total fisheries production. (Table 2)

c. The gross value of yellowfin tuna production during the quarter was recorded at PhP 3.35 billion at current prices. It decreased by 7.5 percent from the PhP 3.62 billion earnings recorded in the same quarter of 2023. (Table 3)

d. At the national level, the average farmgate price of yellowfin tuna during the quarter was PhP 152.80 per kilogram. This indicates an 18.4 percent decrease from the previous year's same quarter average farmgate price of PhP 187.13 per kilogram. (Table 4)

8. Mudcrab (Alimango)

a. In the first quarter of 2024, the mudcrab production was estimated at 2.58 thousand metric tons. This was a 33.2 percent decrease from the 3.86 thousand metric tons production in the same quarter of 2023. (Figure 13 and Table 2)

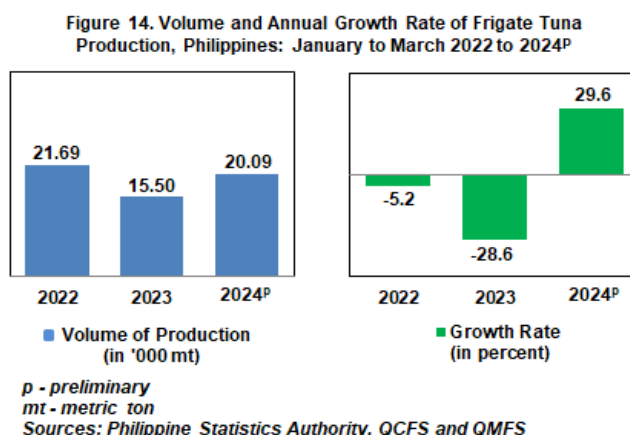


b. Mudcrab caught this quarter contributed 0.3 percent to the total annual fisheries production. (Table 2)

- c. The gross value of production for mudcrab in the first quarter of 2024 amounted to PhP 1.35 billion at current prices. It went down by 33.8 percent from PhP 2.04 billion value in the same quarter of 2023. (Table 3)
- d. The average farmgate price of mudcrab at the national level during this quarter was recorded at PhP 523.26 per kilogram. This indicates a 0.9 percent decrease from the same quarter of the previous year's average farmgate price of PhP 528.18 per kilogram. (Table 4)

9. Frigate tuna (Tulingan)

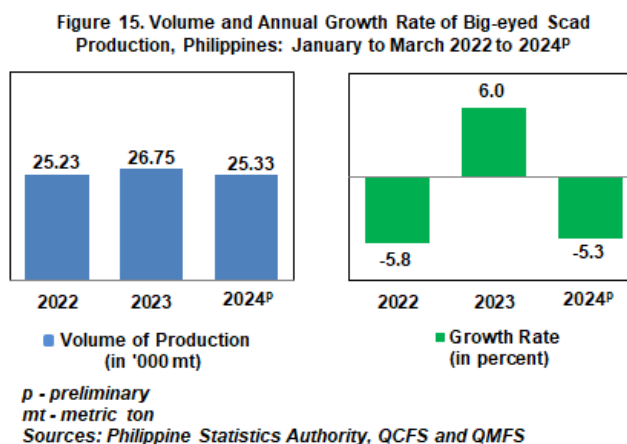
- a. Frigate tuna production was recorded at 20.09 thousand metric tons, which was 29.6 percent higher than the previous year's same quarter production of 15.50 thousand metric tons. (Figure 14 and Table 2)



- b. In the first quarter of 2024, the production of frigate tuna contributed 2.0 percent to the total fisheries output. (Table 2)
- c. At current prices, the total earnings from the production of frigate tuna during the quarter was PhP 2.65 billion. This represents an increase of 26.0 percent from the previous year's same quarter earnings of PhP 2.10 billion. (Table 3)
- d. This quarter's average farmgate price of frigate tuna at the national level was quoted at PhP 131.90 per kilogram. This reflects an increment of 2.8 percent from the average farmgate price of PhP 135.66 per kilogram in the same quarter of 2023. (Table 4)

10. Big-eyed scad (Matangbaka)

a. The total big-eyed scad production was estimated at 25.33 thousand metric tons during the quarter. This indicates a decrease of 5.3 percent from the previous year's same quarter level of 26.75 thousand metric tons. (Figure 15 and Table 2)



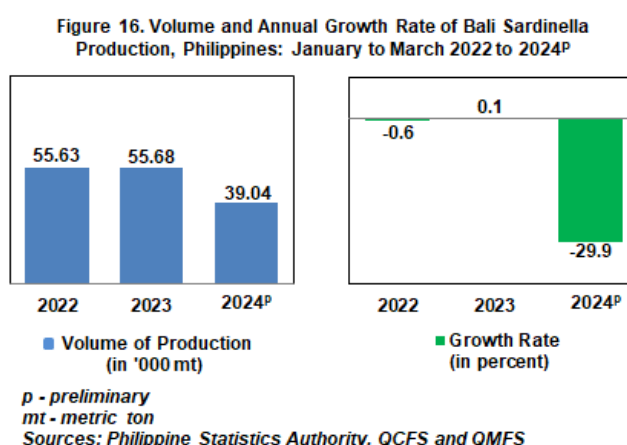
b. Of the total fisheries production, big-eyed scad contributed 2.6 percent during the quarter. (Table 2)

c. The total gross value of big-eyed scad production in the first quarter of 2024 at current prices amounted to PhP 3.04 billion, indicating an decrement of 8.9 percent from the same quarter of 2023 value of PhP 3.33 billion. (Table 3)

d. The average farmgate price of big-eyed scad this quarter reached PhP 119.81 per kilogram. It posted a decrease of 3.8 percent from its quotation of PhP 124.55 per kilogram in the same period of 2023. (Table 4)

11. Bali sardinella (Tamban)

a. A total of 39.04 thousand metric tons of bali sardinella was recorded during the first quarter of 2024. This reflects a decrease of 29.9 percent from the same period of the previous year's production of 55.68 thousand metric tons. (Figure 16 and Table 2)

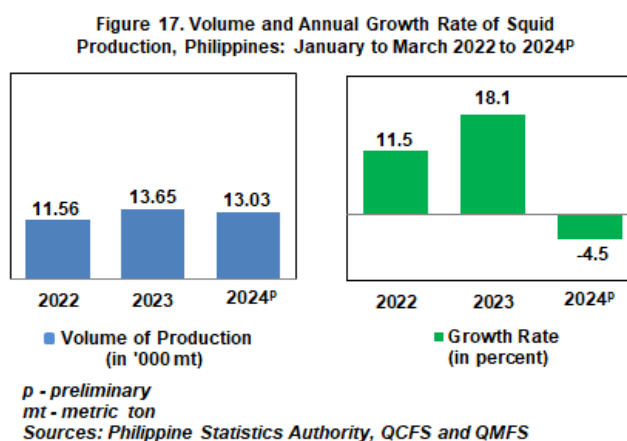


b. The volume of bali sardinella production accounted for 4.0 percent of the overall fisheries production during the period. (Table 2)

- c. The total value of bali sardinella production in January to March 2024 amounted to PhP 1.80 billion at current prices. It went down by 26.5 percent from the gross value in 2023 same quarter at PhP 2.45 billion. (Table 3)
- d. At the national level, the average farmgate price of bali sardinella was registered at PhP 46.07 per kilogram during the period. This was 4.9 percent higher than the same quarter of the previous year's record of PhP 43.93 per kilogram. (Table 4)

12. Squid (Pusit)

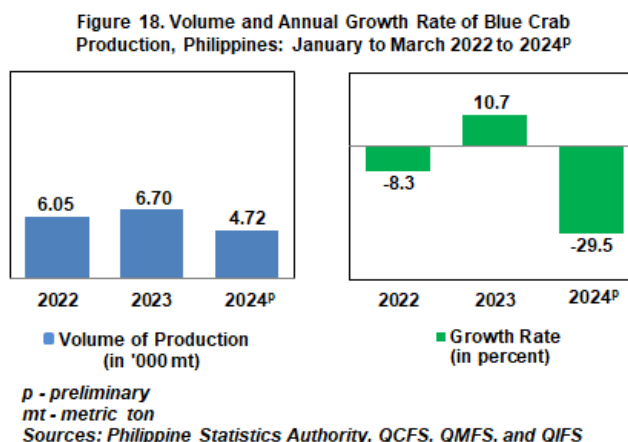
- a. During the quarter, squid production estimated by 13.03 thousand metric tons. It went down by 4.5 percent from the previous year's same quarter production of 13.65 thousand metric tons. (Figure 17 and Table 2)



- b. Squid production in the first quarter of 2024 contributed 1.3 percent to the total fisheries production. (Table 2)
- c. The gross value of squid this quarter was worth PhP 2.05 billion at current prices. It decreased by 13.9 percent from the gross value of 2.39 billion in the same quarter of 2023. (Table 3)
- d. At the national level, the average farmgate price of squid was quoted at PhP 157.64 per kilogram, which indicates a decrease of 9.9 percent from the average farmgate price of PhP 174.91 per kilogram in same quarter of the previous year. (Table 4)

13. Blue crab (Alimasag)

a. During the quarter, the total blue crab production reached 4.72 thousand metric tons. This was 29.5 percent lower than the 6.70 thousand metric tons output in the same quarter of the previous year. (Figure 18 and Table 2)



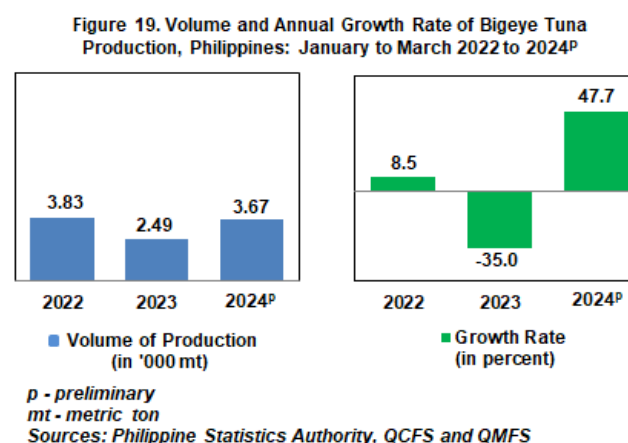
b. Around 0.5 percent of the total fisheries production was shared by blue crab during the quarter. (Table 2)

c. The gross value of blue crab production at current prices amounted to PhP 0.82 billion in the first quarter of 2024, reflecting a downturn of 32.3 percent from the reported value of PhP 1.21 billion in the same period of 2023. (Table 3)

d. The first quarter of 2024 average farmgate price of blue crab at the national level was recorded at PhP 173.31 per kilogram. This was 3.9 percent lower than the same quarter's average farmgate price of PhP 180.28 per kilogram in the previous year. (Table 4)

14. Bigeye tuna (Tambakol/Bariles)

a. In the first quarter of 2024, the total bigeye tuna production was estimated at 3.67 thousand metric tons. It exhibited an uptrend of 47.7 percent from the previous year's same quarter production of 2.49 thousand metric tons. (Figure 19 and Table 2)

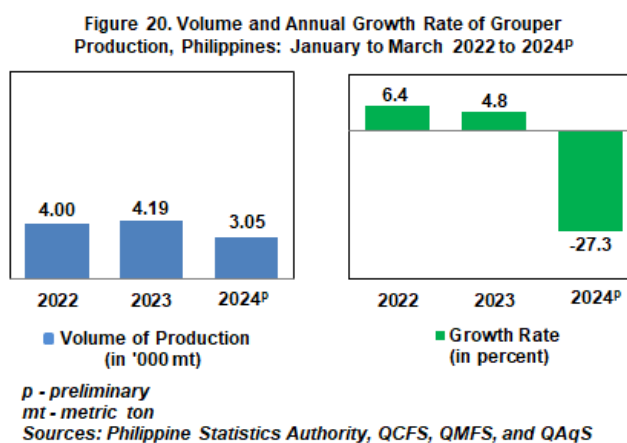


b. The production of bigeye tuna constituted 0.4 percent of the total fisheries production during the quarter. (Table 2)

- c. The gross value of bigeye tuna production during the quarter amounted to PhP 682.21 million at current prices. It increased by 74.0 percent from PhP 392.12 million value in the same period of 2023. (Table 3)
- d. During the quarter, the average farmgate price of bigeye tuna was posted at PhP 185.78 per kilogram. It shows an increment of 17.8 percent from its same quarter quotation of PhP 157.70 per kilogram in 2023. (Table 4)

15. Grouper (Lapu-lapu)

- a. From January to March 2024, the volume of grouper production was estimated at 3.05 thousand metric tons. It indicates a reduction of 27.3 percent from the same quarter of the previous year's output of 4.19 thousand metric tons. (Figure 20 and Table 2)



- b. Of the total fisheries output, grouper production constituted 0.3 percent during the quarter. (Table 2)
- c. At current prices, grouper's value of production at the national level amounted to PhP 734.17 million in the first quarter of 2024. This reflects a decrease of 11.5 percent from the same quarter value worth PhP 829.19 million in 2023. (Table 3)
- d. The annual average farmgate price of grouper was quoted at PhP 240.86 per kilogram this year. It increased by 21.8 percent from the previous year's price quotation of PhP 197.82 per kilogram. (Table 4)

16. Indian mackerel (Alumahan)

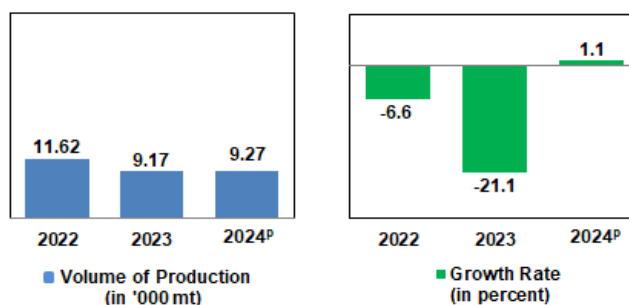
a. Indian mackerel production reached 9.27 thousand metric tons in the first quarter of 2024. This indicates an uptrend of 1.1 percent from the 2023 same quarter level of 9.17 thousand metric tons. (Figure 21 and Table 2)

b. Indian mackerel production contributed 0.9 percent to the total fisheries production during the quarter. (Table 2)

c. From January to March 2024, indian mackerel's total value of production at current prices was recorded at PhP 1.13 billion, registering a decrease of 12.9 percent from the previous year's same quarter level of PhP 1.30 billion. (Table 3)

d. During the period, the average farmgate price of indian mackerel at the national level was noted at PhP 121.77 per kilogram. It went down by 13.8 percent from the 2023 same quarter average farmgate price of PhP 141.33 per kilogram. (Table 4)

Figure 21. Volume and Annual Growth Rate of Indian Mackerel Production, Philippines: January to March 2022 to 2024^P



p - preliminary

mt - metric ton

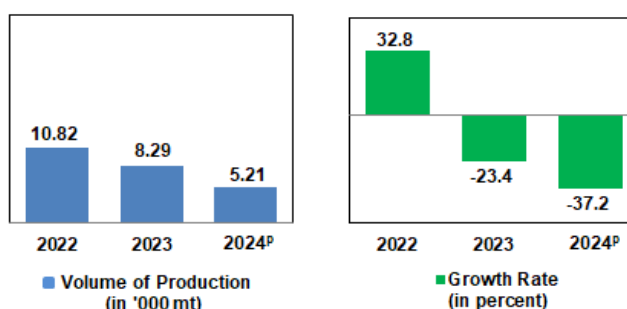
Sources: Philippine Statistics Authority, QCFS and QMFS

17. Threadfin bream (Bisugo)

a. The total volume of threadfin bream production during the first quarter of 2024 was estimated at 5.21 thousand metric tons. It registered a decrease of 37.2 percent from the previous year's same quarter output of 8.29 thousand metric tons. (Figure 22 and Table 2)

b. During the quarter, threadfin bream production shared 0.5 percent to the total fisheries output. (Table 2)

Figure 22. Volume and Annual Growth Rate of Threadfin Bream Production, Philippines: January to March 2022 to 2024^P



p - preliminary

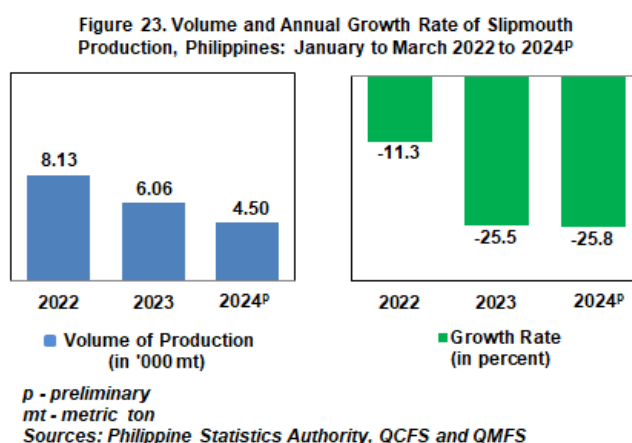
mt - metric ton

Source: Philippine Statistics Authority, QCFS and QMFS

- c. The gross value of threadfin bream at current prices amounted to PhP 0.85 billion during the quarter. This indicates a decline of 45.8 percent from its value of PhP 1.57 billion in the same period of 2023. (Table 3)
- d. The average farmgate price of threadfin bream during the quarter was quoted at PhP 163.40 per kilogram. It decreased by 13.7 percent from the same period of the previous year's price level of PhP 189.42 per kilogram. (Table 4)

18. Slipmouth (Sapsap)

- a. Slipmouth production in the first quarter of 2024 was recorded at 4.50 thousand metric tons. It posted a decrease of 25.8 percent from the same quarter of 2023 level of 6.06 thousand metric tons. (Figure 23 and Table 2)



- b. Of the total fisheries output, slipmouth production shared 0.5 percent during the quarter. (Table 2)
- c. At current prices, the gross value of slipmouth production amounted to PhP 411.70 million in the first quarter of 2024. This was 28.3 percent lower than the previous year's same quarter value of PhP 574.33 million. (Table 3)
- d. The average farmgate price of slipmouth in the first quarter of 2024 was quoted at PhP 91.52 per kilogram. It went down by 3.5 percent from the same quarter of 2023 average farmgate price of PhP 94.80 per kilogram. (Table 4)

19. Cavalla (Talakitok)

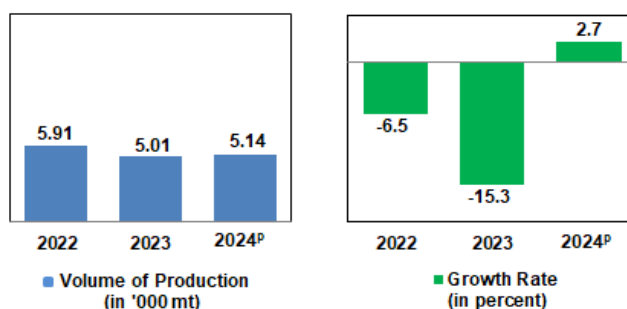
a. During the quarter, a total of 5.14 thousand metric tons of cavalla were produced. This indicates an increase of 2.7 percent from the same quarter of the previous year's output of 5.01 thousand metric tons. (Figure 24 and Table 2)

b. Cavalla output contributed 0.5 percent to the overall volume of fisheries production in the first quarter of 2024. (Table 2)

c. The gross value of cavalla production reached PhP 766.51 million at current prices. This represents a decline of 9.2 percent from its value of PhP 844.23 million in the same period of the previous year. (Table 3)

d. At the national level, cavalla was sold at an average farmgate price of PhP 149.09 per kilogram. It decreased by 11.6 percent from the first quarter of 2023 average farmgate price of PhP 168.63 per kilogram. (Table 4)

Figure 24. Volume and Annual Growth Rate of Cavalla Production, Philippines: January to March 2022 to 2024^P



p - preliminary

mt - metric ton

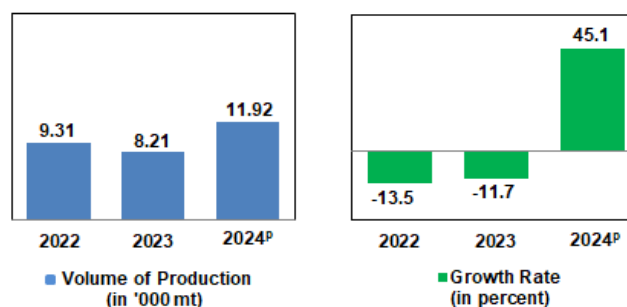
Sources: Philippine Statistics Authority, QCFS and QMFS

20. Fimbriated sardines (Tunsoy)

a. During the first quarter of 2024, fimbriated sardines output was recorded at 11.92 thousand metric tons, which represents an increase of 45.1 percent from its 8.21 thousand metric tons output in the same quarter of 2023. (Figure 25 and Table 2)

b. The production of fimbriated sardines shared 1.2 percent to the total fisheries output during the quarter. (Table 2)

Figure 25. Volume and Annual Growth Rate of Fimbriated Sardines Production, Philippines: January to March 2022 to 2024^P



p - preliminary

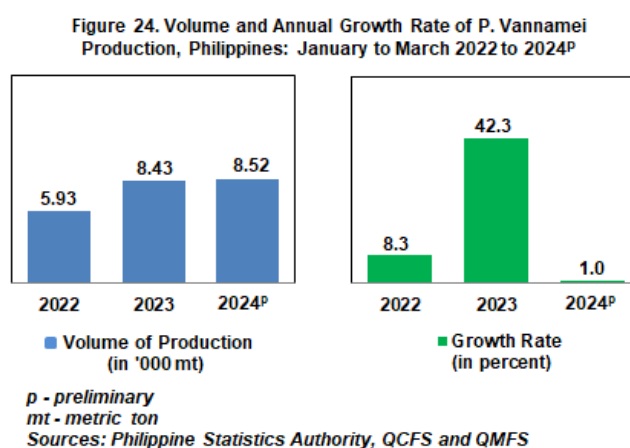
mt - metric ton

Sources: Philippine Statistics Authority, QCFS and QMFS

- c. At current prices, the production of fimbriated sardines generated a gross value of PhP 580.94 million. It went up by 2.8 percent from its value of PhP 565.30 million in 2023 same period. (Table 3)
- d. The average farmgate price of fimbriated sardines was quoted at PhP 48.73 per kilogram. This registered a decrease of 29.2 percent from the previous year's same quarter average farmgate price of PhP 68.82 per kilogram. (Table 4)

21. P. Vannamei

- a. In the first quarter of 2024, the P. Vannamei production was estimated at 8.52 thousand metric tons. This represents a 1.0 percent increase from its 8.43 thousand metric tons production in the same quarter of 2023. (Figure 26 and Table 2)



- b. P. Vannamei caught this quarter contributed 0.9 percent to the total fisheries production. (Table 2)
- c. The gross value of P. Vannamei production at current prices was amounted to PhP 2.64 billion in the first quarter of 2024. It went up by 4.1 percent from the PhP 2.54 billion value in the same quarter of 2023. (Table 3)
- e. At the national level, the average farmgate price of P. Vannamei during this quarter was quoted at PhP 310.32 per kilogram. It indicates an increase of 3.0 percent from the same quarter average farmgate price of PhP 301.29 per kilogram in 2023. (Table 4)

TECHNICAL NOTES

I. Introduction

This Fisheries Situation Report is released every quarter, which presents the data on the volume and value of production of fisheries during the reference quarter. It contains information on the current situation by major species of the four fisheries subsectors, namely, commercial, municipal and inland fisheries, and aquaculture. The data are the results of the four fisheries surveys regularly conducted by the Philippine Statistics Authority (PSA). These surveys are the following:

- a. Quarterly Commercial Fisheries Survey (QCFS);
- b. Quarterly Municipal Fisheries Survey (QMFS);
- c. Quarterly Inland Fisheries Survey (QIFS); and
- d. Quarterly Aquaculture Survey (QAqS).

The volume of production also includes compilation from administrative records of Philippine Fisheries Development Authority (PFDA), Local Government Units (LGUs), and privately-managed landing centers.

Geographic classification is based on the latest Philippine Standard Geographic Code (PSGC). The 21 major species highlighted in this report were identified based on their value of production at constant 2018 prices.

II. Data Collection

A. Surveys

1. QCFS

- a. Data collection procedure

The QCFS gathers data on volume of unloading of sample boats in the sample traditional landing centers of the subsector in 58 provinces. The hired Statistical Researchers (SRs) conduct the interview of sample boats in the landing center during the data collection days. The data collection is done every week during the reference quarter.

- b. Survey Questionnaire

A structured survey form (QCFS Form 1) is used to collect information. The information being gathered are volume of unloading and price per kilogram of the top 31 species and those under the others category. The data items collected include sample identification, boat information,

fishing effort, and fish unloading. Correspondingly, the schedule of data collection and daily information per month are recorded in the QCFS Form 1b.

2. QMFS

a. Data collection procedure

The QMFS gathers data on volume of unloading of sample boats in the sample traditional landing centers of the subsector in 67 provinces. The SRs conduct interview of sample boats in the landing center during the data collection days. The data collection is done every week during the reference quarter.

b. Survey Questionnaire

A structured survey form (QMFS Form 1) is used to collect information. The information being gathered are volume of unloading and price per kilogram of the top 31 species and those under the others category. The data items collected include sample identification, boat information, fishing effort, and fish unloading. Correspondingly, the schedule of data collection and daily information per month are recorded in the QMFS Form 1b.

3. QIFS

a. Data collection procedure

The QIFS gathers data on volume of catch of sample inland fishing households. The SRs inquire about the monthly catch of the sample households during the reference quarter in 79 provinces. The data collection is done during second to third week of the last month of the quarter, except on the last quarter of the year where data collection is a month earlier.

b. Survey Questionnaire

QIFS Form 1 is utilized to obtain data from household head or any knowledgeable member of the sample household. The survey form captures the volume of catch and price per kilogram of the 34 inland species.

4. QAqS

a. Data collection procedure

The QAqS provides the volume and value of production for the aquaculture subsector. It covers aquafarm types in various water environment, such as brackishwater fishpond, pen and cage; freshwater fishpond, pen and cage; marine pen and cage; oyster; mussel; seaweed; rice fish; and small farm reservoir (SFR) in 83 provinces. The respondents are the owner, operator and/or caretaker of the sample aquafarms. The data collection is done every second to third week of the last month of the quarter, except on the last quarter of the year where data collection is a month earlier.

b. Survey Questionnaire

Data gathered using the prescribed collection forms include volume of harvests of species cultured and price per kilogram of the aquafarm. The survey covers 17 species. The QAqS utilizes two survey forms, namely, QAqS Form 1 (Fishpond, Pen, Cage, Rice Fish, and Small Farm Reservoir) and QAqS Form 2 (Oyster, Mussel, and Seaweed).

B. Compilation of Administrative-based data from Commercial and Municipal Non-Traditional Landing Centers

1. Data collection procedure

Data collection is done on a monthly basis depending on the availability of data in the landing centers. The Provincial Statistical Office (PSO) staff and/or SR gather data from administrative records of non-traditional landing centers such as those that are managed by the PFDA, LGUs and private entities for commercial subsector, and PFDA and LGUs only for municipal subsector.

2. Collection Forms

The collection forms are QCFS Form 2 and QMFS Form 2. These forms gather volume, price of fish species, and fishing ground.

III. Sampling Design of Fisheries Surveys

A. QCFS

1. Sampling Frame

The updated list of commercial fish landing centers serves as the sampling frame in the selection of sample landing centers. The said list was generated from the Listing of Marine Fish Landing Centers (LMFLC) which was conducted in September 2021. The enumeration unit for the survey is the landing center.

2. Sample Selection Procedure

The selection of sample landing centers for QCFS utilizes probability proportional to size systematic sampling (PPS-Sys) where the average daily unloading (ADU) is the size measure.

First stage : Selection of Landing Centers (PPS)
Second stage: Selection of Boats (Systematic)

For the first stage, the sampling rate is 25.0 percent of the total number of landing centers in the province with a minimum of three sample landing centers. If the total boats in a landing center is greater than eight, eight boats are sampled. Otherwise, all boats in the landing center are sampled. The frequency of data collection is one day per week, separate for day and night unloadings. The sample operators can be boat operator, technician, fisherman, and/or trader.

3. Domain

The domain of the survey is province. In the case of National Capital Region, the region is the domain.

4. Estimation Procedure

a. Weight

Primary Sampling Unit (PSU) Weight

The PSU weight is computed using the following formula:

$$\alpha_{ij} = \frac{X}{aX_i}$$

where:

- α_{ij} - PSU weight of operator j in landing center i
- X - total average daily unloading for the province
- X_i - total average daily unloading for landing center i
- a - number of sample landing centers for the province

Secondary Sampling Unit (SSU) Weight

The SSU weight is computed using the following formula:

$$\beta_{ijmk} = \frac{B_{ijmk}}{b_{ijmk}}$$

where:

- β_{ijmk} - SSU weight of boat j in landing center i for week k of month m
- B_{ijmk} - total number of sample boats in landing center i for week k of month m
- b_{ijmk} - number of sample boats in landing center i for week k of month m

b. Sampling Weight

Base Weight

The base weight is calculated as the product of PSU weights and SSU weights. The formula below illustrates the base weight calculation:

$$w_{ijmk} = \alpha_{ij} * \beta_{ijmk}$$

where:

- w_{ijmk} - base weight of boat j in landing center i for week k of month m
- α_{ij} - PSU weight of boat j in landing center i
- β_{ijmk} - SSU weight of boat j in landing center i for week k of month m

Adjustment Factor 1

To take into account non-sampled fishing days for week k , the adjustment factor is as follows:

$$A_{imk} = F_{imk} * I_{imk}$$

where:

A_{imk} - adjustment factor for non-sampled fishing days in week k of month m for landing center i

F_{imk} - total number of fishing days in landing center i for week k of month m

I_{imk} - actual data collection status in landing center i for week k of month m (1 if with data collection, 0 otherwise)

Adjustment Factor 2

To take into account fishing days for weeks without data collection at month m , the adjustment factor is obtained as follows:

$$A_{im} = \frac{F_{im}}{f_{im}}$$

where:

$$F_{im} = \sum_{k=1}^{n_k} F_{imk} \quad f_{im} = \sum_{k=1}^{n_k} F_{imk} I_{imk}$$

A_{im} - adjustment factor for non-fishing days in month m of landing center i

F_{im} - total number of fishing days for month m of landing center i

f_{im} - total number of represented fishing days for month m of landing center i

F_{imk} - total number of fishing days in landing center i for week k of month m

I_{imk} - actual data collection status in landing center i for week k of month m (1 if with data collection, 0 otherwise)

n_k - number of weeks in month m

Adjustment Factor 3

To take into account the status of landing centers during the survey for each month, the adjustment factor is obtained as follows:

$$A_m = \frac{\sum_{i=1}^{n_l} E_i}{\sum_{i=1}^{n_l} R_i}$$

where:

A_m - adjustment factor for status of landing centers in month m

E_i - eligibility status of landing center i in month m (1 if eligible, 0 otherwise)

R_i – responding status of landing center i in month m (1 if responding, 0 otherwise)

Final Weight

The final weight is then computed by obtaining the product of the base weight and the adjustment factors.

$$w'_{ijmk} = w_{ijmk} * A_{imk} * A_{im} * A_m$$

where:

- w'_{ijmk} - final weight of boat j in landing center i for week k of month m
- w_{ijmk} - base weight of boat j in landing i for week k of month m
- A_{imk} - adjustment factor for non-sampled fishing days for week k of month m in landing center i
- A_{im} - adjustment factor for weeks with fishing days but no data collection in landing center i for month m
- A_m - adjustment factor for landing centers which closed during the survey in month m

c. Estimation of Totals (Based on the Results of the Survey)

The estimate of the provincial total volume of production is computed using the following formula:

$$\hat{Y}_p = \sum_{i=1}^a \sum_{j=1}^{n_i} \sum_{m=1}^3 \sum_{k=1}^{K_m} w'_{ijmk} * y_{ijmk}$$

where:

- \hat{Y}_p - estimate of total volume of production based on the results of the survey for the province
- w'_{ijmk} - final weight of boat j in landing center i for week k of month m
- y_{ijmk} - volume of production of boat j in landing center i for week k of month m
- a - total number of sampled landing centers in the province
- n_i - number of sampled boats in landing center i
- K_m - total number of weeks in month m

d. Total Volume of Production for Commercial Fisheries

To obtain the total volume of production for commercial fisheries, the estimate based on the results of the survey is added to the volume of production from non-traditional landing centers compiled from the administrative records of PFDA, LGUs, and privately-managed landing centers. The formula is as follows:

$$\widehat{Y}'_p = \widehat{Y}_p + X$$

where:

- \widehat{Y}'_p - estimate of total volume of production for commercial fisheries
- \widehat{Y}_p - estimate of total volume of production based on the results of the survey for the province
- X - administrative data on volume of production from non-traditional landing centers for the province

The estimate of the regional total volume of production is computed using the following formula:

$$\widehat{Y}_r = \sum_{p=1}^{n_p} \widehat{Y}'_p$$

where:

- \widehat{Y}_r - estimate of total volume of fish production for the region
- \widehat{Y}'_p - estimate of total volume of fish production for the province
- n_p - total number of provinces in the region

The estimate of the national total volume of production is computed using the following formula:

$$\widehat{Y} = \sum_{r=1}^{n_r} \widehat{Y}_r$$

where:

- \widehat{Y} - estimate of total volume of fish production at the national level
- \widehat{Y}_r - estimate of total volume of fish production for the region
- n_r - total number of regions with commercial landing center

e. Estimation of Variance and Standard Error

Variance

The variance of the provincial total volume of production is computed using the following formula:

$$V(\hat{Y}_p) = \left(1 - \frac{a}{A}\right) a s_1^2 + \frac{a}{A} \sum_{i=1}^a \left(1 - \frac{n_i}{N_i}\right) n_i s_{2i}^2$$

where:

$$s_1^2 = \frac{\sum_{i=1}^a (y_i - \bar{y})^2}{a - 1}$$
$$s_{2i}^2 = \frac{\sum_{j=1}^{n_i} (y_{ij} - \bar{y}_i)^2}{n_i - 1}$$

$V(\hat{Y}_p)$ - variance of the estimated total volume of fish production for the province

s_1^2 - sample variance between PSUs in the province

s_{2i}^2 - sample variance of SSUs within PSUs in the province

a - number of sample landing centers in the province

A - total number of landing centers in the province

n_i - number of sample commercial boats for landing center i

N_i - total number of commercial boats for landing center i

y_i - estimated production for the landing center i

y_{ij} - estimated production for operator j in landing center i

\bar{y} - mean production of the province

\bar{y}_i - mean production for landing center i

The variance of the regional total volume of production is computed using the following formula:

$$V(\hat{Y}_r) = \sum_{p=1}^{n_p} V(\hat{Y}_p)$$

where:

$V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region

$V(\hat{Y}_p)$ - variance of the estimated total volume of fish production for the province

n_p - total number of provinces in the region

The variance of the national total volume of production is computed using the following formula:

$$V(\hat{Y}_n) = \sum_{r=1}^{n_r} V(\hat{Y}_r)$$

where:

$V(\hat{Y}_n)$ - variance of the estimated total volume of fish production at the national level

$V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region

n_r - total number of regions with commercial landing centers

Standard Error

The standard error for the provincial total volume of production is obtained using the following formula:

$$se(\hat{Y}_p) = \sqrt{V(\hat{Y}_p)}$$

where:

$se(\hat{Y}_p)$ - standard error of the estimated total volume of fish production for the province

$V(\hat{Y}_p)$ - variance of the estimated total volume of fish production for the province

The standard error for the regional total volume of production is obtained using the following formula:

$$se(\hat{Y}_r) = \sqrt{V(\hat{Y}_r)}$$

where:

$se(\hat{Y}_r)$ - standard error of the estimated total volume of fish production for the region

$V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region

The standard error for the national total volume of production is obtained using the following formula:

$$se(\hat{Y}_n) = \sqrt{V(\hat{Y}_n)}$$

where:

$se(\hat{Y}_n)$ - standard error of the estimated total volume of fish production at the national level

$V(\hat{Y}_n)$ - variance of the estimated total volume of fish production at the national level

B. QMFS

1. Sampling Frame

The updated list of municipal fish landing centers serves as the sampling frame in the selection of sample landing centers. The said list was generated from the Listing of Marine Fish Landing Centers (LMFLC) which was conducted in September 2021. The enumeration unit for the survey is the landing center.

2. Sample Selection Procedure

The selection of sample landing centers for QMFS uses two-stage stratified sampling design with landing center serving as the PSU and the boats unloaded as the SSU. The average daily unloading (ADU) serves as the stratification variable.

First stage : Selection of Landing Centers per Stratum (Systematic)

Second stage: Selection of Boats (Systematic)

The sampling rate is 10.0 percent of the total number of landing centers in the province but with a minimum of three sample landing centers. For each sample landing center, 10 boats are selected if total boats unloaded are more than 10, but complete enumeration if total boats is 10 or less. The frequency of data collection is one day per week, separate for day and night unloadings. The sample operators can be boat operator, technician, fisherman, and/or trader.

3. Domain

The domain of the survey is province. In the case of National Capital Region, the region is the domain.

4. Estimation Procedure

a. Weights

PSU Weight

The PSU weight is computed using the following formula:

$$\alpha_{hij} = \frac{A_h}{a_h}$$

where:

α_{hij} - PSU weight of boat j in landing center i at stratum h

A_h - total number of landing centers for the province at stratum h

a_h - number of sample landing centers for the province at stratum h

SSU Weight

The SSU weight is computed using the following formula:

$$\beta_{hijmk} = \frac{B_{hijmk}}{b_{hijmk}}$$

where:

β_{hijmk} - SSU weight of boat j in landing center i at stratum h for week k of month m

B_{hijmk} - total number of sample boats in landing center i at stratum h for week k of month m

b_{hijmk} - number of sample boats in landing center i at stratum h for week k of month m

b. Sampling Weight

Base Weight

The base weight is calculated as the product of PSU weights and SSU weights. The formula below illustrates the base weight calculation:

$$w_{hijmk} = \alpha_{hij} * \beta_{hijmk}$$

where:

w_{hijmk} - base weight of boat j in landing center i at stratum h for week k of month m

α_{hij} - PSU weight of boat j in landing center i at stratum h

β_{hijmk} - SSU weight of boat j in landing center i at stratum h for week k of month m

Adjustment Factor 1

To take into account the non-sampled fishing days for week k , the adjustment factor is as follows:

$$A_{himk} = F_{himk} * I_{himk}$$

where:

A_{himk} - adjustment factor for non-sampled fishing days for week k of month m in landing center i at stratum h

F_{himk} - total number of fishing days in landing center i at stratum h for week k of month m

I_{himk} - actual data collection status in landing center at stratum h for week k of month m (1 if with data collection, 0 otherwise)

Adjustment Factor 2

To take into account fishing days for weeks without data collection at month m , the adjustment factor is obtained as follows:

$$A_{him} = \frac{F_{him}}{f_{him}}$$

where:

$$F_{him} = \sum_{k=1}^{n_k} F_{himk} \quad f_{him} = \sum_{k=1}^{n_k} F_{himk} I_{himk}$$

A_{him} - adjustment factor for non-fishing days in month m of landing center i at stratum h

F_{him} - total number of fishing days for month m of landing center i at stratum h

f_{him} - total number of represented fishing days for month m of landing center i at stratum h

F_{himk} - total number of fishing days in landing center i at stratum h for week k of month m

I_{himk} - actual data collection status in landing center i at stratum h for week k of month m (1 if with data collection, 0 otherwise)

n_k - number of weeks in month m

Adjustment Factor 3

To take into account the status of landing centers during the survey for each month, the adjustment factor is obtained as follows:

$$A_m = \frac{\sum_{i=1}^{n_l} E_i}{\sum_{i=1}^{n_l} R_i}$$

where:

- A_m – adjustment factor for status of landing centers in month m
- E_i – eligibility status of landing center i in month m (1 if eligible, 0 otherwise)
- R_i – responding status of landing center i in month m (1 if responding, 0 otherwise)

Final Weight

The final weight is then computed by obtaining the product of the adjusted base weight and the adjustment factors.

$$w'_{ijmk} = w_{ijmk} * A_{imk} * A_{im} * A_m$$

where:

- w'_{hijmk} - final weight of boat j in landing center i at stratum h for week k of month m
- w_{himjk} - base weight of boat j in landing center i at stratum h for week k of month m
- A_{himk} - adjustment factor for non-sampled fishing days for week of landing center i for month m in landing center i at stratum h
- A_{him} - adjustment factor for weeks with fishing days but no data collection in landing center i of month m at stratum h
- A_m - adjustment factor for landing centers which closed during the survey in month m

c. Estimation of Totals (Based on the Results of the Survey)

The estimate of the provincial total volume of production is computed using the following formula:

Stratum h production

$$\hat{Y}_h = \sum_{i=1}^{a_h} \sum_{j=1}^{n_{hi}} \sum_{m=1}^3 \sum_{k=1}^{K_m} w'_{hijmk} * y_{hijmk}$$

Provincial total

$$\hat{Y}_p = \sum_{h=1}^L \hat{Y}_h$$

where:

- \hat{Y}_p - estimate of total volume of production based on the results of the survey for the province
- \hat{Y}_h - estimate of total volume of fish production at stratum h
- w'_{hijmk} - final weight of boat j in landing center i at stratum h for week k of month m
- y_{hijmk} - volume of production of boat j in landing center i at stratum h for week k of month m
- a_h - total number of sampled landing centers for stratum h of the province
- n_{hi} - number of sampled boats in landing center i in stratum h
- K_m - total number of weeks in month m
- L - total number of strata

d. Total Volume of Production for Municipal Fisheries

To obtain the total volume of production for municipal fisheries, the estimate based on the results of the survey is added to the volume of production from non-traditional landing centers compiled from the administrative records of PFDA and LGUs. The formula is as follows:

$$\hat{Y}'_p = \hat{Y}_p + X$$

where:

- \hat{Y}'_p - estimate of total volume of production for municipal fisheries
- \hat{Y}_p - estimate of total volume of production based on the results of the survey for the province
- X - administrative data on volume of production from non-traditional landing centers for the province

The estimate of the regional total volume of production is computed using the following formula:

$$\hat{Y}_r = \sum_{p=1}^{n_p} \hat{Y}'_p$$

where:

\hat{Y}_r - estimate of total volume of fish production for the region

\hat{Y}'_p - estimate of total volume of fish production for the province

n_p - total number of provinces in the region

The estimate of the national total volume of production is computed using the following formula:

$$\hat{Y} = \sum_{r=1}^{n_r} \hat{Y}_r$$

where:

\hat{Y} - estimate of total volume of fish production for the national level

\hat{Y}_r - estimate of total volume of fish production for the region

n_r - total number of regions with municipal landing center

e. Estimation of Variance and Standard Error

Variance

The variance of the provincial total volume of production is computed using the following formula:

$$V(\hat{Y}_p) = \sum_{h=1}^3 V(\hat{Y}_h)$$

where:

$$V(\hat{Y}_h) = \left(1 - \frac{a_h}{A_h}\right) a_h s_h^2 + \frac{a_h}{A_h} \sum_{i=1}^{a_h} \left(1 - \frac{n_{hi}}{N_{hi}}\right) n_{hi} s_{hi}^2$$

$$s_h^2 = \frac{\sum_{i=1}^{a_h} (y_{hi} - \bar{y}_h)^2}{a_h - 1}$$

$$s_{hi}^2 = \frac{\sum_{j=1}^{n_{hi}} (y_{hij} - \bar{y}_{hi})^2}{n_{hi} - 1}$$

$V(\hat{Y}_p)$ - variance of the estimated total volume of fish production for the province

s_h^2 - sample variance between PSUs on the stratum h

s_{hi}^2 - sample variance within PSUs on the stratum h

a - number of sample landing centers in the province

A - total number of landing centers in the province

-
- n_i - number of sample municipal boats for landing center i
 - N_{hi} - total number of municipal boats for landing center i
 - y_i - estimated production for the landing center i
 - y_{ij} - estimated production for operator j in landing center i
 - \bar{y} - average production of the province
 - \bar{y}_i - average production for landing center i

The variance of the regional total volume of production is computed using the following formula:

$$V(\hat{Y}_r) = \sum_{p=1}^{n_p} V(\hat{Y}_p)$$

where:

- $V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region
- $V(\hat{Y}_p)$ - variance of the estimated total volume of fish production for the province
- n_p - total number of provinces in the region

The variance of the national total volume of production is computed using the following formula:

$$V(\hat{Y}_n) = \sum_{r=1}^{n_r} V(\hat{Y}_r)$$

where:

- $V(\hat{Y}_n)$ - variance of the estimated total volume of fish production at the national level
- $V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region
- n_r - total number of regions with municipal landing centers

Standard Error

The standard error for the provincial total volume of production is obtained using the following formula:

$$se(\hat{Y}_p) = \sqrt{V(\hat{Y}_p)}$$

where:

$se(\hat{Y}_p)$ - standard error of the estimated total volume of fish production for the province

$V(\hat{Y}_p)$ - variance of the estimated total volume of fish production for the province

The standard error for the regional total volume of production is obtained using the following formula:

$$se(\hat{Y}_r) = \sqrt{V(\hat{Y}_r)}$$

where:

$se(\hat{Y}_r)$ - standard error of the estimated total volume of fish production for the region

$V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region

The standard error for the national total volume of production is obtained using the following formula:

$$se(\hat{Y}_n) = \sqrt{V(\hat{Y}_n)}$$

where:

$se(\hat{Y}_n)$ - standard error of the estimated total volume of fish production at the national level

$V(\hat{Y}_n)$ - variance of the estimated total volume of fish production at the national level

C. QIFS

1. Sampling Frame

The QIFS uses the 2012 Census of Agriculture and Fisheries (CAF) as its sampling frame. The frame was used to draw sample inland fishing households for the survey. The enumeration unit for the QIFS is the inland fishing household. An inland fishing household is a household with at least one member engaged in inland fishing.

2. Sample Selection Procedure

The QIFS uses a two-stage sampling design with barangay as the Primary Sampling Unit (PSU) and inland fishing household as the Secondary Sampling Unit (SSU).

Sample barangays are selected using Probability Proportional to Size (PPS) with sampling rate of 10.0 percent. The number of inland fishing households is used as the size measure. Sample inland fishing households are selected using Simple Random Sampling (SRS) for each sample barangay. The number of sample inland fishing households is 10 per barangay. For a sample barangay which has less than 10 inland fishing households, all households are taken as samples.

3. Domain

The domain of the survey is province. In the case of National Capital Region, the region is the domain.

4. Estimation Procedure

a. Sampling Weight

Base Weight

The base weight (w_{ij}) of a sample household in a barangay is computed using the following formula:

$$w_{ij} = \left(\frac{X}{aX_i} \right) \left(\frac{N_i}{n_i} \right)$$

where:

w_{ij} - weight of household j in barangay i

X - total number of inland fishing households for the province

X_i - total number of inland fishing households in barangay i

a - number of sample inland fishing barangays for the province

N_i - total number of inland fishing households in barangay i

n_i - number of sample inland fishing households in barangay i

Adjustment Factor

To account for non-response, the weight adjustment factor for province p (A_p) is computed as follows:

$$A_p = \frac{\sum_{i=1}^a \sum_{j=1}^{n_i} w_{ij} X_{1ij}}{\sum_{i=1}^a \sum_{j=1}^{n_i} w_{ij} X_{2ij}}$$

where:

A_p - adjustment factor for province p

w_{ij} - base weight of household j in barangay i

n_i - number of sample inland fishing households in barangay i

a - number of sample inland fishing barangays for the province

X_{1ij} - eligible status of sample inland fishing household j in barangay i
(1 if eligible, 0 otherwise)

X_{2ij} - responding status of sample inland fishing household j in barangay i (1 if responding, 0 otherwise)

Final Weight

The final weight (w'_{ij}) is obtained by multiplying the base weight and adjustment factor as follows:

$$w'_{ij} = w_{ij} \times A_p$$

where:

w'_{ij} - final weight of household j in barangay i

w_{ij} - base weight of household j in barangay i

A_p - adjustment factor for province p

b. Estimation of Totals

The estimate of the provincial total volume of production is computed using the following formula:

$$\hat{Y}_p = \sum_{i=1}^a \sum_{j=1}^{n_i} w'_{ij} y_{ij}$$

where:

\hat{Y}_p - estimate of total volume of fish production for the province

w'_{ij} - final weight of household j in barangay i

y_{ij} - volume of fish production of household j in barangay i

n_i - number of sample inland fishing household in barangay i

a - number of sample inland fishing barangays for the province

The estimate of the regional total volume of production is computed using the following formula:

$$\hat{Y}_r = \sum_{p=1}^{n_p} \hat{Y}_p$$

where:

- \hat{Y}_r - estimate of total volume of fish production for the region
- \hat{Y}_p - estimate of total volume of fish production for the province
- n_p - total number of provinces in the region

The estimate of the national total volume of production is computed using the following formula:

$$\hat{Y} = \sum_{r=1}^{n_r} \hat{Y}_r$$

where:

- \hat{Y} - estimate of total volume of fish production for the national level
- \hat{Y}_r - estimate of total volume of fish production for the region
- n_r - total number of regions with inland fishing households

c. Estimation of Variance and Standard Error

Variance

The variance of the provincial total volume of production is computed using the following formula:

$$V(\hat{Y}_p) = \left(1 - \frac{a}{A}\right) a s_1^2 + \frac{a}{A} \sum_{i=1}^a \left(1 - \frac{n_i}{N_i}\right) n_i s_{2i}^2$$

where:

$$s_1^2 = \frac{\sum_{i=1}^a (y_i - \bar{y})^2}{a - 1}$$
$$s_{2i}^2 = \frac{\sum_{j=1}^{n_i} (y_{ij} - \bar{y}_i)^2}{n_i - 1}$$

- $V(\hat{Y}_p)$ - variance of the estimated total volume of fish production for the province
- s_1^2 - sample variance between PSUs
- s_{2i}^2 - sample variance within PSUs on stratum
- a - number of sample inland fishing barangays in the province
- A - total number of inland fishing barangays in the province
- n_i - number of sample inland fishing households in barangay i
- N_{hi} - total number of inland fishing households in barangay i
- y_i - estimated production for inland fishing households in barangay i

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- y_{ij} - estimated production for inland fishing household j in barangay i
 - \bar{y} - mean production of the province
 - \bar{y}_i - mean production for barangay i

The variance of the regional total volume of production is computed using the following formula:

$$V(\hat{Y}_r) = \sum_{p=1}^{n_p} V(\hat{Y}_p)$$

where:

- $V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region
- $V(\hat{Y}_p)$ - variance of the estimated total volume of fish production for the province
- n_p - total number of provinces in the region

The variance of the national total volume of production is computed using the following formula:

$$V(\hat{Y}_n) = \sum_{r=1}^{n_r} V(\hat{Y}_r)$$

where:

- $V(\hat{Y}_n)$ - variance of the estimated total volume of fish production at the national level
- $V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region
- n_r - total number of regions with inland fishing households

Standard Error

The standard error for the provincial total volume of production is obtained using the following formula:

$$se(\hat{Y}_p) = \sqrt{V(\hat{Y}_p)}$$

where:

- $se(\hat{Y}_p)$ - standard error of the estimated total volume of fish production for the province

$V(\hat{Y}_p)$ - variance of the estimated total volume of fish production for the province

The standard error for the regional total volume of production is obtained using the following formula:

$$se(\hat{Y}_r) = \sqrt{V(\hat{Y}_r)}$$

where:

$se(\hat{Y}_r)$ - standard error of the estimated total volume of fish production for the region

$V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region

The standard error for the national total volume of production is obtained using the following formula:

$$se(\hat{Y}_n) = \sqrt{V(\hat{Y}_n)}$$

where:

$se(\hat{Y}_n)$ - standard error of the estimated total volume of fish production at the national level

$V(\hat{Y}_n)$ - variance of the estimated total volume of fish production at the national level

D. QAqS

1. Sampling Frame

The basis for the sampling frame of QAqS is the list of aquafarms by type and environment. The said list was the result of the Updating of List of Aquaculture Farms (ULAF) conducted in 2017. The ULAF results serve as basis in updating the sampling frame for the aquaculture survey which covers aquafarm types in various water environment, namely, brackishwater fishpond, pen and cage; freshwater fishpond, pen and cage; marine pen and cage; oyster; mussel; seaweed; rice fish; and small farm reservoir.

2. Sample Selection Procedure

The sample selection for QAqS utilizes Probability Proportional to Size Systematic sampling (PPS-Sys) method with area of aquafarm as the size measure. Sample aquafarms are selected in each domain using systematic sampling by aquafarm type. Sampling rate is 15.0 percent of the total number

of aquafarms with five aquafarms as the minimum for each aquafarm type in the province.

3. Domain

The domain of the survey is province. In the case of National Capital Region, the region is the domain.

4. Estimation Procedure – since the aquafarm types are independent, the estimation will be done per aquafarm type.

a. Sampling Weight

Base Weight

The base weight of the sample aquafarm operator i , or w_i , in the province is given by the formula:

$$w_i = \frac{X}{aX_i}$$

where:

- a - number of sample aquafarm in the province
- X - total aquafarm area in the province
- X_i - aquafarm area of the sample aquafarm

Adjustment Factor

To account for non-response, the weight adjustment factor for province p (A_p) is computed as follows:

$$A_p = \frac{\sum_{i=1}^a w_i X_{1i}}{\sum_{i=1}^a w_i X_{2i}}$$

where:

- A_p - adjustment factor of province p
- w_i - base weight of sample aquafarm i
- X_{1i} - eligible status of sample aquafarm i (1 if eligible, 0 otherwise)
- X_{2i} - responding status of sample aquafarm i (1 if eligible, 0 otherwise)
- a - number of sample aquafarm in the province

Final Weight

The final weight (w_i') of the sample aquafarm i is obtained by multiplying the base weight and adjustment factor as follows:

$$w_i' = w_i * A_p$$

where:

- w_i' - final weight of sample aquafarm i
- w_i - base weight of sample aquafarm i
- A_p - adjustment factor for province p

b. Estimation of Totals

The estimate of the provincial total volume of production is computed using the following formula:

$$\hat{Y}_p = \sum_{i=1}^a w_i y_i$$

where:

- \hat{Y}_p - estimate of total volume of fish production for the province
- w_i - final weight of sample aquafarm i
- y_i - production of aquafarm i
- a - number of sample aquafarm in the province

The estimate of the regional total volume of production is computed using the following formula:

$$\hat{Y}_r = \sum_{p=1}^{n_p} \hat{Y}_p$$

where:

- \hat{Y}_r - estimate of total volume of fish production for the region
- \hat{Y}_p - estimate of total volume of fish production for the province
- n_p - total number of provinces in the region

The estimate of the national total volume of production is computed using the following formula:

$$\hat{Y} = \sum_{r=1}^{n_r} \hat{Y}_r$$

where:

\hat{Y} - estimate of total volume of fish production for the national

\hat{Y}_r - estimate of total volume of fish production for the region

n_r - total number of regions with aquafarms

c. Estimation of Variance and Standard Error

Variance

The variance of the provincial total volume of production is computed using the following formula:

$$V(\hat{Y}_p) = \left(1 - \frac{a}{A}\right) a s^2$$

where:

$$s^2 = \frac{\sum_{i=1}^a (y_i - \bar{y})^2}{a - 1}$$

$$z_i = w_i y_i$$

$V(\hat{Y}_p)$ - variance of the estimated total aquaculture production for the province

s^2 - sample variance between the aquafarms in the province

y_i - weighted average aquaculture production of aquafarm i in the province

\bar{y} - weighted average aquaculture production in the province

a - number of sample aquafarms in the province

A - total number of aquafarms in the province

The variance of the regional total volume of production is computed using the following formula:

$$V(\hat{Y}_r) = \sum_{p=1}^{n_p} V(\hat{Y}_p)$$

where:

$V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region

$V(\hat{Y}_p)$ - variance of the estimated total volume of fish production for the province

n_p - total number of provinces in the region

The variance of the national total volume of production is computed using the following formula:

$$V(\hat{Y}_n) = \sum_{r=1}^{n_r} V(\hat{Y}_r)$$

where:

$V(\hat{Y}_n)$ - variance of the estimated total volume of fish production at the national level

$V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region

n_r - total number of regions with aquafarms

Standard Error

The standard error for the provincial total volume of production is obtained using the following formula:

$$se(\hat{Y}_p) = \sqrt{V(\hat{Y}_p)}$$

where:

$se(\hat{Y}_p)$ - standard error of the estimated total volume of fish production for the province

$V(\hat{Y}_p)$ - variance of the estimated total volume of fish production for the province

The standard error for the regional total volume of production is obtained using the following formula:

$$se(\hat{Y}_r) = \sqrt{V(\hat{Y}_r)}$$

where:

$se(\hat{Y}_r)$ - standard error of the estimated total volume of fish production for the region

$V(\hat{Y}_r)$ - variance of the estimated total volume of fish production for the region

The standard error for the national total volume of production is obtained using the following formula:

$$se(\hat{Y}_n) = \sqrt{V(\hat{Y}_n)}$$

where:

$se(\hat{Y}_n)$ - standard error of the estimated total volume of fish production at the national level

$V(\hat{Y}_n)$ - variance of the estimated total volume of fish production at the national level

IV. Concepts and Definitions of Terms

Aquaculture refers to fishery operation involving all forms of raising and culturing of fish and other fishery species in marine, brackish water, and freshwater environment. Examples are fishponds, fish pens, fish cages, mussel, oyster, seaweed farms, and hatcheries.

Aquafarms are farming facilities used in the culture or propagation of aquatic species including fish, mollusk, crustaceans, and aquatic plants for purposes of rearing to enhance production.

Brackishwater refers mixture of seawater and freshwater with salinity that varies with the tide. Examples are estuaries, mangroves, and mouths of rivers where seawater enters during high tide.

Commercial fishing refers to the catching of fish with the use of fishing boats with a capacity of more than three gross tons for trade, business, or profit beyond subsistence or sports fishing.

Fishermen is a classification of workers who catch, breed, and raise fish, and cultivate other forms of aquatic life for sale or delivery on a regular basis to wholesale buyers, marketing organizations, or at markets.

Fisheries refer to all activities relating to the act or business of fishing, culturing, preserving, processing, marketing, developing, conserving, and managing aquatic resources and the fishery areas including the privilege to fish or take aquatic resources thereof (Republic Act No. 8550 otherwise known as “The Philippine Fisheries Code of 1998”).

Fisheries sector refers to the sector engaged in the production, growing, harvesting, processing, marketing, developing, conserving, and managing of aquatic resources and fishing areas.

Fishing refers to the taking of fishery species from their wild state or habitat with or without the use of fishing vessels.

Fishing boat is a type of watercraft, such as motorized/non-motorized banca, sailboat, motorboat, etc., either licensed or not, used for fishing purposes.

Fish cage refers to 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.

Fishing gear is any instrument or device and its accessories utilized in taking fish and other fishery species.

Fishing grounds refer to areas in any body of water where fish and other aquatic resources congregate and become target of capture.

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

Fishpond refers to a body of water, artificial or natural, where fish and other aquatic products are cultured, raised, or cultivated under controlled conditions. This is a land-based type of aquafarm. Note that the setting-up of fish cages in ponds does not make the operation of fish cage and at the same time a fishpond.

Freshwater refers to water without salt or marine origin, such as generally found in lakes, rivers, canals, dams, reservoirs, paddy fields, and swamps.

Inland municipal fishing is the catching of fish, crustaceans, mollusks, and all other aquatic animals and plants in inland water like lakes, rivers, dams, marshes, etc. using simple gears and fishing boats, some of which are non-motorized with a capacity of three gross tons or less; or fishing not requiring the use of fishing boats.

Landing center is a place where the fish catch and other aquatic products are unloaded and traded.

Marine refers to seawater outside the coastal line such as Manila Bay, Visayan Sea, etc.

Municipal fishing covers fishing operation carried out with or without the use of a boat weighing three gross tons or less.

Mussel farming refers to the cultivation of mussel in suitable water area by any farming method with appropriate intents and purposes.

Oyster farming refers to the cultivation of oysters in suitable water areas by any method for production purposes.

Rice fish culture is an integrated farming system involving raising of fish in rice paddies.

Seawater refers to inshore and open waters and inland seas in which the salinity generally exceeds 20.0 percent.

Seaweed farming is the cultivation of seaweed in suitable water areas by any method with appropriate intensive care for production in commercial quantities.

Small farm reservoirs (SFR) are small bodies of water with an area of less than 10 km, e.g., small ponds, canals, irrigation canals, swamps, etc., which can be suitable for culture-based fisheries.

V. Dissemination of Results and Revision

Dissemination of Results

The quarterly fisheries estimates and Fisheries Situation Report for the year 2024 is released quarterly in the PSA Website with the following schedule:

Reference Quarter	Schedule of Release	
	Estimates for OpenStat	Fisheries Situation Report
Quarter 4 2023	30 January 2024	30 January 2024
Quarter 1 2024	08 May 2024	15 May 2024
Quarter 2 2024	07 August 2024	14 August 2024
Quarter 3 2024	06 November 2024	14 November 2024

Revision of Estimates

The fisheries statistics follows the revision policy as stipulated in the PSA Board Resolution No. 01, Series of 2017-119 dated 14 February 2017, which approves the revision of quarterly estimates on agricultural production, prices, and related statistics to be limited to the immediately preceding quarter and for the past three years with quarterly breakdown to be done only during May of the current year.

VI. Citation

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VII. Contact Information

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Table 1. Volume of Fisheries Production by Subsector: Philippines
January to March 2022 – 2024^P

Subsector	Volume of Production (metric tons)			Percent Change (%)		Percent Share to Total Volume of Fisheries Production (%)
	2022	2023	2024 ^P	2023/2022	2024 ^P /2023	2024
Fisheries	971,763.46	992,334.28	987,193.69	2.1	-0.5	100.0
Commercial Fisheries	177,143.30	170,602.32	188,917.68	-3.7	10.7	19.1
Municipal Fisheries	258,015.51	275,849.30	251,879.31	6.9	-8.7	25.5
Marine	218,965.16	241,370.05	211,328.98	10.2	-12.4	21.4
Inland	39,050.35	34,479.24	40,550.33	-11.7	17.6	4.1
Aquaculture	536,604.65	545,882.67	546,396.70	1.7	0.1	55.3

p - Preliminary

Note: Percent change and percent share may yield different results when computed manually due to rounding.

Sources: Philippine Statistics Authority, Quarterly Commercial Fisheries Survey, Quarterly Municipal Fisheries Survey, Quarterly Inland Fisheries Survey, and Quarterly Aquaculture Survey

Table 2. Volume of Fisheries Production by Species: Philippines
January to March 2022 – 2024^P

Species	Volume of Production (metric tons)			Percent Change (%)		Percent Share to Total Volume of Fisheries Production (%)
	2022	2023	2024 ^P	2023/2022	2024 ^P /2023	2024
Fisheries	971,763.46	992,334.28	987,193.69	2.1	-0.5	100.0
Milkfish (Bangus)	58,696.47	62,816.78	58,027.06	7.0	-7.6	5.9
Tilapia	90,439.69	100,226.48	109,060.01	10.8	8.8	11.0
Tiger prawn (Sugpo)	7,348.86	5,566.79	5,599.08	-24.2	0.6	0.6
Skipjack (Gulyasan)	53,898.22	54,733.74	70,211.06	1.6	28.3	7.1
Roundscad (Galunggong)	40,793.41	35,380.90	37,497.21	-13.3	6.0	3.8
Seaweed	370,483.52	366,757.45	365,197.33	-1.0	-0.4	37.0
Yellowfin tuna (Tambakol/Bariles)	18,357.81	19,367.74	21,936.61	5.5	13.3	2.2
Mudcrab (Alimango)	6,188.17	3,860.10	2,579.68	-37.6	-33.2	0.3
Frigate tuna (Tulingan)	21,693.57	15,496.59	20,086.53	-28.6	29.6	2.0
Big-eyed scad (Matangbaka)	25,232.66	26,752.43	25,332.62	6.0	-5.3	2.6
Bali sardinella (Tamban)	55,633.06	55,677.84	39,037.36	0.1	-29.9	4.0
Squid (Pusit)	11,559.88	13,648.87	13,033.66	18.1	-4.5	1.3
Blue crab (Alimasag)	6,052.34	6,699.42	4,721.42	10.7	-29.5	0.5
Bigeye tuna (Tambakol/Bariles)	3,827.98	2,486.59	3,672.05	-35.0	47.7	0.4
Grouper (Lapu-lapu)	4,000.37	4,191.71	3,048.18	4.8	-27.3	0.3
Indian mackerel (Alumahan)	11,622.60	9,174.04	9,274.65	-21.1	1.1	0.9
Threadfin bream (Bisugo)	10,818.46	8,289.98	5,205.01	-23.4	-37.2	0.5
Slipmouth (Sapsap)	8,127.55	6,058.52	4,498.20	-25.5	-25.8	0.5
Cavalla (Talakitok)	5,908.35	5,006.50	5,141.28	-15.3	2.7	0.5
Fimbriated sardines (Tunsoy)	9,305.37	8,214.27	11,920.64	-11.7	45.1	1.2
P. Vannamei	5,926.01	8,431.82	8,519.57	42.3	1.0	0.9
Others	145,849.12	173,495.71	163,594.48	19.0	-5.7	16.6

p - Preliminary

Note: Percent change and percent share may yield different results when computed manually due to rounding.

Sources: Philippine Statistics Authority, Quarterly Commercial Fisheries Survey, Quarterly Municipal Fisheries Survey, Quarterly Inland Fisheries Survey, and Quarterly Aquaculture Survey

Table 3. Value of Fisheries Production at Current Prices by Species: Philippines
January to March 2022 – 2024^P

Species	Value of Production at Current Prices ('000 PhP)			Percent Change (%)		Percent Share to Total Volume of Fisheries Production (%)
	2022	2023	2024 ^P	2023/2022	2024 ^P /2023	
Fisheries	65,293,603.75	81,903,258.47	75,943,328.22	25.4	-7.3	100.0
Milkfish (Bangus)	6,886,661.47	8,582,474.23	7,588,666.12	24.6	-11.6	10.0
Tilapia	7,152,137.87	9,596,477.68	10,390,969.22	34.2	8.3	13.7
Tiger prawn (Sugpo)	3,636,181.66	3,875,633.50	3,586,184.28	6.6	-7.5	4.7
Skipjack (Gulyasan)	4,403,655.43	6,380,263.61	6,346,472.05	44.9	-0.5	8.4
Roundscad (Galunggong)	3,661,316.30	4,015,427.69	3,931,616.86	9.7	-2.1	5.2
Seaweed	2,929,883.16	3,700,286.01	2,407,659.11	26.3	-34.9	3.2
Yellowfin tuna (Tambakol/Bariles)	2,505,091.40	3,624,252.29	3,351,868.09	44.7	-7.5	4.4
Mudcrab (Alimango)	2,371,305.55	2,038,845.35	1,349,839.45	-14.0	-33.8	1.8
Frigate tuna (Tulingan)	2,087,601.52	2,102,282.56	2,649,431.95	0.7	26.0	3.5
Big-eyed scad (Matangbaka)	2,399,800.65	3,332,015.76	3,035,021.70	38.9	-8.9	4.0
Bali sardinella (Tamban)	1,712,819.74	2,445,830.37	1,798,629.17	42.8	-26.5	2.4
Squid (Pusit)	1,597,159.04	2,387,311.39	2,054,678.68	49.5	-13.9	2.7
Blue crab (Alimasag)	1,212,241.05	1,207,773.35	818,249.43	-0.4	-32.3	1.1
Bigeye tuna (Tambakol/Bariles)	621,708.45	392,123.11	682,208.77	-36.9	74.0	0.9
Grouper (Lapu-lapu)	761,133.44	829,191.81	734,170.05	8.9	-11.5	1.0
Indian mackerel (Alumahan)	1,275,845.48	1,296,591.40	1,129,393.74	1.6	-12.9	1.5
Threadfin bream (Bisugo)	1,807,545.65	1,570,286.61	850,488.48	-13.1	-45.8	1.1
Slipmouth (Sapsap)	690,484.31	574,334.97	411,696.87	-16.8	-28.3	0.5
Cavalla (Talakitok)	904,342.08	844,234.25	766,509.50	-6.7	-9.2	1.0
Fimbriated sardines (Tunsoy)	435,009.55	565,295.96	580,944.52	30.0	2.8	0.8
P. Vannamei	1,586,007.72	2,540,385.82	2,643,789.30	60.2	4.1	3.5
Others	14,655,672.23	20,001,940.75	18,834,840.88	36.5	-5.8	24.8

p - Preliminary

Note: Percent change and percent share may yield different results when computed manually due to rounding.

Sources: Philippine Statistics Authority, Quarterly Commercial Fisheries Survey, Quarterly Municipal Fisheries Survey, Quarterly Inland Fisheries Survey, and Quarterly Aquaculture Survey

Table 4. Average Farmgate Price by Species: Philippines, January to March 2022 – 2024^P

Species	Average Price (PhP/Kg)			Percent Change (%)	
	2022	2023	2024 ^P	2023/2022	2024 ^P /2023
Fisheries					
Milkfish (Bangus)	117.33	136.63	130.78	16.5	-4.3
Tilapia	79.08	95.75	95.28	21.1	-0.5
Tiger prawn (Sugpo)	494.80	696.21	640.50	40.7	-8.0
Skipjack (Gulyasan)	81.70	116.57	90.39	42.7	-22.5
Roundscad (Galunggong)	89.75	113.49	104.85	26.5	-7.6
Seaweed	7.91	10.09	6.59	27.6	-34.7
Yellowfin tuna (Tambakol/Bariles)	136.46	187.13	152.80	37.1	-18.4
Mudcrab (Alimango)	383.20	528.18	523.26	37.8	-0.9
Frigate tuna (Tulingan)	96.23	135.66	131.90	41.0	-2.8
Big-eyed scad (Matangbaka)	95.11	124.55	119.81	31.0	-3.8
Bali sardinella (Tamban)	30.79	43.93	46.07	42.7	4.9
Squid (Pusit)	138.16	174.91	157.64	26.6	-9.9
Blue crab (Alimasag)	200.29	180.28	173.31	-10.0	-3.9
Bigeye tuna (Tambakol/ Bariles)	162.41	157.70	185.78	-2.9	17.8
Grouper (Lapu-lapu)	190.27	197.82	240.86	4.0	21.8
Indian mackerel (Alumahan)	109.77	141.33	121.77	28.8	-13.8
Threadfin bream (Bisugo)	167.08	189.42	163.40	13.4	-13.7
Slipmouth (Sapsap)	84.96	94.80	91.52	11.6	-3.5
Cavalla (Talakitok)	153.06	168.63	149.09	10.2	-11.6
Fimbriated sardines (Tunsoy)	46.75	68.82	48.73	47.2	-29.2
P. Vannamei	267.64	301.29	310.32	12.6	3.0
Others	100.49	115.29	115.13	14.7	-0.1

p - Preliminary

Note: Percent change may yield different results when computed manually due to rounding.

Sources: Philippine Statistics Authority, Quarterly Commercial Fisheries Survey, Quarterly Municipal Fisheries Survey, Quarterly Inland Fisheries Survey, and Quarterly Aquaculture Survey

Table 5. Volume of Fisheries Production with Measure of Precision by Subsector: Philippines, January to March 2022 – 2024^p

Subsector	Volume of Production (metric tons)	Standard Error (SE)	CV (%)	95% Confidence Interval
Fisheries	987,193.69	5,799.89	0.69	(975,825.91 , 998,561.47)
Commercial Fisheries	188,917.68	2,896.16	4.48	(183,241.21 , 194,594.15)
Municipal Fisheries	251,879.31	5,998.99	2.55	(240,121.29 , 263,637.34)
Marine	211,328.98	6,934.75	3.57	(197,736.87 , 224,921.09)
Inland	40,550.33	732.44	1.81	(39,114.75 , 41,985.92)
Aquaculture	546,396.70	1,195.29	0.22	(544,053.94 , 548,739.46)

p - Preliminary

Note: The measures of precision are based on the survey results only.

Sources: Philippine Statistics Authority, Quarterly Commercial Fisheries Survey, Quarterly Municipal Fisheries Survey, Quarterly Inland Fisheries Survey, and Quarterly Aquaculture Survey

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