

BLUE SWIMMING CRAB NATIONAL MANAGEMENT PLAN

A National Framework for the Management of the Philippine Blue Swimming Crab Fisheries



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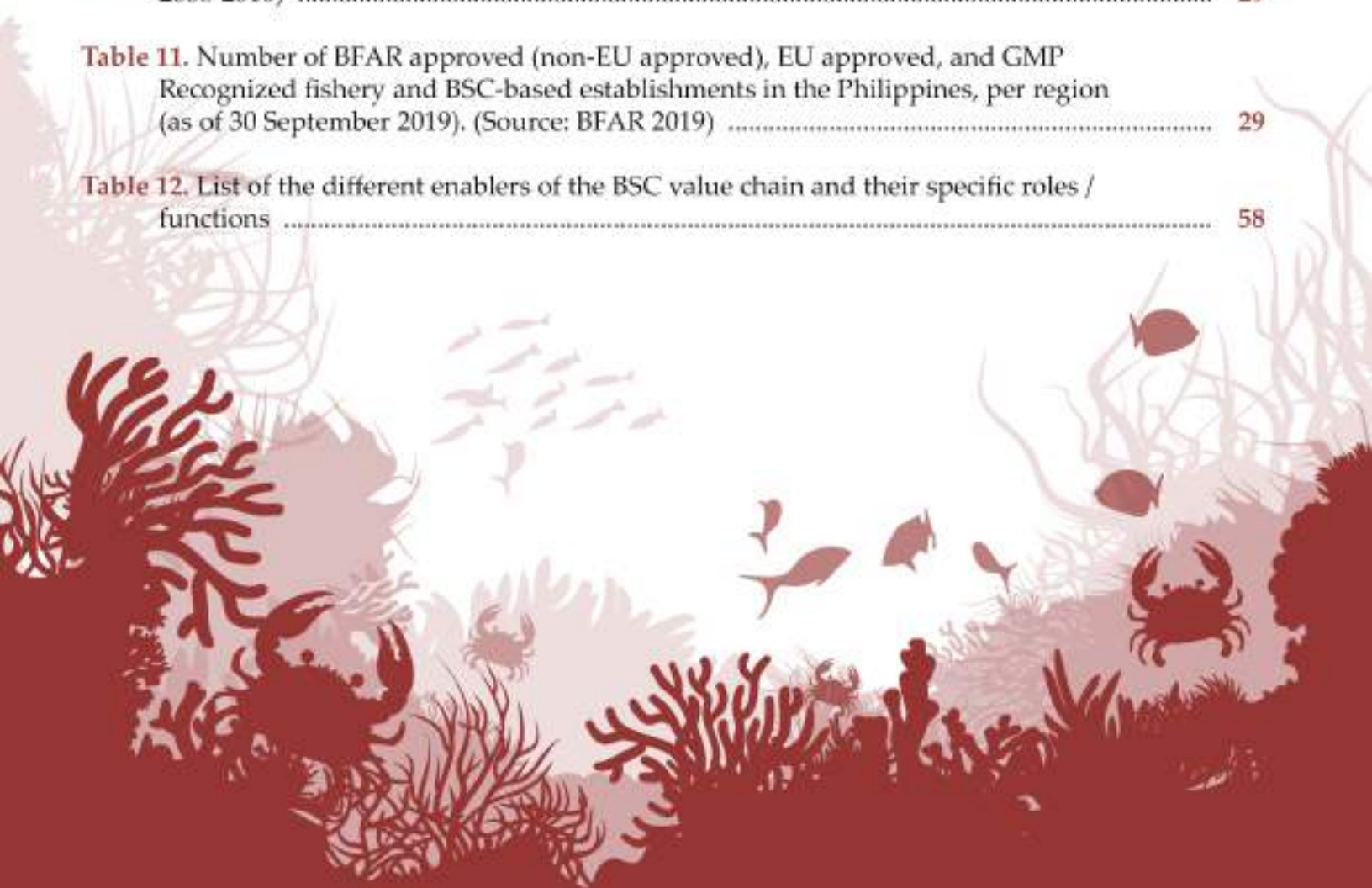
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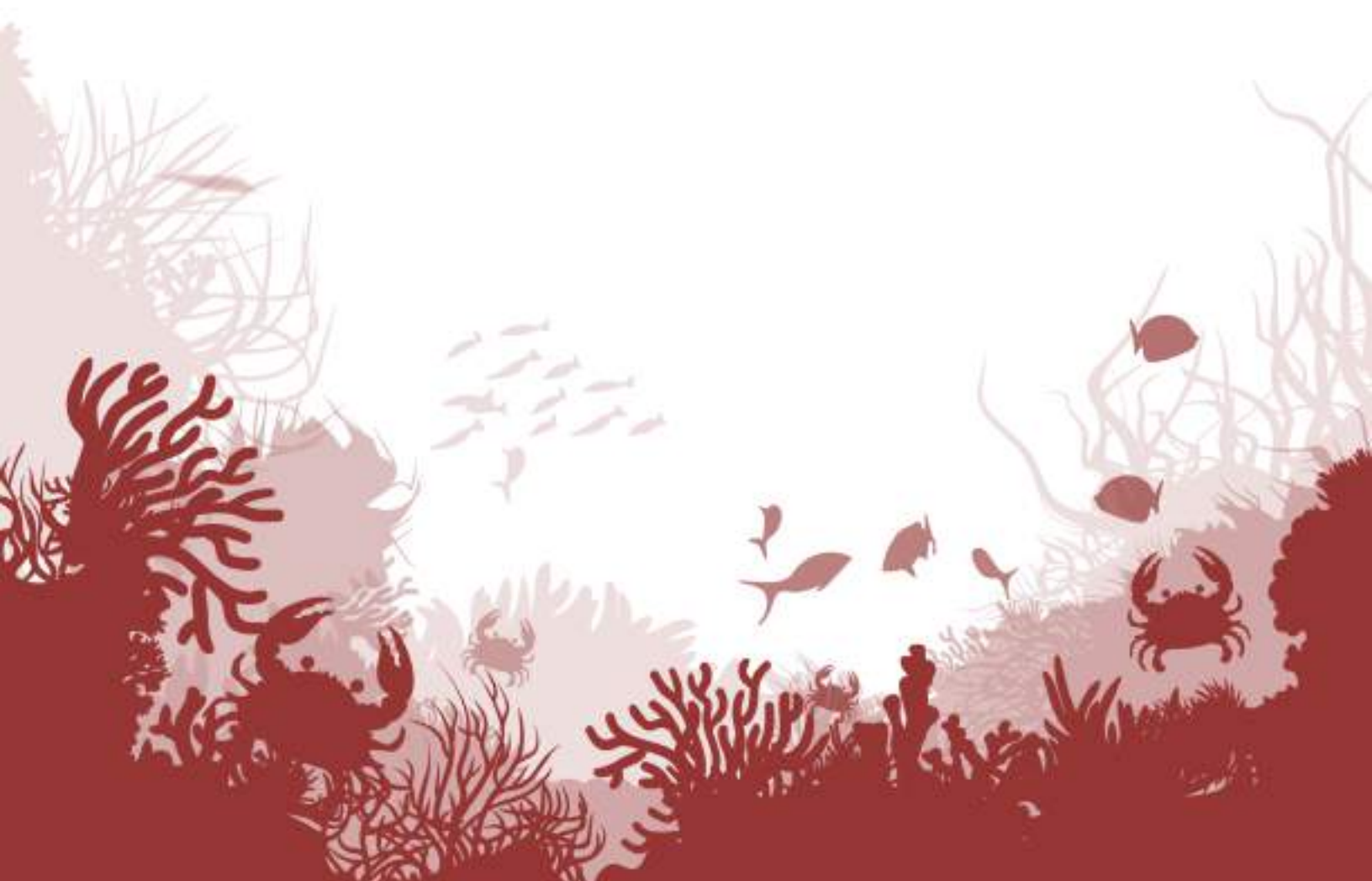
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INTRODUCTION

The rising demand for different food products opens opportunities for seafood to be considered as one of the most important internationally traded food commodities. Such increased seafood trade activities, however, result in the growing concerns for the sustainability of the resource and the distribution of benefits from trade activities to the different stakeholders of the industry.

One of the most commercially important aquatic resources in the Philippines is the blue swimming crab (BSC). This commodity supports a major industry that provides jobs and generates revenues at the local and national levels. As one of the most well-traded seafood commodities in the country, BSC are traditionally caught in high volumes in many parts of the country.

Unfortunately, the BSC production in the entire country has significantly decreased from 34,003.87t in 2008 to 26,251.87t in 2015 (PSA 2020). Although there has been an increase from 2016 onwards, reaching 33,929.60t in 2018, these were followed by a decrease to 29,677.14t in 2019 (PSA 2020). In all these years, BSC traders, processors, and exporters have been facing limited supply, as there has been an increasing demand for BSC by the increasing population in the country and elsewhere.

In terms of value, there have been fluctuations in the values of BSC traded in the country from 2005 until 2016. The 2 succeeding years posted big leaps, from PhP3.02B in 2016 to PhP4.38B in 2017, and to as high as PhP5.77B in 2018 (PSA, 2020). Unfortunately, the latest production value of BSC in the country was pegged at only PhP4.55B in 2019 (PSA 2020).

Just like any other seafood commodities, the economic opportunities derived from the BSC industry are highly dependent on several factors. One of which is the state of the resource that is affected by overharvesting or overexploitation of BSC. Similar to any fisheries resource, the complexity of the aquatic environment and the inability of science to predict with certainty the maximum sustainable yield of a given stock also affect the economic benefits from the BSC industry. Other factors, such as natural calamities and health pandemics, such as the recent spread of COVID-19, can inevitably impact economic activities through several channels, such as health, transportation, tourism, agriculture, and fisheries sectors.

Given all these, the major concern of the BSC industry is, therefore, the need to maintain a delicate balance between the requirements for increased production and economic benefits and the need to conserve and protect the resource for long term sustainability and resiliency.

Earlier, a coalition of stakeholders in the crab industry in collaboration with the Bureau of Fisheries and Aquatic Resources (BFAR) developed the Blue Swimming Crab Management Plan (BSCMP) in 2011. The plan included, among others, the establishment of minimum carapace width to be traded, protection of crab nursery areas, and establishment of closing season or fishing grounds, among others. Through Joint Department of Agriculture (DA) – Department of Interior and Local Government (DILG) Administrative Order No. 01, series of 2014 (JAO No.1, s. 2014), entitled “Regulation for the Conservation of Blue Swimming Crab (*Portunus pelagicus*)” the BSCMP was put in effect, specifying its intended activities until 2015 only.

Years after the implementation of the 2014 BSC-NMP, a comprehensive review and enhancement of the plan become necessary. Incidentally, the **Global Sustainability Supply Chains for Marine Commodities Project** was launched as an interregional intervention that aims to mainstream sustainability in the supply chains of important commodities (such as the blue swimming crab) and fisheries improvement projects in different countries, including Costa Rica, Ecuador, Indonesia and Philippines.

The project has four (4) major components, one of which deals with the enabling environment for sustainable marine commodity supply chains. Under this component, activities include a comprehensive sector analysis that involves a review the status of the BSC industry, the challenges it is now facing, and the opportunities that are available for the industry. The project also includes the preparation of a five-year strategic plan or a National Management Plan designed to ensure sustainability of the resource while at the same time contributing to improved food security at the national level. In particular, this component focuses on the platform towards the sustainable fisheries management of the Blue Swimming Crab (BSC) commodity in the Philippines, with the Bureau of Fisheries and Aquatic Resources (BFAR) serving as the implementing partner of the project and the United Nations Development Programme (UNDP), as implementing agency of the Global Environment Facility (GEF), providing support to the project implementation.

This partnership presents this more responsive, unified **BLUE SWIMMING CRAB NATIONAL MANAGEMENT PLAN (BSC-NMP)** that serves a national framework for the sustainable management of Philippine blue swimming crab fisheries. The Plan specifically outlines the medium term (2020-2024) strategies for the improved performance of the BSC industry of the Philippines and pays closer attention to all the key actors or stakeholders in the BSC supply chain, how are they linked to each other, and how are benefits distributed along the chain.

This Plan is aligned with the strategies and actions as stipulated in the Comprehensive National Fisheries Industry Development Plan (CNFIDP) Medium Term Plan 2016-2020 of the Philippines, as well as with the Eight Paradigms of the Department of Agriculture that characterize the “new thinking” for Philippine Agriculture and Fisheries. More importantly, the development of this Plan has been carefully guided by the provisions of the United Nations’ 17 Sustainable Development Goals (17SDG).

In crafting this Plan, the results of an in-depth and inclusive multi-stakeholder sector Root Cause Analysis (RCA) were considered. This RCA investigated and identified the challenges faced by the sector and the contributing causes and causality relationships towards sustainable fisheries management for the BSC commodity. Through a structured approach offered by RCA, the most effective solutions and the enabling environment to achieve improved performance of the BSC industry of the Philippines have been identified.

As an example, the Plan addresses the challenges in the international market brought about by the Seafood Watch (SFW) report in December 2018 stipulating their findings that placed the crab pots and gillnet fisheries in the Visayas Sea and Palawan under the “red” or “avoid” rating. Accordingly, the use of gill nets in catching BSC both in the Visayan Sea and Palawan areas have moderate to high levels of by-catch and have some interactions with other species of concern such as sharks, sea turtles, and others, while the use of crab pots in the same areas exhibits strong potential to interact with mammals, corals and other biogenic habitats.

But the more pressing challenge being addressed by the Plan is the impending restriction due to the strict implementation of the Marine Mammal Protection Act (MMPA) of the United States that aims to reduce marine mammal by-catch associated with fishing operations. An important component in implementing the import provisions of this rule is the List of Foreign Fisheries (LOFF) that presently classifies the Philippine BSC caught using pots and gillnet as “Export Fisheries”. This means that, by January 1, 2022, the Philippines must have applied for and received a comparability finding for BSC so as not to disrupt the exportation of the Philippine BSC products to the US.

In the local front and to some extent in the international arena, the challenges in the economic activities brought about by the most recent COVID-19 health pandemic are taunting. These impact the entire value chain, from the fishers in the coastal communities, to the traders in the different localities, and to the exporters who are engaged in global trade. Against this backdrop of uncertainty in the time of COVID-19, efforts must be focused on addressing these challenges that can potentially break the BSC value chain in the country.

Through this new BSC-NMP, it is expected that the industry will be equipped with the necessary tools and strategies that will help the Philippine BSC fishery improve not only rating and classification based on the SFW indicators and LOFF standards, respectively. More importantly, the industry will be guided on how to produce sustainably while making the entire value chain more resilient in the years to come.

The Plan is further enhanced through the use of the Ecosystem Approach to Fisheries Management (EAFM) that seeks to balance environmental and socioeconomic concerns through improved governance. In addition, the performance evaluation of the earlier implementation of the BSCMP and the current PACPI FIP Action Plan for BSC, together with the findings from the RCA and the stakeholders' consultations became the bases of the new BSC-NMP that pursues the overall sustainability of the commodity and the resiliency of the entire industry.

The specific management and conservation measures contained in this Plan apply to all forms of activities related to BSC. Since the areas covered by the Plan include all BSC fishing grounds in the Philippines, it is expected that this plan will serve as a critical decision-support platform in the crafting of BSC-specific plans for the Fisheries Management Areas (FMAs) in the country where BSC is one of the key fisheries of interest.



LEGAL AND/OR CUSTOMARY FRAMEWORK

The **Philippine Fisheries Code of 1998 or Republic Act (RA) 8550**, as amended in **RA 10654** in 2015, stipulates the provisions for the development, management, and conservation of the country's fisheries and aquatic resources and declares the policy of the country to:

1. Achieve food security as the basis in any efforts towards optimum utilization, management, development, conservation, and protection of the country's fishery resources;
2. Limit access to the fishery and aquatic resources of the country for the exclusive use and enjoyment of Filipinos;
3. Ensure the rational and sustainable development, management and conservation of the fishery and aquatic resources in Philippine waters;
4. Protect the rights of fisherfolk, especially of the local communities with priority to municipal fisherfolk, in the preferential use of the municipal waters;
5. Provide support to the fishery sector, primarily to the municipal fisherfolk, including women and youth sectors;
6. Manage fishery and aquatic resources, in a manner consistent with the concept of an integrated coastal area management in specific natural fishery management areas; and
7. Grant the private sector the privilege to utilize fishery resources under the basic concept that the grantee, licensee or permittee not only be a privileged beneficiary of the State but also active participant and partner of the Government in the sustainable development, management, conservation and protection of the fishery and aquatic resources of the country.

The Philippine Fisheries Code adheres to the following objectives: (i) conservation, protection and sustained management of the country's fishery and aquatic resources; (ii) poverty alleviation and the provision of supplementary livelihood among municipal fisherfolk; (iii) improvement of productivity of aquaculture within ecological limits; (iv) optimal utilization of offshore and deep-sea resources; and (v) upgrading of post-harvest technology.

Figure 1 describes the historical development of fishery specific legislations in the country prior to and upon implementation of the Code, highlighting the laws and regulations that presently cover the management and conservation of the BSC industry in the Philippines.



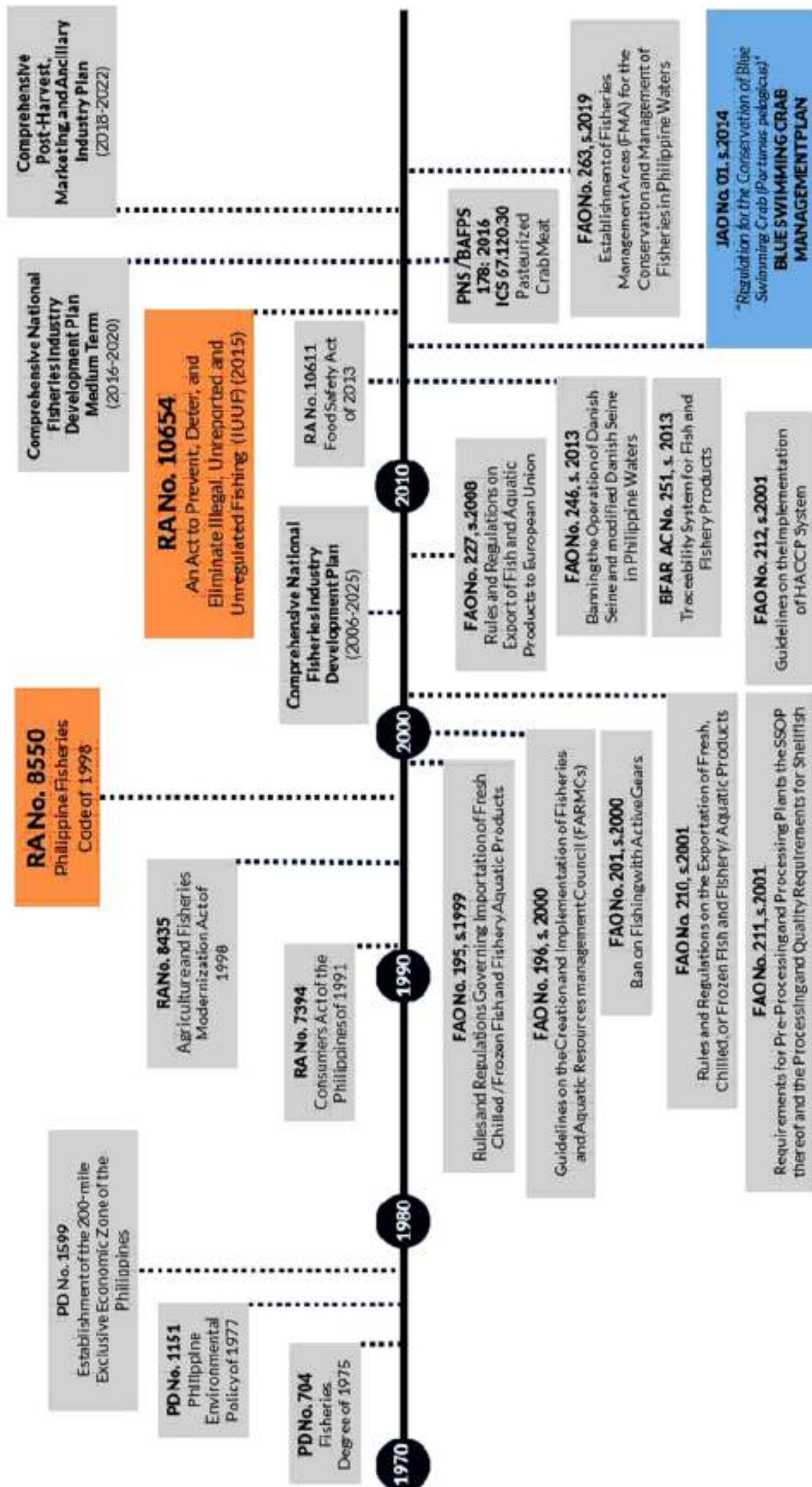


Figure 1. The legal framework for the BSC industry in the Philippines

With the legal framework for the management of the BSC industry in place, and the existing fishery laws and regulation, such as the ones included in Tables 1 and 2, specific management strategies securing crab population have been crafted in the past.

The local government unit (LGU) of the Province of Negros Occidental in 2003, for example, initiated measures for the protection and management of blue swimming crabs through Ordinance No. 019 entitled “An Ordinance Regulating the Catching, Selling, and Possessing or Buying of Gravid Blue Crabs and Crablets in the Province of Negros Occidental” (see Table 3). The objectives of the ordinance are as follows: 1) to address the problem of resource depletion of blue crabs in municipal and city waters in the Province, and 2) to properly utilize blue crabs as sustainable source of livelihood. Later in 2012, the Province of Iloilo adopted the same ordinance and passed Provincial Ordinance No. 2012-093 which limits crab catch size of 11 centimeters (cm) and depth of 50 mesh size for gill net.

Table 1. List of Republic Acts (RA) and Presidential Decrees (PD), related to the governance of Philippine Fisheries

RA/PD/AC	YEAR	TITLE	
RA No. 10654	2015	An Act to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing	An act to prevent, deter, and eliminate Illegal, Unreported and Unregulated Fishing (IUUF), amending RA 8550, and for other purposes.
RA No. 10611	2013	Food Safety Act of 2013	An act to strengthen the food safety regulatory system in the country to protect consumer health and facilitate market access of local foods and food products, and for
RA No. 8550	1998	Philippine Fisheries Code of 1998	An act providing for the development, management, and conservation of the fisheries and aquatic resources, integrating all laws pertinent thereto, and for other purposes
RA No. 8435	1997	Agriculture and Fisheries Modernization	An act prescribing urgent related measures to modernize the agriculture and fisheries sectors of the country in order to enhance their profitability, and prepare said sectors for the challenges of the globalization through an adequate, focused, and rational delivery of necessary support services, appropriating funds therefore and for other purposes.
RA No. 7394	1991	The Consumers Act of the Philippines of 1991	An act to protect the interests of the consumer, promote his general welfare and to establish standards of conduct for business and industry.
PD No. 1599	1978	Establishment of the 200-mile Exclusive Economic Zone of the Philippines	A decree extending 200 miles beyond and from the baselines from which the territorial sea is measured
PD No. 1151	1977	Philippine Environmental Policy of 1977	A decree formulating a Philippine environmental policy holding each individual responsible for the preservation and enhancement of the Philippine environment and submission of individual environmental statements of all agencies of the government in every action, project, or undertaking significantly affecting the quality of the environment
PD No. 704	1975	Fishery Decree of 1975	A decree revising and consolidating all laws and decrees affecting fishing and fisheries

Table 2. List of FISHERIES ADMINISTRATIVE ORDERS (FAO) from the Bureau of Fisheries and Aquatic Resources (BFAR), pursuant to the provisions of the Republic Act No. 8550 that are related to governance of Philippine Fisheries

FAO/AC No.	YEAR OF IMPLEMENTATION	TITLE
FAO No. 263	2019	Establishment of Fisheries Management Areas (FMA) for the Conservation and Management of Fisheries in Philippine Waters
BFAR AC No. 251	2014	Traceability System for Fish and Fishery Products
FAO No. 246	2013	Banning the Operation of Danish Seine and modified Danish Seine in Philippine Waters
FAO No. 227	2008	Rules and Regulations Governing the Export of Fish and Aquatic Products to European Union Member Countries
FAO No. 212	2001	Guidelines on the Implementation of HACCP System
FAO No. 211	2001	Requirements for Pre-Processing and Processing Plants the SSOP thereof and the Processing and Quality Requirements for Shellfish
FAO No. 210	2001	Rules and Regulations on the Exportation of Fresh, Chilled, or Frozen Fish and Fishery/ Aquatic Products
FAO No. 201	2000	Ban on fishing with active gears
FAO No. 196	2000	Guidelines on the Creation and Implementation of Fisheries and Aquatic Resources management Council (FARMCs)
FAO No. 195	1999	Rules and Regulations Governing Importation of Fresh Chilled / Frozen Fish and Fishery Aquatic Products

Table 3. Examples of provincial ordinances that govern the local BSC industry

LOCATION	ORDINANCE NO.	YEAR OF IMPLEMENTATION	TITLE	PROVISION ON CRABS
PROVINCIAL ORDINANCES				
Province of Negros Occidental	Provincial Ordinance No. 019	2003	An Ordinance Regulating the Catching, Selling and Possessing or Buying of Gravid Blue Crabs and Crablets in the Province of Negros	To address the problem of resource depletion of blue crabs in municipal and city waters in the Province, and to utilize properly blue crabs as sustainable
Province of Iloilo	Provincial Ordinance No. 2012-093	2012	An Ordinance Regulating the Catching, Selling and Possessing or Buying of Gravid Blue Crabs and Crablets in the Province of Iloilo”	Limits crab catch size of 11 centimeters (cm) and depth of 50 mesh size for gill net.

Some specific municipal ordinances and resolutions are presently being implemented in several areas in the country, examples of these include the municipal ordinances in Bantayan, Cebu, in Estancia, Iloilo, and in EB Magalona, Negros Occidental (Table 4).

Table 4. Examples of municipal ordinances that govern the local BSC industry

LOCATION	ORDINANCE NO.	YEAR OF IMPLEMENTATION	TITLE	PROVISION ON CRABS
MUNICIPAL ORDINANCES				
EB Magalona, Negros Occidental	Municipal Ordinance No. 30 series of 2009	2009	An Ordinance providing for the sustainable management, conservation, and development of coastal and fisheries resources of the municipality of EB Magalona, Province of Negros	Section 27. Establishment of the Blue Crab Sanctuary for Sustainable Management of Blue Crab Industry of the Municipality. 1 hectare crab sanctuary in Brgy. Tomongtong.
Buenavista, Guimaras	Resolution No. 2007-312	2007	Resolution to enact an ordinance providing for the sustainable management, conservation, and development of coastal and fishery resources of the municipality Buenavista, Province of Guimaras amending for such purpose the existing fishery Ordinance no. 75 series of 1993 and other fishery ordinances of this municipality	Section 47: Taking, Catching and Gathering of Crablets and Spawning crabs.
Estancia, Iloilo	Ordinance no. 2004-12	2004	An Ordinance providing for the sustainable management, conservation, and development of coastal and fisheries resources of the municipality Estancia, Province	Section 80. Prohibition of the catching, selling, processing and transporting of gravid crabs and lobster (mud crabs, blue crabs, "Cruzan" crab, pitik-pitik. Section 81. Prohibition of
Bantayan, Cebu	Municipal Ordinance No. 08 Series of 1999	1999	A modified ordinance regulating fishing and/or fisheries in the municipality of Bantayan, Province	None

In 2008, the processors and exporters formed the Philippine Association of Crab Processors, Inc. (PACPI) in collaboration with several local government units (LGUs) and the BFAR. The PACPI was created to develop a BSC sustainability program to address the declining resources.

In 2011, a coalition of stakeholders in the crab industry in collaboration with the BFAR developed the BSC Management Plan (BSCMP). In July 2012, the final version of the Plan was submitted to the National Fisheries and Aquatic Resources Management Council (NFARMC) stipulating minimum catch size, site-specific close season supported by scientific information, among others (see www.thefishsite.com).

The long term objectives of the BSCMP are to: (a). Ensure the sustainability of the BSC resources and rational management of the fisheries; (b). Develop and improve breeding, hatchery and grow-out technology for BSC; and (c). Maintain the catch and effort of BSC to a sustainable level (with LGU, fisherfolks, other stakeholders with direct dependence on the resource).

The short term objectives of the BSCMP are: (a). to monitor and evaluate the current state of the BSC industry; (b). to regulate the fishing capacity and effort in catching BSC; (c). to recommend the use of environmental and social-friendly fishing gears (i.e. crab pot/trap); (d). to provide regular updates on the scientific data for catch, effort and biological parameters; (e). to provide management measures for gravid crabs and juveniles (regardless of species); (f). to increase public awareness on the conservation and protection of BSC; (g). to create strong linkage with the LGU and other stakeholders for collaborative efforts in the management; (h). to create a Technical Working Group (TWG) to institutionalize the implementation of the plan; (i). to develop a Geographic Information System (GIS)-based map of the BSC fisheries of the country; (j). to empower stakeholders to develop technical competence in managing the blue swimming crab resource; and (k). to enforce the implementation of fishery laws and regulations.

In January 2014, through Joint Department of Agriculture (DA) – Department of Interior and Local Government (DILG) Administrative Order No. 01, series of 2014, titled “Regulation for the Conservation of Blue Swimming Crab (*Portunus pelagicus*)”, the BSCMP was put in effect, specifying its intended activities until 2015 only.

The order specifies the regulations on: (a). the minimum size of BSC allowed for catching, collecting, and trading; (b). the crab fishing gear limitations (including mesh size/diameter holes; (c) the closed season/areas; and (d). other subjects for regulation, such as the number of crab fishers, limits on crab pots/traps per boat, limit on the length/depth and the number of nets a fisher could own and operate, and the specific closed fishing season for BSC. The Order also has provisions related to establishment of holding cages for berried crabs, the monthly recording of information, special permits, research and development plans, and prohibitions and their corresponding penal clauses.

Years after the implementation of the Plan, a comprehensive review and enhancement of the plan become necessary. Table 5 summarizes the results of a performance evaluation of the earlier implementation of the Plan. Essentially, the evaluation shows the minimum accomplishment of the industry vis-a-vis the targeted management options of the BSCMP.

Building upon the results of this evaluation and the results of a series of consultations with the different stakeholders of the BSC industry, the new BSC-NMP includes relevant management options and strategies that are intended to shape the direction for the BSC industry of the country.



Table 5. Status of implementation of the management options in the BSCMP, as of 2019 (Mesa 2019)

MANAGEMENT OPTIONS	STATUS OF IMPLEMENTATION
Inventory of swimming crab gears, fishing boats, fishers, processing plant at the municipal level	Inventory of post-harvest facilities and ancillary industries for all commodities in line with the drafting of the CPHMAIP; not complete
Registration and licensing of swimming crab fishers, gears, boats, processing plants	Implementation of FishR and BoatR but no data on fishing gears; voluntary registration only; licensing with LGUs
BSC Stock enhancement - Development of breeding, hatchery, & grow-out facilities - Natural habitat & ecosystem structure studies/stock assessment - Installation of berried BSC holding cages - Stock reseeding - Grow-out culture/Aqua technique	Only the installation of berried BSC holding cages / lying in cages done but in some areas only; other components not done at all
Proper management of berried crabs thru the installation of cages in prioritized cluster/areas	Only the installation of berried BSC holding cages / lying in cages done but in some areas only; other components not done at all
IEC campaign on the importance of swimming crab resource	Only in some areas
Implementation of integrated BSC resource management measures	Only in some areas
Review and amendments on the formulation of comprehensive MFO	
Capability building of local government units in managing swimming crab resource - INFO Caravan on BSCMP and JAO - FMRED to be tasked for the implementation of BSC activities (to include M&E) - Establishment & management of BSC holding cages and transport of live berried crab - Training on the propagation & culture of BSC (Hatchery and grow-out culture) - Stock Assessment - Review and amendment of MFO - Law enforcement - Management of fish sanctuaries - Licensing & registration - Mgt. measures (minimum size, closed season, fishing gear limitation) - Identification of proper livelihood projects - Provision of technical assistance in the drafting of MFO for BSC management	Mostly done in some areas only; no activities in some of the components

UNIQUENESS OF THE BSC-NMP

2020-2024

The new BSC-NMP was based on a **strategic fisheries management framework**, as shown in Figure 2. Using this framework, the new BSC-NMP has the following salient features:

a). In addition to RA 8550, as amended by RA 10654, other existing development goals serve as motivators that enthuse the crafting of the new BSC-NMP (Figure 2). These include the United Nations Sustainable Development Goals (SDGs) for 2030, the Philippine Development Plan 2017-2022 (as part of the 25-year long term vision entitled Ambisyon Natin 2040), and the recently implemented versions of the Comprehensive National Fisheries Industry Development Plan, 2005-2025 (CNFIDP 2005-2025) and the Comprehensive Post-Harvest, Marketing, and Ancillary Industry Plan, 2018-2022 (CPHMAIP 2018-2022).



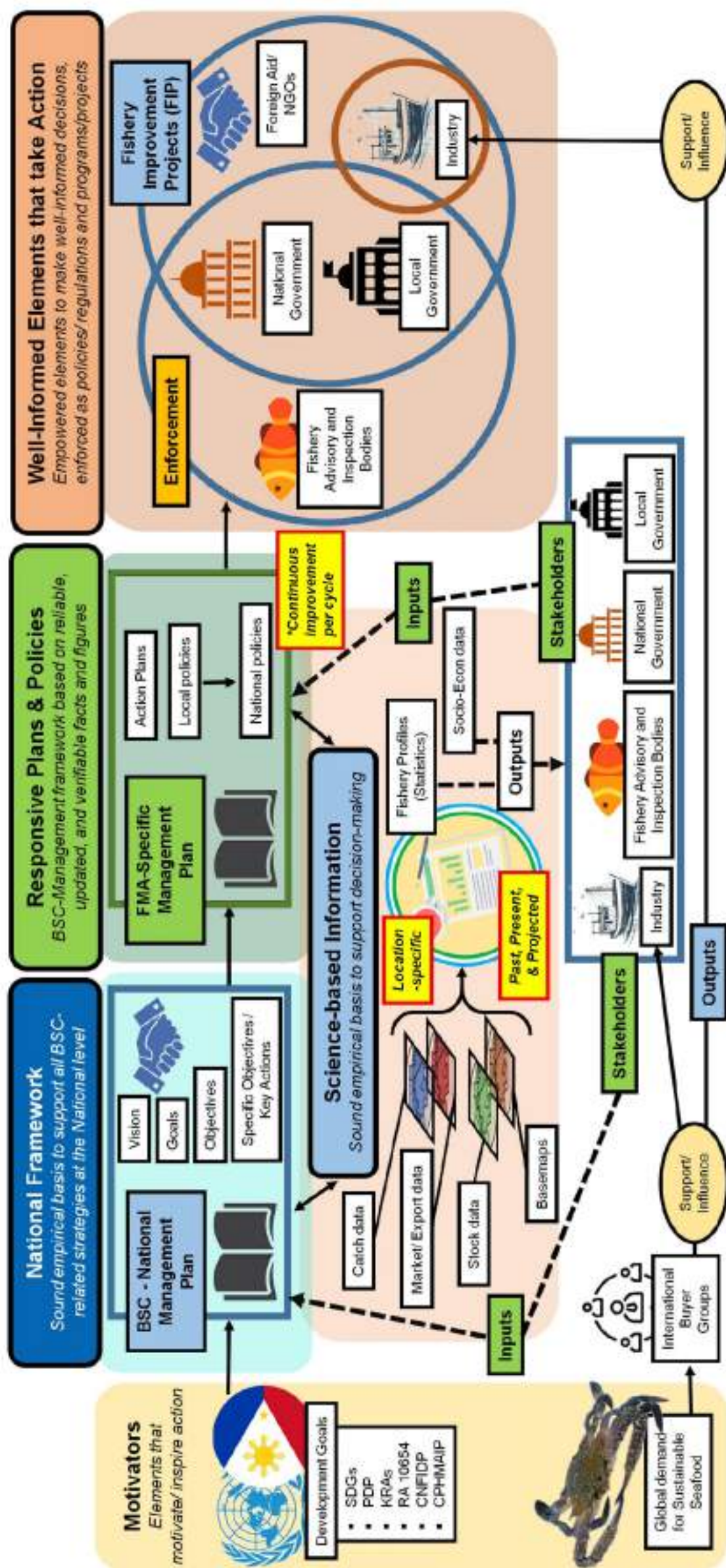


Figure 2. The strategic fisheries management framework for the crafting of the new Blue Swimming Crab National Management Plan

b). The BSC-NMP is science-based. Coupled with the learning from the past implementation of the BSCMP, the best available scientific information from the Fishery Improvement Projects (FIPs) and researches done by the different government agencies, non-government organizations, and the academe and the valuable inputs from the other industry players / stakeholders (see Figure 1) form the basis for the specific components of the new BSC-NMP and the FMA-specific management plans. This ensures that the sustainability, resiliency, conservation, and management of the BSC resource in the country are well-grounded.

c). Responsive action plans and strategies as well as national and local policies are envisioned for the BSC industry of the country. Following the provisions of FAO 263, series of 2019 on the “Establishment of Fisheries Management Areas (FMAs) for the Conservation and Management of Fisheries”, the new BSC-NMP was crafted to serve as the national framework for the management of the Philippine BSC fisheries. Depending on the status of information in, and the fisheries profiles gathered from, each of the FMAs in the country, specific management plans can be tailored-fit for each of the FMAs, using the BSC-NMP as a guide. These make all interventions (e.g. policies, regulations, information, education, and communication materials, research and development initiatives, etc.) focus on what the BSC industry needs to achieve improved performance, sustainable development, and resiliency for each of the FMAs.

d). All components of the new BSC-NMP mirror a participatory, inter-disciplinary stakeholder-oriented process. To sustain the support of all the stakeholders in the implementation of the BSC-NMP, their crucial roles, interests, and expectations were all considered in the drafting of the Plan. The stakeholders were directly involved in all the stages of its development. It is expected that the same stakeholders will likewise be involved in the crafting of the FMA-specific management plans.

e). The new NMP pays closer attention to all the key actors or stakeholders in the BSC supply chain, how are they linked to each other, and how are benefits distributed along the chain. The socio-economic struggles and lamentations of the key players of the industry are considered and the impacts of both natural and man-made calamities and other disturbances are taken into consideration.

There are three different but related approaches that are given emphasis in this BSC-NMP. Firstly, a “**continuous improvement approach**” is emphasized. Guided by the recommended steps of the Ecosystem-based Approach to Fisheries Management (EAFM), that are somehow similar to Deming’s Plan, Do, Check, and Act (PDCA) cycle for an effective quality management system, there are built-in quality assurance measures in the BSC-NMP.

The steps towards continuous improvement include the following:

First cycle. The goal is to initially come up with an action plan with targeted improvements, for example, in the data pools (i.e. catch, stock, and market/export data) and base maps for improving decision-making for fishery sustainability and resiliency at the local level. Particular attention in the plan is directed to the end-goal of FMA-specific policies and then local policy ordinance adoption.

To help encourage actual commitment to agreed-upon responsibilities by the key actors and the adoption of local policy ordinance by the recipients, the interests and actual utility for each player are to be ensured. For example, for the LGUs, it will be favourable, even at the earlier cycles of the BSC-NMP implementation, to chart out for select municipalities the production trends based on past and present stock to project future stock status (e.g. decline in production). This is to give the key actors at the local level an overview of what “could” happen in a business-as-usual scenario. Likewise, policy recommendations at the local level could be systematically prescribed for easier development and adoption of policies, even at the local level.

Second cycles. Given the extreme complexity in generating reliable data sets in some parts of the Philippines due to several factors, available data may still remain lacking. Nonetheless, culling out of good initial location-specific data sets in select targeted municipalities could still be done to aid in recommending updates, improvements, or enhancements in existing national policies or in coming up with new FMA-specific policies or even new national policies.

Succeeding cycles. When robust and detailed location-specific data become available, a wider detailing of trends could be done. With strategic clustering of municipalities, system wide policies, such as provincial or FMA based policies, could be prescribed. This would then be continuously improved in terms of data specificity and robustness in every succeeding cycle.

Secondly, a fishery sustainability challenge through a **"systems-approach"** is emphasized in this BSC-NMP. Through this approach, a problem is being addressed by looking at the end-to-end process, rather than concentrating on snapshots of the problem.

And thirdly, the implementation of this BSC-NMP follows a **"targeted approach"** wherein supports are to be channelled to the identified "champion" LGUs within specified FMAs that will serve as change leaders or drivers. Successes of these champions are to be replicated in other areas within a certain FMA until it gets to a point that the new BSC-NMP is robust enough to ambition FMA-wide or even nationwide adoption.

Given all the salient features of the Plan, coupled with the strategic approaches to be used, specific management and conservation measures are expected to be crafted for all forms of activities related to BSC.

Since the areas covered by the Plan include all BSC fishing grounds in the country, this Plan serves as a critical decision-support platform in the formulation of FMA-specific action plans for the different FMAs in the country where BSC is one of the key fisheries of interest.



PROCESS OF PREPARING THE BSC-NMP 2020-2024

The preparation of the BSC-NMP followed a participatory, inter-disciplinary stakeholder-oriented process where challenges and interactions between the identified challenges of the BSC industry are viewed as a whole. In order to do this, the following activities that were participated in by the different stakeholders and enablers of the industry were conducted.

Activity 1. ROOT CAUSE ANALYSIS

An in-depth sector analysis for the BSC commodity sector in the country was conducted using the Root Cause Analysis (RCA) approach. This is a structured approach in identifying the underlying causes of problems so that the most effective solutions can be identified and implemented. It is considered as a proactive management strategy that is used to identify and analyze the main or the root cause(s) of a problem and the several factors that may have contributed to this problem. This makes the RCA as an important first step in the development of the BSC-NMP for the Philippines.

In the RCA, three types of analyses were conducted. These consisted of the following:

Situation Analysis. This involved a systematic collection and evaluation of available data or information, aimed at identifying the factors that may have influenced the performance of the BSC industry both at the local and international markets. Sources of data were as follows: (a). key informant interviews and focus group discussions with different stakeholders and enablers; (b). primary data from the previous works on BSC; (c). secondary data that were culled from research publications, government reports, technical and working papers, and records from private sectors; and (d). national and local policies and the existing rules and regulations and their implications on the BSC industry.

In addition, to investigate and identify the weaknesses, threats, and gaps of the sector towards sustainable fisheries management for the BSC commodity as well as the strengths of, and opportunities for, the industry, the different stakeholders and enablers of the BSC supply chain in the Philippines were engaged in participatory discussions / consultations that were strategically conducted in Iloilo City (23-24 July 2019) and Cebu City (8-9 August 2019).

During these consultations, the participants identified the factors that affect the BSC industry of the Philippines. These factors were then categorized into internal and external factors via the SWOT (Strength-Weaknesses-Opportunities-Threats) Analysis. Internal factors referred to the strength and weaknesses of the industry, while the external factors included the opportunities and threats.

Problem Analysis. To come up with more robust information on the main problems of the BSC industry in the Philippines, other valuable information on the different issues and concerns of the industry, based on the Situation Analysis, were assessed by the participants and then used to establish the problem tree and the different contributing causes and causality relationships confronting the BSC industry in the country.

The Problem Analysis of the BSC industry in the Philippines was likewise guided by the concept of the EAFM that seeks to balance environmental and socioeconomic concerns through improved governance. In particular, the problems were identified and then clustered into **environmental** (or ecological), **socio-economic** (or human), and **governance** related problems. The interactions between them were likewise established.

The discussions among the participants highlighted three important things: the main or the root causes of the problems, the causes or the factors that contribute to these problems, and the effects of the main problems.

Solution Analysis. During the stakeholders’ consultations, the participants transformed the Problem Trees, as determined in the Problem Analysis, into Solution Trees that enabled the identification of the Vision for the BSC industry of the Philippines and the goals and objectives for the industry for the next 5 years. These goals and objectives were focused on three main concerns, namely, **environmental** (or ecological), **socio-economic** (or human), and **governance** related concerns.

Activity 2. ACTION PLANNING AND STRATEGIES FORMULATION

The exhaustive and highly participative action planning and strategies formulation processes involved three (3) stakeholders and enablers consultations in three (3) strategic locations, namely Legazpi City (Luzon cluster; 02-03 October 2019), Iloilo City (Visayas cluster; 28-29 August 2019), and Zamboanga City (Mindanao cluster; 16-17 October 2019).

These consultations enabled the identification of key actions for each of the identified goals and objectives, the specific objectives or key actions, the specific actions or activities, key performance indicators (expected outputs and outcomes), the budget for each of the activities, the main implementers and implementing partners, and the timetable of activities.

Activity 3. BSC-NMP LAUNCHING AND AFFIRMATION OF COMMITMENTS

The capstone activity after the series of stakeholders and enablers consultations was the BSC-NMP Launching where the draft of the BSC-NMP was officially presented to the Department of Agriculture Secretary and other key government officials. This was held in Manila in May 2020.

This activity was highlighted by a signing ceremony of all institutions that have expressed their commitment to support the implementation of the Plan.

Meetings of the BSC TECHNICAL WORKING GROUP (BSC-TWG)

The BSC-TWG was established in 2018 through Fisheries Office Order No. 166, Series of 2018, dated 18 June 2018, to perform the following functions:

1. Establish the roadmap for the Balik Sigla sa Kasag initiatives based on the BSCMP until 2022;
2. Establish guidelines / criteria for the site selection and installation of holding pens / cages as basis for national program on the establishment of holding cages for kasag;
3. Discuss feasibility and develop terms of reference for the conduct of assessment / scientific study and develop reference points and harvest control rules for future consultation on possible closed season for kasag before the issuance of regulation;
4. Formulate schemes in the conduct of inventory, registration, and licensing of kasag gears, boats, fishers, and processors.
5. Discuss and develop strategies and materials in implementing Information and Education Campaign for the conservation of kasag;
6. Develop strategies in implementing livelihood initiatives for kasag stock enhancement program such as, but not limited to, stock reseedling, development of technology on hatchery and grow out as aquaculture initiative;

7. Prepare prescribed form for the crab traceability and catch documentation system for catch certification; and
8. Perform other related functions in providing technical support on the implementation of JAO No. 1, series of 2014, as maybe deemed necessary.

The 1st BSC-TWG meeting for the new BSC-NMP was held on 14 June 2019 in Seda Hotel, Iloilo City. During this inception meeting, the group approved the activities of the GMC-PHI that were to be conducted in line with the comprehensive sector analysis and the preparation of a five-year strategic plan or a BSC-NMP. Included in this line up of activities was the conduct of stakeholders' consultations that were to ensure an inclusive, stakeholder-oriented conduct of an in-depth analysis of the BSC commodity sector in the country. Outputs of these consultations were expected to form part of the Root Cause Analysis (RCA) of the BSC industry in the country.

The 2nd BSC-TWG meeting was held last 27 August 2019 in The Mansion Hotel, Iloilo City. The results of the RCA and the 1st draft of the BS-NMP were presented and approved during the meeting.

The 3rd BSC-TWG meeting was held in The Madison Hotel in Iloilo on 29 October 2019. The final draft of the RCA and the 2nd draft of the BSC-NMP were discussed during the meeting.

Finally, the last BSC-TWG meeting was held in Iloilo City on 13 February 2020 where final draft of the Plan was discussed and approved prior to its presentation for approval of the National Fisheries and Aquatic Resources Management Council (NFARMC).

The entire BSC-NMP consultative process is summarized in Figure 3.

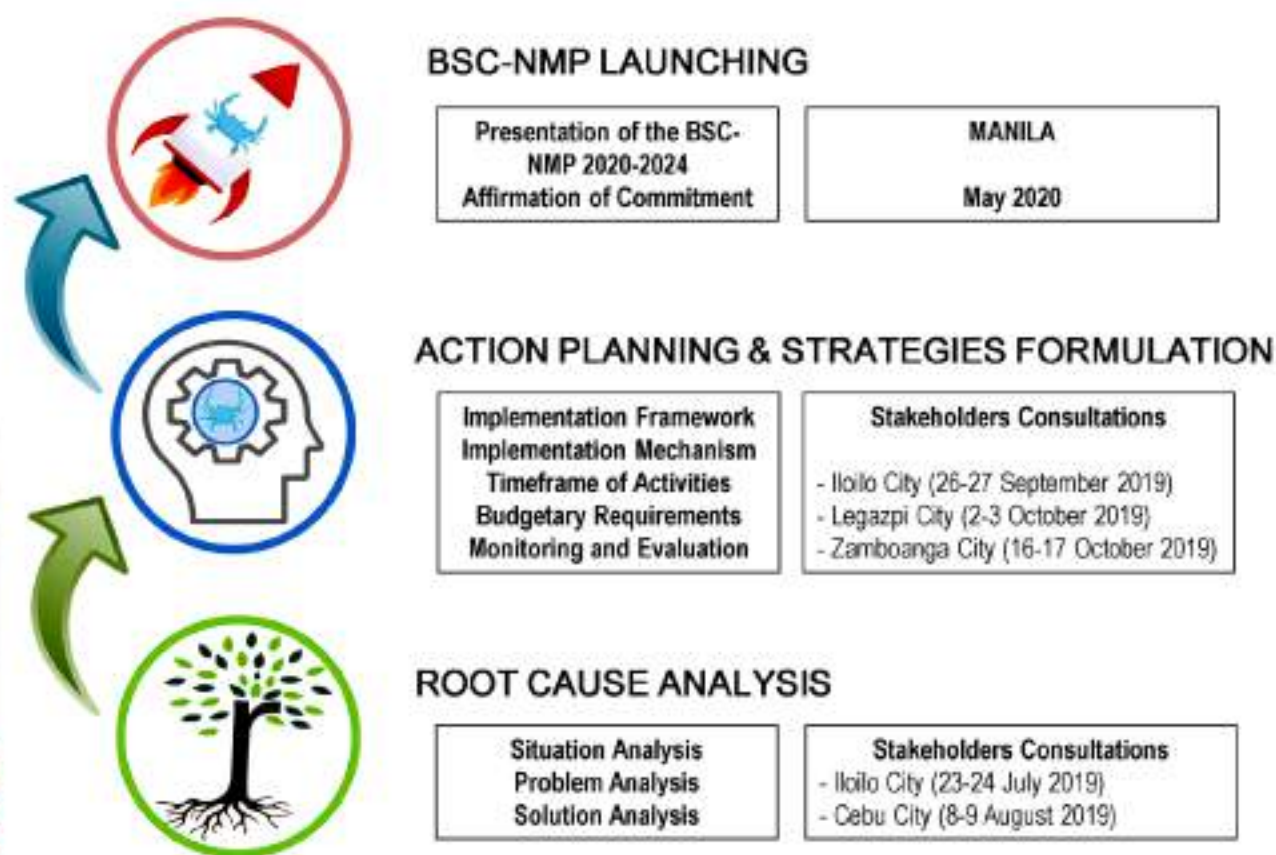


Figure 3. The BSC-NMP consultative process

STATUS OF THE BLUE SWIMMING CRAB FISHERIES

The Blue Swimming Crab (BSC) as a Marine Commodity. The blue swimming crab, *Portunus pelagicus* (Linnaeus 1758) is a species of phylum Arthropoda, class Malacostraca, order Decapoda (or those referring to organisms with ten appendages), infraorder Brachyura (or true crab), and family Portunidae (or swimming crab).

BSC is a commercially important marine brachyuran decapod which is bilaterally asymmetrical in appearance. It has a rough to granulose, broad, and flattened carapace which varies from being transversely ovate to transversely hexagonal, and sometimes circular. The frontal region of the carapace is composed of four acutely triangular teeth. Each anterolateral margin has nine teeth on each side, with the very pronounced last pair of teeth resembling horns that are ~2-4 times larger than the preceding teeth (see Mesa et al. 2018).

The clawed legs of the BSC are long, elongated, and rigid, with the last pair functioning as swimming paddles to help pursue potential prey or avoid predators. These edible crustacean species are gonochoric or have separate sexes. The males usually have distinctive blue color and a triangular abdomen, while the females are mottled brown to dull green in color, with a semi-circular abdomen (Figure 4).



MALE



FEMALE



Figure 4. The male (M) and female (F) blue swimming crab, *Portunus pelagicus*, in the Philippines (Sources: Mesa, 2019; museum.wa.gov.au)

This species is known in various names, including blue manna crab, blue swimmer crab, blue crab, and sand crab. In the Philippines, it is locally known as “alimasag” (Tagalog), “lambay” or “masag” (Cebuano), and “kasag” (Hiligaynon).

Life history. The mating behavior of BSC is usually through pre-copulatory courtship, where the sperm is transferred indirectly through olfactory and tactile cues.

This species exhibits several larval stages before metamorphosing into the crab stage (Figure 5). During its larval stage, it undergoes four zoeal stages (Shinkarenko 1979) that are largely planktonic. The larvae drift up to 80 km offshore and spend up to six weeks in coastal waters (Williams 1982).



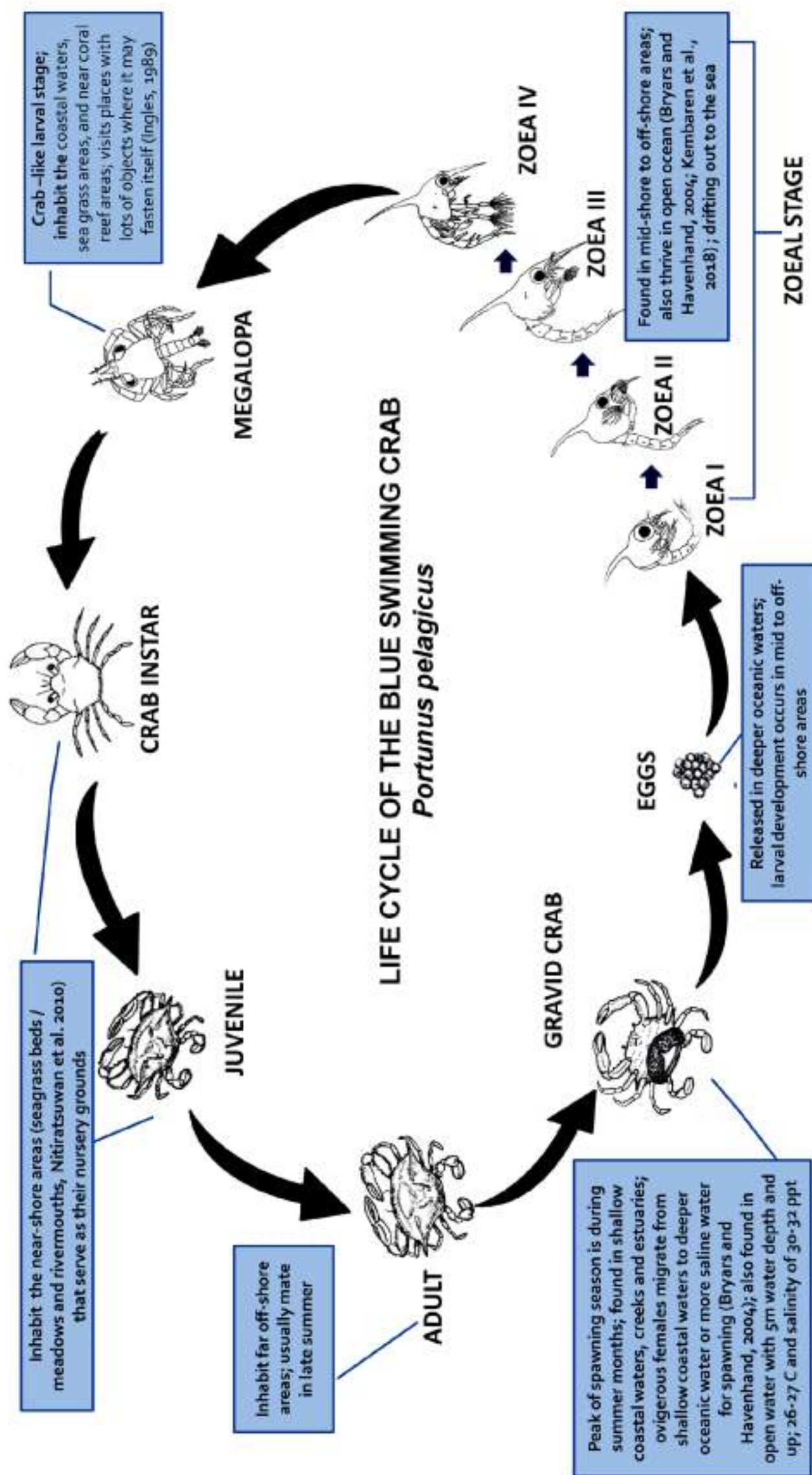


Figure 5. The life cycle of the blue swimming crab, *Portunus pelagicus*

The first zoeal stage is characterized by a carapace length of 0.44-0.54 mm. The eyes are not stalked yet, with the abdomen consisting of five segments plus a telson (length = 1.07-1.23 mm). For the second zoeal stage, the carapace length has increased to about 0.72-0.77 mm after molting and its eyes have become stalked at this point. The general morphology of the cephalothorax and the abdomen are essentially the same as in Zoea I (Junawa et al. 1987), but with added pair of short hair-like projections to the central arch of telson. After 3-4 days, each larva molts into third zoeal stage that is characterized by a carapace length of 0.79-0.87 mm. The abdomen is now composed of six abdominal segments (with spine being absent on the sixth segment). In addition, pleopods buds now appear on the second to six abdominal segments. The larva in the fourth zoeal stage has a carapace with a length of 0.98-1.06 mm and an abdomen-telson length of 2.61-3.03 mm (Josileen and Menon 2004). It also has pleopods that are already well-developed and biramous on the second to fifth abdominal segments (Junawa et al. 1987). The last two stages takes about 2-3 days to develop (Arshad et al. 2006). In general, all zoeal stages are characterized by a long rostral, a dorsal spine, and a pair of short lateral spines on the carapace. The exopodites of the first and second maxillipeds are used in swimming (Arshad et al. 2006).

The larva then undergoes major metamorphosis to the megalopa stage. In this stage, the larva appears to be more crab-like in appearance with a broader carapace. Biting claws and pointed joints at the end of its swimming legs are now more developed. The megalopa measures approximately 1.0 mm in width with the duration of the stage for about 3-4 days (Josileen and Menon 2004).

The megalopa then undergoes final metamorphosis to the 1st crab instar, about 15-18 days of development after hatching. The instar stage of BSC now resembles its adult form, with completely curved abdomen below the cephalothorax (Arshad et al. 2006, Josileen and Menon 2004). It is now in benthic form and preys on small shrimps and clams and other benthic invertebrates.

The BSC instar then undergoes several molting until it reaches the juvenile stage. During this stage, the carapace has grown up to 60 mm in width. Some of these juveniles now migrate to the estuarine waters. They forage and grow in nursery shallows, preferably in seagrass beds and near-shore areas (Kenyon et al. 1999).

From this point and until about five to six months after hatching, the BSC will once molt until it finally reaches full maturity (Juwana et al. 2015). Adults mate during late summer and generally spawn either in the entrance channels or in adjacent coastal waters (Banks and Trumble 2011).

The blue swimming crab is a carnivorous species. Their main diet includes bivalves while the octopus is considered as their main predator (Ingles 1996).

Reproductive Biology. This species follows a year-round spawning cycle with the highest spawning activity generally observed between May and October (Potter et al. 1983, Ihsan et al. 2014) in tropical waters. It reaches sexual maturity at a carapace length of about 11.43 cm for females and 22.86 cm for the males (BFAR 2013). Female crabs release up to two million eggs per batch.

According to Sumpton et al. (1994), there are five stages in the reproductive cycle of BSC, exhibiting the changes during its gonadal maturity. Stage I (or the Immature/Virgin Stage) is characterized by being non-ovigerous. As it reaches Stage II (or the Developing/Maturing Stage), it becomes ovigerous, with pale to dark yellow mass, with no visible eyespots in the eggs. In Stage III (or the Mature/Ripening Stage), it is still ovigerous, with yellow to yellow-grey egg mass and visible eyespots. During Stage IV (or the Spawning/Gravid Stage), the crabs are ovigerous, with grey egg mass, and the eyespots and chromatophores becoming discernible. The last stage (Stage V or the Spent or Resting Stage), only the remnants of eggs are present in the abdominal flap.

The movement of BSC in and out of the estuaries, into open ocean waters generally occurs in response to lower salinities (Banks and Trumble 2011). The average lifespan of blue swimming crabs is approximately three years (Williams 1982).

Distribution. The BSC is widely distributed in the Indo and West Pacific oceans, from Japan and Philippines throughout Southeast and East Asia, to Indonesia, the East of Australia, and Fiji Islands, and westward to the Red Sea and East Africa.

In the Philippines, the BSC is among the 51 species of swimming crabs. It is found in shallow water areas between 10 to 50 m depth, with sandy to muddy substrate, including areas near reefs, mangroves, seagrass, and algal beds.

Juvenile BSC most commonly occur in intertidal shallower areas, with its age of maturity around 1 year. It feeds on a wide variety of sessile and slow moving benthic invertebrates (such as hermit crabs, gastropods, bivalves, ophiuroids, and gammarid amphipods). This species is almost exclusively carnivorous, that rarely consume plant material.

The habitats of the BSC at its different life stages are schematically presented in Figure 5.

Fishing Gears for BSC. The BSC in the Philippines are caught by a wide variety of fishing gears, such as gill nets, crab pots, crab lift nets, push nets, and trawl. The major crab fishing gears being used are the following:

- a). **Crab Entangling Net or Bottomset Gillnet.** This gear (Figure 6) is locally called “pukot pangasag”, “palugdang” or “palubog”. It is usually operated by 1-3 persons per boat, with 1 person rowing the boat while the other two sets the net in place. The length of net ranges from less than a kilometer to almost 3 kilometers long. It consists of panels of meshes that are made up of nylon.

In setting up the net, heavy sinkers are placed on the lead line to keep the net on the bottom and the net is set in one place by having anchors at both ends. The setting procedure usually takes 10-15 minutes, depending on the length of the net. Once the entire net has been set, buoys are attached at the end of the head rope.

The crab entangling net is usually set at the bottom before sunset and early the next day, the fishers return to the area to retrieve the net. Firstly, the buoy is retrieved slowly and the net is hauled by hand. While retrieving the gear, the fishers carefully remove each of the entangled crab from the net. With this practice, the soaking time (that is, from the time the crab gets entangled until it is retrieved from the net) ranges from 2 hours to almost 24 hours.

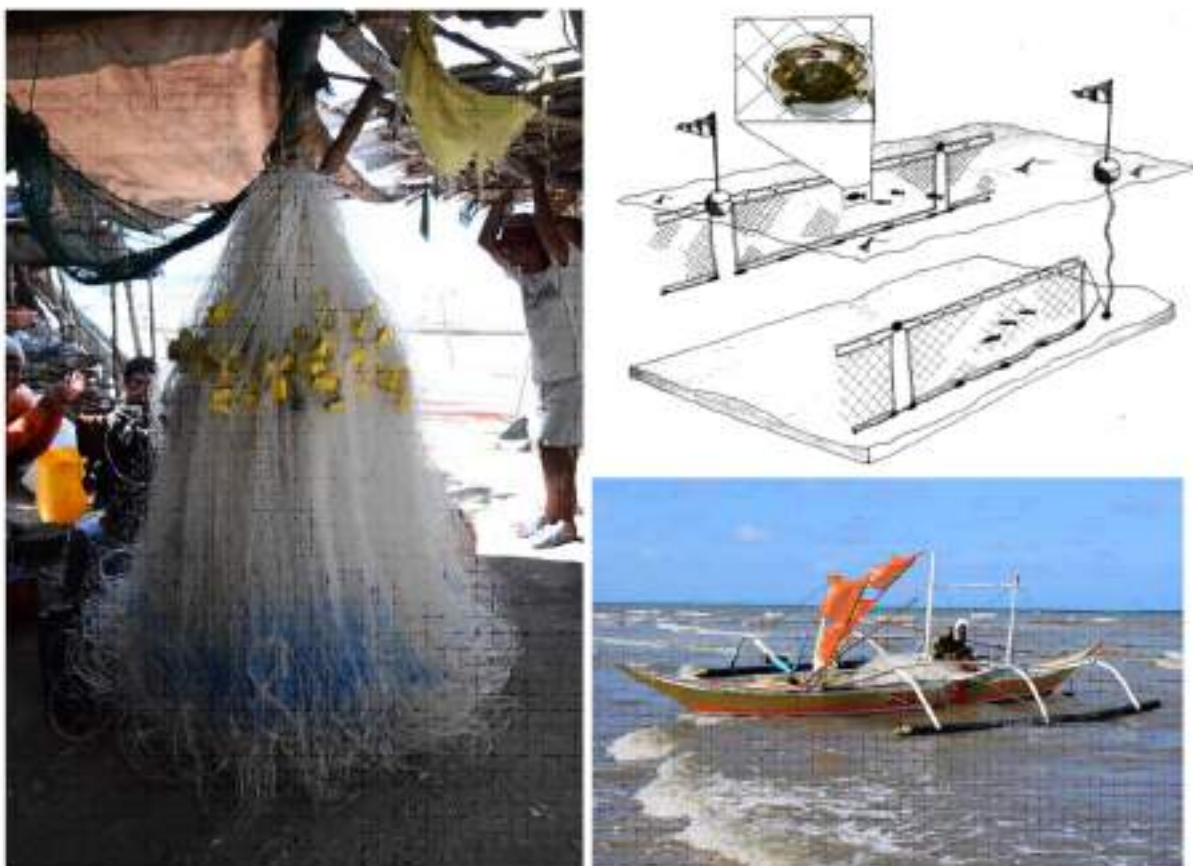


Figure 6. The crab entangling driftnet (A) or bottomset gillnet (B) (Bjorndal 2002) being used in the BSC Fishery in the Philippines

As soon as the fishers are able to reach the landing area and the catch sent to the buyers, the fishers immediately arrange the net carefully to ensure easy setting during the next operation.

Crab entangling net is prone to by-catch and ghost fishing. By-catch may include fish and marine mammals. It may also catch small and juvenile crabs depending on its mesh size.

- b). **Crab pots.** Locally known as “bubo pangasag”, “panggal”, and “timing”, a crab pot is a passive gear that is made up of bamboo and netting material. The frame, which gives shape to the gear and serves as attachment for the net, bait holder, sinkers and retrieving line, is usually made of bamboo.

This fishing gear works by luring (through bait) the organism into an enclosure that may have one or more entrances depending on its design. The different crab fishing communities in the country develop their own crab pot design, based on their preference (Figure 7). For example, the shape of the pot may be circular, rectangular, or square in varied sizes. Crab pots are generally made of different materials, such as bamboo strips, polyethylene net, or synthetic chicken wires, with the frame typically made up of bamboo.

The crab pot operation involves 1 to 3 fishermen, depending on the number of units (usually ranging from 40 to 800 units) and the size of the fishing boat. The use of bait is very crucial, since no bait means no operation for most fishers. The fishers are using different baits depending on what is available in their communities. The most common baits include small fishes, crabs, and shells. The bait is usually placed inside the bait holder which is attached inside the pot, either at the bottom, centre, or upper portion of the frame. The soaking time of crab pots ranges from 5 hours to more than 24 hours and the whole fishing operation ranges from 1 to 3 days.

Crab pots that are made of bamboo are one of the most eco-friendly crab fishing gears. It has minimal by-catch and catches less number of small and juvenile crabs especially if the “mesh size” is bigger than 3 inches. Crab pots are being constructed by fishers themselves or their wives.



Figure 7. The different crab pots and crab traps being used in the BSC Fishery in the Philippines

- c). **Crab lift net.** This is a passive gear (Figure 8) used mainly to trap crabs. This gear is composed of a bamboo frame and a netting material. The bamboo frame provides shape to the gear. There are sinkers attached to the tips of the bamboo frame, a float that is used to mark the site where the fishing gears are set, and a retrieving line that is used to pull the gear to the surface. In order to lure crabs, baits, usually chopped trash fish, are placed inside a bait holder.

This gear is usually operated by one person with at least 20 to 120 units of crab lift nets, depending on the availability of capital. It is usually used from morning until night time, with soaking time ranging from 5 to 30 minutes. Hauling of the gear requires some skill as the crab may escape while the gear is being retrieved. The whole operation, however, typically ranges from 4 to 11 hours. Average catch is about 2-4 kgs during peak season and 1-2 kgs during lean season.

This gear is being operated in a more shallow areas and it generally catches smaller sized crabs. This is locally known as “sapyaw” (in Bohol) and “bintol” (in other areas in the country).



Figure 8. The crab lift nets being used in the BSC Fishery in the Philippines

Production. Figure 9 shows the major BSC fishing grounds, located in the different FMAs in the country. Eight (8) of them are found in Luzon, 4 in the Visayas region, and 2 in Mindanao. In 2019, about 57.10% of the total production in the BSC came from the Luzon fishing grounds, 34.00% from Visayas, and 8.90% from Mindanao (PSA 2020).

Since the BSC fisheries is commercially and economically important, it has been experiencing high level of exploitation resulting to fluctuations in catch data as shown in Figure 10. The production of BSC in all producing regions also varies (Table 6), with the top 20 BSC producing provinces also showing fluctuating volumes in the last ten (10) years (Table 7).



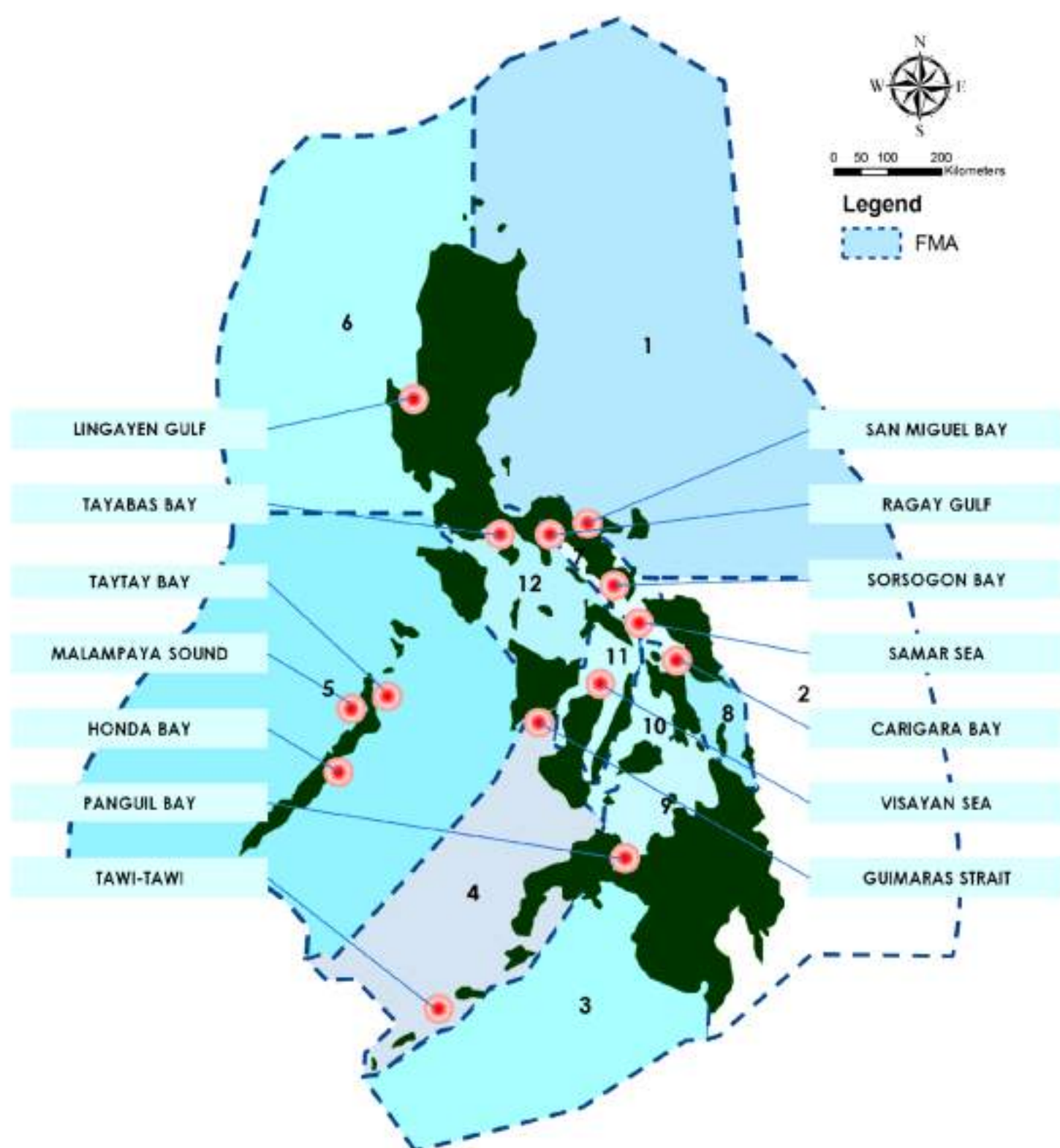


Figure 9. Major fishing grounds for the blue swimming crab in the Philippines that are situated in the different Fisheries Management Areas (FMAs). These fishing grounds include Lingayen Gulf, Tayabas Bay, Ragay Gulf, San Miguel Bay, Sorsogon Bay, Samar Sea, Carigara Bay, Visayan Sea, Guimaras Strait, Taytay Bay, Malampaya Sound, Honda Bay, Panguil Bay, and Tawi-tawi (Source of data: Ingles, 1996; FMA map: USAID Fish Right Program)

Table 6. Production volume (in MT) of BSC from 2010 to 2019, from the municipal waters of all BSC-producing regions (Source: PSA, 2020)

Regions	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Region VI (Western Visayas)	9,383	8,928	8,140	7,873	7,448	7,287	8,682	10,862	10,281	7,108
Region V (Iloilo Region)	5,210	4,784	4,080	4,811	4,989	5,540	5,735	5,989	6,105	5,524
Region 4-B (MIMAROPA)	3,322	3,358	3,570	3,631	4,760	3,810	2,783	2,926	5,221	5,245
Region 3 (Central Luzon)	1,161	1,179	1,073	1,092	1,120	1,086	1,457	2,096	2,783	3,809
Region 4-A (CALABARZON)	1,332	1,913	1,510	1,628	1,705	1,587	1,657	2,362	1,595	1,823
Region 8 (Eastern Visayas)	3,314	2,982	2,457	2,159	2,175	2,221	2,356	1,604	1,870	1,596
Region 9 (Zamboanga Peninsula)	1,287	1,397	1,075	1,161	1,103	1,103	1,921	1,799	1,360	1,087
Region 7 (Central Visayas)	1,428	1,420	1,187	979	847	729	823	1,007	955	1,043
Autonomous Region in Muslim Mindanao	350	443	422	440	437	474	479	474	596	754
Region 1 (Ilocos Region)	117	199	105	117	126	128	146	176	529	561
National Capital Region	271	423	476	425	540	395	371	172	185	486
Region 10 (Northern Mindanao)	651	553	483	389	420	426	474	440	435	441
Region 13 (Caraga)	105	137	136	143	168	165	190	231	236	268
Region 11 (Davao Region)	91	49	107	129	106	91	54	33	46	47
Region 2 (Cagayan Valley)	100	109	93	84	91	65	47	38	35	32
Region 12 (SOCCSKSARGEN)	49	49	48	44	41	39	32	21	10	16

Although there has been an increase in production from 2016 onwards, reaching 33,930.00t in 2018, but dropping to 29,677.14t in 2019 (Figure 10), BSC traders, processors, and exporters are still faced with limited supply, as there has been an increasing demand for crabs by the increasing population in the country and elsewhere.

In terms of value, there has been fluctuation but increasing production values from 2004 until 2016, with promising increases in the 2 succeeding years (Figure 11). In 2018, the production value of the BSC industry in the country reached an all time high of ~PhP 5.47B, but this was followed by a drop in 2019 to PhP4.55B (PSA 2020). Table 8 identifies the production value of BSC in the different BSC-producing regions in the country, while Table 9 provides the list of the Top 20 BSC-producing provinces all over the country.

Table 7. Production volume of BSC from 2010 to 2019 from the municipal waters of the top 20 BSC-producing provinces (Source: PSA, 2020)

Provinces	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Palawan	3,078	3,103	3,327	3,370	4,493	3,538	2,539	2,704	5,052	5,101
Iloilo	6,567	6,500	2,161	1,645	1,810	1,744	4,111	4,981	5,889	3,634
Bataan	770	821	790	810	823	779	1,228	1,888	2,601	2,726
Sorsogon	622	726	638	1,334	1,393	2,351	2,805	2,684	2,879	2,280
Negros Occidental	274	248	3,808	4,219	3,697	3,654	2,634	3,166	2,820	1,928
Masbate	2,357	2,879	1,352	1,258	1,349	1,105	1,208	1,771	1,835	1,886
Quezon	1,189	1,711	1,322	1,450	1,418	1,299	1,326	2,013	1,206	1,255
Capiz	2,051	1,722	1,847	1,719	1,609	1,479	1,557	1,567	1,255	1,238
Samar	2,681	2,390	1,759	1,540	1,498	1,584	1,685	1,226	1,263	1,099
Bohol	554	606	506	509	360	309	300	390	560	682
Tawi-tawi	221	314	307	335	337	384	399	408	533	631
Cavite	113	118	155	157	278	262	304	316	338	518
Camarines Norte	510	478	528	629	676	618	444	426	434	515
Camarines Sur	1,377	1,163	1,166	1,160	1,152	1,088	907	765	638	582
Pangasinan	89	163	7	37	48	48	55	73	412	432
Zamboanga Sibugay	344	401	269	331	256	264	1,104	1,007	611	378
Zamboanga City	363	377	312	316	317	348	370	355	364	376
Cebu	799	748	625	420	450	387	482	570	351	333
Zamboanga del Sur	545	606	468	497	489	441	404	409	355	381
Albay	149	174	267	296	311	280	302	289	270	381

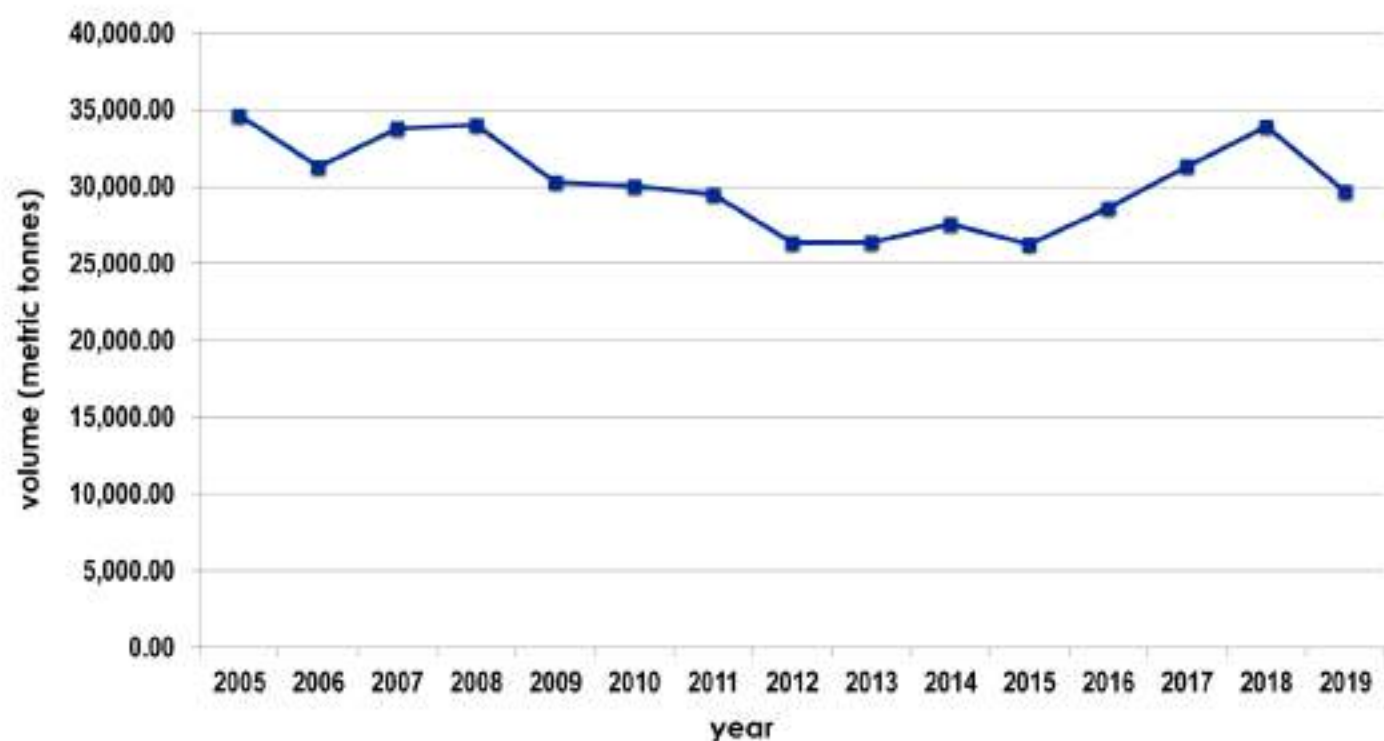


Figure 10. Production volume of blue swimming crabs in the Philippines from 2005 to 2019 (Source: PSA, 2020)

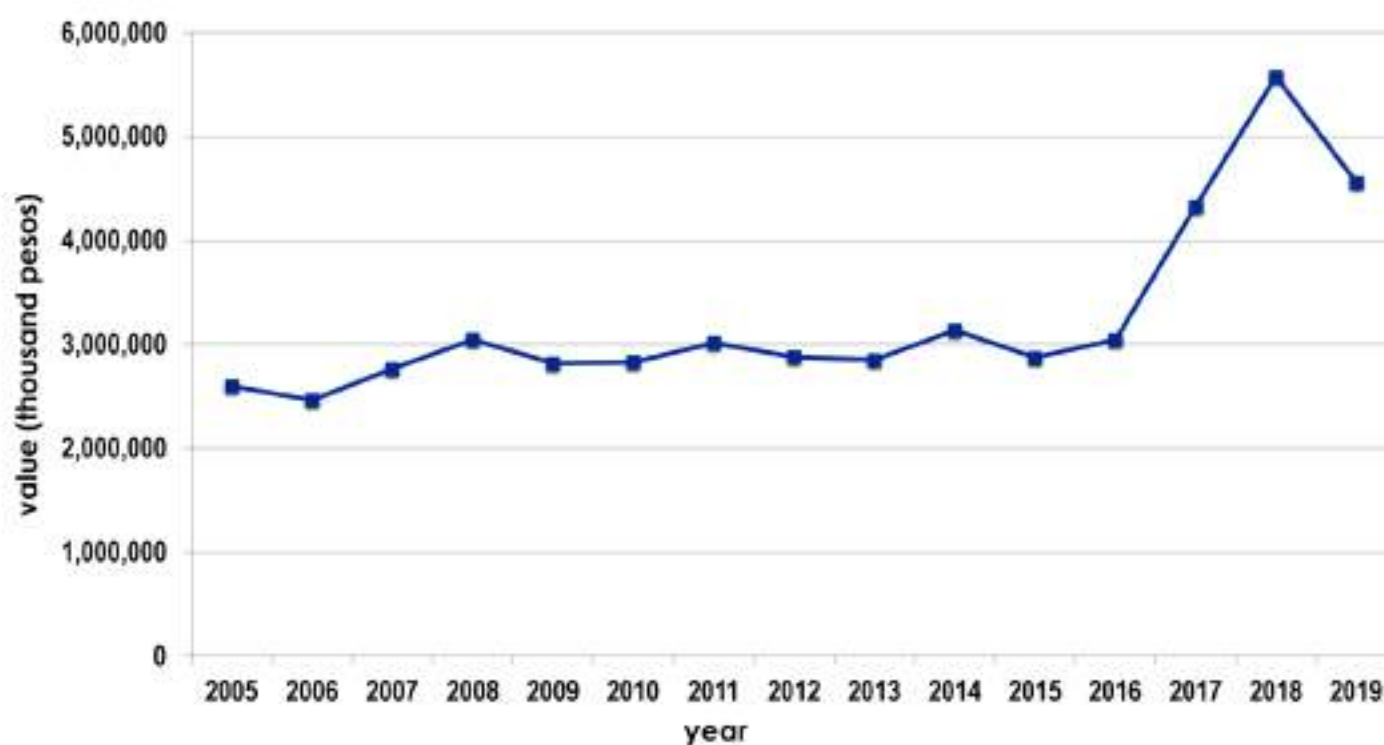


Figure 11. Production value (in thousand pesos) of BSC in the Philippines from 2005 to 2019 (Source: PSA, 2020)

Table 8. Production value (in thousand pesos) of BSC in the Philippines from 2010 to 2019, from the municipal waters of all BSC-producing regions (Source: PSA, 2020)

Regions	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Region 6 (Western Visayas)	886,162	979,265	992,807	971,697	973,018	818,117	949,206	1,713,517	2,057,820	1,458,464
Region 5 (Bicol Region)	540,363	498,662	414,019	461,330	522,791	565,791	584,368	790,045	1,010,273	711,997
Region 4-B (MMAROPA)	243,847	266,251	346,328	331,675	464,804	385,566	256,164	306,573	709,122	603,198
Region 3 (Central Luzon)	103,087	114,875	104,638	109,977	111,521	105,604	136,721	232,135	408,891	452,661
Region 4-A (CALABARZON)	152,112	225,230	178,921	180,949	202,746	200,953	199,358	319,215	262,591	352,107
Region 8 (Eastern Visayas)	324,195	315,879	280,994	260,326	272,298	278,976	298,321	187,535	289,131	261,984
Region 7 (Central Visayas)	181,789	188,380	158,749	129,521	130,926	110,694	105,053	154,128	161,183	176,070
Region 9 (Zamboanga Peninsula)	78,270	93,559	70,529	76,929	73,183	76,488	147,383	158,049	126,838	95,308
Region 1 (Ilocos Region)	11,958	21,975	11,306	11,760	13,203	13,201	18,214	22,377	57,754	85,394
Autonomous Region in Muslim Mindanao	21,621	26,789	34,540	41,226	42,318	47,184	48,402	48,383	61,052	79,393
National Capital Region (NCR)	27,421	50,209	55,799	47,570	59,976	48,808	44,950	25,736	36,727	75,035
Region 10 (Northern Mindanao)	52,316	46,129	40,612	32,567	36,234	37,935	43,372	41,135	42,077	45,089
Region 13 (Caraga)	8,337	12,732	14,224	16,984	19,958	21,451	25,477	32,878	31,879	41,543
Region 11 (Davao Region)	7,062	3,882	11,394	12,541	13,124	10,855	5,440	3,788	7,529	7,400
Region 2 (Cagayan Valley)	9,312	10,251	8,783	8,623	9,230	7,567	5,371	4,489	4,364	3,964
Region 12 (SOCCSKSARGEN)	3,260	4,033	3,975	4,579	5,105	5,198	4,577	2,954	2,161	2,247

Table 9. Production value of BSC in the Philippines from 2005 to 2019 from the municipal waters of the top 20 BSC-producing provinces (Source: PSA, 2020)

Provinces	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Iloilo	703,102	813,629	283,847	203,983	257,420	220,634	465,693	950,146	1,229,811	861,542
Palawan	225,858	246,790	327,430	311,299	443,693	364,065	236,583	286,759	691,329	583,615
Bataan	74,140	87,635	82,083	88,027	88,499	82,270	116,357	211,981	389,268	422,046
Negros Occidental	34,347	31,502	559,337	628,565	576,374	452,881	334,750	591,448	593,554	371,816
Sorsogon	55,684	66,110	70,839	119,295	158,254	210,081	265,621	368,720	529,977	299,416
Marikina	310,983	277,659	180,945	169,924	187,686	157,907	148,274	259,381	310,438	247,452
Quezon	125,447	197,527	153,393	157,139	167,764	161,111	150,349	271,540	193,659	241,579
Samar	269,807	264,857	214,046	201,709	204,520	215,779	213,796	152,219	205,235	188,401
Capiz	100,978	89,004	117,935	109,841	104,441	101,536	103,803	129,215	188,773	177,537
Bohol	61,502	74,626	66,382	68,586	52,706	44,796	33,459	50,923	88,764	108,137
Cavite	12,691	16,374	20,014	19,708	31,602	35,173	43,955	41,880	59,172	101,285
Camarines Norte	36,348	34,457	31,492	37,612	41,210	60,245	46,089	43,850	50,204	81,108
Camarines Sur	115,241	98,524	104,609	105,429	107,326	103,961	88,374	86,502	85,939	75,163
Pangasinan	9,293	18,881	704	4,094	5,705	5,416	6,419	8,836	42,528	69,878
Cebu	111,150	107,832	86,237	56,164	74,324	62,474	69,097	100,037	69,319	64,642
Tawi-tawi	7,811	14,409	22,890	30,145	31,661	36,950	38,793	40,481	53,214	63,069
Zambo Sibugay	28,108	34,071	18,134	20,963	19,054	21,371	87,544	95,622	66,036	38,265
Northern Samar	33,143	26,879	28,823	23,735	21,491	19,291	18,062	15,904	29,313	37,325
Albay	8,779	10,442	16,776	18,235	20,156	26,776	29,497	26,700	28,451	34,070
Zamboanga City	29,957	31,353	27,895	29,102	26,880	29,341	30,900	30,200	31,082	32,621

Utilization. The BSC is mostly consumed fresh in the Philippines. However, due to high consumer demand in the international market and the economic benefits derived from this species, a significant part of the BSC production in the country goes to the export market. This has led to a dramatic increase in the average local retail price per kilogram of the BSC within a 15-year period, from PhP118.85/Kg in 2004 to PhP305.49/Kg in 2019 (PSA, 2019). However, this figure is expected to drop by the end of 2020, as a result of the worldwide health pandemic during this year.

The increasing demand in the international market until 2019 places BSC as one of the top export fisheries commodities of the country. The volumes of exported crab products that are processed as pasteurized crab meat are shown in Table 10, and are mainly exported to the United States and to some Asian markets.

Just like any other fishery commodities that are traded in the international market, the exporters must show proof that they are following quality and safety standards in the manufacturing of pasteurized crab meat in cans. Table 11 shows the number of crab processing facilities that BFAR approved (non-EU approved), EU approved, and GMP Recognized fishery and BSC-based establishments.

Incidentally, the Bureau of Agriculture and Fisheries Standards issued in 2016 the Philippine National Standard (PNS): Pasteurized crab meat (PNS/BAFS 178:2016). This PNS specifically “aims to provide a common understanding on the scope of the standard, product description, process description, essential composition and quality factors, food additives, contaminants, hygiene and handling, packaging and labeling, methods of sampling, examination and analysis, definition of defectives and lot acceptance” for pasteurized crab meat.

Table 10. Export volumes of different crab products from the Philippines from 2008 to 2016 (Source: BFAR, 2008-2016)

PRODUCT TYPE	2008	2009	2010	2011	2012	2013	2014	2015	2016
Live, Frozen/Fresh or Chilled	1,689	3,011	3,368	4,240	5,207	11,579	8,217	7,568	10,292
Crab fat (Prepared/Preserved)	356	110	303	181	26	812	451	445	467
Crab meat (Prepared/Preserved)	1,542	1,236	2,124	1,743	1,682	1,495	3,246	3,451	3,401

Table 11. Number of BFAR approved (non-EU approved), EU approved, and GMP Recognized fishery and BSC-based establishments in the Philippines, per region (as of 30 September 2019). (Source: BFAR 2019)

REGION	Number of BFAR Approved Establishments	Number of BFAR Approved BSC Establishments	Number of EU Approved Establishments	Number of EU Approved BSC Establishments	GMP Recognized Establishments	GMP Recognized BSC Establishments
1	2		1		0	
2	0		0		0	
3	8		3		6	
4a	13		3		3	
4b	9		1		6	
5	4	1	0		3	1
6	12	5	1		5	3
7	15	3	4	2	6	6
8	2		0		5	2
9	7		12		17	1
10	0		1		0	
11	4		0		0	
12	8		24		11	
13	2		0		3	
NCR	30		15		3	
ARMM	0		0		4	
CAR	0		0		0	
TOTAL	116	9	65	2	72	13

THE PHILIPPINE BLUE SWIMMING CRAB SUPPLY CHAIN

Value chain analysis. The value chain analysis is an analytical tool used in understanding the policy environment, in terms of efficiency in allocating resources within the domestic economy, while simultaneously understanding the manner in which firms and countries participate in the global economy (Jacinto 2004).

The application of value chain in fisheries and aquaculture is growing in number (e.g. Gudmundsson et al. 2006; Islam 2008; Janthaya & Silva 2010; Loc et al. 2010; Mai et al. 2010; Jiménez-Toribio & García-del-Hoyo 2010; De Silva 2011).

In the Philippines, value chain analyses have been extensively done for different fishes (e.g. milkfish, siganids, roundscad, sardines, red coral trout, yellowfin tuna, frigate tuna, and anchovies) and non-fish / invertebrates (e.g. black tiger shrimp, abalone, sergestid shrimp, mud crab, blue swimming crab, and seaweeds), as reported by Pido et al. (2018).

Value chain analyses have been done for BSC, covering 18 sites in 7 regions, i.e. Regions 3, 4B, 5, 6, 7, 8, and NCR (Yap et al. 2017), and other areas such as Sulu archipelago (Rosales et al. 2017) and in Danajon Reef in the province of Bohol (Armada et al. 2009).

The application of the concept of value chain in fisheries takes into consideration the ecosystem and the human communities that are affected by the fisheries. In particular, mapping of seafood value chain networks must focus on the identification of inefficiencies in the marketing system, or economic inequalities that emerge between stakeholders, such as fishers and middlemen (see Yap et al. 2017).

The main actors in the BSC industry. The main actors or key players of the Philippine BSC industry include the fishers, processors (including pre-processors and small, medium, and large scale processors), traders (including consolidators, distributors, wholesalers, and retailers), consumers, and the enablers that include the resource managers, concerned government agencies, non-government organizations, civil society groups, and others.

The positions of these main players in the supply chain of the BSC are shown in Figure 12.



SUPPLY CHAIN MAP OF THE BLUE SWIMMING CRAB IN THE PHILIPPINES

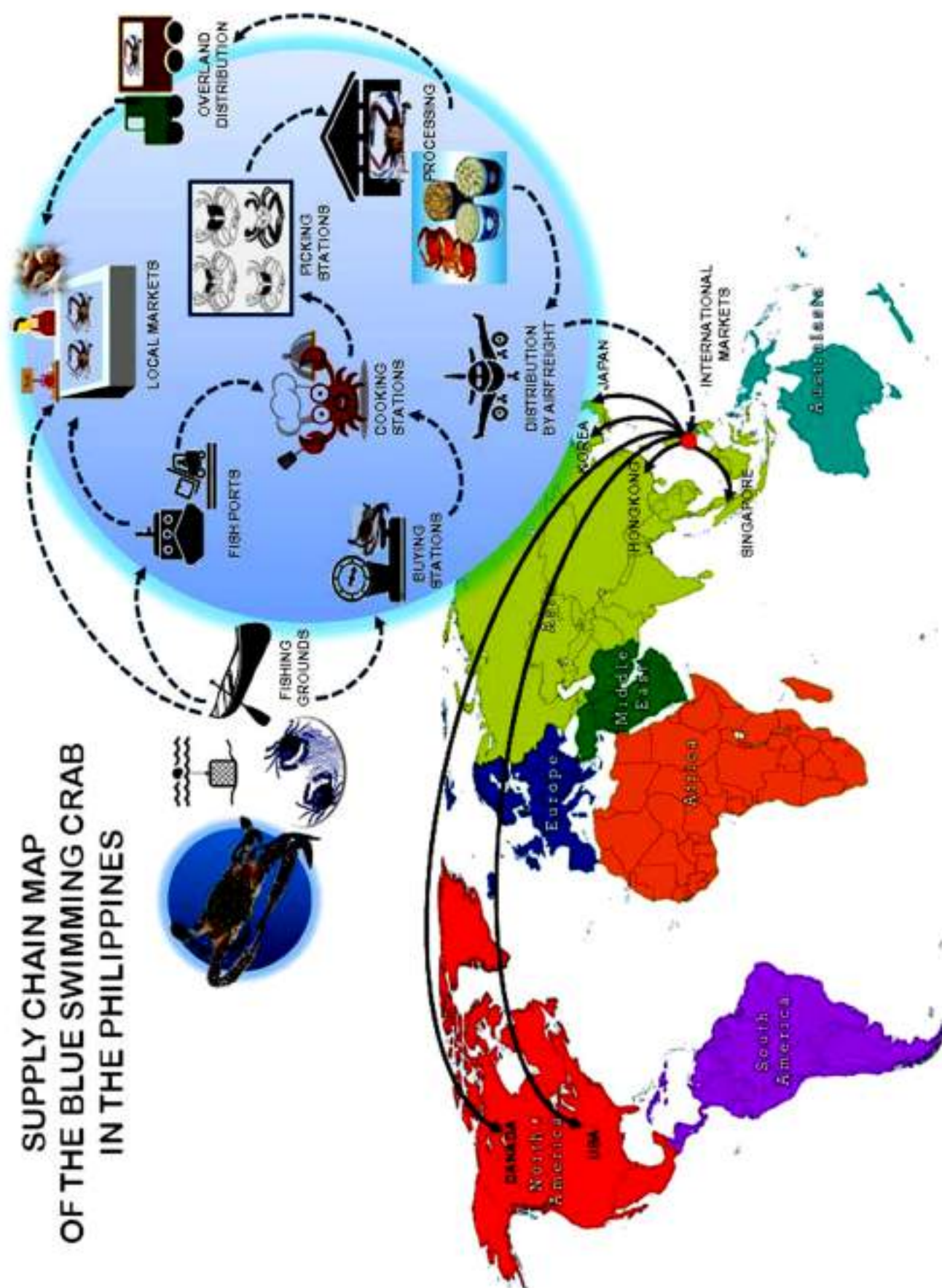


Figure 12. The supply chain map of the BSC in the Philippines (Source: Yap et al., 2017)

The relationship between the main actors of the BSC industry. Individual actors operate quite differently in the various parts of the country. For example, the BSC fishers are either the boat owners or they rent the boat from another person or from the boat owners.

The crabbing activities generally happen on the same site where most of the fishers reside, since these fishers limit their fishing activities in their respective municipal waters. Some fishers transfer to other nearby fishing grounds in pursuit of better catch volume while other fishers frequently visit large span of fishing areas.

After catching, primary trading usually happens in the traditional fish landing sites or fish ports near the fishers' residence. The middlemen or traders serve as consolidators of raw BSC, financier to some fishers, and as traders in some rural and urban markets.

From the trading sites, BSC for local consumption go directly to the local wet markets or are sold directly to the consumers in the landing sites. Those BSC for processing go to the buying stations that are mostly situated near the landing sites.

Most of the pre-processing activities in the cooking and picking stations occur in the same areas where the primary trading activities take place. There are areas, however, that do not have cooking stations. Thus, buyers from these areas have to sell their BSC to nearby areas or municipalities.

The medium scale processors mostly own the buying, cooking, and picking stations that are peppered in high BSC producing provinces. Some large scale processors have satellite stations (cooking and picking) where they assign company workers (purchasing and quality control officers) to oversee the operations.

From the picking stations, the goods are transferred to the processing plants. These main processing plants are mostly concentrated in Cebu (Region 7) and Bacolod (Region 18), with some plants also located in Naga City in Region 5, Catbalogan in Region 8, and Concepcion in Region 6 (Yap et al. 2017).

Once processed as pasteurized crab meat in cans, the products mostly go the international market and then to the consumers.

Figure 13 outlines the flow of products from the source (i.e. municipal and commercial waters) to the consumers.

Most recently, both the BSC supply chain (Figure 12) and the flow of products (Figure 13) have been heavily impacted by the COVID-19 health pandemic. While the key players such as the fishers in the coastal communities and the traders in the different localities have some activities, the exporters who are engaged in global trade suddenly experienced very minimal activities due to local ordinances on work suspensions and the seizing of exportation. Against this backdrop of uncertainty in the time of COVID-19, efforts must be focused on addressing these challenges that can potentially break the BSC value chain and the usual flow of BSC products in the country.

Practices in post-harvest handling, processing, and marketing of BSC. Raw BSC, immediately after capture, are traded in local wet markets in the same rural areas where the fishers reside, or in nearby areas.

Premium quality raw BSC for domestic consumption are usually traded in the regions where most of the big urban cities are located, i.e. Iloilo City in Region 6, Cebu City in Region 7, Catbalogan and Tacloban City in Region 8, and Naga City in Region 5.



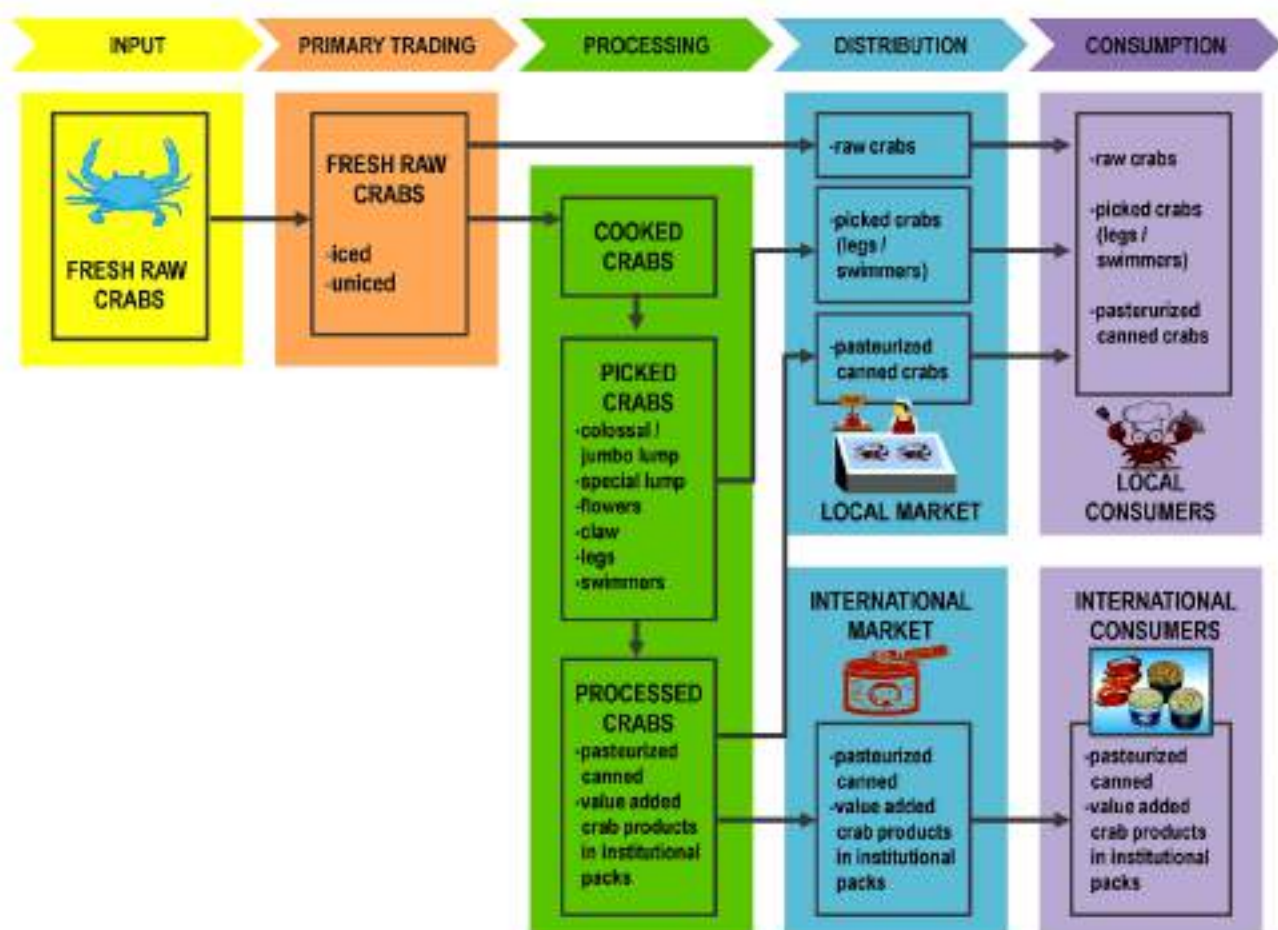


Figure 13. Product flow along the supply chain of the BSC in the Philippines (Source: Yap et al., 2017)

In the Luzon provinces, most of the traders bring their raw BSC to Manila. This is apparently due to the demand of the institutional markets (e.g. hotels, resorts, restaurants, etc.) and high price of crabs in the metropolitan areas.

Premium quality raw BSC for international markets are consolidated by traders and/or sold in buying stations that are directly sending the BSC to the cooking stations. BSC are cooked as fast as they can to avoid spoilage. Different practices on cooking of crabs can be observed in different parts of the country.

The cooking and picking stations pre-process BSC with the size of $>4''$. The pickers sort the crab meat based on the prescribed forms: colossal lump, jumbo, lump, claw (Figure 14).

The crab meats are separately placed in plastic tubs and are placed under refrigerated conditions until transport to the processing plants, usually by land (in big trucks). These crab meats are then processed either as pasteurized crab meats in cans or as value added crab products.

Pasteurized canned crabs are mostly intended for the export market, with some marketed in select supermarkets in the big cities in the country. The processing plants are strictly following the specifications of their respective international buyers.

Figure 15 shows the standard processing method for pasteurized canned BSC in the Philippines.





Colossal /Jumbo Lump



Lump



Special Lump



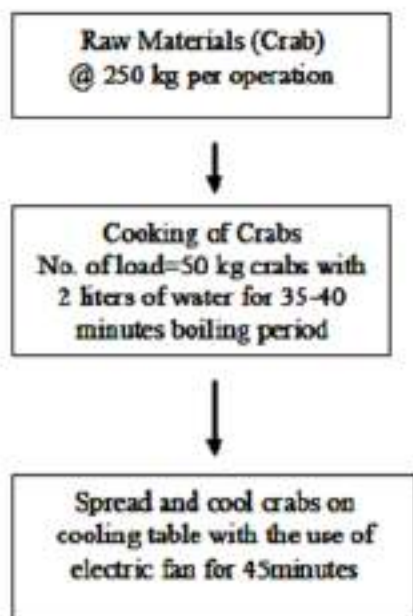
Claws, legs

Figure 14. Classification of crab meats in the Philippines

The role of women in the BSC fisheries in the Philippines. Women are involved in the series of activities along the BSC supply chain in the Philippines, from fishing preparation and operation, including gear construction, to marketing and processing.

Crab fishing is mostly dominated by men. However, the participation of women is valuable before (preparation and construction of gears) and after fishing operations (e.g. gathering of crabs from different fishing gears and repair and maintenance of gears).

Step 1 (Cooking and Cooling)



Step 2 (Picking and Packaging)

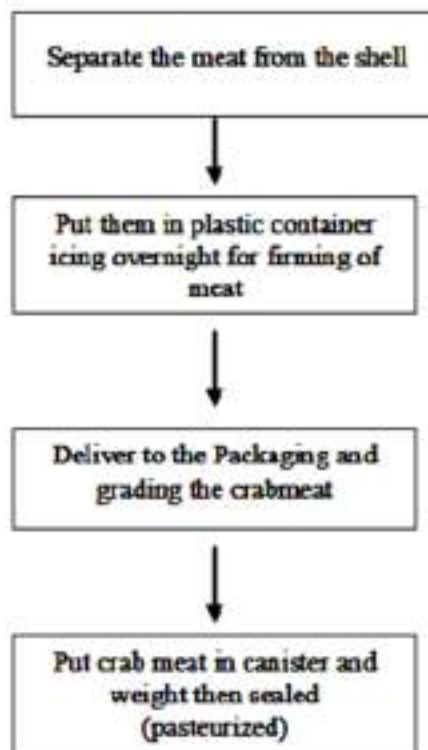


Figure 15. The recommended steps in the crab cooking and picking stations, as stipulated in the BSCMP (2014)

Such sharp distinction between the roles played by men and women has been prominent for a long time (e.g. Siason 1998; Tietze et al. 2007; Macalagdag et al. 2014; Yap et al. 2017), wherein men still remain the fishers because of the strenuous fishing activities, while women are designated to do light load of mending nets, preparation of nets prior to fishing and other similar activities.

Active involvement of women is observed in the processing of BSC (i.e. in picking, sorting, cleaning/sanitation, supervising, and ensuring product quality) and selling of crabs in the wet markets. Interestingly, Yap et al. (2017) noted that more women are involved in the top level management of several BSC processing plants in the country.



PROBLEMS OF THE PHILIPPINES BLUE SWIMMING CRAB

Just like any other fishery industry in the Philippines or elsewhere, the BSC industry in the country is beset by different problems or challenges that have been identified by the different stakeholders during consultations. The results of the SWOT analyses were the bases in determining these problems.

These problems that were categorized as **environmental** (or ecological), **socio-economic** (or human), and **governance-related** issues and concerns, are as follows.

ENVIRONMENTAL (OR ECOLOGICAL) ISSUES AND CONCERNS

There are various environmental or ecological problems confronting the BSC industry of the Philippines. In particular, the main environmental (or ecological) problems include the following:

1. **PROBLEM:** Declining supply of BSC due to overfishing - A study on the BSC in the Western Visayan Sea shows a decreasing trend in catch per unit of effort or CPUE (Mesa et al. 2018). The CPUE in 2017 alone shows that, on an average, a bottom set crab gill net can catch 1 crab per panel (Mesa et al. 2018), with the data on Maximum Sustainable Yield (MSY) likewise showing a decreasing trend with an accompanying increase in the effort or the number of panels per boat. These figures clearly show that the crab gillnet fishers in Western Visayan Sea tend to increase the length of gillnet in order to catch more crabs.

In general, this evidence reveals that Western Visayan Sea is experiencing overfishing in the last several years. Interestingly, crab fishers, not only from the Western Visayan sea areas, believe that recent BSC catch has been decreasing as compared to the amount of crabs they had ten years ago (Yap et al. 2017).

EFFECTS: Overfishing greatly affects the municipal fishers. Traditionally, most of these municipal fishers do their crabbing activities nearby since most of them do not have any fishing arrangements with other nearby municipalities. Some of them, however, have different arrangements with other municipalities, such as the issuance of fishing permits or license for them, an agreement not to go inside declared fish sanctuaries, payment of fish landing fees and taxes, not to engage in illegal fishing activities, and the catch to be sold in the municipality where it was caught.

Recently, however, majority of the fishers change the areas where they usually catch crabs and quite apparently, these areas are the ones either farther from the shore but not necessarily outside their municipal waters or in areas covered by the other municipalities. Accordingly, fishers do this in pursuit of higher amount of catch.

This frequent changing of fishing grounds among fishers unnecessarily put too much pressure on the resource, thus spreading the effect of overfishing to other nearby areas.

2. **PROBLEM:** Incidence of by-catch - Little information is available on the amount of by-catch and/or discards when using either crab bottom gillnets (SFW 2013) although Romero (2009) noted unwanted, untargeted species comprising half (or 50%) of the discards. For the highly selective crab pots, the estimated amount of the unwanted catch (or discards) is ca 5% (Romero 2009). Because of this and other similar reports, Seafood Watch (SFW) reported in December 2018 that the use of crab pots and gill nets must be avoided in catching BSC both in the Visayan Sea and Palawan areas. Gillnets, in particular, reportedly have moderate to high levels of

by-catch and have some interactions with other species of concern such as sharks, sea turtles, and others. Crab pots, on the other hand, exhibit strong potential to interact with mammals, corals and other biogenic habitats. These findings placed the crab pots and gillnet fisheries in the Visayas Sea and Palawan under the “red” or “avoid” rating (Seafood Watch 2018).

EFFECTS: Should the present SFW rating persist, the Philippine BSC products in the export market may be jeopardized. The potential benefits of getting the nod from SFW and other similar groups/standards can boost the sales of BSC products in the world market.

It must be noted, however, that Seafood Watch, Marine Stewardship Council (MSC), and other similar initiatives are voluntary in nature. What is more taunting for the Philippine BSC industry is the impending restrictions due to the implementation, in January 2022, of the Marine Mammal Protection Act (MMPA) Imports Provisions Rule that aims to reduce marine mammal by-catch associated with fishing operations. One of the components of this act includes the so-called List of Foreign Fisheries (LOFF). At present, the Philippine BSC caught using pots and gillnet are presently both classified, under LOFF, as “Export Fisheries” and this implies that the Philippines must receive a comparability finding before 2022 to enable the Philippine exporters to continue to export BSC products to the United States (see full discussion below).

3. **PROBLEM:** Limited research activities on reference points for BSC. Except for the Visayan Sea, other areas have limited information on the reference points for the BSC. In particular, researches that are focused on the biological indicators that can be used to construct the reference points are very limited. These indicators include, among others, the levels of biomass, spawning biomass, fishing mortality, catch, and catch rates (or catch per unit effort), and others. Researches on the genetic structures of the BSC stocks are at the minimum.

EFFECTS: The absence of reference points in specific BSC-areas that basically represent the state of the fishery in these areas reflects the inability of any fishery management strategy to have clear, more focused, and indisputable actions and/or harvest control measures for the management of the BSC stocks. More so, the absence of sufficient information on the genetic stock structures or genetic characterization of BSC that provide indications on the relatedness of BSC populations may eventually result in the mismanagement of the BSC fishery in the long-term.

4. **PROBLEM:** Environmental pollution - Environmental pollution can be due to the presence of some coal power plants and the continuous non-utilization or improper utilization of wastes (including those from crab processing plants). In particular, significantly large quantities of crabs are lost or wasted the Philippines during capture, post harvest handling and processing, distribution, and storage. The high percentage of non-utilizable crab parts from processing plants, for example, is quite alarming since it creates a significant amount of wastes that are discarded to the environment.

Unfortunately, both crab post-harvest losses and wastes in the Philippines and elsewhere, are difficult to quantify and qualify. For example, except for the volumes of products that have been rejected in the export market, all other losses associated with poor practices (e.g. inappropriate handling techniques, temperature during handling and storage, etc) are not quantified. Those wastes such as fishing discards, physically damaged crabs, soft-shelled crabs, and others are simply just thrown away and are not quantified at all.

EFFECTS: The use of coal to generate power harms the environment since coal is considered as one of the most damaging fossil fuels. It also has severe effects on human health since burning of coal for power generation releases toxic elements and small particulates that can access the human respiratory and cardiovascular systems.

The non-utilization of wastes from crab processing plants likewise contributes significantly to the accumulation and subsequent release of organic nutrients to nearby bodies of water. The impact of this becomes even more especially in areas with poor water exchange or water flow. These effluents can alter the balance in the ecosystem, reducing the biomass, density, and diversity of the benthos, plankton, and other aquatic organisms in the receiving environment.

5. **PROBLEM:** El Niño/Southern Oscillation (ENSO) and climate change - These natural or man-made phenomena may have been changing the transition patterns in the switching of wind directions from the hot and humid wind during the “habagat” months to the cool northeast trade winds during the “amihan” months.

EFFECTS: Based on the fishers’ and other stakeholders’ perceptions, they believe that ENSO affects their catch because they experience a decreasing amount of BSC catch in the recent years (Yap et al. 2017). This can be due to the fact that the seasonality of the BSC may be affected by ENSO and climate change. For instance, previous reports show that August is the common peak month/season for blue swimming crab fishing while March and April are considered the lean months (BSCMP 2014). However, more recent data reveal that the crab fishers identified the start of the peak months, generally, in June, August, or September depending on the region (Yap et al. 2017). In comparison with the published peak catching seasons for the BSC in the different crab fishing grounds in the country (BSCMP 2014), the peak season of this species had been longer in the more recent years. The lean season, on the other hand, generally starts either in December, January, or February and lasts for 3-5 months in the recent years.

The differences in the onset of the peak seasons and lean season in the different BSC producing regions in the country in the recent years affects the abundance of crab in the affected areas as the state of the environment of the fishing grounds varies seasonally.

GOVERNANCE RELATED ISSUES AND CONCERNS

Some of the governance-related issues and concerns confronting the BSC industry in the country include the following:

1. **PROBLEM:** Lack of coordinated multi-stakeholders action plan for BSC and the absence of a BSC Roadmap - The problems in the BSC production in the Philippines in the recent years can generally be associated with the following factors: a) presence of illegal and unregulated fishing activities which inflict major and multiple damages to the crab fisheries e.g. Danish seines and trawls (Ingles 1996; Ingles and Flores, 2000); b) local crab fishers resort to catching undersized and gravid/berried crabs to increase production; c) lack of effective management strategies to protect crab population; and d). absence of a clear roadmap for the BSC industry of the country. Although the BSCMP had been released in 2014, efforts to implement the provisions of the plan and the associated JAO No. 1, series of 2014, had been limited.

EFFECTS: The lack of coordinated multi-stakeholders action plan hinders the BSC industry in reaching its full potential. The limited activities related to the implementation of the 2014 BSCMP result in improper management of the BSC fishery in the country thereby causing overfishing and depletion of the BSC stocks / resources in some parts of the country. Other illegal and unregulated activities include illegal fishing, fishing of juveniles and/or gravid crabs, and use of inappropriate fishing gears.

2. **PROBLEM:** Weak implementation of laws. There are existing laws and regulations that presently cover the management and conservation of the BSC industry in the Philippines. In fact, specific management strategies securing crab population have been crafted in the past, both at the provincial (e.g. Province of Negros Occidental Ordinance No. 019, series of 2003 entitled “An Ordinance Regulating the Catching, Selling and Possessing or Buying of Gravid Blue Crabs and Crablets in the Province of Negros Occidental”, Iloilo Provincial Ordinance No. 2012-093, series of 2012

-093, series of 2012 which limits crab catch size of 11 centimeters (cm) and depth of 50 mesh size for gill net, specific municipal ordinances and resolutions (e.g. Municipal Ordinances in Bantayan, Cebu, in Estancia, Iloilo, in EB Magalona, Negros Occidental, in Taytay, Palawan, in Calabanga, Camarines Sur, etc.).

Unfortunately, evidence reveals that crab fishers still get juveniles and/or berried crabs, although some crab fishers report that they immediately return undersized and/or gravid/berried to their natural environment (see Yap et al. 2017). Nonetheless, majority of them report that they either consume or sell these undersized and/or berried crabs, while some of them put the berried crabs either in the lying in sites provided in the area or they just simply discard them (see Yap et al. 2017).

EFFECTS: These findings show the apparent lack of knowledge or awareness among the majority of the fishers and other stakeholders on the existence of specific rules on BSC, such as the prohibition on the catching of undersized and/or berried crabs, the use of lying in stations for the berried crabs, and other rules. This apparent disregard of fishers to existing BSC rules and regulations and consequently, their limited support to government programs on Coastal Resource Management can be due to several factors, including the limited dissemination of information about these rules and regulations, limited training support for the fishers, limited government assistance being given to them, and a whole set of governance related problems.

5.

As a consequence, the overfishing can be observed, as in the case of the documented evidence in the Western Visayas Sea (see Mesa et al. 2018) and elsewhere.

PROBLEM: Lack of institutionalized monitoring mechanism for BSC-related initiatives. There have several efforts to put management plans (e.g. the BSCMP in 2014) and other BSC-initiatives in place, but problems still exist. This can be due to the absence of an institutionalized governing body that oversees the accomplishments of all the action plans and programs for the BSC industry of the country.

EFFECTS: Noteworthy initiatives that aim to conserve and manage the BSC fisheries in the country are apparently not given due attention and, as such, continuous deterioration of the fishery is possible in the near future.

SOCIO-ECONOMIC (OR HUMAN) ISSUES AND CONCERNS

The socio-economic or human problems that are confronting the BSC industry of the Philippines are as follows:

1. **PROBLEM:** Low income among fishers and other BSC stakeholders. The income of the crab fishers is generally not enough for them to meet the needs of their families. Even during the peak season, crab fishers incur deficits in terms of income that may even reach up to more or less PhP 1,000 per day (see Yap et al. 2017). The same observation is true during the lean season. This can be due to: (i) limited training support for the fishers; (ii) limited assistance programs being given to them; (iii) other fishers who use fishing gears that tend to damage the gears of crab fishers. These factors may result to low catch and therefore low income among fishers.

In addition, the transactions between each of the main actors in the supply chain of the BSC greatly affect the fishers. These transactions are controlled, in terms of value and volume, by the exporters. The latter deploy their own buying, cooking, and picking stations, and the people manning these stations have the greatest control. This scenario greatly affects the fishers, for they cannot get the best value for their catch. This also has effects on the local consumers, for they cannot get good crabs, since the priority of the fishers is to sell their catch to the consolidators from the buying stations.

EFFECTS: Due to low income, some of the fishers resort to using inappropriate fishing gears such as push nets, trawl, or even crab pots with small mesh sizes. Some of them even engage in illegal fishing activities that inflict major and multiple damages to the crab fisheries, e.g. Danish seines and trawls (see Ingles 1996; Ingles and Flores, 2000).

For the consumers, they usually end up having small, juvenile crabs, or even berried crabs at very high price, or they do not get any crabs at all. Evidence shows that fishers still get juveniles and/or berried crabs (see discussion above), with majority of them reportedly either consume or sell these undersized and/or gravid crabs to the local consumers.

2. **PROBLEM:** Limited capital to invest on appropriate fishing gears for crabbing. There are three (3) types of fishing gears commonly used by the crab fishers, namely crab lift net, crab pots, and gill nets. Crab pots are mostly used in Region 6, crab lift net in Regions 5, 7, and 8, and gill net in Regions 4B, 5, 6, 7, and 8. A study of Mesa et al. (2018) noted that in the Western Visayan Sea alone, majority of the crab fishers have been using either crab pots or gillnets. However, these fishing gears have different capture mechanisms, operational requirements, handling, and stress response. The choice among fishers of the fishing gear to use depend largely on, among others, the skills that they possess, the availability of gears in the area, and costs of operation, with crab gill net having the biggest cost of fishing per day, due to the cost of gasoline and their nets. With limited capital, fishers utilize any available gear that they can make use of.

EFFECTS: With limited capital to invest on the appropriate gears that they can use, coupled with the limited access of the fishers to financial support as a result of high interest rates and stringent bank loan requirements, the income of the fishers is largely affected. In addition, the inability of the fishers to invest on appropriate fishing gears makes them experience low catch, thus causing poor quality of life among the BSC fishers.

3. **PROBLEM:** Limited competitiveness of BSC products in the market. The limited competitiveness of the BSC products can be due, but not limited, to the following:
 - a). Use of non-standardized processes especially in pre-processing facilities. This problem is due to the difficulty in maintaining cooking stations, as new cooking stations are being put up every time, depending on the crab supply and the crab peak seasons in the area. In addition, the apparent inability to practice basic Good Manufacturing Practices (GMP) in these pre-processing facilities (see Table 11 on the list of establishments with GMP recognition from BFAR) places the BSC products from the country in trouble.
 - b). Non-compliance to food safety standards. For example, although the Philippine National Standard for Pasteurized Crabs have been released in 2017, there is still a need to have well defined industry protocols that will answer the concerns on the quality and safety of the fresh and processed crab products and the post-harvest losses in the industry. As shown in Table 11 above, the small number of BSC-establishments that are either BFAR or EU-approved reveals the inability of even the big BSC processing establishments to follow food quality and safety regulations.
 - c). Limited value adding activities. BSC is mostly consumed fresh in the Philippines. Due to high consumer demand in the international market and the economic benefits derived from this species, most of the BSC is processed into pasteurized canned meat that is intended for the export market. Other product forms are lacking.
 - d). Limited post-harvest infrastructure facilities. The unavailability of appropriately maintained post-harvest facilities in the different parts of the country has been a perennial problem of the industry. In the case of BSC, since the choice for the construction of cooking stations largely depends on the

availability and abundance of crab in the area, the availability of ice making/ice storage facilities in that area poses a problem leading to unsteady supply of ice in the stations that supposedly ensures the quality of the cooked crab meat. Functional landing facilities still remain a problem in various parts of the country.

- e). Traceability related problems. For those engaged in the exportation of crab products, the processing establishments must be accredited by different bodies. Such accreditation ensures, among others, the traceability of the products. The establishments in the country that are engaged in pre-processing (cooking and picking) and processing (pasteurized crab and/or value added crab products) are peppered in almost all BSC-producing areas. However, Table 11 reveals that the number of establishments that are with Hazard Analysis and Critical Control Point (HACCP) accreditation, labeled as either BFAR approved or EU approved, is quite low. The same table likewise clearly indicates that almost all of the pre-processing facilities are not HACCP-accredited although some of these facilities are run or under the supervision of the processing plant. In fact, most of these pre-processing facilities are not even registered as compliant to the basic Good Manufacturing Practices (GMP).

EFFECTS: Over-all, the existence of the above mentioned problems place our BSC products in a very disadvantageous position in the international market. Specifically, the problems result to the following:

- a). Despite the presence of the recommended steps in cooking crabs, different cooking and cooling practices are observed in the different regions in the country. These practices lead to losses due to the different quality and safety concerns, including meat discoloration, textural problems, undercooking, overcooking, and inconsistent quality of cooked meat.
 - b). In terms of food quality and safety, processors are required to comply with the specifications as required by the export markets and non-compliance results to rejection and revenue losses. If the number of GMP and HACCP compliant establishments does not improve, this may lead to loss of market for the BSC products from the country.
 - c). In the absence of any other BSC product forms, it becomes increasingly difficult to compete with other seafood products in the market. Needless to say, the market share of BSC can further be improved through value addition. Filipinos have to capitalize on the recent explosion in the introduction of new and varied seafood products in the market, both locally and internationally.
 - d). Limited infrastructure facilities inevitably lead to improper cooking and cooling temperatures of crabs in pre-processing facilities and this may lead to deterioration of meat quality, especially during the ice transport of the cooked crabs. In addition, the absence of simple ice making facilities may lead to different practices in different cooking stations wherein cooling times vary from 30 min to 3 hrs, depending on the availability of ice in the area.
 - e). Traceability in the BSC industry is crucial, as this is an important component of a reliable HACCP quality system. Without which, it will be increasingly difficult for the BSC products from the country to compete in the international market and ensure the quality and safety of these BSC products.
3. **PROBLEM:** Possible negative impacts of entering into responsible fishing and sourcing. In 2018, SFW tagged the BSC from the Visayan Sea and Palawan with the “red” or “avoid” rating, especially those caught using crab pots and gill nets. One option for the Philippines to get out of the rating while at the same time reducing the fishing pressure on the existing BSC resources and its effects on other fisheries in the country, is to thoroughly look at the type, number, size, and efficiency of the fishing gears that are now being used by our fishers. However, a study of Mesa et al. (2018)

noted that in Western Visayas Sea alone, majority of the crab fishers have been using either crab pots or gillnets.

EFFECT: Should there be banning on the use of these gears, there may be some deleterious effect to the fishers. In particular, since each gear is operated by different numbers of individual fishers (see discussion above on fishing gears), restricting the use of these gears would have negative impact on the lives of those in the coastal communities.

To lessen the burden to the fishers, alternative livelihoods could be introduced as well as the use of eco-friendly, innovative fishing gears that would enable us to get out of the “red” tag status.

RELATIONSHIP BETWEEN THE ENVIRONMENTAL (OR ECOLOGICAL), SOCIO-ECONOMIC (OR HUMAN), AND GOVERNANCE-RELATED ISSUES AND CONCERNS

The different clustered problems besetting the entire BSC industry in the country are inter-related, as schematically summarized in the BSC Problem Tree (see RCA Report).

This interrelatedness encourages a more defined, well organized, and systematic solutions to these problems that are aimed to ensure that the sustainability, conservation, and management of the BSC resource in the country are well-grounded and are geared towards the improvement of the lives of the major players of the industry.

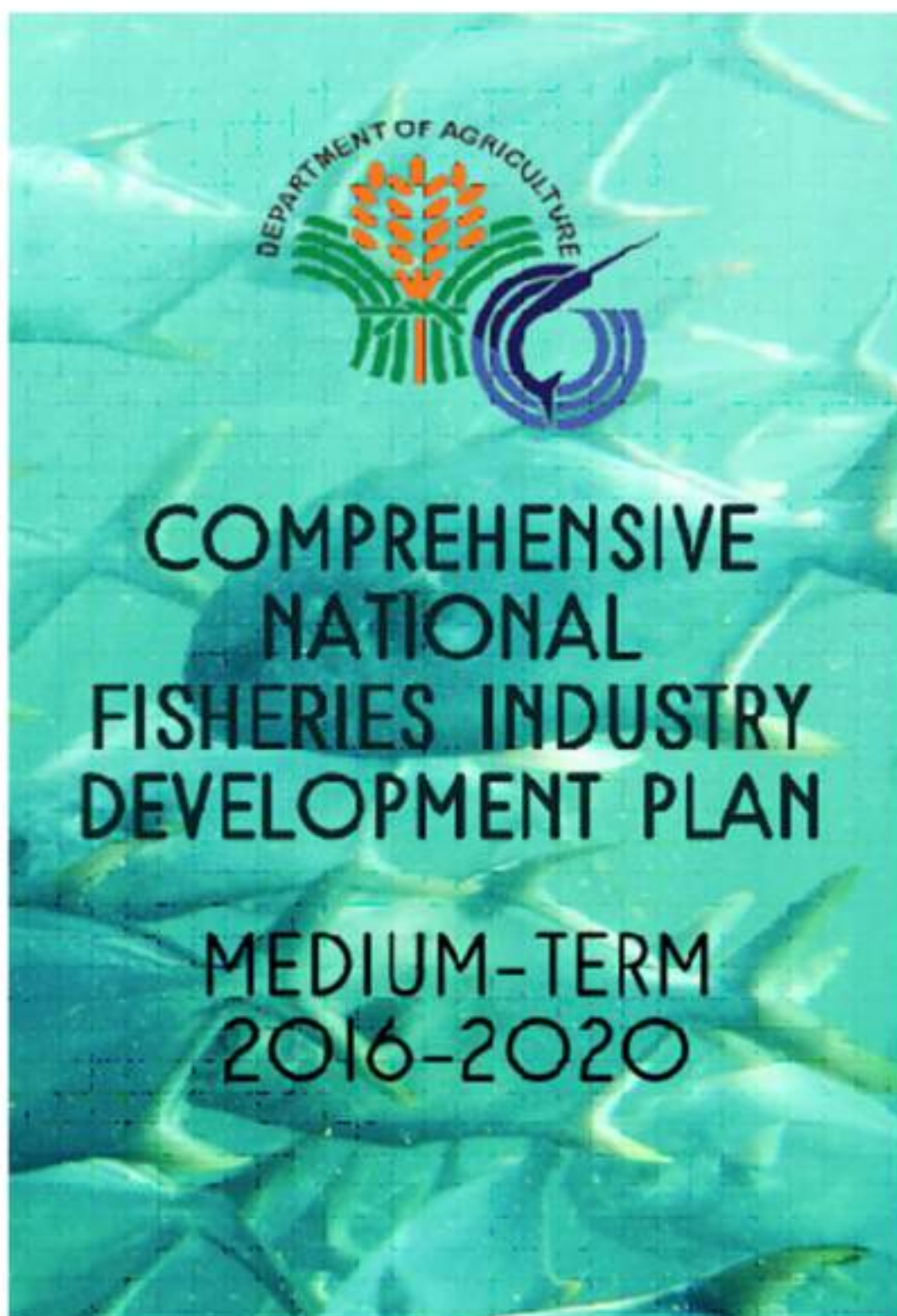


STRATEGIC SOLUTIONS TO THE PROBLEMS OF THE BLUE SWIMMING CRAB INDUSTRY OF THE PHILIPPINES

Building upon the results of an in-depth and inclusive multi-stakeholder sector Root Cause Analysis (RCA) and the lessons from the implementation of the 2014 BSCMP and other Fishery Improvement Projects, strategic solutions to the problems of the BSC industry of the Philippines are formulated and enumerated in the next section. These solutions are aligned with the following:

COMPREHENSIVE FRAMEWORK FOR THE OPTIMAL DEVELOPMENT AND LONG-TERM SUSTAINABILITY OF PHILIPPINE FISHERIES

The Comprehensive National Fisheries Industry Development Plan (CNFIDP) provides the strategic and all-inclusive framework for the Philippine fisheries industry from 2006 to 2025.



Guided by the vision of having “a sustainable and competitive fisheries industry that contributes to food security and provides optimum socio-economic benefits to Filipinos”, the CNFIDP goals for the industry include the following:

- (a) Sufficient contribution to national food security;
- (b) Inclusive growth within the industry;
- (c) Sustainable science-based fisheries and aquatic resources management practices;
- (d) Compliance to international laws, policies, and standards, and enforcement of local laws and regulations;
- (e) Strengthened capacities in infrastructure, technologies, human resource, and information sharing; and
- (f) Resilience to environmental hazards.

To achieve these goals, the updated CNFIDP (Medium Term 2016-2020) specifies sustainable and science-based management strategies to achieve increase in fisheries production without overexploiting the fishery habitats and fish stocks. And for the Philippine fisheries industry to move forward in one direction towards its vision, these strategies should serve as the basis for the management plan of all seafood commodity, such as the BSC.

NEW THINKING VISION FOR PHILIPPINE AGRICULTURE AND FISHERIES

The Philippine Department of Agriculture follows the EIGHT PARADIGMS that are necessary to level up the country’s agriculture sector. These paradigms, as enumerated below, make up the “new thinking” that is expected to level up the income of farmers and fishers in the country. Likewise, these paradigms can serve as guide for the development of the blue swimming crab industry of the country, while providing answers to the problems of the industry, as noted above.



- a). Modernization – Modernizing the BSC industry of the country entails, in particular, the development and use of innovative, eco-friendly fishing gears, and other state-of-the-art communication facilities. These fishing gears are expected to result to better catch and less by-catch of ETP (endangered, threatened, and protected) species among the fishers. Likewise, modern communication and information dissemination facilities may lead to more efficient and wider broadcasting of information for improved management and conservation of the BSC fisheries of the country, among others.
- b). Industrialization. The key to increased productivity in the BSC industry is industrialization in some nodes along the BSC value chain. Through introduction of innovative technologies in the pre-processing, processing (including value addition), and marketing of BSC products, manufacturing time will be

significantly reduced, the competitiveness of these products enhanced, and the income of the stakeholders improved. Development of these technologies involves the partnership of the academic and research institutions with the private sector.

- c). Promotion of exports. As the BSC products and any other fishery products from the Philippines experience rejection in the export market, the need to come up with strategies to improve the quality and safety of these products is paramount. Only through these, coupled with effective marketing and product promotion initiatives we can ideally position our products in the export market. Through the concerted effort of concerned government institutions, the private sector, and other industry players, an enabling environment for better quality and safe BSC products can be established.
- d). Consolidation of small- and medium-sized farms. To bring about economies of scale, particularly for the crab fishers, efforts can be focused on the organization of these fishers into associations and/or cooperatives that can act as consolidators of the crab catch from the different fishing areas. These schemes can also make it easier for the fishers to maintain the quality of their catch, command premium price for their commodity, and establish a good partnership with the processors. An incentive mechanism for those fishers or fisher organizations/cooperatives who are compliant to sustainability measures can be established so that they can be given premium prices for their catch. In doing so, they are assured of income regardless of the seasonality of the catch. The concept of “Big Brother-Small Brother” can likewise be applied, not necessarily to the crab fisheries (who are mostly municipal fishers) but the to the pre-processors (i.e. those involved in cooking and picking of BSC). Big brothers (i.e. the medium and large scale BSC processors) mostly having their own cooking and picking stations, can possibly network with their small brothers who could either be the crab fishers and housewives with no existing pre-processing stations or those with existing small-scale pre-processing stations. Although at present, there are existing similar arrangements but these are to be enhanced. The big brothers are to provide sufficient logistical support, such as equipment, facilities, technical information, trained personnel, and transport facilities, that are necessary to help their small brother. This is expected to help the small brothers stay in business and increase their income while providing and assuring their big brothers high quality pre-processed crab meat for their processing needs.
- e). Infrastructure development. Noted as one of the pressing problems of the BSC industry is the limited infrastructure facilities for BSC post-harvest. The inability of some fishers to transport their catch from the source to the trading areas inhibit them from getting better prices (and consequently better income). In particular, the absence of functional trading facilities or “crab terminals” and simple ice making facilities prevent them for accessing pre-processing facilities with fresh crabs. Massive investments must be provided in the BSC-producing areas to empower the fishers.
- f). Budget and investment to match needs. New programs and projects for the development of the BSC industry are necessary. In particular, budget coming from the government and some investments from the private sector can help boost the developmental needs of the industry. In addition, a well-funded Research and Development Agenda for the BSC must be in place to enable the development of technologies that will help leapfrog the industry, as well as valuable research findings that would be used in the proper management and conservation of the BSC resource of the country.
- g). Pro-poor legislative support. The income of the crab fishers is generally not enough for them to meet the needs of their families, even during the crab peak season. Investing their precious lives in getting the BSC is a noble thing to do that must be recognized and well compensated. Adoption of the BSC management strategies and initiatives in the local legislative agenda of the BSC-producing municipalities is timely and appropriate. In other words, everybody must be encouraged to be part of the “Balik Sigla sa Kasag” initiatives.

- h). Development of new roadmap. It is about time that all the initiatives, both the existing and the new ones and all the ideas, as stipulated in line with the other new paradigms above, are put together to come up with an industry with much improved performance. Intervention measures must be instituted and the vision for the entire BSC industry established. With the new BSC-NMP, an inclusive multi-stakeholders developmental plan will guide all the key actors and enablers of the BSC supply chain in attaining increased productivity, profitability, competitiveness, resource sustainability, and equal access and opportunity for all.



THE BLUE SWIMMING CRAB – NATIONAL MANAGEMENT PLAN(2020-2024) VISION, GOALS, AND OBJECTIVES

The sustainable management of the Philippine BSC industry shall be guided by the following vision, goals, and long- and short-term objectives

Vision:

A sustainable, equitably accessed, and globally competitive Philippine Blue Swimming Crab industry

GOALS:

- 1. Rehabilitated marine habitat for increased BSC production
- 2. Increased compliance of BSC regulations for sustainable management of the BSC fishery
- 3. Sustainable income and enhanced global competitiveness of BSC products for improved quality of life of BSC stakeholders

LONG TERM OBJECTIVE:

The long term objective of the Plan is to **sustainably institutionalize sustainable fisheries management**, in all levels, i.e. from the local / grassroots or the local government units up to the national level.

SHORT TERM OBJECTIVES:

The short term objectives of the Plan included the following:

GOALS	OBJECTIVES
Rehabilitated marine habitat for increased BSC production	To conduct BSC resource mapping and determine the impacts of the fishery to the ecosystem
	To increase BSC production by 10% from 29,960.59t, in 5 years through the improvement and development of technologies in at least 19 BSC production areas
	To promote the use of eco-friendly fishing gears in different fishing grounds in 5 years
	To increase the BSC stock biomass by 10% (from 4.27kg/day CPUE in FMA 11 as an example) in FMAs where BSC is one of the key fishery of interest
	To establish a network of MPAs (Marine Protected Areas) for BSC in 5 years
	To minimize the level of environmental pollution due to crab meat industry wastes

GOALS	OBJECTIVES
Increased compliance with BSC regulations for sustainable management of the BSC fishery	To institutionalize a multi-stakeholder BSC council by 2020
	To institutionalize the BSC Roadmap in 2020
	To adopt and integrate the BSC-NMP into the local executive legislative agenda and implement the BSC-NMP in all LGUs (where BSC is a major commodity) in 5 years
	To increase awareness on all BSC regulations by 80% of the key players (fishers, traders, processors, exporters, enablers, resource managers) in 5 major BSC fishing grounds in 5 years
	To increase regulatory compliance in the BSC fisheries (e.g. catch documentation, size regulations, catching of berried and juvenile crabs, food safety and quality standards, traceability, and social compliance) by 20% annually over 5 years
Sustainable income and enhanced competitiveness of BSC products for better quality of life	To increase access to, and strengthen, the extension and business development services for BSC stakeholders
	To increase all BSC fishers' net income by up to 50% from PhP241.00/day in 5 years
	To improve inclusiveness for all gender and circumstances (e.g. PWDs, etc.) to opportunities in BSC
	To increase the competitiveness of BSC products in the local and international markets by 2% in 5 years
	To increase access to market/trade and market information by 10% annually over 5 years
	To increase access of all BSC fishers to appropriate financial services by 10% annually over 5 years



STRATEGIC PROGRAMS TOWARDS SUSTAINABLE, EQUITABLY ACCESSED, AND GLOBALLY COMPETITIVE PHILIPPINE BLUE SWIMMING CRAB INDUSTRY

The new BLUE SWIMMING CRAB NATIONAL MANAGEMENT PLAN (BSC-NMP 2020-2024) is expected to serve as the basis in coming up with well-informed and reliable decision-support platform, in enforcing specific policies and regulations, and in implementing fishery improvement programs/projects that are specifically crafted for the Fisheries Management Areas (FMAs) in the country where BSC is one of the key fisheries of interest. With this, the Plan is anchored on a strategic framework for the long-term sustainability and resiliency of the Philippine BSC industry.

For the Plan to specifically pay closer attention to the state of the resources and to all the key actors or stakeholders in the BSC supply chain, how are they linked to each other, how do they cope with different situations, and how are benefits distributed along the chain, the following **strategic or banner programs** are necessary.

1. INSTITUTIONALIZATION OF THE NATIONAL BSC COUNCIL

The design of the new BSC-NMP favors a regular multi-stakeholder consultative process that aims to provide venue for identification of challenges that are met and for finding solutions in order to achieve the main goals of the plan. This process also serves as a feedback mechanism that allows immediate action to relevant concerns among and between stakeholders and implementing partners.

In order to provide a strong enabling environment for the implementation of the plan, however, it is important for the present BSC-TWG to transition into a National BSC Council through an executive order from the President of the Republic of the Philippines.

The structure of the National BSC Council is illustrated in Figure 16. The membership of the Council shall be selected as follows:

- a). The National Director of BFAR shall serve as the Chair of the Council
- b). The vice-chairmanship shall be based on the votation result among the key officers / Regional Directors of the major BSC regions of the country.
- c). The BFAR representative shall come from the BFAR Central Office and its corresponding alternate shall be from NFRDI.
- d). The industry representative of the BSC-processors shall come from organized groups and/or representatives from the picking plants or cooking stations.
- e). The industry representative of processors/exporters shall be selected from the group of exporters or from organizations/processing plants that are implementing FIP initiatives.
- f). The BSC Fishers' representative shall be selected from a list of organized POs or FARMC.
- g). The MLGU and PLGU Representatives shall come from major BSC areas of the country, through a selection process that shall be facilitated by BFAR.
- h). The Science Consultant or the Research Institution and Academe Representative shall be open for endorsement. The Council shall select by votation from a shortlist of nominees who must have significant track record of BSC-related research studies or projects.

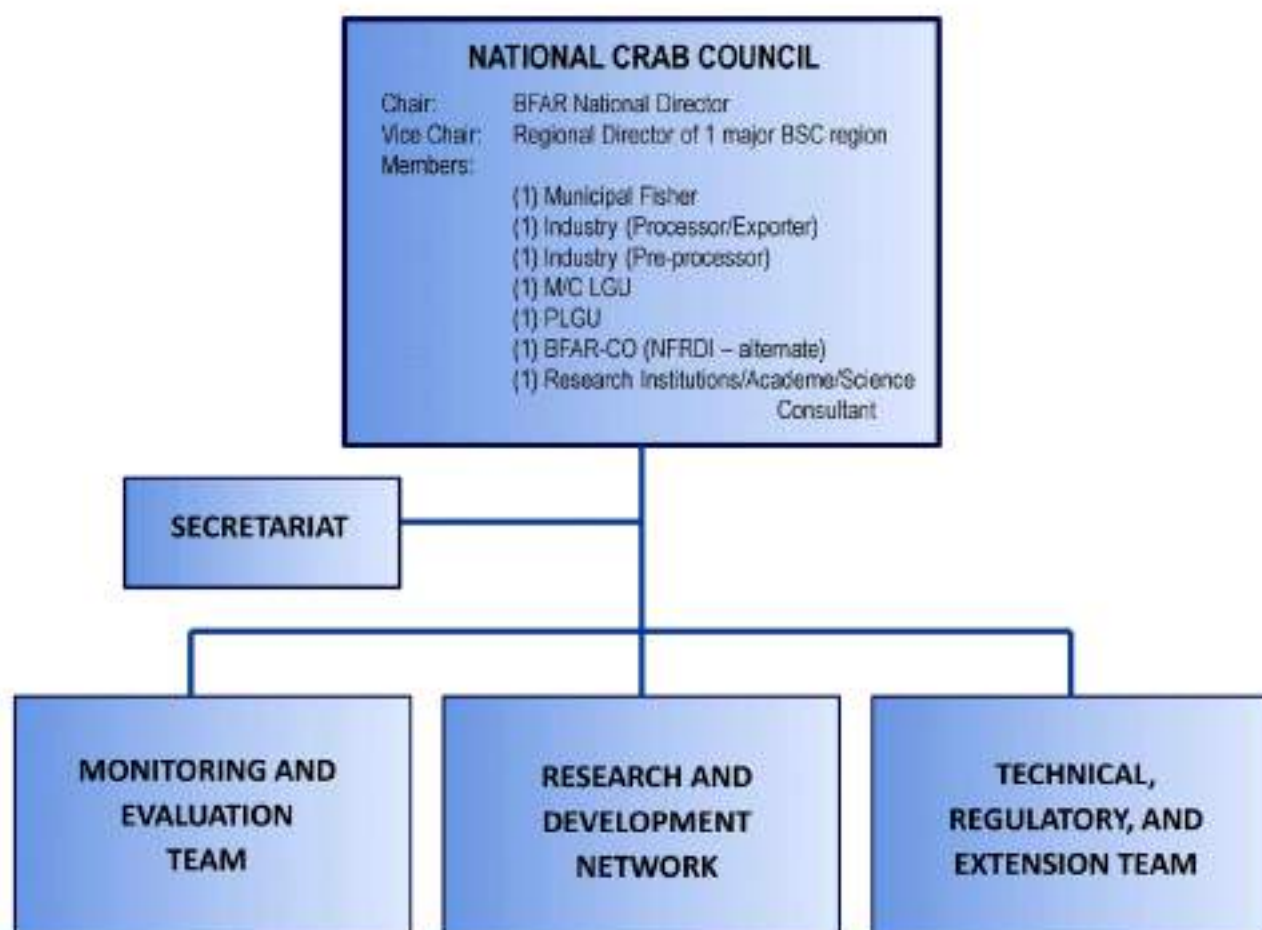


Figure 16. The organizational structure of the National Blue Swimming Crab Council (approved during the BSC-TWG Meeting in October 2019).

The Terms of Reference of the Council are as follows:

- a). All officers and members of the Council shall have a term of three (3) years. The Chair should be the National Director of BFAR, since BFAR is being the main agency responsible for the implementation of the BSC-NMP and the operation of the BSC Council.
- b). The Council shall perform the following duties and responsibilities:
 1. Act as the decision-making body in the formulation of national policies for the management and sustainable development of the BSC industry;
 2. Conduct regular stakeholders' consultation meetings to get feedbacks and appropriate recommendations;
 3. Formulate a mechanism to monitor the activities of the Plan via its Monitoring and Evaluation arm, taking into consideration, among others, the verifiable indicators for each of the key/specific actions as specified in Annexes A-C;
 4. Orchestrate the conduct of relevant scientific information that will form the basis for BSC-related policies through information derived from its Research and Development network;
 5. Institutionalize efficient and effective information dissemination mechanism via its Information and dissemination team;
 6. Formulate guidelines that will facilitate conflict resolution, if there is any;
 7. Perform other functions as may be provided by law.

2. ESTABLISHMENT OF A MODEL CRAB VILLAGE

One of the main objectives for the entire Philippine fisheries industry is to uplift the condition of the lives of the stakeholders, most especially the fishers. One strategy to do this is the provision of supplementary livelihood to fishing communities through the use of appropriate eco-friendly technologies. However, understanding the needs and plight of these communities is an important prerequisite in planning and implementing meaningful and sustainable livelihood interventions.

Key to this is the conduct of a community-based participatory action program that is designed to look at the social and economic well-being of one particular coastal crabbing community, and to determine the most appropriate community-based technologies for these communities. This participatory appraisal technique will also serve as a springboard for the development of a holistic framework for community-based fisheries resource management of the area. More specifically, the program intends to increase the income of the crab fishers and other stakeholders in the community while reducing pressure on the wild fisheries and improving the management of their BSC resources.

This program, therefore, essentially aims to lead to the organization of the Model Crab Village. It envisions the shaping of a community of BSC stakeholders where the activities are all following the concept of blue economy, that is, all economic activities are geared on the sustainable use of the ocean resources for economic growth of the people in the community, improved livelihood, and jobs for these people while preserving and conserving the health of the ocean ecosystem.

Key activities of the program include the use the methodological approach involved in a community based participatory action program. Initial identification of sites that can potentially serve as model crab villages will be done through diagnostic consultations and the so-called participatory model of community development. From the list of potential sites, one pilot site will be developed as a model crab village. Eventually, the learning from this model crab village will be replicated in other nearby crab communities.

Clearly, the implementation of this program follows a “targeted approach” wherein activities are to be focused on the identified “champion” crab community. Successes of this champion or model crab community or village are then to be replicated in other areas until it gets to a point where most of the crab communities in a Fisheries Management Area (FMA) follow the practices of the model village. The learning from this FMA can then be replicated in other FMAs in the country where BSC is one of the major commodities.

3. DEVELOPMENT OF FMA-SPECIFIC MANAGEMENT PLANS

As one of the salient features of the new BSC-NMP, the specific actions have to consider the learning from the past implementation of the BSC-MP. These actions must also be coupled with the best available scientific information from the Fishery Improvement Projects (FIPs) and researches done by the different government agencies, non-government organizations, and the academe and the valuable inputs from the other industry players / stakeholders. This information is expected to serve as well-grounded basis for efficient resource management strategies that ensure the sustainability, conservation, and management of the BSC resource in the country.

Following the provision of FAO No. 263, series of 2019, on the “Establishment of Fisheries Management Areas (FMAs) for the Conservation and Management of Fisheries”, the new BSC-NMP provides a national framework that can be used by the different FMAs in the countries. In particular, the Plan can serve as the basis in the crafting or development of FMA-tailored Management Plans with provisions on ecological policies that are aligned with international sustainability standards and best practices, as shown in Figure 17.

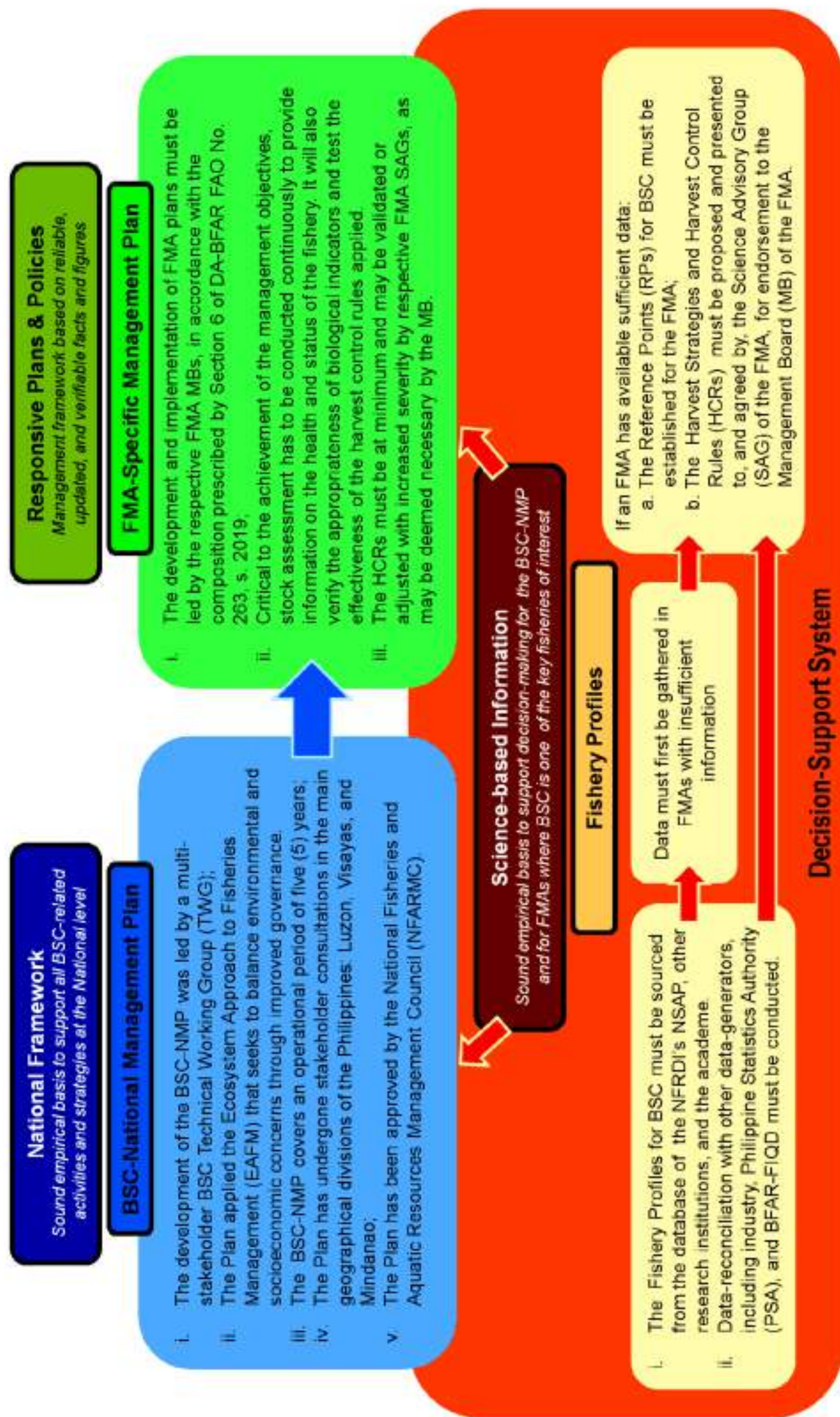


Figure 17. Strategic framework for the development of the ecological policies of an FMA-specific Management Plan that are aligned with international sustainability standards and best practices

As part of the development of FMA-specific management plans, key activities include the following.

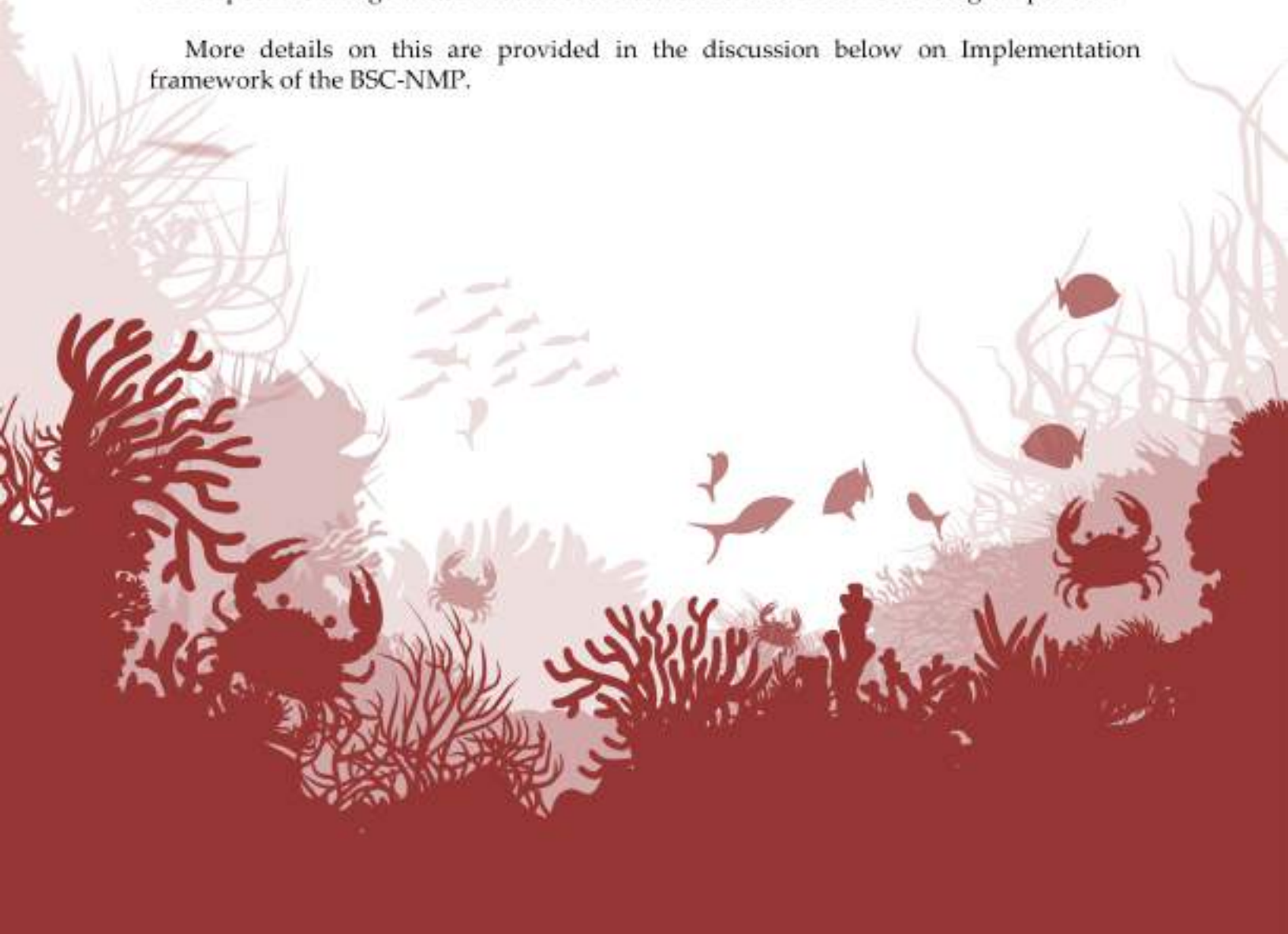
(1) Stocktaking of all initiatives and published scientific information related, but not limited, to the following: different biological indicators (e.g. levels of biomass, spawning potential ratio, fishing mortality, catch, and catch rates (or catch per unit effort), and others) needed for the construction of site-specific reference points (both limit and target reference points); reproductive biology; genetic stock structures; results of stock assessment projects; existing practices related to fishing methods and gears; and other BSC-related information, will have to be conducted. This is to be done through a BSC Summit that will: (a) highlight BSC-related research initiatives and findings; (b) come up with a thorough evaluation of existing gaps in the fishery profiles and other research areas on BSC; (c) chart the research and development (R&D) agenda for the BSC fisheries of the country; and (d) organize an R&D network of BSC researchers/research institutions.

(2) Once determined, gathering of lacking information that would best describe the state of the fishery in specific areas within each FMA, is to be conducted. Such information would include those needed in the construction of reference points (i.e. target, limit, and trigger reference points) and in the genetic management of the BSC stocks in each FMA. These would then be used to form more focused and indisputable stock-specific strategies for the management of the BSC stocks in that particular FMA (e.g. harvest strategies, harvest control rules, etc.).

(3) The site-specific scientific information to clarify issues, identify potential management options, and estimate plausible consequences are then expected to provide the empirical basis to support ecological policy decisions for each FMA.

Following the targeted approach, site-specific (or FMA-specific) gathering of scientific information and formulation of ecological policies may be initially conducted in identified “champion areas”. This relevant information related to ecological policies needed for an FMA-specific management plan may then be used by other FMAs in the crafting of their own management plans. Annex D provides an excellent example of an FMA-specific Management Plan that are based on science-informed ecological policies.

More details on this are provided in the discussion below on Implementation framework of the BSC-NMP.



IMPLEMENTATION FRAMEWORK

The implementation framework of the new **BLUE SWIMMING CRAB NATIONAL MANAGEMENT PLAN (BSC-NMP 2020-2024)** defines the strategies to be used in achieving the vision and goals for the industry. It basically outlines the long and short term objectives that have been translated into the needed key actions (or specific objectives) and specific actions, key performance indicators, the roles and responsibilities of the main and co-implementers, and the time table of activities and budget. The monitoring and evaluation scheme that will be used is also included.

CRITICAL SUCCESS FACTORS AND KEY PERFORMANCE INDICATORS

The Critical Success Factors include the key actions or specific objectives and the specific actions or tasks that are necessary to meet the stated objectives for each of the three goals of the BSC-NMP. These include specific projects or tasks which are multi-stakeholders efforts to improve the sustainability of BSC in the Philippines, as shown in Annexes A-C.

This section in the implementation framework also prescribes the key performance indicators (KPIs) that serve as the metrics or the expected outputs of the management system against its objectives (to the extent applicable). In particular, the KPIs specify the following: (1) the available baseline information that can be used as basis in assessing the success in achieving the targets set for each of the objectives and (2) the index or measures or outputs that are to be used to quantitatively assess what has been achieved. In line with the planned implementation scheme of the BSC-NMP, the projects/programs are to be implemented in specific sites within a Fisheries Management Unit (FMA). Hence, prior to the implementation of any project/program in any of the sites, the gathering of baseline line information, as noted in Annexes A-C shall include inventory, consolidation, and sorting of relevant information (that are specific to the sites) shall be conducted. These shall serve as the baseline data for these sites.

The targeted outcomes for each of these action or strategies are likewise stipulated, and these also include the need for compliance with specific local and international certification(s) or standard(s) and rules and regulations for fishery sustainability, food quality and safety, environmental protection, and others that each of the specific actions supports.

INTERNATIONAL CERTIFICATION/S OR STANDARD/S FOR FISHERY SUSTAINABILITY

As a market-driven initiative, the BSC-NMP identifies and aligns with globally respected indicators that support fisheries sustainability. In so doing, the local BSC industry players are empowered to leverage their fulfilment to committed actions in the BSC-NMP while generating further support (e.g., technical and financial) from global buyer networks and organizations.

Likewise, this favours a more robust monitoring and evaluation component of the BSC-NMP that considers global sustainability indicators, such as those specified by the Marine Stewardship Council (MSC), Seafood Watch (SFW), the MMPA Imports Provision Rules related to List of Foreign Fisheries (LOFF), and others. Brief descriptions of two global certification standards are as follows:

1. MSC is an international non-profit organization that sets a standard for sustainable fishing. With its headquarters in London, United Kingdom, MSC's mission is to use "ecolabel and fishery certification program to contribute to the health of the world's oceans by recognising and rewarding sustainable fishing practices, influencing the choices people make when buying seafood and working with partners to transform the seafood market to a sustainable basis". With its MSC Fisheries Standards, a fishery is assessed if it is well-managed and sustainable. Once a fishery is successfully certified by an accredited independent third party Conformity Assessment Body or a certification body based on these Fisheries Standards, the products from that fishery can be labeled and sold with the so-called "blue MSC label". These Fisheries Standards include three (3) main core principles, namely: a) Sustainable Fish Stocks; b) Minimizing Environmental Impact; and c) Effective Fisheries Management. These principles have a total of 28 performance indicators that are used to score a fishery. Minimum acceptable performance score is at least 60 for each of the indicators and an average score of 80 across all indicators under each of the 3 principles. A score of 80 corresponds to a global best practice while a score of 100 means an almost perfect performance.
2. The Monterey Bay Aquarium Seafood Watch Program aims to raise public awareness on choosing seafood that is fished or farmed in a sustainable way. The program provides recommendations on which seafood items are "Best Choices" or "Good Alternatives", and which ones are to "Avoid". It regularly issues consumer guides that are distributed worldwide.

Historically, there have been efforts to consider a market based approach type of management such as certification for the BSC fisheries in the Philippines. In 2000, for instance, WWF-Philippines attempted to certify the community-based BSC fisheries of the Northeastern Guimaras Strait using the Community-Based Certification (CBC) approach devised by WWF for promoting MSC certification in small-scale fisheries (Jayme et al. 2003). The implication of these management schemes to the whole gamut of the BSC industry is yet to be examined.

In the recent years, efforts are being made by the Philippine Association of Crab Producers Incorporated (PACPI). Several PACPI-initiated and funded Fisheries Improvement Projects (PIFs) have been launched and are continuously being implemented in order to help in the sustainability program for the entire BSC fishery in the country.

Clearly, the potential benefits of these standards and the importance of international buyers networks that can support the commodity's local business sector in pursuing the respective certification/ standard are important in enhancing the competitiveness of the BSC products in the international market.

However, both MSC and Seafood Watch are voluntary in nature. What is more taunting for the BSC industry is the impending restrictions due to the implementation of the Marine Mammal Protection Act (MMPA) Imports Provisions Rule that aims to reduce marine mammal by-catch associated with commercial fishing operations. One component of these provisions is the List of Foreign Fisheries (LOFF) that classifies the export fish entering the United States as either "export" or "exempt" fisheries, depending on the frequency and likelihood of incidental mortality and deleterious injury of marine mammals. Exempt fisheries refer to "fisheries that have no known or a remote likelihood of marine mammal by-catch and are exempt from instituting a regulatory program", while export fisheries include "fisheries with more than a remote likelihood of marine mammal by-catch or insufficient information available on marine mammal interactions".

Unfortunately, the Philippine BSC caught using pots and gillnet are both classified as "Export Fisheries". This implies that by January 1, 2022, the Philippines must receive a comparability finding to enable the Philippine exporters to continue exporting BSC products to the United States.

Interestingly, through this new BSC-NMP, it is expected that the industry will be equipped with the necessary tools that will help the BSC fishery gets accreditation from the MSC and will improve its rating and classification based on Seafood Watch indicators and LOFF standards, respectively.

IMPLEMENTATION MECHANISM

For more systematic implementation of the plan, the specific implementation period for each of the key action plans were charted out, as shown in Annexes A-C.

Following the **continuous improvement approach**, the BSC-NMP's implementation scheme includes the initial identification of targeted implementation of specific actions or tasks in selected municipalities that are identified as "champions" or "drivers". Through this, policy recommendations at the local level could be systematically prescribed for easier development and adoption of policies.

When robust and detailed location-specific data become available, a wider, strategic clustering of municipalities or "champions" will be done and policies, such as provincial or FMA based policies, will be prescribed. This will then be continuously done until the national implementation of policies become plausible.

As an example, the relevant information that are related to the ecological policies needed for an FMA-specific management plan for the Visayan Sea component of FMA 11 are illustrated in Annex D. Said information, once approved and implemented, can become the template for other FMA-specific management plans, within and outside FMA 11, to follow.

Hence, using this approach, relevant to the BSC-NMP implementation is the identification of the main implementers and the partners for each of the identified specific actions or tasks (see Annexes A-C). This ensures the smooth and up-to-date execution of activities as enumerated in the plan.

THE MAIN IMPLEMENTERS AND THE IMPLEMENTING PARTNERS

The success of the BSC-NMP depends on the commitment and dedication of the main implementer (BFAR) and each of the implementing partners (see list in Annex E). These partners include the stakeholders (fishers, traders, pre-processors, processors, and exporters/distributors), the industry organization (i.e. PACPI), and the private sector. They are the movers of the industry. Helping them are the so-called enablers (e.g. government and non-government organizations, the academe, LGUs, civil society organizations, funding/credit institutions / agencies, developmental agencies including the UNDP, USAID, WB, AUSAID, and others. The specific roles of some of these enablers are prescribed in Table 12.

The crafting and signing of MOAs between partner agencies, after the initial signing and/or show of commitment of support/collaboration between and among the different partner institutions shall be done as the next crucial step. These MOAs shall specify, among others, the responsibilities and commitments of the different stakeholders in line with the implementation of the BCS-NMP.

The new BSC-NMP likewise considers the role of the global buyer networks/groups and international initiatives that support/co-finance sustainability programs, and, in the process, focuses on how this role can support the transformation process from business-as-usual fishery management to sustainable fishery management.

For the smooth implementation of the new **BLUE SWIMMING CRAB NATIONAL MANAGEMENT PLAN (BSC-NMP 2020-2024)**, main and partner implementers are assigned to each of the identified key actions, with an experienced Field/Program Coordinator appointed for each of the FMAs where BSC is one of the key fisheries of interest. Supports coming from the implementing partners are expected. The names of these agencies / groups are shown in Annex E.

BUDGETARY REQUIREMENTS AND TIMEFRAME

The implementation of the new **BLUE SWIMMING CRAB NATIONAL MANAGEMENT PLAN (BSC-NMP 2020-2024)** requires a total budget of approximately PhP 816M for the period of 5 years, as shown in Annexes A-C.

The annexes likewise specify the amount of the targeted budget for each of the activities, highlighting those that are programmed for 2020 as initial activities. These activities already have earmarked budget for the year. This is to ensure that there are action plans being implemented or to be implemented right after the launching of the BSC-NMP.

It also provides a list of expected sources of funds for the projects/programs and the potential/target collaborators and/or partners, e.g. private sector, international trade groups, international organizations, etc. These figures, however, are indicative, for they still require the final evaluation and approval of the targeted funding sources. Those institutions or partner implementers, as listed in Annexes A-C, have already signified their commitment to work for the sourcing of funds and the implementation of the plans in the pre-determined period.



MONITORING AND EVALUATION FRAMEWORK

The new BSC-NMP provides a built-in mechanism to look at the accomplishments / performance of the entire BSC industry, via (i) a system that ensures the timeliness of the implementation of the program activities; and (ii) the identification of the strategic role of BFAR, as well as the roles of the different stakeholders in the implementation of the plan.

As described above, a Monitoring and Evaluation Team (M&E Team) will be formed and this is going to be under the management of the National BSC Council (see Figure 16). Specific functions of the team include the following:

1. Develop metrics to assess the progress at project and program levels, taking into consideration, among others, the verifiable indicators for each of the key/specific actions as specified in Annexes A-C;
2. Describe monitoring methods to be used for specific programs/projects, and how they are linked to specific project elements or objectives;
3. Identify responsible parties that will help the team carry out the monitoring and reporting;
4. Look for possible funding support for M&E, in close coordination with the National BSC Council;
5. Develop, if necessary, an External Peer Review mechanism for some specific programs/projects; and

Perform other related functions as may be defined by the National BSC-Council.

The M&E Team shall include the different Project/Field Coordinators who know the status of the project implementation in their respective FMAs and as such, shall serve as the link between the National BSC Council (via its M&E arm) with the implementing units (i.e. the FMAs). The other members the team and their respective period of engagement shall be determined by the National BSC Council.

Table 12. List of the different enablers of the BSC value chain and their specific roles / functions

AGENCY	ROLES/FUNCTIONS IN THE BSC VALUE CHAIN
Bureau of Fisheries and Aquatic Resources (BFAR)	A government agency under the Department of Agriculture that is mandated to be responsible for the production, management, regulation, protection, conservation, law enforcement, and policy formulation for the country's fisheries and aquatic resources.
National Fisheries Research and Development Institute (NFRDI)	An institute that provides science-based information. As per RA 8550 in 1998, amended by RA 10654 in 2015, the research function of BFAR was transferred to NFRDI.
Southeast Asian Fisheries Development Center (SEAFDEC) – Aquaculture Division(AQD)	An international organization that conduct research, develop technologies, disseminate information, and train people in the farming of fishes, crustaceans, mollusks, and seaweeds for food, livelihood, equity, and sustainable development.
Higher Education Institutions (HEIs)	Institutions that provide science-based information
Philippine Association of Crab Processors Incorporated (PACPI)	A trade association with six member companies that process and export crab meat products sourced from the Philippines. PACPI conducts FIPs that aim to promote long-term sustainability of the Philippine BSC

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Agricultural Training Institute (ATI) of the Department of Agriculture (DA)	An institute that leads in the provision of extension services in collaboration with the various agencies, bureaus, and organizational units of the Department of Agriculture. The Institute also integrates and harmonizes ICT-based extension delivery system for agriculture and fisheries.
Philippine Statistics Authority (PSA)	Serves as the central statistical authority on primary data collection in the Philippines. It conducts censuses on different sectors of the Philippine economy such as population, housing, agriculture, fisheries, and business. It collects, compiles, analyzes, and publishes statistical information on economic, social, demographic, political affairs, and general affairs of the people of the Philippines. Likewise, it enforces the civil registration functions in the Philippines.
Department of Trade and Industry (DTI)	Tasked as the main economic catalyst that enables innovative, competitive, job generating, inclusive business, and empowers consumers. It helps in the intensification of the private sector activities in order to accelerate and sustain economic growth through comprehensive industrial growth strategy, progressive and socially responsible trade liberalization, and deregulation programs and policymaking, designed for the expansion and diversification of Philippine trade - both domestic and foreign.
Department of Labor and Employment (DOLE)	The executive department of the Philippine Government mandated to formulate policies, implement programs and services, and serve as the policy-coordinating arm of the Executive Branch in the field of labor and employment. It is tasked with the enforcement of the provisions of the Labor Code.
National Economic and Development Authority (NEDA)	The country's premier socioeconomic planning body that is highly regarded as the authority in macroeconomic forecasting and policy analysis and research
Technical Education and Skills Development Authority (TESDA)	The government agency tasked to manage and supervise technical education and skills development (TESD) in the Philippines.
NGOs (WWF etc)	Organizations that help in capacity building and in research.
Land Bank of the Philippines	A universal bank in the Philippines owned by the Philippine government with a special focus on serving the needs of farmers and fishers. While it provides the services of a universal bank, it is officially classified as a "specialized government bank" with a universal banking license.

AGENCY	ROLES/FUNCTIONS IN THE BSC VALUE CHAIN
Agricultural Credit Policy Council (ACPC)	Institution mandated to deal with agri-credit policy and program development that promotes a sustainable and effective delivery of financial services to the countryside.
Cooperative Development Authority (CDA)	A government agency that supports cooperative development



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ANNEX A

ECOLOGICAL-RELATED ACTION PLANS AND STRATEGIES
for the improvement of the Blue Swimming Crab Industry of the Philippines



A. Critical Success Factors, Key Performance Indicators, and Implementation Scheme

CRITICAL SUCCESS FACTORS		KEY PERFORMANCE INDICATORS			IMPLEMENTATION SCHEME	
SPECIFIC OBJECTIVES / KEY ACTIONS	SPECIFIC ACTIONS	BASELINE DATA (if available) / SOURCES OF SITE-SPECIFIC DATA	OUTPUTS Verifiable Measures	EXPECTED OUTCOMES	MAIN IMPLEMENTERS	IMPLEMENTING PARTNERS
GOAL: Rehabilitated marine habitat for increased BSC production						
OBJECTIVE #1. To conduct BSC resource mapping and determine the impacts of the fishery to the ecosystem						
Improvement of data collection and reporting protocols	Implementation of the NSAP with some modifications	NSAP data	NSAP report	Improved data collection / reporting and enhanced BSC resource map for	NFRDI	BFAR, LGU
	Harmonization of BSC data collection and reporting	NSAP, PSA, BFAR, PFDA data	Harmonized Protocol on data collection/reporting	Identification and prevention of ecosystem degradation	BFAR	NFRDI, PFDA, PSA, BFAD
Conduct of BSC resource mapping (BSC sources and sinks; BSC facilities, etc) in selected areas (at least 10 in Luzon/Visayas areas, 38 in Mindanao)	Inventory and rapid assessment of existing technologies/studies and benchmarking activities through an R&D summit, to gather baseline information that can be used in evaluating the performance of the different projects for appropriate management of the BSC fishery in the different FMAs.	Published articles	Number of existing technologies assessed and studies reported	Compliance to Laws / Standards / Criteria, such as -RA 8550(Philippine Fisheries Code), as amended by RA 10654 -Agriculture and Fisheries Modernization Act (AFMA) of 1997	NFRDI	Academe (SSU, UPV), BFAR, PSA, PFDA
	Conduct of Geo-tagging of BSC facilities (i.e. cooking stations, picking stations, processing plants) and BSC fish landing centres	published articles	reports submitted	-RA9147 (Wildlife Resources Protection and Conservation Act of 2001)	NFRDI	Academe, Science-based NGOs, BFAR, LGU
	Conduct of focus group discussions on resource mapping	(0) base	FGD Report	-CNFIDP 2016 -FAO 263 (FMA, 2019)	NFRDI	Academe, Science-based NGOs, BFAR
	Conduct of underwater assessment	(0) base	Underwater assessment report	-Marine Mammal Protection Act of the USA, 1972 -MSC Principle 1 (1.2.4 Assessment of Stock Status);	NFRDI	Academe, Science-based NGOs, BFAR
	Conduct of grid mapping of BSC fishing gears operation	published articles	grid map report	-MSC Principle 2 (2.5.1 Ecosystem Outcome)	NFRDI	Academe, Science-based NGOs, BFAR

	Conduct of BSC Habitat Profiling (Oceanographic, Biophysical, Natural Productivity studies) on identified BSC Areas	published articles	Studies conducted and reports generated	- SFW Factor 1.2 Stock Status - SFW Factor 4.3 Impacts on the Ecosystem and Food Web	NFRDI	Academe, Science-based NCOs, BFAR, LGU
Investigation of the impacts of the fishery to the ecosystem and identification of appropriate measures to prevent irreversible ecosystem change	Development of ETP By-catch Risk Analysis methodology and the capacity of the research teams in the Philippines	published articles	report of the study		FishRight, UPV	BFAR
	Mapping out of critical habitats (e.g. in Region 6 portion of the Visayas Sea), to determine areas where at risk species are frequently spotted, identify safe zones, and recommend for adoption of LGUs	published articles	number of critical habitats mapped out; number of recommended policies for LGU adoption		FishRight	BFAR, LGU
	Study/investigation of the trophic impact and the likelihood of cascades from the BSC fishery	published articles	Number of studies conducted		PACPI	Academe, BAR, DOST
	Communication of results, implementation of precautionary measures, if necessary, and conduct of long term monitoring activities	published articles	number of IEC materials disseminated		FishRight	BFAR, LGU
OBJECTIVE #2. To increase BSC production by 10% from 29,960.59t in 5 years through the improvement and development of technologies in at least 19 BSC production areas						
Improvement of facilities and development of technologies for BSC	Inventory and rapid assessment of existing technologies/studies and benchmarking activities through an R&D summit to gather baseline information that can be used in evaluating the performance of the different projects for appropriate management of the BSC fishery in the different FMAs.	Published articles	Number of existing technologies assessed	Improved / New technologies for increased BSC production	SEAFDEC, Academe	NFRDI
	Monitoring of catches in the crab landing areas and improvement of facilities and practices to reduce post-harvest losses	NSAP data	Number of crab landing centres monitored and facilities improved	Compliance to Laws / Standards / Criteria, such as: -RA 8550(Philippine Fisheries Code), as amended by RA 10654	LGU, BFAR, NFRDI	Academe, DOST
	Establishment and improved management of hatcheries for BSC (5 in Visayas, 3 in Mindanao)	LGU	Number of hatcheries established	-CNFIDP 2016 -MSC Principle 2 (2.1.1 Primary Species Outcome);	BFAR, LGU	PACPI

Establishment and improved management of lying-in areas such as crab condominium, etc. (at least 19 in Visayas, 10 in Luzon, 10 in Mindanao)	LGU	Number of lying-in areas established and maintained	-SWF Factor 2.2 Stock Status	LGU	BFAR
	LGU	Number of stock reseeding areas established		LGU	BFAR
	Published articles; IPO	Number of technologies developed		SEAFDEC, Academe	NFRDI
OBJECTIVE # 3. To promote the use of eco-friendly fishing gears in different BSC fishing grounds in 5 years					
Assessment and identification of the different types of gears that have by-catch in different fishing grounds (5 in Visayas, 8 in Luzon, 3 in Mindanao)	Testing and validation of eco-friendly collapsible crab traps(e.g. the Maqueda Bay model) (NB: <i>Mindanao will engage on validation experiment e.g. escapement rate of juveniles</i>)	published articles; IPO	reports submitted	LGU (Maqueda Bay area)	BFAR
	Determination of by-catch composition of gillnet, pot, and trap (design and specification) for the BSC fisheries	published articles; NSAP data	Published by-catch composition report	PACPI	BFAR, Academe
	Determination of by-catch composition and identification, and classification of by-catch into primary, secondary, or ETP species of BSC fishery	published articles; NSAP data	Published by-catch composition report	PACPI	BFAR, Academe
	RBF (Risk Based Framework) Assessment of the BSC fishery, with PSA (Productivity Susceptibility Analysis) for the secondary species and CSA (Consequence Spatial Analysis) for habitats	published articles	RBF report submitted	PACPI	WWF
	Gear inventory and specification to be included in stock assessment programs of LGU and BFAR	published articles; NSAP data	published gear inventory report	PACPI	BFAR
	Assessment and development of alternative measures, i.e. fishing gear and practices / gear modifications, etc., and their effectiveness at	published articles	report on alternative measures	PACPI	BFAR 7, Academe
	Increased use of innovative, eco-friendly fishing gears with minimal by-catch				
	Compliance to Laws / Standards / Criteria, such as: -DA's New Paradigm -RA 8550(Philippine Fisheries Code), as amended by RA 10654 -Agriculture and Fisheries Modernization Act (AFMA) of 1997 -RA9147 (Wildlife Resources Protection and Conservation Act of 2001) -FAO 237 (JTED, 2010) -Marine Mammal Protection Act of the USA, 1972 -MSC Principle 2 (2.2.1 Secondary Species Outcome) -MSC Principle 2 (2.2.2 Secondary Species Mgt				

	reducing mortality of unwanted and ETP bycatch				Strategy) -MSC Principle 2 – By-catch Species (2.2.3 Information) -SWF Factor 2.2 Stock Status -SFW Factor 2.3 Fishing Mortality		
	Development and innovation of eco-friendly crab fishing gears	published articles; IPO	number of innovative eco-friendly fishing gears developed			NFRDI	Academe, BFAR, LGU, Science-based NGOs
	Standardization of specifications for all crab fishing gears throughout the country	published articles; IPO	reports submitted			BFAR	Academe, NFRDI, LGU
Investigation of the impacts of crab fishing gears on habitat structure and function, and develop a strategy to ensure habitat integrity	Assessment of the scale and intensity of impacts of the BSC fishing gears on different habitats (i.e. seagrass beds, mangrove areas, coral reef areas) in the Visayan Sea, including spatial attributes and mapping	published articles; NSAP data	reports submitted		Management strategies to minimize impact of fishing gears on habitat structure Compliance to Laws / Standards / Criteria, such as: - RA 8550 (Philippine Fisheries Code), as amended by RA 10654 - RA9147 (Wildlife Resources Protection and Conservation Act of 2001) - MSC Principle 2 (2.4.1 Habitat Outcome) - MSC Principle 2 (2.4.2 Habitats Mgt Strategy) - SFW Factor 4.1 Impact of Fishing Gear on Substrate - SFW Factor 4.2 Modifying Factor: Mitigation of Fishing Gear Impacts	PACPI	Academe
	Development of an appropriate management strategy to ensure protection of habitats, including but not limited to fishing gear management and zonation and MPAs	published articles; NSAP data	reports submitted			PACPI	LGU
		Collection of information related to ghost fishing (including but not limited to accounting of gear loss, concentration, and distribution of lost fishing gears, evaluation of economic and environmental impacts) and the use of these information to come up with appropriate actions and policy guidelines to mitigate the impact of ghost fishing.	published articles; NSAP data	reports submitted			PACPI
OBJECTIVE #4. To increase the BSC stock biomass by 10% (from 4.27kg/day CPUE in FMA 11, as an example) in different FMAs where BSC is one of the key species of interest							
Establishment of biologically based	Conduct of studies on the population genetic structure and management of the BSC fishery in the Philippines	published articles	number of population genetics studies conducted	Established reference points as basis for harvest strategies and harvest control rules in	Academe (Silliman Univ, UPD, etc), NFRDI		PACPI

target and limit reference points as basis in the determination of harvest strategies and harvest control rules	Conduct of studies on reproductive biology of BSC and other crustaceans	published articles	number of studies conducted	different FMAs	Academe (SSU, UPV)	NFRDI, BFAR, Other SUCs
	Establishment of fishery management units	BFAR	number of FMAs launched			
	Conduct of comprehensive stock assessment in selected areas (e.g. at least 10 in Visayas, 8 in Luzon, 20 in Mindanao)	published articles	number of studies conducted			
	Determination of biological indicators as basis in establishing target and limit reference points (e.g. fishing mortality, catch rate, spawning potential ratio, exploitation values, length at first maturity, etc.)	published articles	limit and target reference points determined			
	Establishment of harvest strategies and harvest control rules based on reference points	BFAR	assessment report			
	Dissemination of results to all stakeholders		number of IEC disseminated			
	Drafting of policy recommendations on harvest control rules / measures through MFOs	BFAR	number of policy recommendations			
	Implementation of harvest strategies and harvest control rules	BFAR	number of HCR implemented			
	Conduct of studies on stock enhancement of BSC through breeding and seed production	published articles	number of studies conducted			
	Conduct of a study on the proper management of holding cages, improvement of handling and survival rate of berried crabs	published articles	refer to BSC lying-in and holding cages indicator			
Implementation of stock enhancement strategies	Installation of holding cages	published articles	refer to BSC lying-in and holding	Compliance to Laws / Standards / Criteria, such as -RA 8550(Philippine Fisheries Code), as amended by RA 10654	Academe (SSU, UPV)	NFRDI, BFAR, Other SUCs
				Enhanced stocks in different FMAs	BFAR 7, Academe (SSU)	LGU, CSO
				Compliance to Laws / Standards / Criteria, such as -RA 8550(Philippine Fisheries Code), as amended by RA	BFAR 7, Academe	LGU, CSO
					LGU, BFAR	CSO

				cages indicator	10654 -2000 Bangkok Declaration on Strategy for Aquaculture Development -MSC Principle 1 (1.1.3 Stock rebuilding); -SFW Factor 3.1 Mgt of Impacts			
	Benchmarking, monitoring, and impact assessment of holding cages	published articles		refer to BSC lying-in and holding cages indicator			BFAR, Academe	LGU, CSO
	Monitoring and impact assessment of stock enhancement	published articles		M&E report submitted			BFAR, Academe	LGU, CSO
Identification of the spawning season of BSC in selected areas for the implementation of closed season in 2022	Conduct of stock assessment and reproductive biology studies to determine spawning season (5 for Visayas area, 5 for Mindanao) ; <i>Note:</i> other major crabbing regions to conduct periodic stock assessment	published articles		Number of studies conducted	Closed season implemented in some FMAs		NFRDI	Academe, DOST, BAR
	Information dissemination of the results on the identified spawning seasons for BSC in the selected areas	LGU; BFAR		Number of IEC Activities and IEC Materials	Compliance to Laws / Standards / Criteria, such as - RA 8550(Philippine Fisheries Code), as amended by RA 10654 - FAO 263 (FMA, 2019) - MSC Principle 1 (1.1.2 Stock Rebuilding and 1.2.1 Harvest Strategy); - SFW Factor 1.2 Stock Status; - SFW Factor 3.1 Mgt of Impacts on Retained Stocks - Mgt Strategy and Implementation (HCRs)		BFAR (IFCU,RFIMC, CFD)	LGU's, Academe
	Establishment of closed season for BSC in select areas						BFAR, LGU	FMA-SAF, Academe
OBJECTIVE # 5. To establish a network of MPAs (Marine Protected Areas) for BSC in 5 years								
Determination of functional MPAs in different areas and restoration of non-functional MPAs	Inventory of existing MPAs (through BFAR Regional Offices), e.g. through MPA Support Network	LGU/BFAR/DENR Data		Inventory report per region	Proper management of MPAs for increased BSC production		LGU & BFAR	DENR (MENRO, CNERO, PENRO), Academe, NGOs, & POs
	Classification of functional MPAs through MEAT (specifically for BSC)	LGU/BFAR/DENR Data		MEAT report per region	Compliance to Laws / Standards / Criteria, such as - RA 8550(Philippine Fisheries Code), as amended by RA 10654		Academe (BUCEF)	POs, BFAR-5, NGOs
	Technology development for sea grass transplantation	Published articles		Number of technologies developed				
Establishment and	Defining location selection criteria	LGU/BFAR/DENR Data		1 user manual	- RA 7586 - National		BSC-TWG	LGU, DENR,

management of at least 19 functional MPAs (Marine Protected Areas) for BSC in 5 years	Assessment of potential sites for the establishment of MPAs for BSC through initial baseline surveys and associated analyses	LGU/BFAR/DENR Data	Number of potential sites as SFMPAs or MPAs assessed	Integrated Protected Areas System - series of 1992 - FAO 196 (FARMC, 2000)	BFAR	NGOs
	Establishment of social license, community engagement and acceptance through various forms of public consultations or public hearing	LGU/BFAR/DENR Data	Number of consultations conducted; evidence of community acceptance and engagement			
	Organization and strengthening of BFARMCs/MFARMCs to recommend the re-enactment of MFCs	LGU/BFAR/DENR Data	Number of FARMCs organized and strengthened			
	To fully engage in the processes necessary for the enactment/declaration of MFO by the Sangguniang Bayan / Panlalawigan (i.e., presentation of results, committee hearing, approvals, etc.)	LGU/BFAR/DENR Data	Number of Approved BSC MPAs			
	Capacity building of organized fisherfolk association and management team/committee on proper/responsible fisheries management through the engagement of communities and enablers	LGU/BFAR/DENR Data	Number of MPAs established			
	Establishment of BSC MPAs (i.e., installation of marker buoys, procurement of logistics for monitoring, etc.)	LGU/BFAR/DENR Data	Number of BSC MPAs functionalized / activated			
OBJECTIVE #6. To minimize the level of environmental pollution due to crab meat industry wastes						
Development of technologies to utilize	Technology verification on the existing studies on feed formulation using crab shell (e.g. NONESCOST)	published articles	reports submitted	Use of improved/new technologies for utilization of BSC wastes from pre-	Academe (NONESCOST)	DOST

solid and liquid wastes from crab pre-processing and processing stations	Technology development on the use of crab shell as fertilizers/feeds other foods and innovative products (e.g. CBSUA, Par5U, CN5C, 55C, BU, all other SUCs and HEIs)	published articles, IPO	Technology developed; patents approved	processing and processing plants	RIIs, Academe	LGU, private sector, DA-BAR, NFRDI
	Conduct of other research activities on the viability of solid and liquid wastes from crab pre-processing and processing stations	published articles, research institutions	Number of research reports submitted	Compliance to Laws / Standards / Criteria, such as -DA's New 8 Paradigms -Phil Clean Water Act of 2004 (RA 9275); Ecological Solid Waste Mgt Act of 2001 (RA 9003)	Academe, SEAFDEC	DENR-EMB
	Establishment of treatment facilities for unusable and usable waste and its proper storage and disposal	private sector, EMB data	Number of established treatment facility		Academe, SEAFDEC	DENR-EMB

B. Implementation Schedule, Budgetary Requirements and Sources of Funds

CRITICAL SUCCESS FACTORS		IMPLEMENTATION SCHEDULE																PROPOSED BUDGET		SOURCES OF FUNDS						
SPECIFIC OBJECTIVES / KEY ACTIONS	SPECIFIC ACTIONS	2020				2021				2022				2023				2024				Year 1	Years 2-5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4					
GOAL: Rehabilitated marine habitat for increased BSC production																										
OBJECTIVE #1. To conduct BSC resource mapping and determine the impacts of the fishery to the ecosystem																										
Improvement of data collection and reporting protocols	Implementation of the NSAP with some modifications																					2,500,000	2,500,000	NFRDI		
	Harmonization of BSC data collection and reporting																					2,500,000	2,500,000	BFAR, NFRDI		
Conduct of BSC resource mapping (BSC sources and sinks; BSC facilities, etc) in selected areas (at least 10 in Luzon/Visayas areas, 38 in Mindanao)	Inventory and rapid assessment of existing technologies/studies and benchmarking activities through an R&D summit, to gather baseline information that can be used in evaluating the performance of the different projects for appropriate management of the BSC fishery in the different FMAs.																					1,250,000	1,250,000	NFRDI, DOST		
	Conduct of Geo-tagging of BSC facilities (i.e. cooking stations, picking stations, processing plants) and BSC fish landing centres																					500,000	1,500,000	BFAR, PACPI		
	Conduct of focus group discussions on resource mapping																						1,000,000	1,000,000	BFAR, NFRDI	
	Conduct of underwater assessment																						2,000,000	2,000,000	NFRDI	
	Conduct of grid mapping of BSC fishing gears operation																							2,000,000	2,000,000	NFRDI, DOST, Academe
	Conduct of BSC Habitat Profiling (Oceanographic, Biophysical, Natural Productivity studies) on identified BSC Areas																							3,000,000	3,000,000	NFRDI, DOST, Academe
Investigation of the impacts of the fishery to	Development of ETP By-catch Risk Analysis methodology and the capacity of the research teams in the Philippines																					1,750,000		FishRight		

OBJECTIVE # 3. To promote the use of eco-friendly fishing gears in different BSC fishing grounds in 2021																			
Assessment and identification of the different types of gears that have by-catch in different fishing grounds (5 in Visayas, 8 in Luzon, 3 in Mindanao)	Testing and validation of eco-friendly collapsible crab traps(e.g. the Maqueda Bay model) (NB: <i>Mindanao will engage on validation experiment e.g. escapement rate of juveniles</i>)	500,000																	Academe, DOST, BAR
	Determination of by-catch composition of gillnet, pot, and trap (design and specification) for BSC fishery	1,000,000																	PACPI, BFAR
	Determination of by-catch composition and identification, and classification of by-catch into primary, secondary, or ETP species of BSC fishery	1,000,000																	PACPI, BFAR
	RBF (Risk Based Framework) Assessment of the BSC fishery, with PSA (Productivity Susceptibility Analysis) for the secondary species and CSA (Consequence Spatial Analysis) for habitats	2,000,000																	PACPI
	Gear inventory and specification to be included in stock assessment programs of LGU and BFAR																		NFRDI, BFAR, LGU
	Assessment and development of alternative measures, i.e. fishing gear and practices / gear modifications, etc., and their effectiveness at reducing mortality of unwanted and ETP by-catch	2,000,000																	PACPI, BFAR
	Development and innovation of eco-friendly crab fishing gears	7,000,000																	PACPI, DOST, BAR, Academe
	Standardization of specifications for all crab fishing gears throughout the country	1,000,000																	NFRDI, BFAR, LGU

ANNEX B

GOVERNANCE-RELATED ACTION PLANS AND STRATEGIES
for the improvement of the Blue Swimming Crab Industry of the Philippines



A. Critical Success Factors, Key Performance Indicators, and Implementation Schemes

CRITICAL SUCCESS FACTORS		KEY PERFORMANCE INDICATORS			IMPLEMENTATION SCHEME	
SPECIFIC OBJECTIVES / KEY ACTIONS	SPECIFIC ACTIONS	BASELINE DATA (if available) / SOURCES OF SITE-SPECIFIC DATA	OUTPUTS Verifiable Measures	EXPECTED OUTCOMES	MAIN IMPLEMENTERS	IMPLEMENTING PARTNERS
GOAL: Increased compliance with BSC regulations for sustainable management of BSC fishery						
OBJECTIVE #1. To institutionalize a multi-stakeholder council on BSC by 2020						
Transitioning of the BSC-TWG into the National BSC Council and institutionalization and recognition of the National BSC Council	Reconstitution of the BSC-TWG to include all stakeholders	Existing TWG	Reconstituted TWG, to include other members	Institutionalized National BSC Council	BFAR-TWG	LGU, Academic, Private Sector, Fishers
	Strengthening of the function of the BSC-TWG to cover other funding sources in preparation for the institutionalization of the BSC Council	Present BSC-TWG	Strengthened BSC-TWG	Compliance to Laws / Standards / Criteria, such as: -DA's New Paradigms -JAO 01, 2014 -MSC Principle 3 - (3.1.2 Consultation, Roles and Responsibilities) -MSC Principle 3 - (3.2.2 Decision-making Processes) -SPW Factor (Mgt of Impacts - Stakeholders Inclusion)	BFAR-TWG	LGU, Academic, Private Sector, Fishers
	Organization of the BSC Council	Strengthened BSC-TWG	Institutionalized National BSC Governing Council		National BSC Council	All Stakeholders
	Conduct of regular quarterly meetings of the Council to discuss issues which may include the following:					
	a. Monitoring of BSC traceability (Local Transport Permit) and documentation, and recommend improvement to policies b. Review and make appropriate recommendations on prices c. Research and development activities for stock enhancement and BSC culture					
OBJECTIVE #2. To institutionalize the BSC Roadmap in 2020						
Formulation of the BSC Roadmap, including localised roadmaps (e.g. for San Miguel Bay)	Revisit of previous and existing Philippine and overseas management plans as resource materials	(0) base on previous MP	1 Roadmap	Institutionalized BSC Roadmap Compliance to Laws /	BFAR-TWG	LGU, Academic, Private Sector, Fishers

	Establishment of comprehensive BSC fishery database	NSAT data; PSA data	Harmonized BSC database	Standards / Criteria, such as: - DA New Paradigms - MSC Principle 3 - (3.1.2 Consultation, Roles and Responsibilities); - SFW Factor (Mgt of Impacts - Stakeholders Inclusion)	BFAR, LGU	Academe, NGO, BFAR, Key Industry Players
	Drafting of the BSC Roadmap and consultation prior to implementation	Results of studies (UPV, ISCOF and other SUCs)	BSC Roadmap		BFAR	LGU, Key Industry stakeholders
OBJECTIVE #3. To adopt and integrate the BSC-NMP into the local executive agenda, and implement the BSC-NMP in all LGUs (where BSC is a major commodity) in 5 years						
Preparation of DILG Memo Circular (i.e. SCLG) to adopt/integrate in the local executive agenda the implementation of the BSC-NMP	Provide template on municipal ordinances for LGUs to follow	Results of studies (UPV, ISCOF and other SUCs)	Number of LGUs with ordinances	Adoption of the BSC-NMP in the local executive agenda for the proper and sustained implementation of the BSC-NMP	LGU, BFAR	All Stakeholders
Implementation of at least 5 capacity building programs on effective fisheries management of BSC resource for LGUs where BSC is a major commodity	Conduct of information caravan on LCEs to increase awareness on the need to integrate the BSC NMP.	Existing IEC materials	Number of info-caravan launched	Compliance to Laws / Standards / Criteria, such as: - DA New Paradigms - RA 8550 (Philippine Fisheries Code), as amended by RA 10654 - RA 7160 (Local Govt Code, 1991) - FAO 263 (FMA, 2019) - FAO 196 (FARM, 2000) - MSC Principle 3 - (3.1.1 Legal and/or Customary Framework	LGU, BFAR	All Stakeholders
	Conduct of surveys and development of training modules	(0) base	Number of capacity building training modules developed		LGU, BFAR	Academe, CSO
	Conduct of trainings/capacity building	LGU lists	Number of capacity building programs conducted		LGU, BFAR	Academe, CSO
For all coastal communities where BSC is a major commodity to have Municipal Fishery Ordinances with BSC-specific regulations based on science, within 5 years	Conduct of assessment (Rapid and Comprehensive Assessment) of municipal / city / provincial ordinances on BSC	UPV Study ISCOF and other SUCs	Report on the Rapid Comprehensive Assessment		LGU	BFAR, Academe and other stakeholders
	Consolidation of available data	LGU data	Database of consolidated data			
	Collaboration among LGUs, FARMs, and concerned agencies	Existing tie ups	Number of collaborations established			

Organization of 2 inter-LGU alliances for a (harmonized) MFO implementation in 3 years	Conduct of quarterly and special meetings involving FARMCs.	Existing LGU Alliances	Number of inter-LGU alliances established through MOAs	Organized LGU-alliance for common implementation of the BSC-NMP	LGU, BFAR	BFAR, CSOs, Academe
	Institutionalization/Organization of inter-LGU alliances through MOAs	n/a	Number of MOAs signed and implemented	Compliance to Laws / Standards / Criteria, such as: -RA 8550(Philippine Fisheries Code), as amended by RA 10654 -FAO 196 (FARMC, 2000) -RA 7160 (Local Govt Code, 1991) -MSC Principle 3 - (3.2.2 Decision-making Processes)		
OBJECTIVE #4. To increase awareness of all BSC regulations among the key players (fishers, traders, processors, exporters, enablers, resource managers) in 5 major BSC fishing grounds in 5 years						
Design and conduct of training programs / IEC to build the capacity and understanding of fishery management among BSC fishers and other key players	Profiling/Baselining e.g. level of awareness and no. of fishers/traders, number of BSC-related rules and regulations, etc.	Existing IEC Caravan in Partnership with SUCs and LGUs	Number of IEC activities conducted; % increase in awareness	Increased awareness among stakeholders of all BSC regulations		
	Intensification of IEC drive specifically on JAO to LGUs (LCE, Legislative body, MAO/PFO, and other LGU personnel)	LGU data	No. of IEC activities conducted; % increase in awareness	Compliance to Laws / Standards / Criteria, such as: - JAO 01, 2015 - MSC Principle 3 - (3.2.3 Compliance and Enforcement - SFW Factor 3.1 Mgt of Impacts on Retained Stocks	BFAR, Private Sector	CSOs, Academe, LGU
	Conduct of IEC drive at the municipal and barangay levels using all media platforms e.g. facebook and teach-in demos	LGU data	No. of IEC activities conducted; % increase in awareness			

OBJECTIVE #5. To increase regulatory compliance in the BSC fisheries (e.g. catch documentation, size regulations, catching of berried and juvenile crabs, food safety and quality standards, traceability, social compliance) by 20% annually over 5 years						
Identification of major municipalities / provinces with BSC fisheries, review their regulations/ ordinances, and strategize enforcement of rules and regulations	Assessment of municipalities / provinces with BSC as major commodity	Existing data on number of apprehensions	increase in compliance	Increased compliance among stakeholders of all BSC regulations	BFAR, LGU	Private Sector, all Stakeholders and law enforcement agencies
	Consolidation of available data on municipal ordinances	LGU data	Number of collaborations established			
	Collaboration among municipal and provincial LGUs and concerned agencies on regulatory matters	LGU data	Number of law enforcement activities conducted			
	Law enforcement activity (e.g. conduct of land-based enforcement such as market denial in Zamboanga and Tawi-Tawi, conduct of Seaborne Patrol in BASULTA area and Isabela)	Existing line of activities (if available)				
	Regulation of the number of meshdown in the use of gillnets from 100 to 25 (stretch), through issuance of fishing gear license					
	Recognition/ incentivization of best practices on BSC initiatives.		Number of programs recognized with best practices			
	Increase in compliance to HACCP guidelines for food quality and safety	Number of existing processing plants that are HACCP-compliant	Percent compliance against total number of processors and picking plants			
	Strengthening of the implementation / local adaption of JAO through the issuance of an Executive Order	JAO No. 1 series of 2014	Revised JAO No. 1 series of 2014			
	Strengthening of the enforcement of waste management policies, including monitoring of post-harvest waste disposal	LGU data	Number of management policies reviewed / strengthened			
				Compliance to Laws / Standards / Criteria, such as: - DA's New 8 Paradigms for Agriculture and Fisheries - RA 8550(Philippine Fisheries Code), as amended by RA 10654 - Phil Clean Water Act of 2004 (RA 9275); - Ecological Solid Waste Mgt Act of 2001 (RA 9003) - RA 7586 - National Integrated Protected Areas System - series of 1992 - JAO 01, 2014 - FAO 212 (HACCP, 2001) - FAO 210 (Exportation, 2001) - FAO 228 (Rules on		
					LGU, DA	All Stakeholders
					BFAR	LGU, private sector
					LGU	BFAR, FARMC
					LGU	Buyers, BFAR, Operators, DENR

Allocation of (additional) funds for the enforcement of policies (personnel, operation expenses, logistics, capacity development for law enforcers, etc.)	Monitoring of compliance of fishing activities associated with MPAs	LGU data	Amount of funds allocated / budgeted	exportation to EU, 2008) - FAO 251 (Tracability System, 2014) - PNS 178:2016 (Pasteurized Crab Meat) - 2000 Bangkok Declaration on Strategy for Aquaculture Development - MSC Principle 3 - (3.2.3 Compliance and Enforcement; - SFW Factor 3.1 Mgt of Impacts on Retained Stocks	LGU	PCG, PNP, Maritime, PLGU, BFAR
		LGU data	Number of MPAs monitored		LGU	BFAR
	Crafting of policy for closed season, law enforcement of existing BSC policies and stock enhancement activities	(0) base	Number of areas with closed season policy guidelines in place		BFAR	LGU, Academe, CSO
Increase in the number of crab processing facilities that are socially compliant by at least 20% of all crab processing facilities in 5 years	Survey of the level of social compliance of existing facilities	Data from private sector	Number of socially compliant facilities	Increased number of socially compliant plants for improved quality of life among workers Compliance to Laws / Standards / Criteria, such as: -Conservation Alliance for Seafood Solutions Framework on Socially and Environmentally Responsible Seafoods	BFAR, PACPI	LGU, CSO
	Preparation and dissemination of IEC materials on the guidelines for social compliance	Data from private sector	Number of IEC materials disseminated		BFAR, PACPI	LGU, CSO

B. Implementation Schedule, Budgetary Requirements and Sources of Funds

CRITICAL SUCCESS FACTORS		IMPLEMENTATION SCHEDULE												PROPOSED BUDGET		SOURCES OF FUNDS			
SPECIFIC ACTIONS / KEY ACTIONS	SPECIFIC ACTIONS	2020			2021			2022			2023			2024			2020	2021- 2024	
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3			
GOAL: Increased compliance with BSC regulations for sustainable management of the BSC fishery																			
OBJECTIVE #1. To institutionalize a multi-stakeholder BSC Council by 2020																			
Transitioning of the BSC-TWG into the National BSC Council and the institutionalization and recognition of the National BSC Council	Reconstitution of the BSC-TWG to include all stakeholders																500,000		UNDP
	Strengthening of the function of the BSC-TWG to cover other funding sources in preparation for the institutionalization of the BSC Council																		
	Organization of the BSC Council																500,000		UNDP
	Conduct of regular quarterly meetings of the Council to discuss issues which may include the following:																		
	a. Monitoring of BSC traceability (Local Transport Permit) and documentation, and recommend improvement to policies																	4,000,000	BFAR, NGO, UNDP
	b. Review and make appropriate recommendations on prices																		
	c. Research and development activities for stock enhancement and BSC culture																		
OBJECTIVE #2. To institutionalize the BSC Roadmap in 2020																			
Formulation of the BSC Roadmap, including localised roadmaps (e.g. for San Miguel Bay)	Revisit of previous and existing Philippine and overseas management plans as resource materials																		(no budgetary requirement)
	Establishment of comprehensive BSC fishery database																		(included under Ecological Plans

ANNEX C

SOCIO-ECONOMIC-RELATED ACTION PLANS AND STRATEGIES
for the improvement of the Blue Swimming Crab Industry of the Philippines



A. Critical Success Factors, Key Performance Indicators, and Implementation Scheme

CRITICAL SUCCESS FACTORS		KEY PERFORMANCE INDICATORS			IMPLEMENTATION SCHEME	
SPECIFIC OBJECTIVES / KEY ACTIONS	SPECIFIC ACTIONS	BASELINE DATA (if available) / SOURCES OF SITE-SPECIFIC DATA	OUTPUTS Verifiable Measures	EXPECTED OUTCOMES	MAIN IMPLEMENTERS	IMPLEMENTING PARTNERS
GOAL: Sustainable income for BSC stakeholders and enhanced competitiveness of BSC products for better quality of life						
OBJECTIVE #1. To increase access to, and strengthen, the extension and business development services for BSC Stakeholders						
Establishment of at least 3 Model Crab Villages by 2024	Identification of a pilot site for the community-based management and conservation model village	No existing model village	Number of model villages established	Established BSC village with responsible practices that can sustain income of stakeholders Compliance to Laws / Standards / Criteria, such as: - DA's New 8 Paradigms - RA 8550 (Philippine Fisheries Code), as amended by RA 10654 - Agriculture and Fisheries Modernization Act (AFMA) of 1997 - RA 7160 (Local Government Code of 1991)	CSO HEIs	LGU, BFAR, HEIs, LGU, Private sector
	Piloting of 1 site as a model village					
	Replication of the model village in other sites					
Capacity building and engagement of extension and Business Development Services providers for at least 5% of the registered and licensed fisherfolk involved in BSC production by 2024	Conduct of socio-economic studies of BSC fishery	Published articles	Report of the socio-economic studies	Established BSC village with responsible practices that can sustain income of stakeholders Compliance to Laws / Standards / Criteria, such as: - DA's New 8 Paradigms - RA 8550 (Philippine Fisheries Code), as amended by RA 10654 - Agriculture and Fisheries Modernization Act (AFMA) of 1997 - RA 7160 (Local Government Code of 1991)	HEIs CSO	M/CLGU, DA-BFAR, BARMIM, PLGU
	Identification of municipalities engaged in BSC industry	NSAP data	Number of identified municipalities engaged in BSC industry		LGU CSO	BFAR ROs, DENR-PAMB, DILG
	Needs assessment of extension services	Published articles	Number of identified extension services needed		B/M/CLGUs, CSO	DILG, DSWD, HEIs
	Setting of qualification standards for the hiring of extension personnel	Civil Service QS as basis	Qualification standards established		M/CLGU	DILG, CSC
	Hiring of an Extension Officer in each of the BSC producing municipalities	None	Number of hired extension personnel		M/CLGU	HEIs, BFAR, DILG, CSC, DOLE, TESDA
	Conduct of capacity building programs for extension officers	Results of needs assessment	Number of capacity building programs conducted		M/CLGU CSO	HEIs, BFAR, DA-ATL, DTI, CDA, TESDA

OBJECTIVE #2. To increase all BSC fishers' net income by 50% from PHP241.00/day, in 5 years Provision of sustainable livelihood enterprises to at least 5% of the registered and licensed fisherfolk involved in the BSC industry by 2024	Assessment of extension services appropriate for BSC stakeholders	Results of needs assessment	Number of extension services assessed	M/CLGU	DTI, NGOs, BFAR, PAO, ATI
	Strengthening of the extension services of LGUs to BSC stakeholders	Results of needs assessment	Number of extension services strengthened / enhanced	M/CLGU	DTI, NGOs, BFAR, PAO, ATI, DOST
	Conduct of study tours to learn good practices	Results of needs assessment		M/CLGU	BFAR, BARM, DENR, DOST
	Setting up of community-based management and conservation models	Results of needs assessment	Number of models established	Fish Right PACPI	LGUs, BFAR, Private Sector
	Profiling and inventory of BSC fisherfolk	NSAP data	Database of BSC fisherfolk in BSC-producing areas	B/LGU	BFAR, HEIs, NGOs, M/CLGU
	Strengthening of the awareness of fisherfolk and non-fisherfolk (i.e. schools, religious sectors, media, social networks) on registration and licensing	n/a	Number of fishers registered	M/CLGU	CSO, BFAR, Religious Sector, POs
	LGUs to devise mechanism / strategies to increase the number of registered fisherfolk	LGU	Number of developed mechanism strategies	M/CLGU	BLGU, PNP, Religious Sector, POs, PCG
	Economic valuation of the feasibility of the identified livelihood	Published articles		HEIs, CSO	BFAR, NGOs, DSWD
	Setting up of the criteria for the selection of qualified recipients MSME of the provided livelihood to the fisherfolk	CSOs	Criteria established for the selection of qualified recipients	FARM, BFAR, MAPC	M/CLGU
	Conduct of trainings to capacitate the BSC fisherfolk on sustainable livelihoods including entrepreneurship (financial literacy and management)	CSOs	Number of trainings conducted	CSO, HEIs	DA-ATI, DTI, CDA, DOST, DOLE, TESDA
	Established livelihood enterprises that can sustain income of stakeholders Compliance to Laws / Standards / Criteria, such as: - DA's New 8 Paradigms - RA 8550 (Philippine Fisheries Code), as amended by RA 10654 - Agriculture and Fisheries Modernization Act (AFMA) of 1997; - RA 7160 (Local Government Code of 1991)				

Organization, strengthening, and registration of at least 1 fisherfolk association or cooperative in each municipality engaged in the BSC industry by 2024 in order to build support for self-regulation within the supply chain	Identification and provision of appropriate sustainable livelihood programs for qualified BSC fisherfolk to mitigate the impacts of seasonality, the implementation of harvest control strategies, and other policies	LGU, DOLE, SEC, CDA	Number of identified sustainable livelihood programs Number of fisherfolk beneficiaries		M/CLGU, DSWD, DOLE	BFAR, CSOs, DA-ATI
	<i>Baseline data will be collected under Socio-economic studies</i>	Socio-econ studies		Recognized and functional fisherfolk associations / cooperatives that can sustain income of stakeholders Compliance to Laws / Standards / Criteria, such as: -DA's New 8 Paradigms - RA 8550 (Philippine Fisheries Code), as amended by RA 10654 -Agriculture and Fisheries Modernization Act (AFMA) of 1997; -RA 7160 (Local Government Code of 1991)	CSO HEIs	LGU, BFAR, Private Sector, DTI
	Establishment of transparent bidding or auction systems	n/a	Number of established bidding or auction system		M/CLGU, Pos	BFAR, DTI
	Establishment of a barangay resource center for easy access to information (i. e. technology, source of inputs, marketing, financial access)	LGUs			BLGU	M/CLGU, DA-BFAR, BARM, PLGU
	Establishment of fisherfolk organizations	LGU	Number of organizations established		M/CLGU CSO	LGU, HEIs
	Organization/Conduct of RTDs on self-regulation solutions industry can provide (e.g. quality/grade-based pricing, market denial for undersized/berried, plant audits) in response to key concerns (e.g. continued acceptance of undersized and berried BSC, overfishing)	n/a	Number of RTDs conducted		FishRight	BFAR Private Sector, Seafood Watch, Thai Union
	Engagement of supply chain actors to enter into agreements aligned with MFOs and management measures	n/a	Number of agreements forged		POs, PACPL, M/CLGU, FARMC, Pre-processors	BFAR, DILG
	Effective dissemination of information to interested stakeholders	n/a	Number of IEC materials disseminated / campaigns conducted		M/CLGUs, FARMC, MAFC	BFAR, DA-ATI, Media, HEIs

	Implementation of self-regulation measures and monitoring	n/a	Monitoring report		LGUs, BFAR	CSOs
Application of the "Big Brother - Small Brother" concept among key players of the BSC industry	Collection of baseline information on the number of pre-processing establishments for BSC and their relationship with the BSC processors/exporters	Socio-econ studies, NSAP data	Number of pre-processing establishments	Compliance to Laws / Standards / Criteria, such as: - DA's New 8 Paradigms - RA 8550 (Philippine Fisheries Code), as amended by RA 10654 - Agriculture and Fisheries Modernization Act (AFMA) of 1997; RA 7160 (Local Government Code of 1991)	BFAR, LGU, PACPI	CSOs, Private Sector
	Establishment of networks between small-scale pre-processing facilities (existing and newly established) and processors, to include organization of crab fishers and housewives to have pre-processing activities	n/a	Number of networks enhanced thru the Big Brother-Small Brother Scheme		BFAR, LGU, PACPI	CSOs, Private Sector
Value addition and product development (e.g. crab paste, chilli crab)	R&D for product development (for fast food chains, consumer packs for local markets, etc)	Published articles; IPO	Number of R&D projects conducted	New and varied BSC product forms that can help sustain income of stakeholders	HELs, NFRDI, POs, LGU	DA-BAR, DOST
	Application for patents or utility models	Data from IPO	Number of patent or utility model	Compliance to Laws / Standards / Criteria, such as: - DA's New 8 Paradigms - RA 8550 (Philippine Fisheries Code), as amended by RA 10654 - RA 10055 (Technology Transfer Act of 2009)	HELs, NFRDI, DTI	DA-BAR, DOST, IPO
	Conduct of market studies	Published articles	Number of market studies conducted		HELs, NFRDI, DTL, Private Sector	DA-BAR, DOST
	Conduct of studies on commercialization and adoption of technologies	IPO; published articles	Number of commercialised and adopted products		HELs, NFRDI, DTL, Private Sector	DA-BAR, DOST
OBJECTIVE #3. To improve inclusiveness for all gender and circumstances (e.g. PWDs) to opportunities in BSC						
Gender mainstreaming and provision of equal opportunity to BSC stakeholders	Identification of gender roles in BSC industry and provision of equal benefits	GAD offices; published articles	Listing of specific gender roles	Recognized equal opportunities for all BSC stakeholders regardless of gender and circumstances	HELs (BU, PSU)	NGOs, DSWD
	Identification of champion municipalities based on a given criteria (provision of awards and incentives)	GAD offices	Number of identified champion municipalities	Compliance to Laws / Standards / Criteria, such as: - Magna Carta of Women of 2009 (RA 9710);	BFAR ROs	BFAR-CO, DOLE, DENR
	Application of community-based management and conservation measures	GAD offices	Number of applied community-based management and		POs, M/CLGUs	DA-BFAR, DENR, DOLE

			conservation measures	-RA 8550 (Philippine Fisheries Code), as amended by RA 10654		
	Identification and dissemination / replication of success stories	GAD offices	Number of success stories identified and disseminated		M/CLGU	BFAR, BARM, DENR, DOST
	Formulation of criteria to identify GAD related issues and development needs	GAD offices	Gender related criteria developed		POs, M/CLGUs	DSWD, DILG, PLGU
	Evaluation of the supply chain to identify GAD issues and develop necessary action points	GAD offices	Number of GAD issues identified		POs, M/CLGUs	DSWD, DILG, PLGU
OBJECTIVE #4. To increase the competitiveness of BSC products in the local and international markets by 2% in 5 years						
Reduction in the production cost along the supply chain by 5% in 5 years	Identification of nodes in the supply chain for cost reduction	DOLE, DTI, LGUs	Percent cost reduction in each node of the chain		HEIs, POs	M/CLGU, DTI, NGAs
	Establishment of subsidy mechanisms or incentive schemes for the key players in each node of the supply chain (NB: similar to subsidies provided to PUJs, Tricycle drivers)	DOLE, DTI, LGUs	Number of incentive scheme established		M/CLGUs	Private Sector, NGAs
	Identification of alternative, indigenous materials to reduce the cost of fishing inputs	DOLE, DTI, LGUs	Number of identified and implemented schemes		POs, M/CLGUs	HEIs, DOST
	Identifications of alternative fishing schemes for sustainable baits	DOLE, DTI, LGUs	Number of identified and implemented fishing schemes		POs, M/CLGUs	HEIs, DOST, BFAR
Improvement of BSC pre-processing and processing establishments to comply with food safety standards by 20% in 2024	Random spot checks on the compliance of cooking and picking stations	BFAR data	Number of compliant pre-processing and processing establishments	Increased competitiveness of BSC products in the local and international markets for sustained income among stakeholders Compliance to Laws / Standards / Criteria, such as: -DA's New 8 Paradigms -RA 8550 (Philippine Fisheries Code), as amended by RA 10654 -RA 7394 (Consumers Act of	M/CLGUs, BFAR	DOH, DENR, PNP, BFP
	Standardization of protocols in pre-processing and processing establishments	BFAR data	Number of standardized protocols		M/CLGUs, BFAR, POs	DOH, DENR, PNP, BFP

Improvement of infrastructure and facilities in the BSC industry	Needs assessment of infrastructure needs Conduct of feasibility studies Construction of infrastructure facilities	PFDA, LGU, BFAR PFDA, LGU, BFAR PFDA, LGU, BFAR	Number of infrastructure and facilities established Number of FS conducted Number of infra projects conducted	1994) -FAO 212 (HACCP, 2001) -FAO 228 (Rules on exportation to EU, 2008) -FAO 251 (Traceability System, 2014) -PNS 178:2016 (Pasteurized Crab Meat)	M/CLGUs, BFAR	PFDA, CSOs
					M/CLGUs, BFAR	PFDA, CSOs
					M/CLGUs, BFAR	PFDA, CSOs
					NCC/ Authority	LGUs, BFAR, Industry
					Private sector	LGUs, BFAR
					FARMC, MAFC	M/CLGU, BFAR, Private sector
OBJECTIVE #5. To increase access to market/trade and market information by 10% annually over 5 years						
Establishment of a market development program	Profiling and database management for BSC stakeholders at the local level	NSAP data; LGUs	Database of stakeholders	Increased access to all market and trade channels, including market information systems for the BSC stakeholders to have more competitive advantage Compliance to Laws / Standards /	LGU, POs	Industry, BFAR
	Conduct of value chain study in specific areas, giving focus on the identification and assessment of the local markets	published articles	Number of site-specific VCAs done		HEIs (BU, UPV, ISCOF, MSU, ZSCMST)	CSOs, BFAR

	Market linking, locally and internationally, for enhanced distribution of catch to different areas	DTI, private sector	Number of market sites accessed	Criteria, such as: -DA's New 8 Paradigms -RA 8550 (Philippine Fisheries Code), as amended by RA 10654 - RA 7160 (Local Government Code of 1991)	BFAR	Industry, LGU, DTI, DOT
	Organization, registration, and support to fisherfolk organization and cooperatives	LGUs	Number of cooperatives / POs organized		M/CLGU	DOLE, CDA, CSOs, BFAR, NGOs
	Engagement of stakeholders in sustainable livelihood/enterprises and development or product branding to promote cooperatives practicing sustainable crab fishery	LGUs	Number of stakeholders engaged in livelihood / enterprises		LGU and BFAR, DTI	DSWD, DOLE, DOST, NGOs, LBP, ACPIC)
	Infrastructure development and increasing access to technology	PFDA, LGU, BFAR	Number of infrastructure development finished		DA, DPWH, DA-BFAR and DOST	HEIs, M/CLGU
OBJECTIVE #6. To increase access to appropriate financial services by 10% annually over 5 years						
Conduct of product development activities for financial services for at least 5% of the fisherfolk beneficiaries	Institutionalization of programs such as smart grants (financial services and products that reduce the barriers for people to do business more efficiently and effectively) and blended finance (combination of financial schemes best suited for the purpose)	ACPD, LGU, BFAR	Number of programs to increase access to soft loans	Increased access to all appropriate financial services for the BSC stakeholders Compliance to Laws / Standards / Criteria, such as: -DA's New 8 Paradigms -RA 8550 (Philippine Fisheries Code), as amended by RA 10654 -RA 9510 (Credit Information System Act of 2008) -RA3765 (Truth in Lending Act of 1963) -RA9474 (Lending Company Regulation Act of 2007)	Government Financial Institutions (ACPC, LBP, DBP), NGOs	DTI, DOST, DSWD, DOLE
	Development of innovative financial services (e.g. use of catch documentation data that provides income history of fishers as collateral, better insurance coverage, etc.)	ACPD, LGU, BFAR	Number of financial services established.		Government Financial Institutions (ACPC, LBP, DBP)	DTI, DOST, DSWD, DOLE, PCIC, NGOs, PRC

B. Implementation Schedule, Budgetary Requirements and Sources of Funds

CRITICAL SUCCESS FACTORS		TARGET IMPLEMENTATION PERIOD																PROPOSED BUDGET		SOURCES OF FUNDS				
SPECIFIC OBJECTIVES / KEY ACTIONS	SPECIFIC ACTIONS	2020				2021				2022				2023				2024				2020	2021-2024	
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4			
GOAL: Sustainable income for BSC stakeholders and enhanced competitiveness of BSC products for better quality of life																								
OBJECTIVE #1. To increase access to, and strengthen, the extension and business development services for BSC Stakeholders																								
Establishment of at least 3 Model Crab Villages by 2024	Identification of a pilot site for the community-based management and conservation model village																							
	Piloting of 1 site as a model village																							
	Replication of the model village in other sites																							
Capacity building and engagement of extension and Business Development Services providers for at least 5% of the registered and licensed fisherfolk involved in BSC production by 2024	Conduct of socio-economic studies of BSC fishery																							
	Identification of municipalities engaged in BSC industry																							
	Needs assessment of extension services																							
	Setting of qualification standards for the hiring of extension personnel																							
	Hiring of an Extension Officer in each of the BSC producing municipalities																							
	Conduct of capacity building programs for extension officers																							
	Assessment of extension services appropriate for BSC stakeholders																							
	Strengthening of the extension services of LGUs to BSC stakeholders																							
Conduct of study tours to learn good practices																								
Setting up of community-based management and conservation models																								

OBJECTIVE #2. To increase all fishers' net income by 50% from PHP241.00/day, in 5 years																									
Provision of sustainable livelihood enterprises to at least 5% of the registered and licensed fisherfolk involved in BSC industry by 2024	Profiling and inventory of BSC fisherfolk																			BFAR, NFRDI					
	Strengthening of the awareness of fisherfolk and non-fisherfolk (i.e. schools, religious sectors, media, social networks) on registration and licensing																			1,000,000	2,000,000	LGU, BFAR			
	LGUs to devise mechanism / strategies to increase the number of registered fisherfolk																								
	Economic valuation of the feasibility of the identified livelihood																				2,000,000	BAR			
	Setting up of the criteria for the selection of qualified recipients MSME of the provided livelihood to the fisherfolk																								
	Conduct of trainings to capacitate the BSC fisherfolk on sustainable livelihoods including entrepreneurship (financial literacy and management)																				15,000,000	BAR, DOST			
Identification and provision of appropriate sustainable livelihood programs for qualified BSC fisherfolk to mitigate the impacts of seasonality, the implementation of harvest control strategies, and other policies																									
Organization, strengthening, and registration of at least 1 fisherfolk association or cooperative in each municipality engaged in the BSC industry by 2024 in order to build support for self-regulation within the supply chain	Baseline data will be collected under Socio-economic studies																				0		2,000,000	8,000,000	LGU, DOST, BAR
	Establishment of transparent bidding or auction systems																								
	Establishment of a barangay resource center for easy access to information (i. e. technology, source of inputs, marketing, financial access)																								
	Establishment of fisherfolk organizations																								

ANNEX D

Ecological Policies for the Visayan Sea Component of the FMA 11 Management Plan

(as per recommendation of the FMA 11 Scientific Advisory Group (SAG), subject to stakeholders' consultation and approval of the Management Board of FMA11)



BIOLOGICAL REFERENCE FRAMEWORK

Section 8 of RA 10654 states that the Secretary may establish reference points and harvest control rules, provided that in municipal waters and fishery management areas, these may be established upon the concurrence and approval or recommendation of such special agency and the concerned LGU in consultation with the FARMC for conservation or ecological purposes.

Biological indicators with reference points are developed from the National Stock Assessment Program of the National Fisheries Research and Development Institute. Thus far, the following biological indicators and reference points for BSC have been reviewed and recommended by the Science Advisory Group (SAG) of FMA 11:

Specific Objective	Biological Indicator	Target Reference Point	Limit Reference Point
To increase the BSC stock biomass by 10% within 5 years	Proportion of juvenile:adult:megaspawner	80% mature	50% mature
	Fishing Mortality (F)	$F/M < 1$	$F=1.5M$
	Exploitation Value (E)	0.5	0.6
	Spawning Potential Ratio	$> 20\%$	$< 20\%$
	CPUE @ MSY (Schaefer) $CPUE_{current}/CPUE_{MSY}$	> 1	< 1

Other FMAs may adopt the above biological indicators and reference points subject to review and approval of its respective Scientific Advisory Group (SAG).

HARVEST STRATEGIES

The BSC fisheries will operate in compliance with the Philippine Fisheries Code, as amended by RA 10654, and the Joint DA-DILG Administrative Order 1, series of 2014. Specifically, the following regulations stipulated in JAO No.1 related to harvest controls will be used to manage the fishery:

Minimum size of blue swimming crab. The minimum carapace width of blue swimming crab allowed for catching, collecting, and trading shall be 10.2 cm. This minimum value could be increased subject to consultations with stakeholders.

Fishing gear restrictions. Favor the use of crab pots over gillnets. For the later, the minimum mesh size shall be 5 cm stretch mesh and that no gillnet fishing activity in areas with depth less than 10 meters to minimize the catching of juvenile crabs (Germano, 2006). The design of crab pots shall also be evaluated, looking into the appropriate size of the entrance and provision of an escape hatch for the exit of juvenile crabs.

Interdiction of capturing berried crabs. Catching, collecting, and trading of berried crabs shall be prohibited.

Critical to the achievement of the management objectives, stock assessment has to be conducted continuously to provide information on the health and status of the fishery. It will also verify the appropriateness of biological indicators and test the effectiveness of the harvest control rules applied.

HARVEST CONTROL RULES

Consistent with the BSC-NMP objectives, the following harvest control rules (HCRs) were recommended by Science Advisory Group (SAG) of FMA 11, subject to the approval of the FMA 11 Management Board and consultation with the stakeholders. These HCRs may be adopted by other FMAs upon review and approval of their respective FMA's SAG and MB.

Depending on the result of the annual stock assessment, the regulatory authority in concurrence with the SAG and the Management Board may apply the following scenarios:

Case 1: If the indicator is $>$ target reference point (80% mature; $F/M < 1$; 0.5 E-ratio; $> 20\%$ SPR; > 1 CPUE @MSY) for two or more consecutive years, agree to maintain the fishing effort; or agree to increase fishing effort at a certain level of input controls?

Case 2: If the indicator is $<$ target reference point (80% mature; $F/M < 1$; 0.5 E-ratio; 20% SPR; > 1 CPUE @MSY) but $>$ limit reference point (50% mature; $F=1.5M$; 0.6 E-value; 20% SPR; < 1 CPUE @MSY) for two or more consecutive years, agree to reduce the fishing effort by a percentage lower than that of Case 3, subject to consultation and approval of the SAG.

Case 3: If the indicator is $<$ limit reference point (50% mature; $F=1.5M$; 0.6 E-ratio; $< 20\%$ SPR; < 1 CPUE @MSY) for two or more consecutive years, agree for a staggered reduction of fishing effort by 20% in 5 years; or agree to put limits on fisheries input/output controls such as gear swap; or agree to implement spatio-temporal BSC fishing closure.

RECOVERY PERIOD: Consistent with the generation time of BSC, the maximum recovery period is set at 5 years.

ANNEX E

LIST OF PARTNER INSTITUTIONS

for the improvement of the Blue Swimming Crab Industry of the Philippines



GOVERNMENT AGENCIES

Department of Agriculture - Bureau of Fisheries and Aquatic Resources (DA-BFAR)

Department of Agriculture - Bureau of Agricultural Research (DA-BAR)

Department of Agriculture – Philippine Council for Agriculture and Fisheries (DA-PCAF)

Department of Agriculture – Philippine Fisheries Development Authority (DA-PFDA)

Department of Interior and Local Government (DILG)

Department of Science and Technology - Philippine Council for Agriculture and Aquatic Resources Research and Development (DOST-PCAAARD)

Department of Science and Technology - Philippine Council for Industry and Energy Research and Development (DOST-PCIERD)

Department of Environment and Natural Resources (DENR)

Department of Trade and Industry (DTI)

Department of Tourism (DoT)

Department of Labor and Employment (DOLE)

Department of Social Welfare and Development (DSWD)

Philippine Coast Guard (PCG)

Philippine National Police (PNP)

GOVERNMENT FINANCIAL INSTITUTIONS

Department of Agriculture - Agricultural Credit Policy Council (DA-ACPC)

Land Bank of the Philippines (LBP)

Development Bank of the Philippines (DBP)

Philippine Crop Insurance Corporation (PCIC)

LOCAL GOVERNMENT UNITS

Provincial Government of Iloilo

Provincial Government of Capiz

Provincial Government of Negros Occidental

Provincial Government of Samar

Provincial Government of Bohol

Provincial Government of Cebu

Provincial Government of Zamboanga Sibugay

Provincial Government of Albay

Provincial Government of Camarines Norte

Provincial Government of Camarines Sur

HIGHER EDUCATION INSTITUTIONS

Aklan State University (ASU)

Bicol University (BU)

Camarines Norte State College (CNSC)
Capiz State University (CSU)
Carlos Hilado Memorial State College (CHMSC)
Cebu Technological University (CTU)
Iloilo State College of Fisheries (ISCOF)
Mindanao State University - Naawan (MSU-Naawan)
Mindanao State University - Tawi-tawi (MSU-Tawi-tawi)
Northern Negros State College of Science and Technology (NONESCOT)
Palawan State University (PSU)
Partido State University (ParSU)
Samar State University (SSU)
Sorsogon State College (SSC)
University of the Philippines Visayas (UPV)
Western Philippine State University (WPU)
Zamboanga State College of Marine Science and Technology (ZSCMST)

RESEARCH INSTITUTIONS

National Fisheries Research and Development Institute (NFRDI)
Southeast Asian Fisheries Development Centre - Aquaculture Division (SEAFDEC-AQD)

ORGANIZATIONS / GROUPS

Philippine Association of Crab Producers Incorporated (PACPI)
United Nations Development Program (UNDP)
United Nations Food and Agriculture Organizations (UN-FAO) – TA specific project
United States Agency for International Development (USAID)
GMCBSC
BSC National Management Plan
USAID FishRight Program
Oceana
RARE
Environmental Defense Funds (EDF)
NSF

MEMORANDUM





Republic of the Philippines
OFFICE OF THE SECRETARY
Elliptical Road, Diliman
1100 Quezon City



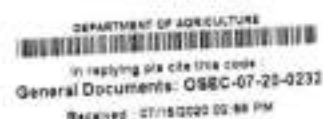
October 7, 2020

MEMORANDUM

TO : OIC-DIRECTOR JUAN D. ALBALADEJO
Bureau of Fisheries and Aquatic Resources

FROM : UNDERSECRETARY AND CHIEF OF STAFF

SUBJECT : COMMENTS, OBSERVATIONS, AND SUGGESTIONS ON THE FINAL
DRAFT OF THE BLUE SWIMMING CRAB NATIONAL MANAGEMENT
PLAN 2020-2024



We attach herewith the comments, observations, and suggestions on the final draft of the Blue Swimming Crab National Management Plan 2020-2024.

For your consideration.

Thank you.


CHERYL MARIE NATIVIDAD-CABALLERO

JCP
10/13/20
3:02 PM



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



REVIEW OF THE FINAL DRAFT OF THE BFAR BSC (*Portunus pelagicus*) NMP (2020-2024)

COMMENTS / OBSERVATIONS / SUGGESTIONS:

Based on the LBCed (September 7) final draft of the Main Document and Annexes A to E.

The Office of the Secretary acknowledges and appreciates the great efforts and time devoted by the BFAR and all participants in the rigorous process undertaken in forging and preparing this proposed Blue Swimming Crab National Management Plan (BSCNMP).

In its present form, the drafted BCSNMP is impressive. It seems that everything has been well thought of and fitted together in order to come up with a perfect proposal. However, a plan is one thing and its actual implementation is another thing. At the end of the day, the degree of success in this undertaking will depend on the determination and hard work rendered by the planners, implementers and everyone involved in achieving the set objectives and anticipated outcomes of the plan. Having said that, the Office of the Secretary would like to share some observations, comments or suggestions which might help further improved or be considered in the plan. These are as follows:

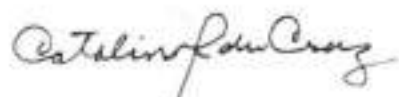
1. Provide the baseline information on the following: a) Increasing BSC production by 10% from _____% in 5 years; b) Increase BSC stock biomass by 10% from _____%; c) Increase farmers income by 50% from _____%?
2. It is noted that the bulk of actions/activities will make use of published materials (IF AVAILABLE). This is much appreciated as it will unearth and use valuable information (old, unused or not implemented). However, the inventory, consolidation and sorting of these information, and ensuring availability, perhaps should be given space/ time prior to the implementation.
3. On Annex A – Ecological-related action plans and strategies.
The six objectives and the respective activities / actions under each are among the necessary components in the management of the BSC. It is observed that these activities consist largely of basic /applied research (studies on biology, reference points, stock biomass, screening of existing technologies, roadmap, mapping of resources and so on), and of establishing breeding and hatcheries facilities and MPAs, promotion of eco-friendly gears, conduct of closed and open season of fishing or crabbing, enforcement of regulatory measures and so on, in the management plan. Thus, it is a combination of concerted research efforts to generate complementary management options for adoption or infusion later into the total management plan. Obviously, this will require varied level of management schemes to be applied in the different BSC resources.

Is it possible to separate or make a distinction among each BSC Resource by making a list of what information / facilities / management tools (kind of gears used, with or without MPAs, regulatory measures enforced, etc) each has at the start, to serve as baseline information during the evaluation of its performance under the applied management scheme?

4. The signed commitment of support / collaboration of agencies / institutions with BFAR might not be sufficiently binding. This can probably be strengthened by crafting a co-management scheme covered by a MOA among the BFAR partners as necessary – the LGU /communities and others, to specifically include an identified / willing SUC (at least one or more) preferably located nearest each BSC resource to participate in conducting continuing research, technology development and implementation of worthy findings in its management, and as necessary, of capacity building of BFAR technical employees and NFRDI as well. SUCs have the research manpower and equipped laboratory facilities. Also, the participation of other interested SUCs located farther can be considered.
5. On Annex B – Implementation, Budgetary...
Clarification:
 - a. The required budget for the BSCNMP is Php 816 Million for five years. No comment on this.
 - b. Standardization of specifications for all fishing gears throughout the country. Is it not for BSC only? It seems that the choices are focused on Crab Pots or Traps, Lift nets and Bottom set Gill Nets, with mention of Maqueda Model. But the Sea Watch (2018) listed the crab pots and bottom set gill nets under "Red or Avoid" list. Are the standardized gears to replace the mentioned gears and be used in this management plan, and be documented?
 - c. Collection of information related to ghost fishing ... and distribution of lost fishing gears, evaluation of economic and environmental impacts is to be done in three years. Once this information is established, what appropriate action(s) can be implemented to mitigate impact from ghost fishing- resulting from lost functional, destroyed or garbage fishing nets, in the management of BSC? If none, this might just become an academic information.
6. Under the socio-economic or human concern and the eight paradigms to level up agriculture (*Masaganang Ani Mataas na Kita*). In increasing fisherfolk or fishers income by 50% , – is it possible (if it would apply only in the BSC PLAN), to craft a scheme on the BIG BROTHER – SMALL BROTHER CONCEPT (This is an idea of the Secretary which is about the Big Fishers taking care of the small fishers or fisherfolk by increasing share in fishing / crabbing benefits)?
7. In the BSC Management Council, qualified/experienced Programs /Projects Field Coordinators and implementers of BFAR to satisfy the Objectives (1-6) under Annexes A to D, and the respective activities under each, should be appointed.
8. In the development of the Monitoring and Evaluation Instrument, include the measure of success in the Implementation of the BSCNMP.

As stated above, the proposed BSCNMP is very well written and impressive. Its approval can be considered by the Secretary, once the matters raised above are settled.

Prepared by:



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SUMMARY OF RESPONSES



COMMENTS	RESPONSES	CHANGES DONE IN THE BSC-NMP
1. Provide baseline information on the following:		
Increasing BSC production by 10% from _____ for 5 years	Increasing BSC production by 10% from 29,960.59t for 5 years. NB: The value of 29,960.59t represents the average production volume of BSC from 2015 to 2019 (PSA, 2020). This implies that if the target increase is 10% for the next 5 years, the average production within this period is expected to increase to 32,956.65t.	Goal: Restored marine habitat for increased BSC production OBJECTIVE #2. To increase BSC production by 10% in 5 years through the improvement and development of technologies in at least 19 BSC production areas <u>changed to:</u> To increase BSC production by 10% from 29,960.59t, in 5 years through the improvement and development of technologies in at least 19 BSC production areas <u>Changes have been done in the following:</u> 1). Section in the main plan titled: BLUE SWIMMING CRAB- NATIONAL MANAGEMENT PLAN (2020-2024) Vision, Goals and Objectives (p. 62) 2) Annex A (Ecological Related Action Plans and Strategies)
Increase BSC stock biomass by 10% from _____	Increase BSC stock biomass by 10% from 4.27kg/day CPUE (for Fisheries Management Area (FMA) 11; other FMAs may have a different value for CPUE). NB: This uses catch per unit effort (CPUE) as an indicator of the stock biomass. The value of 4.27kg/day is the average CPUE is for the BSC fishery in the Visayan Sea (or FMA11) only (Mesa et al. 2020). Given this value, the target 10% increase in stock biomass implies the increase from 4.27kg/day to 4.70kg/day (on the average for the next 5 years) in FMA 11.	Goal: Restored marine habitat for increased BSC production OBJECTIVE #4. To increase the BSC biomass by 10% in FMAs where BSC is one of the key fishery of interest <u>changed to:</u> To increase the BSC stock biomass by 10% (from 4.27kg/day CPUE in FMA 11, as an example) in FMAs where BSC is one of the key fishery of interest <u>Changes have been done in the following:</u> 1). Section in the main plan titled: BLUE SWIMMING CRAB- NATIONAL MANAGEMENT PLAN (2020-2024) Vision, Goals and Objectives (p.62) 2) Annex A (Ecological Related Action Plans and Strategies)
Increase farmers income by 50% from _____	Increase farmers net income by 50% from PhP241.00/day. NB: The value of PhP241./day refers to the computed net income of a crab fisher, regardless of season (peak or lean) and fishing gear used (gillnets, crab pots, lift nets) (Yap et al. 2017). Given this value, the target 50% increase in net income of a fisher is equivalent to an average increase from PhP241.00/day to PhP361.50/day.	Goal: Sustainable income and enhanced competitiveness of BSC products for better quality of life OBJECTIVE #2. To increase all BSC fishers' net income by up to 50% in 5 years <u>changed to:</u> To increase all BSC fishers' net income by up to 50% from PhP241.00/day in 5 years <u>Changes have been done in the following:</u> 1). Section in the main plan titled: BLUE SWIMMING CRAB- NATIONAL MANAGEMENT PLAN (2020-2024) Vision, Goals and Objectives (p.63) 2) Annex C (Socio-Economic-Related Action Plans and Strategies)

COMMENTS	RESPONSES	CHANGES DONE IN THE BSC-NMP
2. It is noted that the bulk of the actions/activities will make use of published materials (IF AVAILABLE). This is much appreciated as it will unearth and use valuable information (old, unused, or not implemented). However, the inventory, consolidation and sorting of these information, and ensuring availability, perhaps should be given space/time prior to the implementation.	This is very well noted. In line with the planned implementation scheme of the BSC-NMP, the projects/programs are to be implemented in specific sites within a Fisheries Management Unit (FMA). Hence, prior to the implementation in any of these sites, inventory, consolidation, and sorting of relevant information (that are specific to the sites) shall be conducted. These shall serve as the baseline data for these sites.	Under Implementation Framework (Critical Success Factors and Key Performance Indicators) of the main plan, the description of the baseline information has been modified (p. 70). Likewise, the headings in Annexes A-C referring to baseline data <u>have been changed to:</u> BASELINE DATA (if available) Sources of Site-Specific Data
3. On Annex A – Ecological-related action plans and strategies. The 6 objectives and the respective activities/actions under each are among the necessary components in the management of the BSC. It is observed that these activities consist largely of basic/applied research (studies on biology, reference points, stock biomass, screening of existing technologies, roadmap, mapping of resources, and so on) and of establishing breeding and hatcheries facilities and MPAs, promotion of eco-friendly fishing gears, conduct of closed and open season of fishing or crabbing, enforcement of regulatory measures, and so on, in the management plan. Thus, it is a combination of concerted research efforts to generate complementary management options for adoption or infusion later into the total management plan. Obviously, this will require varied level of management schemes to be applied in the different BSC resources. Is it possible to separate or make a distinction among each of the BSC resource by making a list of what information/facilities/management tools (kind of gear used, with or without MPAs, regulatory measures enforces, etc.) each has at the start, to serve as baseline information during the evaluation of its performance under the applied management scheme?	The point is well taken. We agree that there is a need to separate or make a distinction among each of the BSC resources through a comprehensive listing of all available information/facilities/management tools (kind of gear used, with or without MPAs, regulatory measures enforces, etc.) to serve as baseline information for each of the FMAs where BSC is one of the key fisheries of interest. However, during the consultations that have been participated in by stakeholders from the different research institutions, higher education institutions, development agencies/projects, private sector, and others, information on BSC resources (including facilities, management tools being used, research findings, and others) are all over the place. Hence, under the strategic program on Development of FMA-specific Management Plan, the need for stocktaking of all available information/initiatives and published scientific information related, but not limited, to the different biological indicators needed for the construction of site-specific reference points, reproductive biology, genetic stock structures, results of stock assessment projects, existing practices related to fishing methods and gears; and other BSC-related information, will have to be conducted through a <u>BSC Summit</u> (to be organized by NFRDI, UPV and SSU). Once determined, gathering of lacking information would be conducted to come up with site-specific scientific information that will clarify issues, identify potential management options, and provide the baseline information that can be used as the empirical basis to evaluate the performance of the projects and the management of the BSC fishery in the different FMAs.	In Annex A, Objective #1, under Conduct of BSC Resource Mapping, the specific action: Inventory and rapid assessment of existing technologies/studies through an R&D summit, initial baseline surveys and analyses, and benchmarking activities <u>Has been changed to:</u> Inventory and rapid assessment of existing technologies/studies and benchmarking activities through an R&D summit, to gather baseline information that can be used in evaluating the performance of the different projects for appropriate management of the BSC fishery in the different FMAs.
4. The signed commitment of support /collaboration of agencies / institutions with BFAR might not be sufficiently binding. This can probably be strengthened by crafting a co-management scheme covered by a MOA among the BFAR partners as necessary – the LGU/communities and others, to specifically include an identified/willing SUC (at least one or more) preferably located nearest each BCS resource to participate in conducting research, technology development, and implementation of worthy findings in its management, and as necessary, of capacity building of BFAR technical employees and NFRDI as well. SUCs have the research manpower and equipped laboratory facilities. Also, the participation of other interested SUCs located farther can be considered.	This is very well noted and the suggestion is very much appreciated. The crafting and signing of MOAs between partner agencies, after the signing of commitment of support/collaboration between and among the different partner institutions shall be included as an important step. This shall include MOAs between partner agencies, to include, but not limited to BFAR and other government agencies (e.g. DA-BAR, DOST, DA-BAPFS, DTI, DOH), research institutions (e.g. NFRDI, SEAFDEC-AQD), higher education institutions (UPV, CLSU, MSU, SSU, BU, CTU, etc.), industry organization (i.e. PACPI) development agencies (e.g. UNDP, USAID, WB, FAO), non-government organizations, civic society organizations, government	Under Implementation Framework (The Main Implementers and the Implementing Partners) of the main plan, the crafting and signing of MOAs has been added as a crucial step for the smooth implementation of the BSC-NMP (p. 73).

COMMENTS	RESPONSES	CHANGES DONE IN THE BSC-NMP
	funding/credit/lending institutions, and others.	
5. On ANNEX B – Implementation, Budgetary...Clarification:		
a. The required budget for the BSCNMP is PhP816M for 5 years. No comment on this.	Thank you very much.	
a. Standardization of specifications for all fishing gears throughout the country. Is it not for BSC only? It seems that the choices are focused on crab pots or traps, liftnets and bottom set gillnets, with mention of Maqueda Bay. But the Sea Watch (2018) listed the crab pots and bottom set gill nets under “Red or Avoid” list. Are the standardized gears to replace the mentioned gears and be used in this management plan, and be documented?	This is very well noted. In the standardization of fishing gears, activities shall be focused on crab fishing gears only. This means that the specifications (e.g. mesh size, size and length of nets, depth of the set-up, materials to be used, soaking time, design of the crab fishing gear, others) are to be standardized for those commonly used crab fishing gears such as crab pots, gill nets, and lift nets. The standardization efforts shall not target the replacement of these existing crab fishing gears. In addition, this standardization of crab fishing gears shall provide information to foreign governmental agencies/groups providing international certifications/standards on fishery sustainability (e.g. NOAA, Seafood Watch, Marine Stewardship Council) that the Philippine Blue Swimming Crab industry adheres to the principles of sustainable fisheries management.	Annex A, Objective 3, Specific Action: Standardization of specifications for all fishing gear throughout the country <u>has been changed to:</u> Standardization of specifications for all crab fishing gears throughout the country
c. Collection of information related to ghost fishing.... And distribution of lost fishing gears, evaluation of economic and environmental impacts is to be done in three years. Once this information is established, what appropriate action (s) can be implemented to mitigate impact from ghost fishing resulting from lost functional, destroyed or garbage fishing nets, in the management of BSC? If none, this might just become an academic information.	Thank you very much for this comment. It is absolutely necessary to include in the list of specific actions in Annex A, not only the collection of information related to ghost fishing but the use of these information to come up with appropriate actions and policy guidelines to mitigate the impact of ghost fishing.	Annex A, Objective 3, Specific Action: Collection of information related to ghost fishing including but not limited to accounting of gear loss, concentration, and distribution of lost fishing gears, evaluation of economic and environmental impacts <u>has been changed to:</u> Collection of information related to ghost fishing (including but not limited to accounting of gear loss, concentration, and distribution of lost fishing gears, evaluation of economic and environmental impacts) and the use of these information to come up with appropriate actions and policy guidelines to mitigate the impact of ghost fishing.
6. Under the socio-economic or human concern and the eight paradigms to level up agriculture (Masaganang Ani Mataas na Kita). In increasing fisherfolk or fishers income by 50% - is it possible (if it would apply in the BSC PLAN), to craft a scheme on the BIG BROTHER-SMALL BROTHER CONCEPT (This is an idea of the Secretary which is about the Big Fishers taking care of the small fishers or fisherfolks by increasing share in fishing / crabbing benefits)?	This is a very much acceptable concept that can be included in the BSC-NMP. Unfortunately, it appears that it may not apply to the crab fishers since they are all basically municipal fishers. It may, however, apply to the pre-processors (i.e. those involved in cooking and picking of BSC). Big brothers (i.e. the medium and large scale BSC processors) mostly having their own cooking and picking stations, can possibly network with their small brothers who could either be the crab fishers and housewives with no existing pre-processing stations or those with existing small scale pre-processing stations. Although at present, there are existing similar arrangements but these are to be enhanced. The big brothers are to provide sufficient logistical support, such as equipment, facilities, technical information, trained personnel, and transport facilities, that are necessary to help their small brother. This is expected to help the small brothers stay in business and increase their income while providing and assuring their big brothers high quality pre-processed crab meat for their processing needs.	This has been included in Annex C, Objective 2 - Specific Objectives / Key Actions Likewise, this scheme has been included in the section on Strategic Solution (Under New Thinking Vision for Philippine Agriculture and Fisheries (p. 60)

COMMENTS	RESPONSES	CHANGES DONE IN THE BSC-NMP
7. In the BSC Management Council, qualified / experienced Programs/Project Field Coordinators and implementers of BFAR to satisfy the Objectives (1-6) under Annexes A to D, and the respective activities under each, should be appointed.	This is duly noted. In line with the planned implementation scheme of the BSC-NMP, the projects/programs are to be implemented in specific sites within a Fisheries Management Unit (FMA). With this set-up, the qualified/experienced Program/Project Field Coordinator (preferably a BFAR personnel) can then be appointed for each of the FMAs where BSC is one of the key fisheries of interest. The field coordinators from these FMAs shall then automatically become members of the Monitoring & Evaluation Team, instead of the National BSC Council. This is strategic, due to several reasons: 1). The field coordinators who know the status of project implementation in their respective FMAs shall serve as the link between the National BSC Council (via its M&E arm) with the implementing units (i.e. the FMAs). 2). Pooling the field coordinators from the different FMAs in one group, together with the other members of the M&E Team, shall provide an appropriate venue for detailed discussions on what has been happening “on the ground”, for sharing of best practices in the different project sites, and for crafting of strategies that could possibly help the different projects achieve their target outputs. 3) The M&E Team can easily and collegially perform an oversight function to ensure the implementation of the different activities / projects in the presence of the field coordinators in the	Under the Implementation Framework (Main Implementers and Implementing Partners), the last paragraph: For the smooth implementation of the new BLUE SWIMMING CRAB NATIONAL MANAGEMENT PLAN (BSC-NMP 2020-2024), main and partner implementers are assigned to each of the identified key actions (p. 74). Has been changed to: For the smooth implementation of the new BLUE SWIMMING CRAB NATIONAL MANAGEMENT PLAN (BSC-NMP 2020-2024), main and partner implementers are assigned to each of the identified key actions, with an experienced Field/Program Coordinator appointed for each of the FMAs where BSC is one of the key fisheries of interest. Likewise, under the Monitoring and Evaluation Framework of the plan, the last paragraph (p. 76): The composition the team and its period of engagement shall be determined by the National BSC Council. Has been changed to: The M&E Team shall include the different Project/Field Coordinators who know the status of the project implementation in their respective FMAs and as such, shall serve as the link between the National BSC Council (via its M&E arm) with the implementing units (i.e. the FMAs). The other members the team and their respective period of engagement shall be determined by the National BSC Council.
8. In the development of the Monitoring and Evaluation instrument, include the measure of success in the implementation of the BSC-NMP.	This is duly noted. Annexes A-C provide listings of OUTPUTS as the Verifiable Indicators that shall serve as the measures of success of each of the key/specific action or projects. One of the duties and responsibilities of the National BSC Council can be revised to emphasize the importance of these verifiable indicators that practically measures the success of the implementation of these projects, in particular and of the BSC-NMP, in general. Likewise, the importance of these verifiable indicators can further be emphasized by revising one of the functions of the M&E Team.	1. Under Strategic Programs – 1. Institutionalization of the National BSC Council, one of the duties and responsibilities (p.66): Formulate a mechanism to monitor the activities of the Plan via its Monitoring and Evaluation arm <u>Has been changed to:</u> Formulate a mechanism to monitor the activities of the Plan via its Monitoring and Evaluation arm, taking into consideration, among others, the verifiable indicators for each of the key/specific actions as specified in Annexes A-C 2. Under M&E Framework, one of the functions of the M&E Team (p.76): Develop metrics to assess the progress at project and program levels <u>Has been changed to:</u> Develop metrics to assess the progress at project and program levels, taking into consideration, among others, the verifiable indicators for each of the key/specific actions as specified in Annexes A-C

BLUE SWIMMING CRAB NATIONAL MANAGEMENT PLAN

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