



RESEARCH PAPER

OPEN ACCESS

Blue swimming crab (*Portunus pelagicus*, Linnaeus 1758) capture fisheries practices in northern Bohol, Philippines

Christian Rolan C. Laurden*

Bohol Island State University- Calape, Bohol, Philippines

Key words: Blue swimming crab, Capture fisheries, Crab fishers, Crabbing practices

<http://dx.doi.org/10.12692/ijb/24.1.203-208>

Article published on January 09, 2024

Abstract

Blue swimming crab (*Portunus pelagicus*) is an important crustacean commodity contributing significantly to the socio-economic aspect in the Philippines. In Bohol various coastal communities have been practicing blue swimming crab capture fisheries for many years. However, there is a limited study on the blue swimming crab fishing practices and operations in this area. Thus, this study aimed to determine the status of the blue swimming crab capture fisheries in the four crabbing municipalities in Bohol, Philippines; namely Tubigon, Inabanga, Getafe, and Talibon. Personal interviews were conducted in the identified areas aided using a semi-structured survey questionnaire. Results showed that most of the crab fishers (79.33%) whose income were derived from the blue swimming crab capture fisheries were insufficient to meet and sustain the fundamental needs of their family. There are three different fishing gears used by the local crab fishers where majority are using crab gillnet (70%), followed by crab pot (23.33%), and crab liftnet (6.67%). The fishing operations and practices for these fishing gears vary depending on its type. The daily fishing operation, as well as, the significant number of crab fishers and fishing gears operated in the fishing grounds in Bohol may contribute to the decline of blue swimming crab catch. Even though there are already initiatives from the government and private sectors to support and help sustain the crabbing activities in Bohol, these efforts are inadequate without the proper management and participation of the crab fishers. Thus, comprehensive educational campaigns and information dissemination on the current status, existing laws, and national management plans are necessary to promote awareness among crab fishers and other industry players.

* **Corresponding Author:** Christian Rolan C. Laurden ✉ christianrolan.laurden@bisu.edu.ph

Introduction

The blue swimming crab (*Portunus pelagicus*) is a large species of crab that is widely distributed throughout tropical and subtropical waters (Zainal, 2013; Kunsook *et al.*, 2014). It is an important commercial species for coastal communities that rely on fisheries for their livelihoods. Its importance is further emphasized by FAO (2013), which reports that the blue swimming crab is one of the top crab species caught globally, contributing significantly to both local and international seafood markets. The blue swimming crab fishery plays a significant role in the coastal economies of many countries, particularly throughout the Indo-Pacific region, including the Philippines, Indonesia, Thailand, Malaysia, and others, as it provides support to the livelihoods of many fishermen and fishing communities, providing means of income and sustenance.

In the Philippines, the blue swimming crab fishery is a significant sub-sector of the crustacean fishery and plays a vital role in the socio-economic aspect in the country (BFAR, 2013). In 2016, the blue swimming crab was considered as a major fishery export commodity with a total volume of 4,200 metric tons and value of USD 55 million (PSA, 2016). In the first quarter of 2018, the blue swimming crab fisheries production in the Philippines amounted to 5,923.67 metric tons. This production volume represented a contribution of 0.01% to the total fisheries production in the country (PSA, 2018).

Blue swimming crab fishing in the Philippines has a rich history dating back to the 1950s (Mesa *et al.*, 2018). The fishery is characterized as a multi-gear activity, primarily practiced by artisanal crab fishers who employ various techniques to capture blue swimming crabs. These methods include gleaning, the use of bamboo traps, crab lift nets (Gadhavi *et al.*, 2013), crab pots, and gill nets (Del Norte-Campo *et al.*, 2004; Ingles, 2004; Germano and Melgo, 2003). In shallow waters, the most commonly used artisanal gear is the crab pot, but crabbers also employ other methods such as bottom set gillnets, otter trawls, crab lift nets, and push nets (Mesa *et al.*, 2018). The western Visayan Sea, in particular, is known to have a diverse range of eleven different fishing gear types

utilized for catching blue swimming crab (Ingles, 2004; Mesa *et al.*, 2018), with five of these gears being considered as major tools used by crabbers.

In Bohol, blue swimming crab fishing has been a source of livelihood among Boholano fishermen. Accordingly, the blue swimming crab fishery in Bohol is also characterized as a multi-gear fishery. However, the fishing gears, gear operations, and fishing practices are not well documented. Thus, this study aimed to determine the capture fisheries practices in the four northern crabbing municipalities in Bohol. Specifically, this study aimed to determine the demographic profile of the crab fishers, types of fishing gears, crabbing practices and operations, fisheries management, and problems and challenges faced by the crab fishers in the ground level.

Materials and methods

Study sites

A survey was conducted in the four northern crabbing municipalities in Bohol, Philippines, encompassing various coastal and island barangays in Tubigon, Inabanga, Getafe, and Talibon.

Data gathering

Key informant interview (KII) was conducted with the head of Municipal Agriculture Office (MAO) and officers of the Barangay Fisheries and Aquatic Resources Management Council (BFARMC) in each crabbing municipality to gather data on the number of crab fishers and to have an overview of the blue swimming crab fishery. Personal interviews were conducted with the crab fishers aided with semi-structured survey questionnaires to address the objectives of the study. The survey questions included information on the crab fishers' demographic profile, type of fishing gear used, number of fishing gear units and dimension; soaking time of fishing gears; the frequency of crabbing and crabbing practices. Regarding blue swimming crab fisheries management, the crab fishers were asked about the projects and programs being implemented and adopted in their locality to promote sustainable blue swimming crab production and effectively manage blue swimming crab fishery.

Data analysis

The data were tabulated and analyzed. Simple statistical treatments were employed such as the arithmetic mean, frequency, and percentage were used. The mean is the arithmetic average of a set of values, or distribution. It is the set of values divided by their number.

Results and discussion

Crab fishers' demographic profile

A total of 150 crab fishers were interviewed from the four northern crabbing municipalities in Bohol: Tubigon, Inabanga, Getafe, and Talibon. Of the four municipalities, Talibon has the highest estimated number of crab fishers (35.33%), followed by Tubigon (34.67%), Getafe (17.33%), and Inabanga (12.67%) (Table 1). All of the crab fishers in the four northern crabbing municipalities in Bohol were male, aged 21 to 75 years old. Only 6% of the crab fishers belong to the age bracket of 21 to 30 years old, 22.67% belong to the age bracket of 31 to 40 years, 28% belong to the age bracket of 41 to 50 years old, 28% belong to the age bracket of 51 to 60 years old, 13.33% belong to the age bracket of 61 to 70 years old, and 2% belong to the age bracket of 71 to 80 years old, respectively (Table 2).

Majority of the crab fishers (79.33%) had an average monthly income of PHP 1,000.00 (US\$ 18.30) to PHP 10,000.00 (US\$ 183.05) and about 20.67% had an average monthly income of PHP 11,000.00 (US\$ 201.35) to PHP20,000.00 (US\$ 366.09) (Table 3). The study revealed that the average monthly income of the crab fishers in the four crabbing municipalities in Bohol were mostly below the poverty threshold. While some of the crabbers engaged in other fishing activities, the extra income derived from these sources was insufficient to adequately support the basic and other necessities of their families. According to the crab fishers, one of the reasons of this current state of living was attributed from steady decline in catch of blue swimming crab and increasing number of crabbers and fishing gears in their area. These factors have led to a decrease in the catch per individual crabber, impacting their livelihoods.

Crabbing gears and practices

There are three types of fishing gears that are commonly used by the crab fishers in catching blue swimming crab in the four northern crabbing municipalities in Bohol, namely crab gillnet, crab pot, and crab liftnet. ECOFISH (2015) pointed out that these three fishing gears are the common fishing gears used in Bohol contributing 91% of the total catch landings by weight of blue crabs in Bohol. The commonly used fishing gears in Tubigon and Inabanga are crab gillnet and crab pot. In Getafe and Talibon, the commonly used fishing gears are crab gillnet, crab pot and crab liftnet, respectively.

Majority of the crab fishers in the four northern crabbing municipalities in Bohol used crab gillnet (70%), followed by crab pot (23.33%), and crab liftnet (6.67%). In Tubigon, 88.46% of the crab fishers are using crab gillnet while the other 11.54% are using crab pot. In Inabanga, 68.42% of the crab fishers are using crab gillnet while the other 31.58% are using crab pot. In Getafe, 65.38% of the crab fishers are using crab pot, 23.08% are using crab gillnet and 11.54% are using crab liftnet. In Talibon, 75.47% of the crab fishers are using crab gillnet, 11.32% are using crab pot and 13.21% are using crab liftnet (Table 4).

Crab gillnet

Crab gillnet locally known as “pukot panglambay” is a fishing gear commonly used by the crab fishers in the four identified crabbing municipalities in Bohol. Crab gillnets are usually set with no bait in the fishing grounds in Bohol with depths ranging from 6 to 40 m. Crab gillnet crab fishers own an average of 1,174 m of crab gillnet in Tubigon, 1,469 m in Inabanga, 1,183 m in Getafe, and 1,240 m in Talibon. Crab gillnets that are used by the crab fishers have a mesh size of 4.5 cm. Soaking duration for gillnet per set is up to 20 hours, usually soaked at 10:00 in the morning and hauled at 6:00 in the morning in the next day.

Crab pot

Crab pot locally known as “panggal” is a fishing gear also commonly used by the crab fishers in the four crabbing municipalities in Bohol.

Table 1. Number of crab fishers in the four northern crabbing municipalities in Bohol

Municipality	Number of crab fishers	Percentage composition (%)
Tubigon	52	34.67
Inabanga	19	17.33
Getafe	26	12.67
Talibon	53	35.33
Total	150	100.00

Table 2. Age bracket of crab fishers in the four northern crabbing municipalities in Bohol

Municipality	Age bracket					
	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80
Tubigon	-	12	9	17	13	1
Inabanga	-	4	8	6	1	-
Getafe	4	6	7	6	2	1
Talibon	5	12	18	13	4	1
Total	9	34	42	42	20	3
Percentage (%)	6.00	22.67	28.00	28.00	13.33	2.00

Table 3. Monthly income of crab fishers in the four northern crabbing municipalities in Bohol

Municipality	Monthly income (PHP)	
	1,000.00 – 10,000.00	11,000.00 – 20,000.00
Tubigon	41	11
Inabanga	12	7
Getafe	22	4
Talibon	44	9
Total	119	31
Percentage (%)	79.33	20.67

Table 4. Fishing gears used by the crab fishers in the four northern crabbing municipalities in Bohol

Municipality	Fishing gear type		
	Crab gillnet	Crab pot	Crab liftnet
Tubigon	46	6	-
Inabanga	13	6	-
Getafe	6	17	3
Talibon	40	6	7
Total	105	35	10
Percentage (%)	70.00	23.33	6.67

The typical crab pots employed by crab fishers are made up of plastic hexagonal mesh-shaped chicken wire interwoven and shaped into a square form with a width of 30 to 35 cm and a height of 10 cm. The crab pots have a mesh size of 3 cm and a top opening with non-exit valve of 10 to 11 cm in diameter. Crab pots are usually set with baits particularly trash fish. Crab pot crab fishers own an average of 192 crab pots in Tubigon, 492 crab pots in Inabanga, 236 crab pots in Getafe, and 159 crab pots in Talibon. Crab pots are deployed usually connected with a rope that serves as the main line for easy retrieval. Crab pots are deployed in the fishing grounds with depths ranging from 3 to 20 m. Soaking time for crab pots is twice a day, usually soaked at 9:00 in the morning and

hauled at 3:00 in the afternoon, and soaked at 5:00 in the afternoon and hauled at 7:00 in the morning in the next day.

Crab liftnet

Crab liftnet locally known as “sapyaw” is a type of fishing gear popularly used only by the crab fishers in the municipalities of Getafe and Talibon. Crab fishers in Tubigon and Inabanga revealed that they are not using crab liftnet for the reason that it is not as efficient fishing gear as crab gill net and crab pot in catching blue swimming crab. Crab liftnets are flat and square in shape with a base measurement of 35 to 40 cm in all sides and with a height of 15 to 20 cm. Crab liftnets are set with baits particularly trash fish

usually tied up with a piece of used fishing net. Crab liftnet crab fishers own an average of 33 crab liftnets in Getafe and 47 crab liftnets in Talibon. Crab liftnet crab fishers rely heavily on the height of the tide to deploy their crab liftnets. Crab liftnets are deployed during high tides with 1 to 2.1 m height of the tide. Crab liftnet crab fishers usually spent fishing up to 3 hours where the soaking time interval for crab liftnets is from 5 to 10 minutes.

Blue swimming crab fisheries management

The fisheries management adopted and implemented in the four northern crabbing municipalities in Bohol include the development of projects in Local Government Units (LGUs) that are supported both by public and private institutions such as Bureau of Fisheries and Aquatic Resources (BFAR) and Philippine Association of Crab Processors, Inc. (PACPI) to ensure protection, conservation and rational management of blue swimming crab in Bohol. Projects or programs being implemented include the gear-swap program and establishments of holding cages in the crabbing municipalities in Bohol. It is also noted that there are still crab fishers and fishermen organizations aiming for sustainable blue swimming crab production. Most of these crab fishers are aware of the local ordinances and national policies regulating the blue swimming crab fishery such as the ban on catching and selling undersized and gravid female crabs.

Problems and concerns

The major problems identified among crab fishery is the intrusion and operation of trawlers in their fishing ground which frequently results to loss and destruction of their fishing gears, particularly crab pots and gill nets. It is also noted among crab fishers that their blue swimming crabs catch steadily decline relative to previous years. Though there are projects and programs implemented to mitigate the depletion of wild stocks of blue swimming crab and help sustain the crabbing activities of the crab fishers, many of these projects and programs were not effectively managed and were neglected. Many also of the crab fishers were not aware of the existing local ordinances

and national policies governing the blue swimming crab fishery. These crab fishers tend to catch and sell undersized and gravid female crabs, especially during lean seasons.

Conclusion

Generally, the income generated from the blue swimming crab fishery, which constituted the larger portion of the income of the crab fishers, was insufficient to meet the fundamental needs of their family. In terms of fishing gears, there are three types of fishing gear used to catch blue swimming crabs in the crabbing municipalities in Bohol; however, the most favoured gear used by the crab fishers is the crab gillnet. The fishing operations and practices for these fishing gears vary depending on its type. The daily fishing operation, as well as, the significant number of crab fishers and fishing gears operated in the fishing grounds in Bohol may contribute to the decline of blue swimming crab catch. Even though there are already initiatives from the government and private sectors to support and help sustain the crabbing activities in Bohol, these efforts are inadequate without the proper management and participation of the crab fishers. Thus, comprehensive educational campaigns and information dissemination on the current status, existing laws, and national management plans are necessary to promote awareness among crab fishers and other industry players.

References

- Bureau of Fisheries and Aquatic Resources.** 2013. The Philippine Blue Swimming Crab Management Plan. 33p.
- Del Norte-Campos AGC, Villarta KA, Panes JB, Declarador M.** 2004. Catch and catch rates of the blue swimming crab (*Portunus pelagicus* L.) in various fishing grounds in Panay Island. UPV Journal of Natural Sciences **9**(1), 79-86
- Ecosystems Improved for Sustainable Fisheries.** 2015. Value Chain Analysis for Blue Swimming Crabs in Danaojon Bank, Bohol. 56p.

- Food and Agriculture Organization.** 2013. FAO Fisheries Aquaculture - Aquatic species: *Portunus pelagicus*. Electronic Data Information Source <https://www.fao.org/figis/pdf/fishery/species/2629/en?title=FAO%20Fisheries%20%26amp%3B%20Aquaculture%20-%20Aquatic%20species>
- Gadhavi MK, Kardani HK, Rajal P, Prajapati PC, Vachhrajani KD.** 2013. Impact of trawl fish ban on artisanal brachyuran crab fishery in and around Sikka, Gulf of Kutch, Gujarat, India. *Research Journal of Animal, Veterinary and Fishery Sciences* **1**(1), 22-27.
- Germano BP, Melgo JLF.** 2003. Population, reproductive and fishery biology of the blue crab, *Portunus pelagicus*, in Leyte and Samar, and management implications. *UPV Journal of Natural Sciences* **8**, 63-82.
- Ingles JA.** 2004. Status of the blue crab fisheries in the Philippines. pp 47-52. In *Turbulent Seas: The Status of Philippine Marine Fisheries*. Coastal Resource Management Project. Cebu City, Philippines. 378p.
- Kunsook C, Gajasen N, Paphavasit N.** 2014. The feeding ecology of the blue swimming crab, *Portunus pelagicus* (Linnaeus, 1758), at Kung Krabaen Bay. Chanthaburi Province, Thailand. *Tropical Life Sciences Research* **25**(1), 13–27.
- Mesa SV, Bayate D.EE, Guanco MR.** 2018. Blue swimming crab stock assessment in the western Visayan sea. *The Philippine Journal of Fisheries* **25**(1), 77-94.
- Philippine Statistics Authority.** 2016. Fisheries Statistics of the Philippines, 2014-2016. 578p.
- Zainal K.** 2013. Natural food and feeding of the commercial blue swimmer crab, *P. pelagicus* (Linnaeus, 1758) along the coastal waters of the Kingdom of Bahrain. *Journal of the Association of Arab Universities for basic and applied sciences* **13**, 1–7.