

National Sardines Management Plan



Republic of the Philippines
DEPARTMENT OF AGRICULTURE
BUREAU OF FISHERIES AND AQUATIC RESOURCES



National Sardine Management Plan

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Executive Summary

Sardines make up around 15% of total fish catch and is one of the most accessible protein sources for Filipinos. It is also foundational to the marine food web as food for many predators. A large proportion of the production comes from East Sulu Sea/Sulu Archipelagic Waters (Fishery Management Area 4). Other major fishing grounds are Ragay Gulf-Ticao Pass-San Bernardino Strait, Bohol Sea, Moro Gulf-Illana Bay, Sibuguey Bay, and Visayan Sea.

Around 68% of production comes from the commercial fisheries sector while around 32% comes from the municipal fisheries sector. Approximately 48,000 workers are employed in the commercial fisheries capture and the allied canning/bottling industries that target small pelagics such as sardines. The number of municipal fishers that depend on sardines is not known.

This plan aims to guide the coordinated management of sardines across the various Fishery Management Areas through reference points, harvest control rules, and appropriate measures in line with the Amended Fisheries Code (Republic Act 10654). The plan is a product of a participatory process that involved key stakeholders of the sardine industry in the country: scientists/technical personnel, fisheries managers, and various fishers' representatives from May 2018 to early 2020.

The National Sardines Management Plan 2020-2025 envisions "A sustainable and equitably-shared sardine fishery that contributes to food security and increased income through responsible management".

To contribute to this vision, the plan aims to:

(1) Establish (reference points) and monitor progress with respect to Biomass-based and Fishing Mortality-based reference points for the top 3 sardine species by 2023 through:

- 1a. improving multi-stakeholder partnership,
- 1b. consolidation and analysis of data,
- 1c. catch documentation and traceability system (CDTS)

(2) Reduce juvenile catch by 10% by 2025 in 5 priority sardine fishing areas by 2022 through:

- 2a. securing FMA (Management Body) and LGU adoption and implementation of the National Sardines Management Plan supported by good local governance, and
- 2b. broad stakeholder awareness and compliance to catch effort/limits (according to at least 3 limit and target reference points) and

(3) Reduce poverty incidence of sardines fishers by 5% by

- 3a. increasing income by 10% annually of the 10% poorer sardine fisher families
- 3b. alternative/diversified livelihoods and
- 3c. reducing post-harvest losses by 10% by 2022.

AC	Administrative Circular	LRP	Limit Reference Point
ACPC	Agricultural Credit Policy Council	MARINA	Maritime Industry Authority
AFMA	Agriculture and Fisheries Modernization Act	MB	Management Body/Board
B	Biomass	MC	Memorandum Circular
BAS	Bureau of Agricultural Statistics	MCS	Monitoring Control and Surveillance
BFAR	Bureau of Fisheries and Aquatic Resources	MFO	Municipal Fisheries Ordinance
BoatR	Boat Registration	MOA/MOU	Memorandum of Agreement/Understanding
CFD	Capture Fisheries Division	MPA	Marine Protected Area
CFGL	Commercial fishing gear license	MSU	Mindanao State University
CFVL	Commercial fishing vessel license	MSY	Maximum Sustainable Yield
CMM	Conservation on and Management Measures	MSME	Micro and Small Medium Enterprises
CNFIDP	Comprehensive National Fisheries Industry Development Plan	NEDA	National Economic Development Authority
CO	Central Office	NGAs	National Government Agencies
CPUE	Catch per Unit Effort	NFRDI	National Fisheries Research and Development Institute
CSO	Civil Society Organization	NGO	Non-Government Organization
CSR	Corporate Social Responsibility	NSAP	National Stock Assessment Program
DA	Department of Agriculture	NSMP	National Sardines Management Plan
DILG	Department of Interior and Local Government	PaNaGaT	Pangingsda Natin Gawing Tama
DOST	Department of Science and Technology	PCAARD	Philippine Council for Agriculture and Aquatic Resources Research and Development
DSWD	Department of Social Welfare and Development	PCAF	Philippine Council for Agriculture and Fisheries
DTI	Department of Trade Industry	PFDA	Philippine Fisheries Development Authority
EAFM	Ecosystem Approach to Fisheries Management	PHTD	Post-Harvest Technology Division
EDF	Environment Defense Fund	PPA	Philippine Ports Authority
EEZ	Exclusive Economic Zone	PSA	Philippine Statistics Authority
FARMC	Fisheries and Aquatic Resource Management Councils	PSM	Port State Measures
F	Mortality	RA	Republic Act
FAO	Fisheries Administrative Orders	RDC	Regional Development Council
FeLIS	Fishing Vessel Electronic Licensing System	RFO	Regional Field Office
FGD	Focus Group Discussion	RFTCC	Regional Fisherfolk and Training Coordination Center
FIDSSD	Fisheries Industry Development and Support Services Division	RP's	Reference Points
FIMC	Fisheries Information Management Center	SAG	Scientific Advisory Group
FLE	Fisheries Law Enforcement	SLP	Sustainable Livelihood Program
FMA	Fisheries Management Area	SOPHIL	Southern Philippines Deep Sea Fishing Association
FOO	Fisheries Office Order	SPR	Spawning Potential Ratio
FPED	Fisheries Policy and Economics Division	Sub-FMA	Sub Fisheries Management Area
FRLD	Fisheries Regulatory and Licensing Division	SUCs	State Universities and Colleges
GFI's	Government Financial Institutions	TESDA	Technical Education and Skills Development Authority
GMP	Good Manufacturing Practices	TRP	Target Reference Point
HACCP	Hazard Analysis Critical Control Point	TWG	Technical Working Group
HCR	Harvest Control Rules	UP	University of the Philippines
IEC	Information, Education and Communication	USAID	United States Agency for International Development
IFCU	Information and Fisherfolk Coordination Unit	VMM	Vessel Monitoring Measure
IRR	Implementing Rules and Regulations	VMS	Vessel Monitoring System
IUU	Illegal, Unreported, and Unregulated Fishing	WWF	World Wildlife Fund
JAO	Joint Administrative Order		
KI	Key Informant Interview		
LGU	Local Government Unit		
LGC	Local Government Code		
LM	Length at Maturity		



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As the Philippines adopts the New Thinking in Agriculture, we in the Department of Agriculture welcome the formulation and completion of the National Sardine Management Plan (NSMP) 2020 – 2025 collectively crafted by our very own fisheries stakeholders.

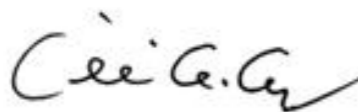
The Sardine Industry has contributed largely to the agri-fisheries sector providing not just quality and affordable protein source to every Filipino, but also in securing countless of jobs for Filipino fisherfolk from the industry's supply chain.

However, due to several factors such as illegal, unreported, and unregulated fishing, climate change and other environmental challenges to name a few, sardine production began to dwindle. Early on, conservation measures were carried out including stock-specific closed fishing seasons on major sardine fishing grounds. These are significant efforts to saving our sardine stock but a comprehensive national management plan would essentially harmonize all existing programs while adopting new ones to appropriately address every challenge that is hounding the sardine industry.

On behalf of the Department of Agriculture, I would like to express my gratitude to all the people whose hard work and dedication paved the way for the creation of this sardine plan. I would also like to acknowledge the National Fisheries and Aquatic Resources Management Council for their invaluable contribution in seeing this plan through. We hope that the same multi-sector cooperation, enthusiasm and commitment would come into play as the government, through the DA-BFAR, starts implementing the National Sardine Management Plan nationwide.

Together, we aim for MASAGANANG ANI at MATAAS NA KITA, guiding the agri-fisheries industry to true prosperity and ensuring a food secure country for the generations to come.

Maraming salamat at mabuhay ang sektor ng pangisdaan!


WILLIAM D. DAR, Ph.D.
Secretary



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The Department of Agriculture - Bureau of Fisheries and Aquatic Resources is pleased to present the first ever National Sardines Management Plan. A product of collaboration between the key players in the Sardine Industry, the government, the non-governmental organizations and the academe, the Sardine Plan encompasses all that we aspire for this industry—a more developed, sustainable, and equitably-beneficial Philippine sardine industry.

As we all know, sardines are one of the most valuable fishery resources in the Philippines. But a lot of factors including illegal and harmful practices of fishing, extensive global climate change, and the destruction of the ocean ecosystem due to pollution, continue to threaten the population of these species. As the government authority in fisheries, it is our mandate to protect these species from further degradation using a science-based approach to fisheries management.

The Sardine Management Plan operates with three goals as its main component:

- (1) Improved Science-based indicators for the sustainability of fish stocks;
- (2) Improved distribution of benefits among sardine fisherfolk and;
- (3) Strengthened science-based management for sustainable sardine fisheries.

We are optimistic that the National Sardines Management Plan will yield positive results as we count on the same collaboration that we had with our partners over the span of years that we did this plan together.

May this serve as a guide as we navigate towards the realization of our goal of providing the Filipino nation with sustainably managed aquatic resources, including sardines, today and beyond.

Maraming salamat at mabuhay ang sektor ng pangisdaan!


EDUARDO B. GONGONA
DA-BFAR National Director

*A food-secure and resilient Philippines
with prosperous farmers and fisherfolk*

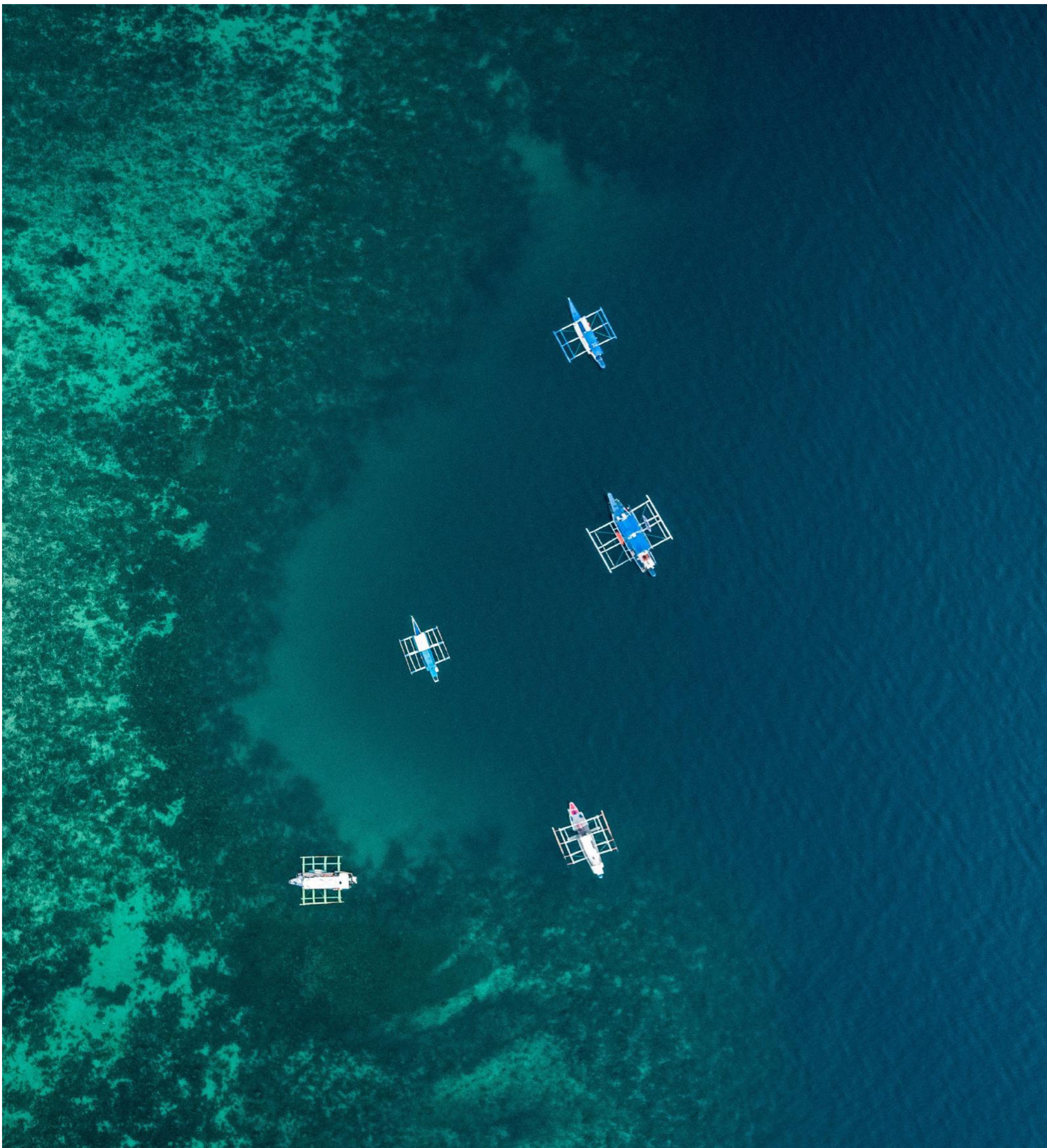




Introduction

The National Sardines Management Plan presents the vision, goals, objectives, benchmarks and indicators, and management actions for the next 5 years towards the sustainability of sardine industry in the county.

The potential management measures to be crafted out of this Plan will apply to the Fisheries Management Areas, covering both municipal and commercial waters and fishers. The Bureau recognizes that the management of sardines should be coordinated across the various fishery management areas and should be based upon reference points and harvest control rules for sardines. The Technical Working Group created through Fisheries Office Order No. 182, series of 2017 redrafted a National Sardine Management Plan with this in mind.



National Sardine Management Plan

2020-2025



VISION

“A sustainable and equitably-shared sardine fishery that contributes to food and increased income through responsible management.”

Background

Bio Physical

Sardines belong to the family of *Clupeidae* and subfamily of *Clupeinae* and are locally known as *lao-lao*, *law-law*, *tamban*, *tunsoy*, *turay*, *tabagak* and *tuloy*. Sardines are characterized by their terminal mouth; with single dorsal fin, located in the middle of the back and no spines; scutes present on the belly; tail short and forked. They are generally found within the continental shelf area.

The National Stock Assessment Program Results provide data on the Length at First Maturity (LM) of sardines in various fishing grounds. *S. lemuru* of San Bernardino Strait and Northern Zamboanga have 15 cm and 13 cm both in standard length respectively. *S. gibbosa* of Visayan Sea has 9.1 cm LM. This data can serve as basis in setting harmonized harvest control standard rules for the sardine industry.

Sardines are among the most commercially important pelagic species in the country, accounting to 25% of the total commercial fisheries production in 2018. Being cheap but high with protein, sardine is one of the most accessible fish species for the Filipinos. Aside from its evident economic value, sardines, have major ecological importance to big predators like tuna, mammals and cetaceans since they are located in the basal part of the food web.

There are nine species of sardines in the Philippines; six of which are major species, namely: *Sardinella lemuru*¹, *Sardinella gibbosa*, *Sardinella albella*, *Amblygaster sirm*, *Escualosa thoracata* and *Sardinella fimbriata*.



Figure 1. Photo comparison of sardines, top left to right: *S. lemuru*, *S. gibbosa*, *S. albella* bottom left to right: *A. sirm*, *E. thoracata*, *S. fimbriata*



¹ *Sardinella lemuru* is misidentified and labeled as *Sardinella longiceps* in the Philippines by the Philippine Statistics Authority and old references from the Bureau of Agricultural Statistics

Life Cycle of Sardines

Sardines are known to inhabit shallow tropical waters, often associated with coral reefs; but they can live up to depths of 70 m. Sardines have an estimated trophic level of 2.9 +0.30s.e.; occupying a position just above primary producers, grazing on them for energy. Sardines are also forage for a variety of predatory animals (Chacko, 1946). This is why any change in the abundance of sardines will have a direct impact on the marine ecosystem (Gosh et al, 2013). Sardines are filter feeders and can be seen swimming en-masse with their mouths open as they strain food from the water with their fine gill-rakers. They feed on both phyto and zooplankton, forming an important link in the marine food web by transferring the energy from the planktons to the upper predatory organisms.

The seasonal distribution and abundance of lesser sardines in the inshore waters is influenced by the pattern of the sea surface circulation of the water masses (Luther, 2001). The entry and abundance of lesser sardines in the coastal waters coincides with the period of maximum biomass production of zooplankton, which forms are the food of the lesser sardines (Desai & Bhargava, 1998). Large nutrient input from river run-off supports high primary production in the coastal waters but the central partsoffshore areas are less productive because of the absence of large-scale mixing or upwelling (Gosh et al, 2013).

Sardines spawn in water banks and relatively shallow continental shelf. Majority of the eggs and larvae are then transported by the water currents. Juvenile sardines aggregate into dense shoals and slowly make their way back to the open ocean and to the spawning grounds where they reach sexual maturity (www.oceansafrica.com).

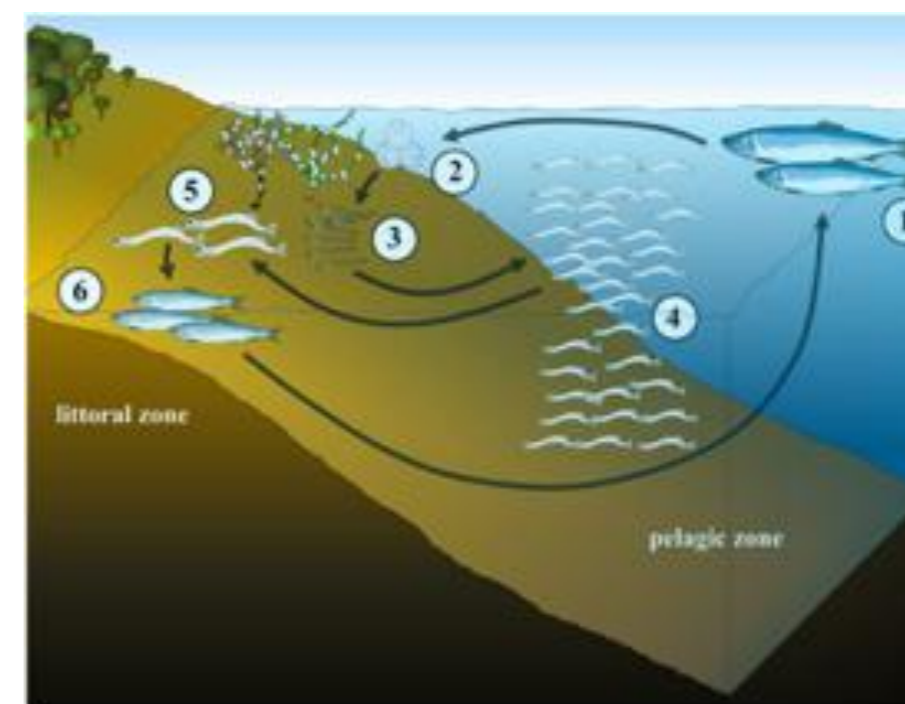


Figure 2. Sardine life cycle and migration route along with its life stage development

Sardines Fishing Grounds in the Philippines

There are six major fishing grounds in the Philippines²:

- (1) Ragay Gulf-Ticao Pass-San Bernardino Strait,
- (2) Bohol Sea,
- (3) East Sulu Sea/Sulu Archipelagic Waters-
- (4) Visayan Sea,
- (5) Moro Gulf-Illana Bay and
- (6) Sibuguey Bay other major fishing grounds for sardines are in the waters of Sulu Sea, Palawan Passage, Mindoro Strait, Lamon Bay, Burias Pass, Samar Sea, Lagonoy Gulf, Tayabas Bay, Sibuyan Sea, Dinagat Sound and Manila Bay.

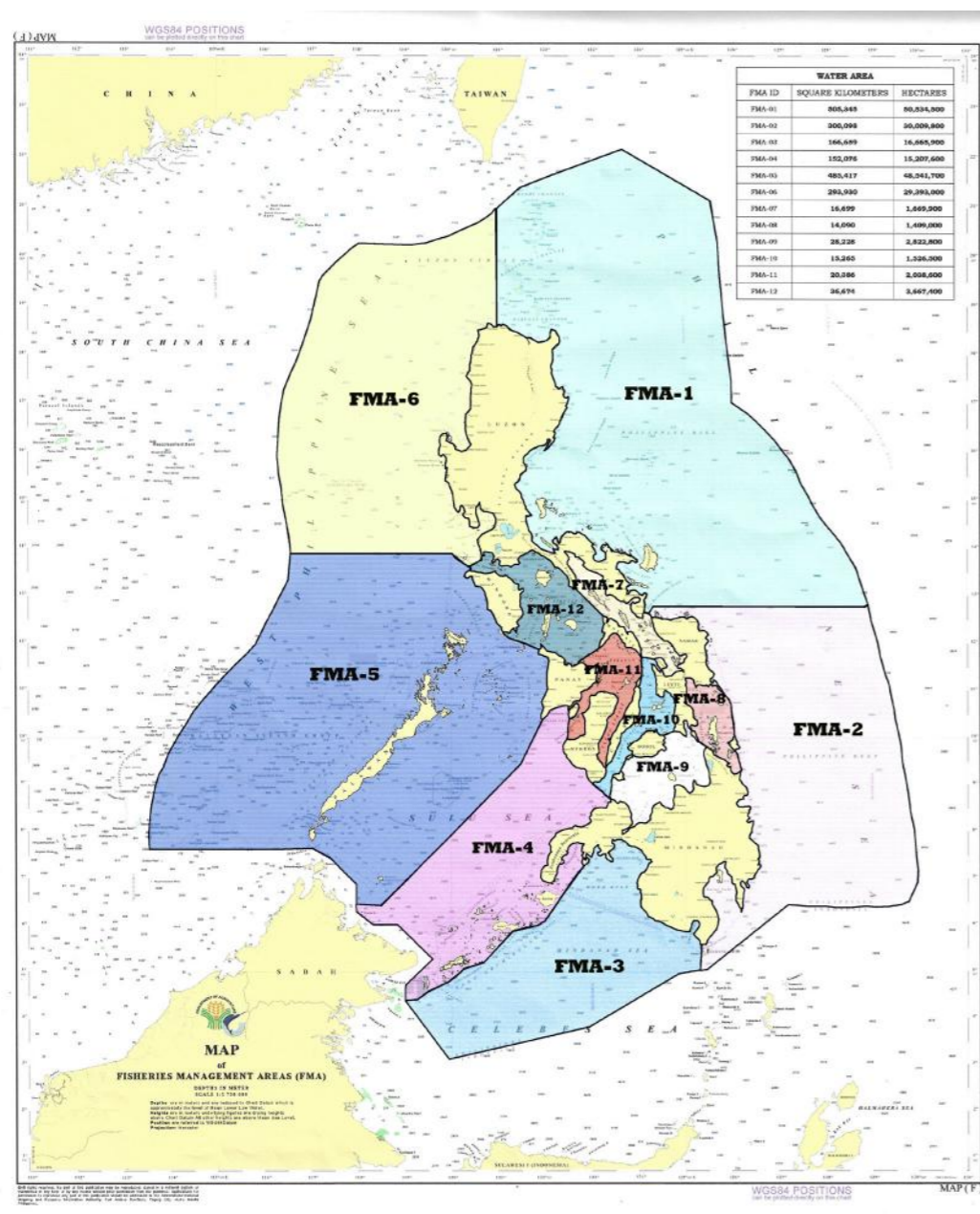


Figure 3. Major Sardine Distribution in FMAs

² National Fisheries Research and Development Institute

Fisheries Status

The production of sardines (fimbriated sardines; Indian sardines³) in the last 15 years averaged about 333,743 mt, or 15% of the total marine capture fisheries during the same period. About 68% was contributed by the commercial fisheries and 32% by the municipal fisheries sector. There was an increasing production trend in 2002-2009, however a sharp decline can be observed in 2010-2011, and stabilized thereafter in the recent 5 years at 346,826 mt annually.

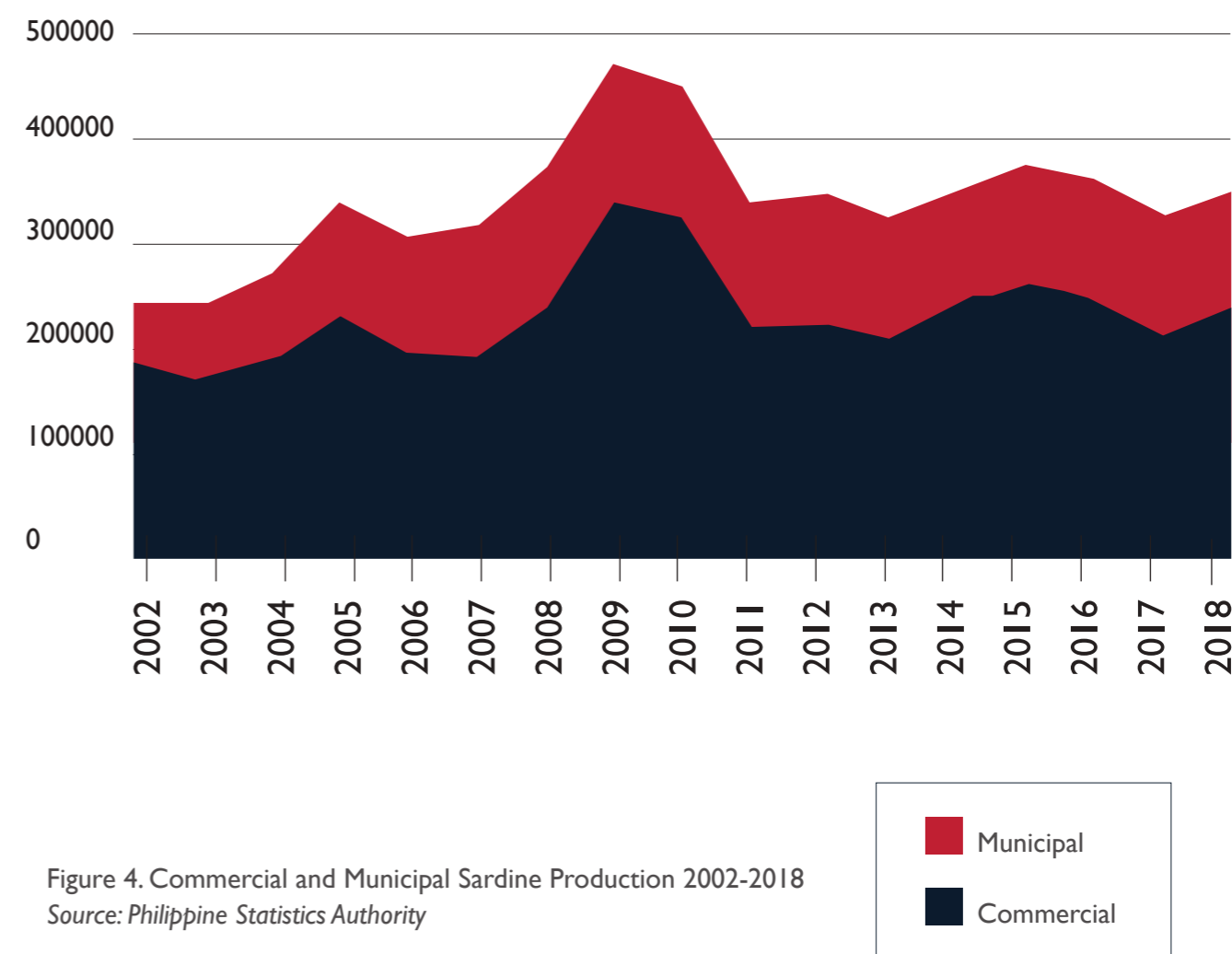


Figure 4. Commercial and Municipal Sardine Production 2002-2018
Source: Philippine Statistics Authority

³ Sardinella lemuru or Bali Sardines is misidentified and labeled as Sardinella longiceps or Indian Sardines in the Philippines by the Philippine Statistics Authority and old references from the Bureau of Agricultural Statistics

About 46% of the production come from Region 9. The other sardines producing regions are Region 5 (14%), Region 10 (6%), NCR (8%), Region 6 (5%), ARMM (6%), Region 4-B (4%), Region 4A (4%). (PSA, 2018; Figure/s below).

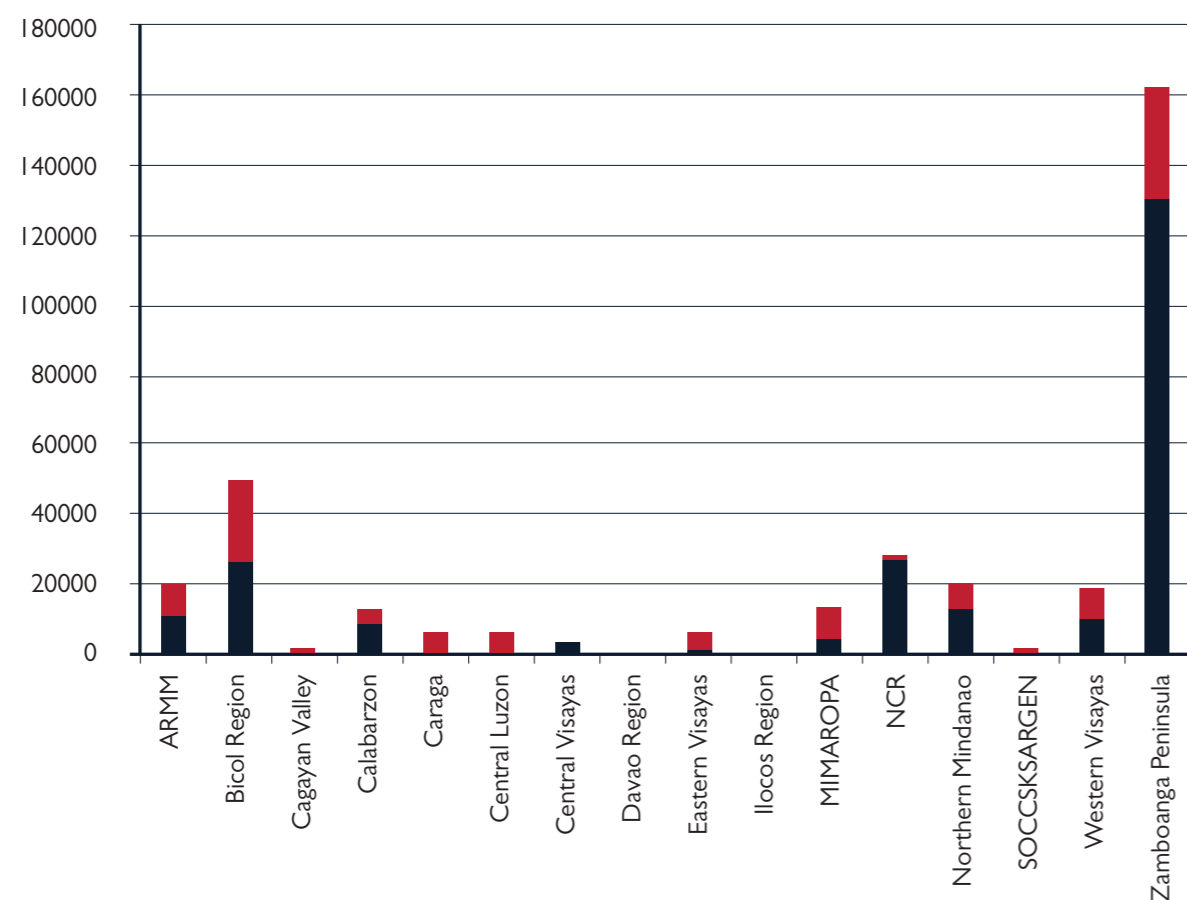


Figure 5. Average annual sardines production by region, 2002-2018
Source: Philippine Statistics Authority



Commercial

In the commercial sector, sardines are mainly caught by purse seine, ringnet and bagnet. There are about 1,856 commercial boats for small pelagics, of which 68% are ringnet, 19% purse seines and 13 bagnets (FeLIS, 2018, Table below).

Table 1. Registered commercial fishing boats for small pelagics, 2018

Regions	Bag Net	Ring Net	Sardine / Mackerel Scad Purse Seine	Grand Total
REGION 1	1	4	0	5
REGION 2	0	73	0	73
REGION 3	0	42	14	56
REGION 4-A	49	206	18	273
REGION 4-B	45	94	0	139
REGION 5	17	195	11	223
REGION 6	1	31	16	48
REGION 7	0	110	43	153
REGION 8	2	105	1	108
REGION 9	39	79	87	205
REGION 10	40	70	2	112
REGION 11	15	68	0	83
REGION 12	0	154	105	259
CARAGA	21	22	0	43
NCR	2	14	60	76
Grand Total	232	1267	357	1856

Source: FeLIS, 2018

Bali sardines compose the second largest percentage of total commercial production at 20.5%, next to skipjack with 24.2% total production in 2018 (Figure 6). Two major species were recorded by the Philippine Statistics Authority, Bali Sardines or *Sardinella lemuru* formerly known as Indian Sardines and Goldstripe Sardinella, or *Sardinella gibbosa* formerly known as Fimbriated Sardines

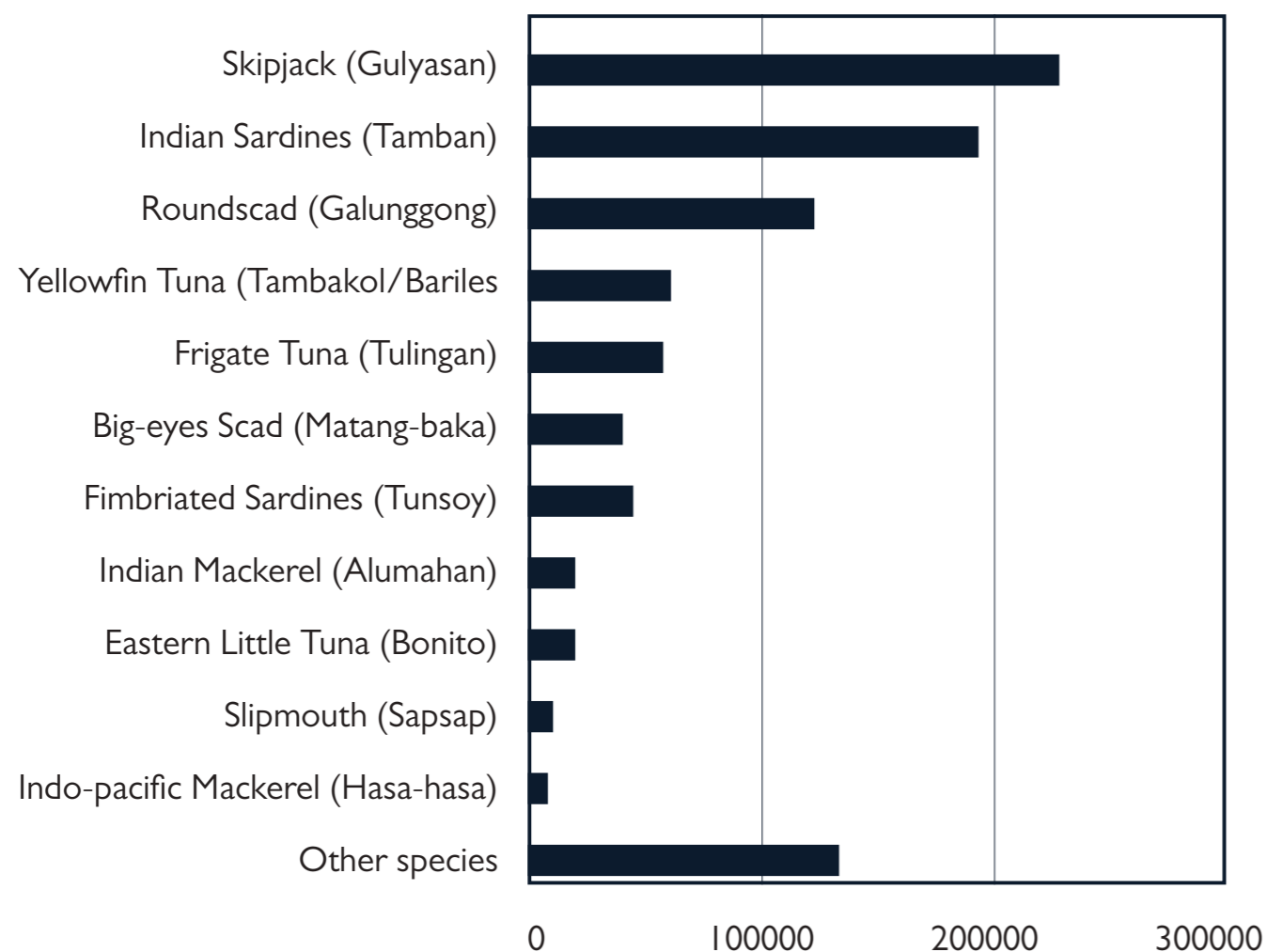


Figure 6. Commercial Fisheries Production, by major species 2018
Source: Philippine Statistics Authority

It should be noted however that data from the canneries in Region 9 shows that in 2016, the required volume for production of *S. lemuru* for canned sardines is 390,000 metric tons versus PSA data of 205,986 metric tons national production of *S. lemuru* in the same year. While NSAP data estimates in 2016 for purse seine catch is 354,367 metric tons of *S. lemuru*. The issue on the discrepancy of collected data by both the DA-BFAR and PSA is intended to be addressed by this plan.

Municipal

In the municipal fisheries sector, sardines are mainly caught by encircling and drift gill nets, small ring net, bag net and fish corral. There are a total of 192,351 municipal boats registered. Region 7, 6 and MIMAROPA have the greatest number of registered boats in 2016.

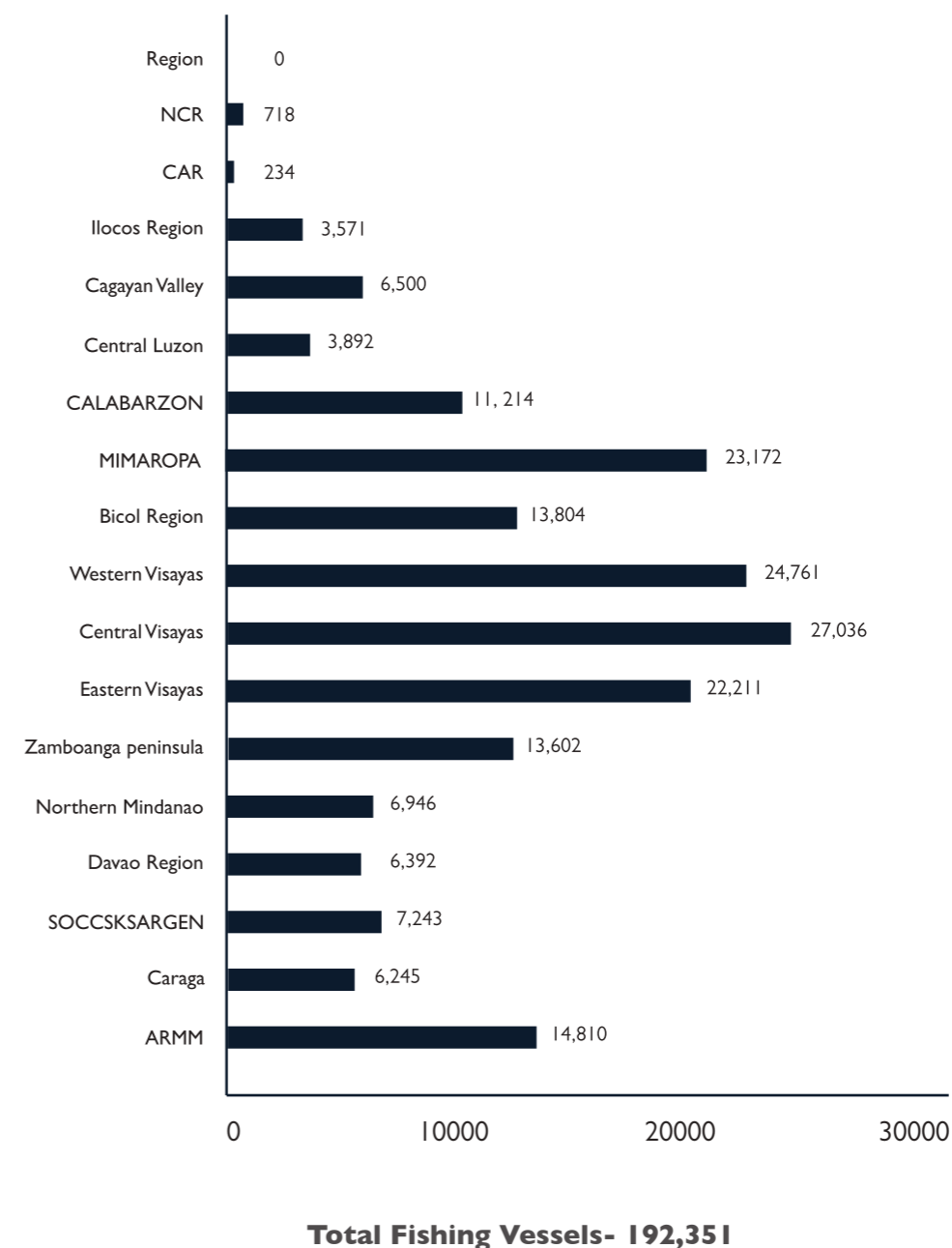


Figure 7. Number of Registered Municipal Fishing Boats, by region in 2016
Source: BFAR Fisherfolk Registration

In municipal waters, sardines comprise 11% of the total production in 2018⁴. Figure 8 shows the production trend of *S. lemuru*⁵ and *S. gibbosa* for 10 years. It can be observed that in 2018, there was an increase in production of *S. gibbosa*.

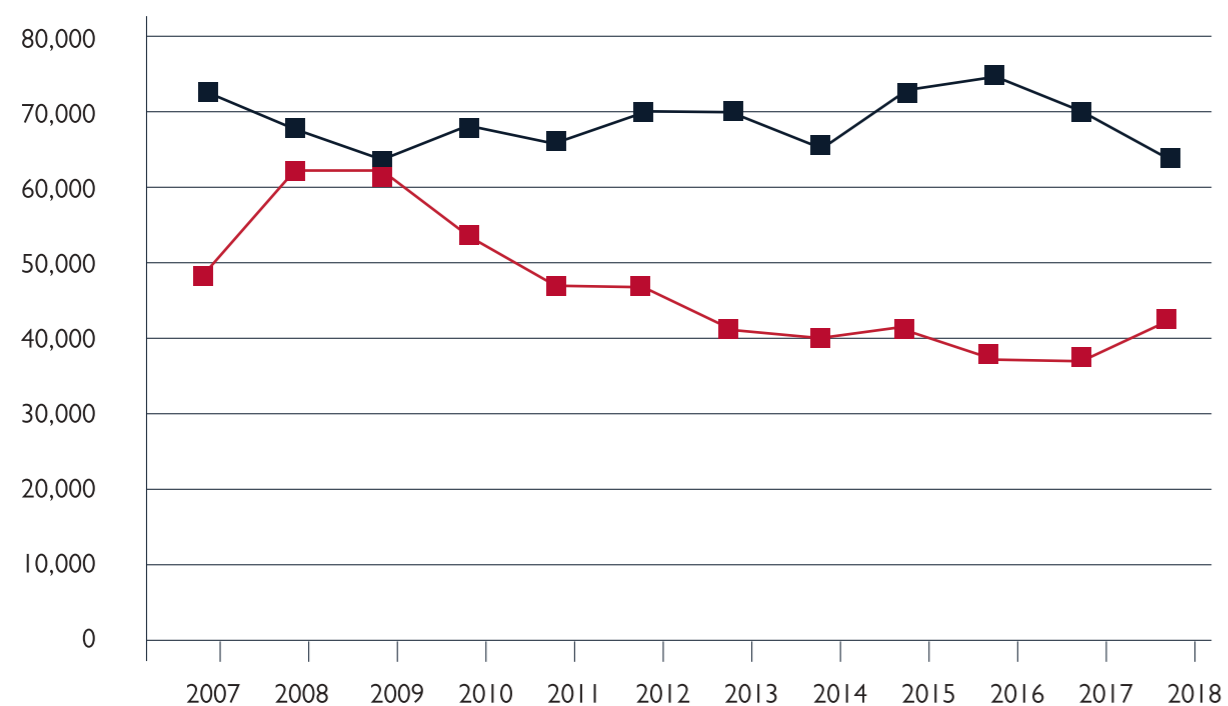
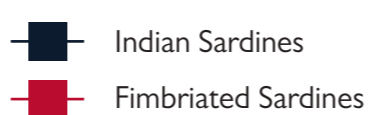


Figure 8. Municipal Production of Sardines for 11 years (2007-2018)
Source: Philippine Statistics Authority



Socio-economic Setting

The table below provides estimates of the number of fishers engaging in each commercial fishing gear/method that targets small-pelagic species, including sardines.

Regions	Bagnet	Ring net	Purse Seine (30)	Bag net
REGION 1	8	80	0	88
REGION 2	0	1460	0	1460
REGION 3	0	840	420	1260
REGION 4-A	392	4120	540	5052
REGION 4-B	360	1880	0	2240
REGION 5	136	3900	330	4366
REGION 6	8	620	480	1108
REGION 7	0	2200	1290	3490
REGION 8	16	2100	30	2146
REGION 9	312	1580	2610	4502
REGION 10	320	1400	60	1780
REGION 11	120	1360	0	1480
REGION 12	0	3080	3150	6230
CARAGA	168	440	0	608
NCR	16	280	1800	2096
Grand Total	1864	25360	10740	37964

Table 2. Estimated Number of Commercial Fishing Crew per Major Fishing Gear for Small-Pelagics (numbers in parentheses refer to the estimated crew per boat)
Source: FeLIS and NSAP

⁴ Philippine Statistics Authority 2018

⁵ *Sardinella lemuru* is misidentified and labeled as *Sardinella longiceps* in the Philippines by the Philippine Statistics Authority and old references from the Bureau of Agricultural Statistics

The benefits of the sardine industry in the country is extended up to the sardine value-added products. In Zamboanga Del Norte and Zamboanga Del Sur, data from AC Nielsen Survey shows that there is an increasing trend in the number of workers in Sardines Cannery and Bottled Sardines. An increase of 94% in the number of workers has been observed from 2008 to 2015 for cannery and 17% for bottled sardines.

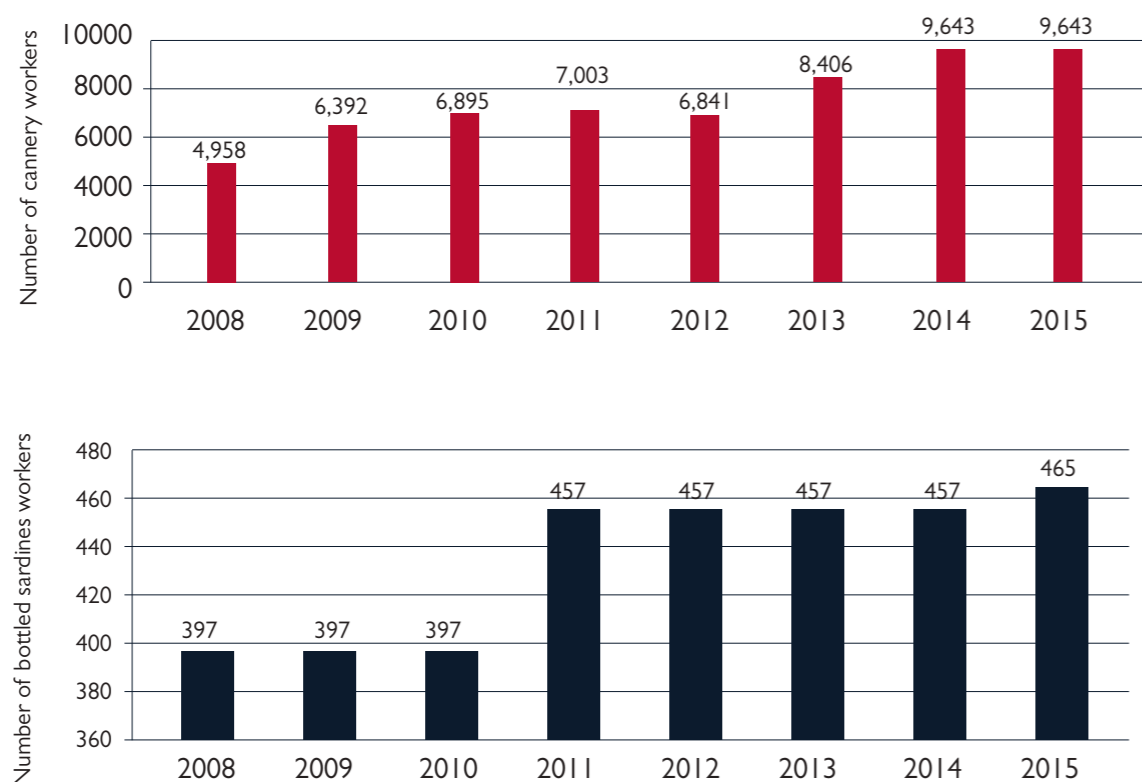


Figure 9. Trends in Total Number of Workers in Sardines Cannery and Bottled Sardines (Zamboanga del Norte and Zamboanga del Sur)
Source: AC Nielsen Survey

The sardine industry in Zamboanga provides employment opportunities for fishers, traders and processors (i.e. various workers from canned, bottled sardines, can production, and fishing crew). Table 3 shows the average annual gross income of each sector from 2008 to 2010 and 2012 to 2015.

INDUSTRY WORKERS	AVERAGE ANNUAL GROSS INCOME PHP	
	C.Y. 2008-2010	C.Y. 2012-2015
Canning	64,870.70	57,116.18
Bottled sardines	45,287.33	43,488.11
Can production	68,834.83	65,246.67
Fishing crew	40,136.50	61,598.10

Table 3. Average Annual Gross Income of Sardine Industry and Allied Industry Workers
Source: AC Nielsen Survey, 2008-2015

Existing Policies

The Bureau of Fisheries and Aquatic Resources is undertaking management measures to sustainably manage the sardine industry in the country. This Plan aims to provide measures to strengthen the implementation of existing policies.

Republic Acts (RA)
The Amended Fisheries Code (RA 10654)

The RA 8550 was amended to put emphasis on the act to prevent, deter and eliminate illegal, unreported and unregulated fishing. Accordingly, it is the policy of the State to achieve food security as the overriding consideration in the utilization, management, development, conservation and protection of fishery resources in order to provide the food needs of the population. A flexible policy towards the attainment of food security shall be adopted in response to changes in demographic trends for fish, emerging trends in the trade of fish and other aquatic products in domestic and international markets, and the law of supply and demand.

Sections with specific concerns on sardines are:

Harvest Control Rule. This refers to actions or set of actions to be taken to achieve a medium- or long-term target reference point while avoiding reaching or breaching a limit reference point. (Section 4(54) of RA No. 10654).

Vessel Monitoring System (VMS). Refers to a satellite-based system used to track and monitor the position, course and speed of the vessel at any given time for the purpose of management of fishing effort and fisheries resources and for traceability. (Rule 4.1(s) of the IRR of RA No. 10654).

Compliance with Vessel Monitoring Measures. – Pertains to municipal, commercial or distant water fishing vessel that engage in fishing activity to comply with the vessel monitoring measures. It also provides for the penalties for non-compliance as well as tampering with, switch of or disable the vessel monitoring system. (Sec. 119 of RA No. 10654)

Registration and Licensing of Fishing Gears. Before a commercial fishing holding a commercial fishing vessel license may begin fishing operations in Philippine waters, the fishing gear it will utilize in fishing shall be registered and a license granted therefore. (Section 29 of RA No. 10654).

Requirement for a Catch Documentation. Refers to the reportorial requirement for each commercial fishing vessel to keep a daily record of fish catch and spoilage, landing points, and quantity and value of fish caught, and off-loaded for its transshipment, sale and/or other disposal. (Section 38 of RA No. 10654)

The Wildlife Conservation and Protection Act of 2001 (RA 9147)

It shall be the policy of the State to conserve the country's wildlife resources and their habitats for sustainability. In the pursuit of this policy, this Act shall have the following objectives:

- (1) conserve and protect wildlife species and their habitats to promote ecological balance and enhance biological diversity;
- (2) regulate the collection and trade of wildlife;
- (3) pursue, with due regard to the national interest, the Philippine commitment to international conventions, protection of wildlife and their habitats; and
- (4) initiate or support scientific studies on the conservation of biological diversity.

Agriculture and Fisheries Modernization Act (AFMA) (RA 8435)

The establishment of an act empowering the agricultural and fisheries sector to develop and sustain themselves. Through this, the following objectives are aimed to be achieved:

- (1) modernize the agriculture and fisheries sectors by transforming these sectors from a resource-based to a technology-based industry;
- (2) enhance profits and incomes in the agriculture and fisheries sectors, particularly the small farmers and fisherfolk, by ensuring equitable access to assets, resources and services, and promoting higher-value crops, value-added processing, agribusiness activities, and agro-industrialization;
- (3) ensure the accessibility, availability and stable supply of food to all at all times;
- (4) encourage horizontal and vertical integration, consolidation and expansion of agriculture and fisheries activities, group functions and other services through the organization of cooperatives, farmers' and fisherfolk's associations, corporations, nucleus estates, and consolidated farms and to enable these entities to benefit from economies of scale, afford them a stronger negotiating position, pursue more focused, efficient and appropriate research and development efforts and enable them to hire professional managers;
- (5) promote people empowerment by strengthening people's organizations, cooperatives and NGO's and by establishing and improving mechanisms and resources for their participation in government decision-making and implementation;
- (6) pursue a market-driven approach to enhance the comparative advantage of our agriculture and fisheries sectors in the world market;
- (7) induce the agriculture and fisheries sectors to ascend continuously the value-added ladder by subjecting their traditional or new products to further processing in order to minimize the marketing of raw, unfinished or unprocessed products;
- (8) adopt policies that will promote industry dispersal and rural industrialization by providing incentives to local and foreign investors to establish industries that have backward linkages to the country's agriculture and fisheries resource base;

(9) provide social and economic adjustment measures that increase productivity and improve market efficiency while ensuring the protection and preservation of the environment and equity for small farmers and fisherfolk; and (10) improve the quality of life of all sectors.

Local Government Code (LGC) (RA 7160)

Enforcement of Fishery laws in Municipal waters including the conservation of mangroves. Under RA 7160, the Sanggunian, as the legislative body of the local government unit, must approve ordinances and pass resolutions necessary for an efficient and effective local government, and in this connection shall protect the environment and impose appropriate penalties for acts which endanger the environment, such as dynamite fishing and other forms of destructive fishing, illegal logging and smuggling of logs, smuggling of natural resources products and of endangered species of flora and fauna, slash and burn farming, and such other activities which result in pollution, acceleration of eutrophication of rivers and lakes, or of ecological imbalance.

Fisheries Circular and Administrative Orders

Joint Administrative Order No. 1 s. 2011.

Establishing Closed Season for the Conservation of Sardines in East Sulu Sea, Basilan Strait, and Sibuguey Bay.

This Joint Administrative Order by the DA-BFAR and DILG promulgates the conservation of sardines in the portion of the East Sulu Sea, Basilan Strait and Sibuguey Bay, also known as the conservation area of about 4,078 square nautical miles or 13,978.15 square kilometers encompassing the western municipal/national waters of Zamboanga Del Norte, the waters bordering south and eastern waters of Zamboanga City and southern portion of Zamboanga Sibugay.

BFAR Administrative Circular No. 255 s. 2014. Establishing Closed Season for the Conservation of Sardines in East Sulu Sea, Basilan Strait, and Sibuguey Bay.

Memorandum Circular 2018-59. Policies and Guidelines on the Regulation and Monitoring of Fishery Activities in Municipal Waters

Fisheries Administrative Order No. 155. Regulating the use of fine-meshed nets in fishing.

Fisheries Administrative Order No. 155-1. Amending Section 2 of Fisheries Administrative Order (FAO) No. 155, regulating the use of fine meshed nets in fishing.

Fisheries Administrative Order No. 167 (1-3). Establishing a closed season for the conservation of sardines and herrings and mackerels in the Visayan Sea.

Fisheries Administrative Order No. 198. Rules and Regulations on Commercial Fishing.

Fisheries Administrative Order No. 198-1. Amended Rules and Regulations on Registration and Licensing of Commercial Fishing Vessels, Fishing Gears and Fishworkers.

Fisheries Administrative Order No. 201. Ban of fishing with active gear. This management measure orders the ban of active gear fishing of in municipal waters, bays, and fishery management areas.

Fisheries Administrative Order No. 223/BFAR Circular No. 253-I Moratorium on the issuance of new Commercial Fishing Vessel and Gear License (CFVGL) as part of a precautionary approach to fisheries management. In order to maintain the current level of fishing effort in Philippine Waters, a one-year moratorium on the issuance of new licenses has been implemented by the Department through the Bureau.

Major Issues and Problems

During the Planning Workshop, the stakeholders identified issues related to sardine fishery. To help them focus on more important issues, an activity on prioritization was done using Risk Assessment Tool. The three (3) components of EAFM were used as categories for the issues. A risk analysis typically answers questions of risk, likelihood and impact.

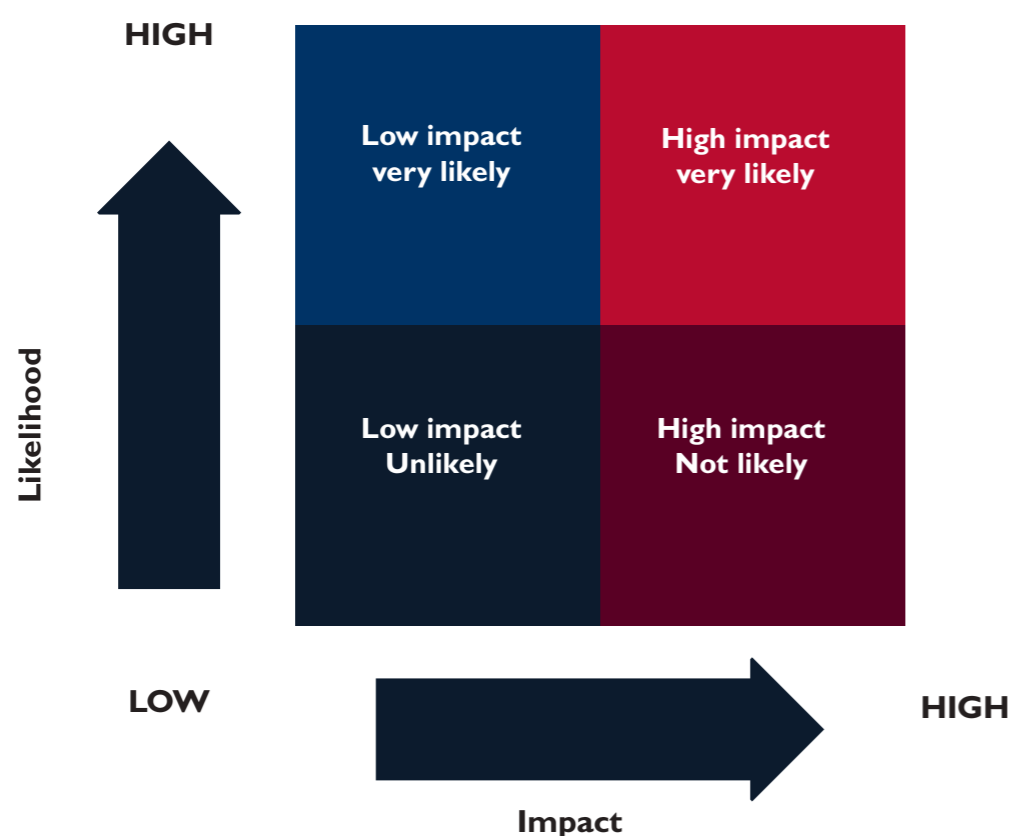


Figure 10 Semi-quantitative risk assessment. Likelihood is the probability of occurrence and impact is how change would occur

The following are the issues identified by the stakeholders which affect the productivity of the sardine fishery.

Fisheries / Ecological	<ul style="list-style-type: none"> • Increasing juvenile catch/ Catching of small size sardines • Inadequate science-based studies as to the actual presence of adults within municipal waters (stock assessment within municipal) –fish catch report, logsheets, location of fishing grounds should all be required from the commercial • Use of fine mesh nets and other unsustainable gears for sardines • Decreasing production/decreased productivity • Decreasing CPUE or catch rates • Need for more studies on the reproductive biology and ecology of sardines in various areas • The need for climate change impacts studies
Socio Economics / Human Well-being	<ul style="list-style-type: none"> • Post-harvest losses during peak season • Limited market for excess production during peak season • Inadequate livelihood programs for fishers affected by management measures including closures and weather-related events • Low awareness on and compliance to fisheries policies related to sardine management • Lack of capacity to access financial credit programs
Governance	<ul style="list-style-type: none"> • Weak institutional capacity and mechanisms to implement national fisheries management programs • No proper delineation of municipal boundaries in some areas • Illegal fishing • Conflicting policies by the LGUs and National agencies • Limited commercial fishing areas of sardines • Manning requirement of MARINA • Lack of implementing rules/laws on catching of juveniles • Encroachment of commercial vessels in municipal waters • Need to improve implementation of (RA 9003) of solid waste and other forms of pollution management • Weak IEC • Too much political interventions • Conflict of interest

Goals

The major issues and problems faced in Sardine Fisheries are categorized into three issue clusters, namely:

Fisheries / Ecological
Socio-Economics
Governance

The stakeholders developed three goals in response to these issue clusters. These long-term goals are what needs to be achieved so that the overall vision set for sardine industry becomes a reality.

Goal 1: Improved Science-based indicators for the sustainability of sardine stocks
Goal 2: Improved distribution of benefits among sardine fisherfolk communities
Goal 3: Strengthened science-based management for sustainable sardine fisheries

Objectives, Indicators and Benchmarks

Guided by the high priority issues identified, objectives under each of the four goals are defined. These objectives state what will be achieved by management actions within a certain time period.

GOAL 1 Improved Science-based indicators for the sustainability of sardine stocks	Objective 1: Establish B-based or F-based reference points for 3 top sardine species by 2023 Objective 2: Reduce proportion of juveniles in the landed catch by 10% in 5 years
GOAL 2 Improved distribution of benefits among sardine fisherfolk communities	Objective 1: Reduce post-harvest losses by 10% by 2022 in all sardine fishery communities Objective 2: Reduce poverty incidence of sardines fisherfolk by 5% by 2022 Objective 3: Increase awareness in policies to 100% of the Sardines Stakeholders by 2022 Objective 4: Increase income by 10% annually of the 10% of the poor ⁶ sardine fisherfolk families through alternative livelihoods by 2022
GOAL 3 Strengthened science-based management for sustainable sardine fisheries	Objective 1: Ensure compliance to the set catch /effort limit according to at least 3 LRP/TRP for 5 sardine fishing areas by 2022 Objective 2: Reduce juvenile catch by 10% Objective 3: Establish a platform among institutions on data collection by 2020 Objective 4: Develop and deploy a single, accessible sardine fishery information by 2020 Objective 5: By 2020, all sardine fishing areas have adopted and implemented the National Sardine Management Plan in 5 priority sardine fishing areas Objective 6: Increase compliance of LGUs on implementation of sardine fishery-related laws and policies Objective 7: Establish an e-CDTS for sardines in 5 priority sardine fishing areas by 2023 Objective 8: Implement a program on seal of good governance on fisheries management for all LGUs in the 5 priority sardine fishing areas by 2023

⁶ as defined by the National Economic Development Authority

Benchmarks and Indicators

Sardine stakeholders also decide whether the objectives are being achieved. This is done through setting indicators and benchmarks to measure management performance to determine whether management is meeting the objectives.

An indicator measures the current status at one point in time (e.g. length of fish, volume of production, % increase or decrease, etc); while a benchmark describes the target (where you want to go), the baseline (where you came from), and the limit (where you don't want to be. Comparing the indicator with an agreed benchmark (a target, baseline, or limit) provides a measure of how well management is performing.



Photo courtesy of BFAR-IPRG

Management Actions, Benchmarks, Implementation and Monitoring

Goal 1 (Ecological):

Improved Science-based indicators for the sustainability of sardine stocks

Goal 2 (Human Well-being):

Improved distribution of benefits among sardine fisherfolk communities

Goal 3 (Governance):

Strengthened science-based management for sustainable sardine fisheries



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for USAID/ Philippines

Goal I
Ecological

Improved Science-based indicators for the
sustainability of sardine stocks

Objective 1

To establish F-based or biomass B-based reference points for 3 top sardine species by 2023

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(1) To establish and endorse at least 1 Reference Point by FMA annually as basis for setting up harvest control rules	(a) Review and validation of the proposed RPs/ Conduct of SAG workshop	BFAR RFOs/NSAP, NFRDI, BFAR CO Respective SAG per FMA	2nd Quarter 2020	Technical report on RPs per FMA for the 3 major species	RPs are established as basis in the formulation of HCR
	(b) Endorse validated RPs	BFAR RFOs/NSAP, NFRDI Respective SAG per FMA	2nd Quarter 2020	Memorandum endorsing RPs to BFAR CO and respective FMAMBs	RPs are established as basis in the formulation of HCR
(2) Improve and scaling up of RPs	(a) Capacity building: Trainers' Training	BFAR RFOs/NSAP, NFRDI	2020-2021	Training reports	Capacitated NSAP personnel
	(b) Repro-bio and SPR training	BFAR RFOs/NSAP, NFRDI	2021	Training reports	Capacitated NSAP personnel
	(c) Standardization of CPUE	BFAR RFOs/NSAP, NFRDI	2021	Training reports	Capacitated NSAP personnel

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of technical reports	0	1/FMA	BFAR RFOs/NSAP	Annually BFAR and NFRDI		1,500,000
Number of memos endorsed	0	1/FMA	BFAR RFOs/NSAP	Annually BFAR and NFRDI		
Number of training report	0	2	BFAR RFOs/NSAP	Annually BFAR and NFRDI		1,000,000
Number of training report	0	2/FMA	BFAR RFOs/NSAP	Annually BFAR and NFRDI		1,200,000
Number of training report	0	2/FMA	BFAR RFOs/NSAP	Annually BFAR and NFRDI		1,000,000

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(2) Improve and scaling up of RPs	(d) Workshops on RPs with experts	BFAR RFOs/NSAP, NFRDI	2021	Workshop reports	Capacitated NSAP personnel
	(e) Training on the conduct of boat and gear inventory	BFAR RFOs/NSAP, NFRDI, BFAR CO	2021	Training reports	Capacitated NSAP personnel
	(f) Continuous conduct of repro-bio	BFAR RFOs/NSAP, NFRDI	2020 onwards	Annual Technical Report	Estimated SPRs, spawning pattern, seasonality as bases for regulations
	(g) Conduct of boat and gear inventory	BFAR RFOs/NSAP	2020-2021	Annual Technical Report	computed MSYs by 2023
	(h) Engage academe, DOST, other NGAs, NGOs, CSOs in research studies	NFRDI, BFAR RFOs/NSAP	2020	Signed MOA/ MOU	Established linkage w/ other NGAs, CSOs, Academes

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of training report	0	2/FMA	BFAR RFOs/NSAP	Annually BFAR and NFRDI		700,000
Number of technical reports	0	2/FMA	BFAR RFOs/NSAP	Annually BFAR and NFRDI		600,000
Number of Study	0	1/FMA	BFAR RFOs/NSAP	Annually BFAR and NFRDI		4,000,000
Number of Inventory/Study	0	1/FMA	BFAR RFOs/NSAP	Annually BFAR and NFRDI		6,400,000
Number of MOUs/ MOAs	1	2/FMA	BFAR	Annually BFAR and NFRDI		1,000,000

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
	(i) Conduct study on: <ul style="list-style-type: none"> • Oceanographic surveys • Larvae distribution • Otolith • Trophic Analysis/ Impact on other species 	NFRDI, SUCs, MV DA-BFAR	2021-2023	Technical Report/ Paper	Input to policy
(3) Determine the F-based or B-based MSY as RP	(a) Review NSAP methodologies and assessment tools	NFRDI	2020 and 2022	Workshop Report	Improved and standardized assessment methodologies
	(b) Capacity building on improved stock assessment	NFRDI	2020 and 2022	Training Report	Improved stock assessment
	(c) Workshop to come up with F-based and B-based RPs 3 major sardine species	NFRDI, BFAR RFOs	2021-2022	Workshop Report	Estimates of B-based and F-based RPs for 3 sardine species in 5 FMAs
	(d) Inventory of available scientific information	NFRDI, BFAR RFOs	Continuing	Inventory List	Gaps identified
	(e) Creation of Science Group	DA-BFAR, NFRDI, Academe	2020	Fisheries Office Order	Gaps identified

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of technical paper/ reports	0	1/FMA	BFAR RFOs/NSAP	Annually BFAR and NFRDI		10 M
Number of Workshop Report	0	1	NFRDI	Annually BFAR and NFRDI		400,000
Number of Training Report	0	1	BFAR RFOs/NSAP	BFAR and NFRDI		600,000
Number of Workshop Report	0	1/FMA	BFAR RFOs/NSAP	BFAR and NFRDI		400,000
Number of Inventory	0	1/FMA	BFAR RFOs/NSAP	BFAR and NFRDI		1,200,000
Number of SAG established	0	1/FMA	BFAR	BFAR		1,000,000

Objective 2

Reduces catches of Juvenile sardines to 20%

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(1) Determine seasonal and spatial distribution of juveniles	(a) Conduct of Migration (Stock distribution at different stages) study	BFAR RFOs, Academe, Stakeholders	2021	Migration Study Report	Input to policy
(2) Determine efficiency of gears	(a) Conduct study on gear efficiency for juvenile sardines (from NSAP data)	BFAR RFOs/NSAP	2021	Technical Report	Input to policy

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of Study Report/Technical Paper	0	1/FMA	BFAR RFOs/NSAP	Annually BFAR and NFRDI		See objective 1 mgt action
Number of reports	0	1/FMA	NSAP data	Annually BFAR and NFRDI		500,000



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Goal 2

Human Well-being

Improved distribution of benefits among sardine
fisherfolk communities

Objective 1:

Reduce catch of Juvenile sardines to 20%

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(1) Establishment and Upgrading of post-harvest facilities & structure (operation & maintenance) Cold storage Ice plant Ice-making machines	(a) Inventory of existing facilities	BFAR PHTD/FPSSD PFDA/LGUs	2021	Inventory report	Guidelines on the establishment and use of CFLCs
	(b) Conduct cost-benefit analysis on the establishment and upgrading of post-harvest facilities and structure	BFAR PHTD/FPSSD PFDA/LGUs	2021	Cost benefit analysis	Guidelines on the establishment and use of CFLCs
	(c) Upgrading and establishment	BFAR, PFDA LGUs	2022		Upgraded and/or established post-harvest facilities
(2) Product development and value adding	(a) Conduct value chain analysis on sardines	Academe (UPV) DA-BAR, DTI, Academe	2021	Value chain Analysis	
	(b) Training program on handling and product development and value adding & packaging	BFAR PHTD/ RFTFCD RFOs DA-BAR, DTI, Academe	2021	Training Report	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Percentage of losses	Updated SOFIA 2018: 37%	Reduced by 10% from the baseline	Fish catch report: NSAP/Fishers/ Industry/ Commercial/ Municipal operators	Annual BFAR		Plan presented to RDC/NEDA
Number of Cost Benefit Analysis Report	0	1	BFAR	Annual BFAR		
Number of facilities/equipment upgraded Number of facilities/equipment established	0	1 /region	BFAR	Annual BFAR		
Number of value chain report	0	1	BFAR	Annual BFAR		
Number of training report	0	5/region	BFAR	Annual BFAR		

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(3) Enhance marketing development and linkage	(a) Conduct of capacity building for MSME for sardines	BFAR PHTD/FPSSD PFDA/LGUs	2021	Training Report	
	(b) Market matching	BFAR FIDSSD	2021	Successful market matching	
	(c) Conduct of exhibits and trade fairs	BFAR FIDSSD	2022	Exhibits and trade fairs	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of training report	0	5/region	BFARs	Annual BFAR		
Number of market matching conducted	0		BFAR	Annual BFAR		
Number of exhibits and trade fairs hosted	0		BFAR	Annual BFAR		

Objective 2:

Reduce poverty incidence of sardine fisherfolk by 5% by 2022

Objective 4:

Increase income by 10% annually of the 10% of the poor* sardine fisherfolk families through alternative livelihoods by 2022

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(1) Support to the provision of alternative/ diversified livelihood programs and social enterprise	(a) Creation of convergence among NGAs, Private Partners, LGUs using existing mechanisms (RDC and PESO)	BFAR PHTD/FPSSD PFDA/LGUs	2021	Established convergence and cooperation with NGAs and Private Sector through a MOA	Increased economic activity
	(b) Provide access to financing institutions	BFAR FDISSD	2021	List of POs assisted Project Proposal	
	(c) Capacity building and Technical assistance	BFAR FDISSD	2022	Capacitated fisherfolk Training report	
	(d) Assessment of feasible enterprise	BFAR FDISSD	2021	List of feasible enterprise	
	(e) Piloting of identified feasible enterprise	BFAR FDISSD	2021	Pilot enterprise/ livelihood	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
No. of MOA executed	0	1/FMA	Report and interview done by PSA and DSWD	Annual BFAR	Perceived: Uplifted standard of living of Sardine fisherfolks	1,000,000
# POs assisted/ linked w/ financing institutions # Projects Implemented	0	3/ Region	BFAR	Annual BFAR		1,000,000
Number of fisherfolk capacitated Number of livelihood trainings conducted		200 fishers/ Region	BFAR	Annual BFAR		1,000,000
Number of feasible enterprise		5/ Region	BFAR	Annual BFAR		600,000
Number of pilot enterprise Increased in income	300 pesos per family per day	500 pesos per family per day	BFAR	Annual BFAR		3,600,000

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(2) Determine Impact of Closed Seasons and other Fishery Management Measures	(a) Conduct Baseline			Baseline report	Input to adaptive management
	(b) Impact Assessment			Assessment report	
	(c) Conduct economic valuation study/ determine resource rent			Technical Report	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of baseline report	0	I/FMA	Reports Interview TESDA/BFAR/DTI/DA/LGU/Academe	3 years BFAR		900,000
Number of assessment report	0	I/FMA	List of existing and new alternative livelihoods and estimated income from these of men and women	3 years BFAR		900,000
Number of report	0	I/FMA or Sub-FMA	LGUs revenue from fisheries, tourism/	3 years BFAR		
Employment Rates in fisheries and non fisheries livelihoods among sardines fishing and fishery-dependent households	To be determined	Increase by 10%	Number of employed (and unemployed) full-time/part-time men and women in fishery-related livelihoods over time	BFAR		

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(3) Support to the provision of Job opportunities during closed season (i.e.CSR initiative for canning factories in Zamboanga	(a) Capacity building and Technical assistance	SOPHIL, DOLE BFAR RFO 9	2020-2025	Capacitated fisherfolk Training report	Increased economic activity
	(b) Assessment of feasible enterprise	SOPHIL, DOLE	2020-2025	List of feasible enterprise	
	(c) Implementation of enterprise	BFAR RFO	2020-2025	Implemented project/enterprise	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of fisherfolk capacitated Number of livelihood trainings conducted		200 fishers/Region	BFAR 9/SOPHIL	Annually BFAR RFO 9		1,000,000
Number of feasible enterprise		5/Region	BFAR 9/SOPHIL	Annually BFAR RFO 9		600,000
Number of implemented enterprise			BFAR 9/SOPHIL	Annually BFAR RFO 9		

Objective 3:

Increase awareness in policies to 100% of the sardines stakeholders by 2022

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(1) To establish baseline on awareness	(a) Workshop to develop survey framework and tools	BFAR FPED Academe	2020	Workshop Report and Survey Framework	Input to adaptive management
	(b) Conduct of surveys, KI, FGDs • Baseline • Data Validation	BFAR RFO	2020 and 2022	Survey Report	
	(c) Assessment on the awareness level of sardine stakeholders	BFAR RFO	2023	Survey Report	
(2) Implement NSMF communication plan	(a) Revive "Lana Sardinas" campaign/ Develop sardines campaign materials	BFAR RFO, FMAMB Industry	2020-2022		Increased Awareness
	(b) Develop/update AVPs on sardines	BFAR IFCU	2020	AVP	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of Workshop Report	0	1	BFAR	BFAR		400,000
Number of Technical Paper/ Report	0	1	BFAR	Every 3 years BFAR		Included in the socio-econ baselining 500,000
% Increase in Level of Awareness	40% (Zamboanga Peninsula Area) To be determined in other FAs	100% in all areas	Studies results, KI, FGD, survey, primary data/survey	After 3 Years Academe/ Research Institutions		Included in the socio-econ impact assessment 500,000
% Increase in Level of Awareness			BFAR	Annually BFAR		2 M
			BFAR	Annually BFAR		

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(2) Implement NSMF communication plan	(c) Promote the “save the sardines” video	BFAR IFCU	2020		Increased Awareness
	(d) TV guestings	BFAR RFOs, FMAMB	2020		
	(e) Generation and distribution of IEC in local dialects (i.e. comics, posters, coloring book)	BFAR IFCU	2020		
	(f) Develop social media campaign	BFAR IFCU	2020		
	(g) Document success stories on sardines	BFAR IFCU, BFAR RFOs	2020		

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
			BFAR	Annually BFAR		
			BFAR	Annually BFAR		
			BFAR	Annually BFAR		
			BFAR	Annually BFAR		
			BFAR	Annually BFAR		



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Goal 3

Governance

Strengthened science-based management for
sustainable sardine fisheries

Objective 1:

To set the Harvest Control Rules based on determined Reference Point of the 3 major species for 5 sardine fishery Managed Areas by 2023

Objective 2:

Reduce juvenile catch to 20%

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
<p>(1) Issuance of Fisheries Administrative Orders Based on RPs per FMA, to include the following guidelines:</p> <p>I. HCRs to achieve TRPs</p> <p>A. When the RPs exceed the TRP:</p> <p>i. Optimize catch/capacity/efforts</p> <p>ii. Maintain management regime</p> <p>B. When RP is within the value of TRP:</p> <p>i. Maintain catch/capacity/efforts</p> <p>ii. Maintain management regime</p> <p>C. When RP is within the value of trigger RP:</p> <p>i. Reduce or maintain capacity/efforts through:</p> <ul style="list-style-type: none"> Moratorium on the issuance of new CFV license Cancellation of license of inactive CFVs and those without renewal for more than 3 consecutive years Regulation of gears that catch juveniles; Establishment of MPAs <p>D. When RP has breached LRP:</p> <p>i. Refer to rule 8.2 of RA 10654</p> <p>ii. Market rules and mechanisms</p> <p>iii. All of the C measures</p>	(a) Adopting the reference points and harvest control rules	BFAR	2021, 2022, 2023	AVP	Implementation of science based regulations
	(b) Drafting of FAO	FMA TWG and Secretariat	2021, 2022, 2023		
	(c) FMA-wide Consultation	FMA MB	2021, 2022, 2023		
	(d) Presentation to NFARMC and Approval of FAO	FMA MBs	2021, 2022, 2023		
	(e) Updating of MFOs and adoption	LGUs	2021, 2022, 2023	Municipal Fisheries Ordinance	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of MB resolutions adopted		2 in 2021 2 in 2022 1 in 2023	BFAR FMA MB	Annually BFAR		120,000 120,000 60,000
Number of draft FAOs		2 in 2021 2 in 2022 1 in 2023	BFAR FMA MB	Annually BFAR		120,000 120,000 60,000
Number of revised FAOs		2 in 2021 2 in 2022 1 in 2023	BFAR FMA MB	Annually BFAR		800,000 800,000 400,000
Number of Approved FAO on Reference points adopted		Target: Moratorium on current effort for commercial 2 in 2021 2 in 2022 1 in 2023	Inventory of fishing boats/ NSAP sampling framework NFRDI/ BFAR-RFO	Inventory- Every 3 years BFAR		60,000 60,000 30,000
Number of LGUs adopting FAOs		20% of LGUs annually	BFAR FMA MB	Semi-Annually BFAR/MB		200,000

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(2) Determine support to both fisherfolks and fishing boat operators to be impacted by management measures, including any reduction in fishing capacity that may be required as a result.	(a) Meeting with Stakeholders/ consensus building	BFAR	2020	Agreement between BFAR and sardine industry	Gain support from the industry to implement management measures Increased compliance
	(b) Prepare project proposal	BFAR	2020	Project Proposal with funding	
	(c) Implement project/ provision of support	BFAR	2020	Implementation report	
(3) Adopt Policies that will reduce juvenile sardines catch	(a) Adopting the reference points		2021		
	(b) Drafting of FAO	BFAR	2020-2021	Draft Fisheries Administrative Order	
	(c) Conduct of National Consultation	BFAR	2021	Consultation Reports	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of fisherfolk supported	0		BFAR	Annually BFAR		
	0		BFAR	Annually BFAR		
	0		BFAR	Annually BFAR		
			BFAR FMA MB	Annually BFAR		
Number of draft FAO	0	1	BFAR FMA MB	Annually BFAR		
Number of Consultation Report	0	4	BFAR FMA MB	Annually BFAR		

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(3) Adopt policies that will reduce juvenile sardines catch	(d) Approval of FAO	BFAR	2021	Approved Fisheries Administrative Order	Increased Compliance
	(e) Updating of MFOs and adoption	LGUs, BFAR RFOs	2021	Updated MFOs based on the new National Regulations on juvenile sardines	
	(f) Regular patrolling	BFAR RFOs	2020-2025	Seaborn Operation Report	
	(g) Conduct market denial of juveniles	BFAR RFOs	2020-2025	Operations Report	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of FAO approved	0	1	BFAR FMA MB	BFAR		
Number of MFOs	0		BFAR FMA MB	BFAR		
Number of operations conducted			BFAR FMA MB	BFAR		Charged to FMRED
Number of operations conducted			Inventory of fishing boats/ NSAP sampling framework NFRDI/ BFAR-RFO	BFAR		Charged to FMRED

Objective 3:

To establish a platform among institutions on data collection by 2020

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(1) Conduct of production data harmonization/reconciliation	(a) Conduct of NSAP sardines catch estimation workshop and National Stakeholders' Workshop	BFAR CFDBFAR RFOs/NSAP	2020-2023	Workshop Report on Catch Estimates	Input to policy and as reference for other scientific researches
	(a) Conduct of multi-agency meeting	BFAR FPED PFDA Stakeholders Academe industry	2020	Meeting Report	Initial Agreement
(2) Institutionalize the multi-agency data collection group	(b) Preparation of MOA including system to collect data from LGUs, industry, processors	PSA/BFAR PFDA Industry LGUs	2020	Signed MOA/MOU	Agreement between NGAs, LGUs, Industry to harmonize data on fisheries

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Workshop Report	0	I	Minutes of Meeting TWG-Group Secretariat BFAR	Annually BFAR		600,000
Meeting Report	0	I	BFAR	Annually BFAR		100,000
MOA/MOU	0	I	BFAR	Annually BFAR		100,000

Objective 4:

Develop and deploy a unified, accessible sardine fishery information by 2020

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(1) Development of sardine information system	(a) Recruitment of IT personnel	BFAR FIMC	2021	Regular personal hired	Sardine database developed
	(b) Procurement of software and hardware	BFAR FIMC	2021	Operational and functional information system	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of personnel hired		2	BFAR	Annually BFAR		960,000/year
Number of operational information system established	0	1	Upon signing of MOU Operational and accessible online database system	PSA/BFAR/ Daily		2M

Objective 5:

Adopt and implement the NSMF in five sardine fishing areas by 2020

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(1) Institutionalize the NSMF Plan at FMA Level	(a) Orientation of BFAR RFOs on the approved Plan in all priority sardine FMAs	BFAR Focal Person on Sardines Program RFOs	1st Quarter 2020	FAO/JAO/MFO/ Ordinance/ Resolutions/ Programs	Increased awareness and compliance of RFOs and LGUs on NSMP
	(b) Conduct of IEC and Orientation on NSMP in the LGU level	BFAR RFOs, FMA MBs	1st Quarter 2020		
	(c) Creation of a National TWG on FMA implementation	BFAR CFD	1st Quarter 2020	Fisheries Office Order	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
% adoption/ implementation of the NSMP of sardine fishing areas	0%		BFAR / LGUs	Annually BFAR/DILG-LGUs	Every 3 years	900,000
No. of FAOs/JAOs approved No. of LGU ordinances implemented No. of LGUs adopting No. of LGUs implementing	0	100% adoption and implementation of NSMP by 5 priority sardine fishing areas	Upon signing of MOU Operational and accessible online database system	PSA/BFAR/ Daily		
			BFAR RFOS	BFAR		Refer to Goal 2, obj.
Approved FOO			BFAR	BFAR	On process/ FOO for approval	

Objective 6:

To improve effectiveness and increase compliance of implementation of sardine fishery-related laws and policies

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(1) Strengthen MCS activities	(a) Conduct capacity building and training programs for BFAR and LGU enforcement units	BFAR/LGUs	2020 onwards	Capacity building/ trainings conducted	Enhanced capacity of enforcers
	(b) IEC / Orientation on laws and policies				increased compliance
(2) Periodic Review and Evaluation of fisheries – related laws and policies (i.e. Manning requirements of MARINA; Sec. 25.1 of Amended Fisheries Code;	(c) Procurement of additional, operational patrol boats		2020 onwards	Patrol boats procured	
	(a) Create TWG to review laws and policies	BFAR Legal, and other concerned agencies; Industry	2020	Approved Fisheries Office Order	Improved policy regulations

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of trainings conducted		100% adoption and implementation of NSMP by 5 priority sardine fishing areas	BFAR	Annually BFAR	Every 3 years	3.6 M per year
		3/region				1.2 M
Number of patrol boats procured		5/region (excluding CAR)	BFAR	BFAR		
Approved FOO		1	BFAR NSAGE	Annual BFAR		100,000

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(2) Periodic Review and Evaluation of fisheries – related laws and policies (i.e. Manning requirements of MARINA; Sec. 25.1 of Amended Fisheries Code;	(b) Review Session		2020 onwards	Evaluation Report	
	(c) Conduct of Consultations	BFAR, NGAs, i.e. MARINA	2020-2021	Consultation Report	
	(d) Issuance of Policy Recommendations		2021 onwards	Policy recommendations	
	(a) Formulate FAO	VMS Unit/NMFDC	2020-2021	draft FAO	Reduced IUUF
(3) Implement VMS	(c) Implementation		2021	VMS installed	

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of policies reviewed		2	BFAR NSAGE	Bi-Annual		200,000
Number of Consultation Report	0	1	BFAR	Annual BFAR		300,000
Number of policies recommended		Within 6 months from the receipt of policy recommendations	BFAR BFAR RFOs	Bi-annual		200,000
Draft FAO	0	1	BFAR	Annual BFAR		c/o IMEMS
Number of boats with installed VMS/VMM	0	100% in 3 years	BFAR Industry	BFAR		c/o IMEMS

Objective 7:

Establish CDS and E-CDTS for sardines in 5 priority sardine FMAs by 2023

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
1) Adopt FAO on CDS and E-CDTS	(a) Review supply chain analysis	BFAR FRLD BFAR Sardines Program Focal Person LGUs/ in partnership with industry	2020-2021	Review report on SCA	Improved market access
	(b) Public Consultations	BFAR FRLD	2021	Consultation report	
2) Deployment of CDS and E-CDTS	(a) Piloting of E-CDTS in priority sardine FMAs	BFAR FIMC and FMA MB /LGUs/ in partnership with industry	2021 onwards	Online database system – operational and accessible	
	(b) Recruitment of IT personnel	Merge w/ sardine's database system	2021 onwards		
	(c) Procurement of software and hardware		2021 onwards		

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of supply chain analysis reviewed	0	1	BFAR	Annual BFAR		BFAR FRLD
Number of consultations conducted	0	4	BFAR	Annual BFAR		
No. of sardine FMA with operational e-CDTS	0	1/FMA	BFAR	Annually BFAR/LGUs-	Every 3 years	
			BFAR	BFAR		
			BFAR	BFAR		

Objective 8:

Establish criteria and implement program on seal of good governance on fisheries management for all LGUs in the 5 priority sardine fishing areas by 2023

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(1) Develop criteria and implement program for seal of good governance for fisheries management	(a) Meeting w/ DILG to discuss proposal/ Submission of proposal to DILG through a MOA for adoption of criteria on seal of good governance for fisheries management	BFAR Sardines Program Focal Person	2020-2021	MOA w/ DILG	Improved governance for fisheries mgt
	(b) Workshop on Developing Criteria for Seal of Good Governance for Fisheries Management	BFAR Sardines Program Focal Person	2020-2021	Workshop Report/Draft Set of Criteria	Improved governance for fisheries mgt
	(c) Issuance of Joint Administrative Order or Memorandum Circular on the implementation of the Seal of Good Governance for Fisheries Management Program	BFAR, DILG	2020-2021	Joint Administrative Order or Memorandum Circular	Improved governance for fisheries mgt awarded

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of MOA executed	0	1	BFAR DILG	Annual BFAR		Thru BFAR-BMB-DILG convergence
Set of Criteria	0	1	BFAR DILG	Annually BFAR		
Number of JAO/ MC Percentage of coastal LGUs awarded with seal of good governance on fisheries management in 5 priority sardine FMAs	0	1 0% by 2022	BFAR DILG	Annually BFAR		

Management Actions	Specific Tasks	Responsible Person / Group / Agency	Timetable	Output	Outcome
(2) Strengthen campaign to address water pollution and solid waste management and climate change issues (refer to BFAR CCA-DRM Framework)	(a) IEC (e.g. dissemination during Annual Sardines Congress)	BFAR and DILG	2020	IEC activities conducted	Increased awareness
	(b) Conduct vulnerability study and develop map for fisheries	LGUs	2020		
	(c) Integrate Climate change adaptation plan to FMA-EAFM Plan	BFAR CO	2020		

Key performance indicator	Benchmark		Monitoring methods or source of data	Monitoring Frequency and who is in charge	Evaluation (notes on progress)	Estimated Budget
	Baseline	Target				
Number of IEC activities	0	1	BFAR NFRDI DENR CCC	BFAR		

Communication Strategy

Throughout the five years of implementation, the results of the NSMP plan will be communicated to the fisherfolk community through various methods.

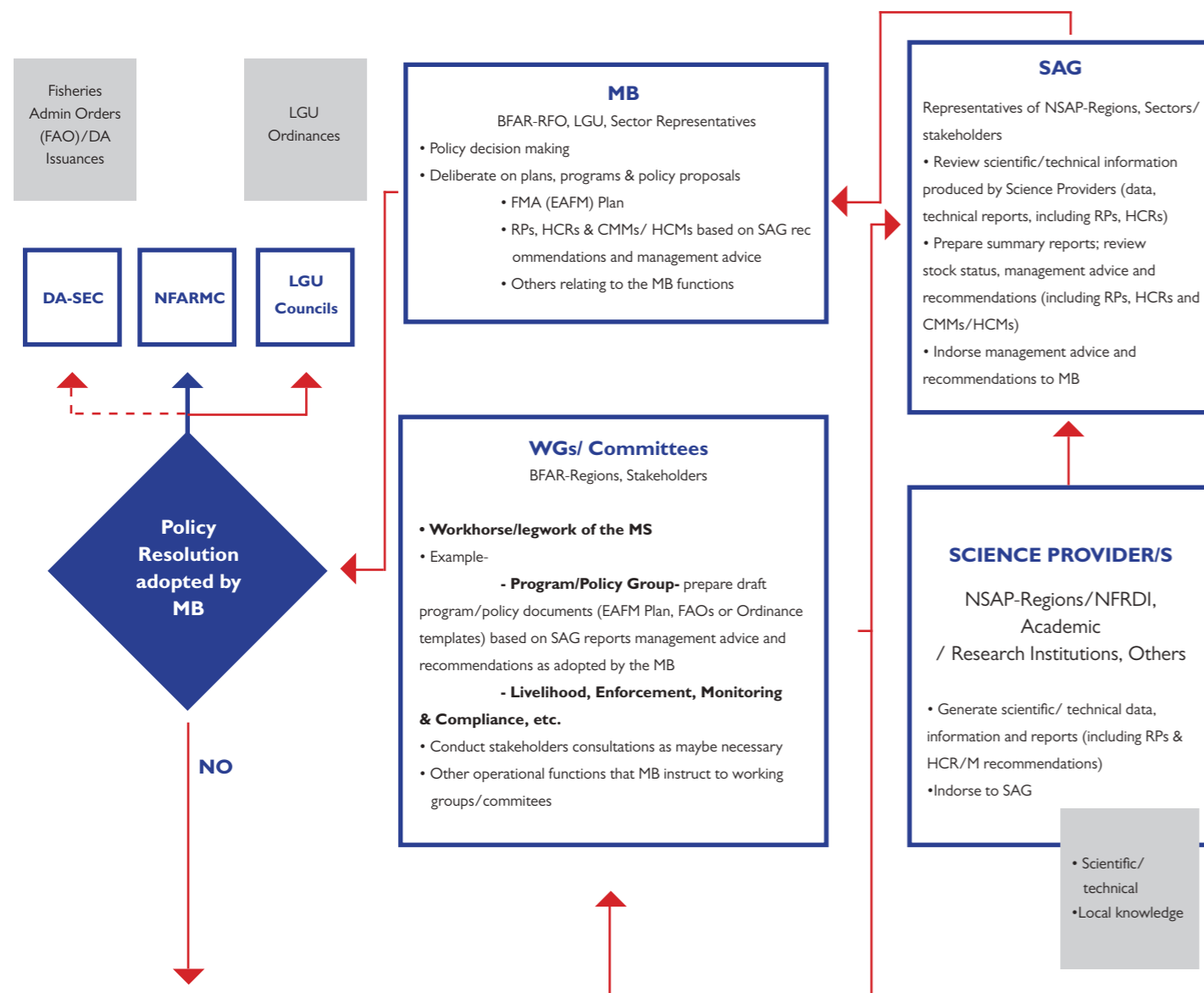
Target Audience	Key Messages	Communication Method	Timing
Fisherfolk Community	Overview of NSMP/ Status of Coastal Habitats	FGD, Forum, Meetings in target sites (in local dialect)/ Mascot / Coco Martin, Piolo Pascual	After lunch 1-2 hrs
	Overview of NSMP/ Status of Coastal Habitats	Jingle re: EAFM, Local Radio Station	Daily
	NSMP	IEC Materials, Pamphlets, komics, tarpaulin, billboard, brochures, slogan One-day convention for NSMP	Displayed in schools, brgy halls, multi-purpose hall, LGU, ports

Institutional Framework

With the new structure provided under the Fisheries Administrative Order No. 263, or the establishment of the Fisheries Management Areas in the Philippines, the National Sardine Management Plan will now be integrated in each FMA-EAFM Plan.

The information, science, and recommended management rules and measures will be generated and provided by the National Stock Assessment Program and other academic and research institutions. The Scientific Advisory Group will then review and vet this information and endorse to the FMA-Management Board which will be adopted after deliberation—after a series of consultations with the stakeholders. The Local Government Units may then adopt the Plan through integrated ordinances or through a Fisheries Administrative Order which will pass through the National Fisheries and Aquatic Resources Management Council if the measures apply to a larger scale.

The BFAR National Office will retain its oversight function over the implementation of the NSM Plan.



Validation and Adoption of the NSM Plan

With the new fisheries governance structure, it is recommended that Management Plans for commodities will be integrated into the EAFM Plan. Such EAFM plans shall be adopted by the LGUs through provincial or municipal ordinances. The responsible offices within national and regional offices of BFAR will then translate the NSMP into work and financial plans.

The BFAR Capture Fisheries Division will be in charge of the overall monitoring and evaluation of the implementation, in consultation with the Technical Working Group.

The Plan is a product of a participatory process that involved key stakeholders of the sardines industry in the country. The Technical Working Group, composed of the key divisions of BFAR, Regional Directors and National Stock Assessment Project Leaders in coordination with the private sector representatives facilitated the conduct of meetings, workshops and consultations to fill in the data needed in the formulation of the Plan.

The timeline of activities facilitated by the TWG which eventually led to the adoption of the NSMP is reflected in the following matrix:

ACTIVITIES	LOCATIONS	DATE
Science Forum	Cebu	May 3-5, 2018
Development of the Draft NSMP	Dipolog City	July 3-5, 2018
Technical Working Group Writeshop	Quezon City	August 29-30, 2018
Data Sourcing from NSAP, NGAs	All major sardine producing regions	August 31, 2018-present
Cluster Public Consultations on the draft NSMP 1. Luzon 2. Visayas 3. Mindanao	Naga City Iloilo City Zamboanga City	September 12, 2018 September 14, 2018 September 26, 2018
BFAR's Presentation on the updates of the draft NSMP to the stakeholders	Zamboanga City	October 3, 2018
TWG writeshop on the finalization of the NSMP	Cebu City	November 13-16, 2018
Stakeholder's consultation and presentation	Quzon City	March 28, 2019
TWG meeting	Quezon City	July 2, 2019
Deliberation and adoption of the NSM Plan by the NFARMC	Roxas Blvd, Manila	January 31, 2020
Final packaging of the Plan for publication	Quezon City	May 2020
Roll-out of NSMP	Quezon City	May 2020

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The development of this plan was made in close coordination and consultation with the sardine industry both from the commercial and municipal fisheries sectors including those engaged in processing and other post-harvest activities that were actively engaged throughout the process. The plan benefited from the scientific advice and technical inputs from partners from the academe such as University of the Philippines-Visayas, University of the Philippines-Los Baños, Mindanao State University-Iligan City, Aklan State University and from non-government organizations such as Environmental Defense Fund, OCEANA Philippines, Rare Philippines, World Wildlife Fund, NGO for Fisheries Reform, Pangingsda Natin Gawing Tama or PaNaGaT Network, and development partner BFAR-USAID-URI Fish Right Program. BFAR and NFRDI are also thankful to the support of all the coastal local government units that shared their insights and experiences from the ground as well as the other national government agencies such as the Department of Environment and Natural Resources, Department of Interiors and Local Government, Philippine National Police, Philippine Coast Guard and National Coast Watch Center.

The leadership and guidance of the BFAR-NFRDI Technical Working Group on Sardine Fisheries composed of Ms. Drusila E. Bayate, Assistant Director for Technical Services; Atty. Demosthenes Escoto, Chief of Legal Division; Mr. Rafael V. Ramiscal, Chief of Capture of Fisheries Division; Mr. Francisco Torres Jr., National Project Leader of NFRDI-NSAP; Ms. Abegail Albaladejo, Chief Fisheries Policy and Economics Division; and all the Regional Directors of the major sardine producing regions namely RD Alfeo G. Piloton, RD Allan I. Poquita, RD Elizer Salilig, RD Fatma M. Idris, RD Isidro Velayo, RD Juan Albaladejo, RD Nelson Bien, RD Remia Aparri, RD Teodoro A. Bacolod, Jr., RD Visa T. Dimerin and RD Wilfredo M. Cruz and all the National Stock Assessment Program Project Leaders in major sardine producing regions namely Romina Yutuc, Maribeth Ramos, Myrna Candelario, Noemi Lanzuela, Sheryll Mesa, Bruna Abrenica, Miriam Amigo, Divina Ignacio, Majen Casinillo, Jose Villanueva and Joyce Baclayo are also acknowledged. BFAR and NFRDI also highlights the contribution of the Secretariat from the BFAR-Capture Fisheries Division composed of Efen V. Hilario, Jennifer Viron, Myrna B. Ramos, Carl Luigi Cervantes and Kima Karla Cedo for shepherding the development and completion of the plan.

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It is envisaged that the National Sardines Management Plan, developed with broad participation from all stakeholders and underpinned by scientific information to serve as a guide for the country in general and for the relevant fisheries management areas in particular, will also be collaboratively implemented in the next 5 years to achieve its multiple objectives and multiple benefits for the ecological enhancement of such an important fish species of our country and for the improved over-all well-being of the sardine industry, especially the families and communities dependent on it.

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Secretariat

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