# Analysing the value chain of skipjack tuna (*Katsuwonus pelamis*) in Partido District, Camarines Sur, Philippines

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**Abstract:** Skipjack tuna is a widely acceptable raw material in the canning industry. There are various written studies on tuna supply and value chain management, but literature focusing primarily on the skipjack tuna industry is limited, particularly in the Philippines. This paper attempts to fill that gap by analysing the value chain of skipjack tuna in Partido District, Camarines Sur. Eleven existing chains in the skipjack tuna industry and the dynamic relationship among players were studied, all of whom earn a reasonable profit in both the peak and lean seasons. This study also identified challenges to the tuna industry in Partido District such as the strict implementation of Republic Acts 10654 and 8550, the seasonality of skipjack tuna in the Lagonoy Gulf, weather-related profit losses, limited financial access or capital for business operation, lack of processing equipment or advanced technology, debtors or partial remittances, and the existing health crisis.

**Keywords:** cost and return analysis; Lagonoy Gulf; skipjack tuna; tuna industry; value chain analysis.

**Reference** to this paper should be made as follows: Delfino, A.N. (2023) 'Analysing the value chain of skipjack tuna (*Katsuwonus pelamis*) in Partido District, Camarines Sur, Philippines', *Int. J. Value Chain Management*, Vol. 14, No. 1, pp.82–105.

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This paper is a revised and expanded version of a paper entitled 'Analyzing value chain of skipjack tuna (*Katsuwonus pelamis*) in Partido District, Camarines Sur, Philippines' presented at Joint International Conference of the Sixth International Conference for Fisheries and Aquatic Sciences & Asian Fisheries Social Science Research Network Forum One, University of the Philippines, Visayas, 24–26 November 2021.

## 1 Introduction

Tuna is one of the Philippines' export products among national fishery commodities (Suhana et al., 2016). Its industry generates enormous local economic opportunities for business and trade through value-adding schemes (Taylor et al., 2007). The Philippines produces 1.2 million metric tonnes (MT) of tuna annually, and General Santos City is the major production site for harvesting, processing, and exporting of tuna – skipjack for canning and yellowfin for *Sashimi* (Yamashita, 2008). In 2020, the entire output of skipjack tuna is 262.08 thousand MT, a drop of 1.6% from the previous year's production of 266.38 thousand MT, contributing to 6.0% of the country's total fisheries output. Skipjack tuna generated PhP18.02 billion in revenue in 2019, based on current prices. It decreased by 11.9% from the previous year's value of PhP20.45 billion. The average price of skipjack tuna is PhP68.74 per kg, which was down by 10.5% from PhP76.79 in 2019 (US$1 = PhP51.12) (PSA, 2020).

However, based on the region's National Stock Assessment Program (NSAP), the Lagonoy Gulf in Camarines Sur has the highest tuna catch and landings in Bicol Region at 5,837.67 MT (Bicol University, 2021). In fact, commercial and municipal fishing methods account for 29.75% of skipjack tuna harvested, with yellowfin tuna accounting for 16.30% (Seilert, 2013). Excessive exploitation of marine ecological habitats such as illegal fishing and overfishing, however, hinders its reproduction in the Lagonoy Gulf, posing a threat to the region's sustainable food production (Olaño et al., 2018).

In addition, skipjack tuna fishing not only has a good effect on the economy and livelihood of fisherfolk and other stakeholders, it also contributes to people's health because of its nutritional value. Much like the yellowfin and bigeye tunas, skipjack tuna is a good source of protein. It has low fat content and is rich in iron, copper, and zinc, which are essential minerals for humans (Mahaliyana et al., 2015). Tuna and tuna-like species are commonly used as primary raw materials in the canning industry around the world. *Sashimi*, fresh tuna steak, *katsuobushi* (dried skipjack stick), and canned tuna are some of the most recent innovations in tuna trade, processing, marketing, consumption, pricing, and profits. Tuna marketing has shifted dramatically from a single local market to a global one (Miyake et al., 2010).

Consequently, despite the skipjack tuna being one of the most prospective commodities to be commercialised in Camarines Sur, the cost efficiency and investment opportunities prompted by various actors in this sector have not yet been explored. This study aims to examine the function of the value chain of skipjack tuna in Partido District, Camarines Sur, Philippines by addressing the following research objectives:

a describe the value chain map in terms of actors, their roles and linkages, and their relationship dynamics

b analyse the costs and return of skipjack tuna production and marketing and the value addition per actor

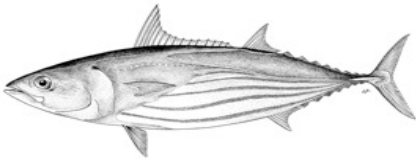
c identify constraints and opportunities in the chain.

This analysis can provide relevant strategic measures that could help specific players and improve the competitiveness of skipjack tuna in the region.

## 2 Literature review

Skipjack tuna (*Katsuwonus pelamis*) a tropical fish and the smallest of the major tuna commercial species, are found predominantly in the Atlantic, Indian, and Pacific Oceans (Figure 1). Geographic limitations are 55–60° North and 45–50° South, with greatest abundance in equatorial waters. Skipjack tuna form both free-swimming schools and schools associated with floating objects. They are caught on the surface predominantly using purse seine nets and pole-and-line gear.

**Figure 1** Skipjack tuna



*Source:* Photo credit: Courtesy of Fisheries and Aquaculture Department/Food and Agriculture Organization of the United Nations

Skipjack tuna are incredibly fertile, with the ability to spawn all year round in tropical and subtropical waters. Environmental conditions are regarded to have a significant effect on recruitment and can generate widely varying levels between years (ISSF, 2019). The common skipjack tuna has an approximate size of 40 to 80 cm (Table 1). However, at the maximum, its size is around 108 cm, with a weight of 33 kg, and a life span of 6 to 10 years. At maturity, skipjack tuna is 1 to 1.5 years old and is usually 43 cm long and weighs 1.6 kg. This tuna species is a highly migratory and dynamic species with a large distribution both vertically and horizontally. The skipjack tuna's dynamic movement is influenced by environmental parameters such as surface temperature and chlorophyll-a concentration (Zainuddin et al., 2017; Hidayat et al., 2019). Several studies have been conducted on skipjack tuna, including the presence of chlorophyll a and its effect on skipjack tuna catch (Hidayat et al., 2019); management of supply chains (Khan et al., 2019); availability and suitable feeding habitat dynamics (Druon et al., 2017; Adam and Sibert, 2002); and assessment of their spawning activity (Schaefer, 2001).

**Table 1** Skipjack tuna approximate attributes

| *Skipjack tuna* | *Size (cm)* | *Weight (kg)* | *Age (Y)* |
|---|---|---|---|
| Common | 40–80 | | |
| Maximum | 108 | 33 | 6–10 |
| Maturity | 43 | 1.6 | 1–1.5 |

*Source:* ISSF (2019)

Tuna is the fourth most traded product in the international fishery trade, accounting for 9% of the total value of seafood exports following shrimp (15%), salmon (14%), and whitefish (10%) (Potts et al., 2016; Lecomte et al., 2017). Trading of marine fishery products is a huge industry, though such products tend to decrease globally (Taylor et al., 2007). Skipjack tuna captures, for example, were more than 289,000 tonnes in 2018, but that is a figure down by 11% from 2017 (ISSF, 2019). Nevertheless, because of its protein content as well as the fair price, this fishery product is the most popular

commodity in the world (Suhana et al., 2016). Canned tuna, fresh and frozen *sashimi*, other fresh and frozen valued-added products, and *katsuobushi* are among the items available in the global tuna market (Hamilton et al., 2011; Khan et al., 2019). Indirectly, domestic and international fish trading help improve food security by providing livelihood and income for basic needs such as food, particularly the staples. Domestic commerce also increases the availability and accessibility of fish to local populations. Fish exports are well-known as a major source of income for developing countries in international trade (Bjorndal et al., 2014). Fisheries are an important source of income, food, and employment. The authorities, however, have little control over the actions of people working in this industry. Overfishing has occurred in many coastal and ocean areas as a result of high population growth and a lack of alternative economic opportunities for the fishing sector (Thuy et al., 2019).

Tuna fishing has long been dominated by a limited number of foreign firms that control both the activity and the opportunities. This economic marginalisation is directly and indirectly linked to industrial fishing, which is generally inaccessible to developing populations such as the Philippines, especially in the small-scale tuna industry. Increased fishing capacity, better technologies, and larger modernised fleets could result in increased wealth and substantial benefits for national economies and investors. However, the fisheries sector faces a challenge in stimulating investment opportunities, particularly onshore processing, and assuring investment in responsible fishing (Agritrade, 2012). Thus, this study intends to address these challenges in order to find and allow ideal conditions for tuna fishers and other stakeholders. Appropriate policies and management methods that rely on access to valuable information are crucial for small-scale tuna fishers in the Philippines. The absence of reliable data and information about many aspects of the tuna industry is one of the most significant barriers to decision- and policy-making for this sector. Therefore, more research through value chain analysis is required to better understand the tuna sector's conditions, opportunities, and constraints.

Michael E. Porter originated and popularised the value chain concept in 1985. He defines value as the maximum amount an individual is willing to pay for an item or to avoid receiving something undesired from a provider. Any value, in principle, is made up of four components: the object, which can be a physical or abstract variable; the attribute that specifies the object's quality or nature; the internal relationship between objects; and the environment in which the value network operates (Simatupang et al., 2017). Furthermore, a value chain is a collection of operations carried out by a focal form in a certain industry in order to deliver a useful product or service to the market (Porter, 1985). As a result, value chain management is defined as the process of managing all sequences of integrated activities and information in order to transfer value along the supply chain (Simatupang et al., 2017).

The value chain is a step forward because it goes beyond simply bringing a product to the market and attempts to create a more mutually advantageous environment for all players. The value chain management's main goal is to maximise net revenue. It adds incremental value to the product at the chain's nodes, either by adding value or by creating value. Higher prices and/or the development of new or expanded markets are used to obtain this value. Value creation is a method of distinguishing fish and fishery products with incremental market value from similar items based on product qualities such as geographical location, environmental stewardship, organic products, and food safety systems. Value chain requires not only factors of production and technology, but also efficient transportation, market information systems, and management to function

properly (Bjorndal et al., 2014). As the product's initial form changes through processing and manufacturing, value addition can occur at various points along the value chain. Value creation can take place at any stage along the chain, but it mostly focuses on the aspects of production and marketing in order to provide a higher-quality, better-branded product. The ultimate value-added or value-created product could be a brand new product on the market that has a competitively higher price. As a result, value chains can be seen as empowering to many, often fragmented, stakeholders, as they recognise innovative opportunities to contribute and increase the value of their product (Bjorndal et al., 2014). This approach aids in describing the current state of the value chain, identifying who is in control of and manages commodity supply, answering questions about the general and specific rules that govern the supply chain, and providing a method for forming value-creating relationships (Simatupang et al., 2017).

The value chain analysis can be used for mapping and analysis, incorporating both qualitative and quantitative data. The indiscernible links that influence operational efficiency, that is, the relationships among players, are an important aspect of the chain (Rosales et al., 2017). These links are: the information on actors, costs and benefits negotiated and distributed across the chain, factors affecting player relationships and the process by which small producers can obtain a greater portion of the chain's benefits in a sustainable way (Dooren, 2005). These factors may help in establishing the value chain's efficiency and functionality (Hellin and Meijer, 2006)

Basically, the study adapted the notion of value chain analysis from Hellin and Meijer (2006) and discourse by Kaplinsky and Morris (2008), as well as Porter's value chain model (Porter, 1985). The concept begins with value chain mapping that identifies and characterises the players, their roles and linkages in the chain, and the enabling environment and support services or issues that have an impact on the entire value chain (Rosales et al., 2017). The product flow (product form, volume, and value), financial flow (costs, value added, and return), and the relationship dynamics (how a particular actor transacts business with another actor) are the criteria to consider when determining the value chain's efficiency. The production and marketing aspects of the value chains are covered by these characteristics. The actors involved in the preparation, harvesting, or collection of a particular commodity or product, and, further in the process, their input suppliers, volume of production, and production costs are all included in the production component. The buying and selling activities and the value adding activities are all part of the marketing element, which considers marketing costs, value added, prices, and returns. This also includes how the actors interact or make transactions, share information, and conduct marketing arrangements. The cost and return analysis is an indicator of profitability in the production and marketing activities of any product (Kumar and Rajeev, 2016).

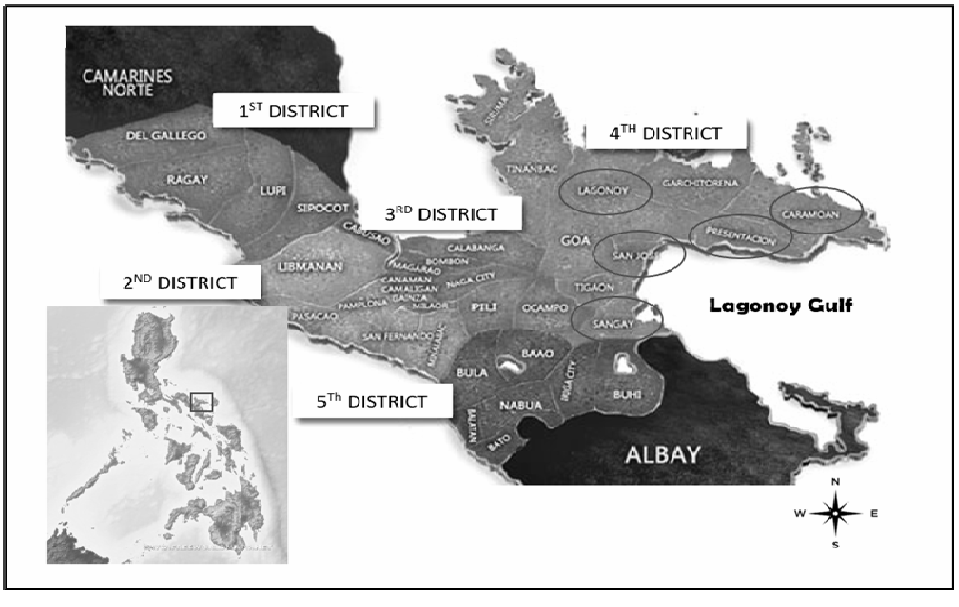
Studies exist on the tuna fishery business and products in terms of value chain analysis; however, there is a dearth of literature focusing primarily on the skipjack tuna in the Philippines. Wardono et al. (2016) concentrated on the fisheries business margin and the value added, whereas MCD (2020) and USAID (2017) highlighted the value chain assessment and analysis of tuna in the Philippines and Vietnam. Gestsson et al. (2010) and Sistani et al. (2021) conducted value chain analyses of yellowfin tuna and tuna-like species in Sri Lanka and Iran. In addition, studies on value chain analysis for small-scale fisheries management, sustainability, and enhancement of competitiveness were carried out by Rosales et al. (2017), Nariyono et al. (2017), Adolf et al. (2016), and Kabu and Tira (2015).

The development of the fisheries sector is intended to improve the role of creating strong linkages with other sectors by increasing value added, absorbing labour forces, and increasing income. As a result, multiplier effects with direct, indirect, or induced impact can increase economic growth. The importance of small-scale fishing to the local and national economy comprises not only the labour forces formed in its sector, but also those created in associated industries.

## 3 Research methodology

This study employed both the quantitative and qualitative methods following the descriptive-narrative research design. Primary data were collected through structured face-to-face interviews with skipjack tuna fishers, wholesalers, retailers, and processors in selected municipalities along the Lagonoy Gulf (Figure 2). Three sets of survey questionnaires were used during the interviews: one set each for the fishers, the wholesalers and retailers, and the processors. Data were taken on the personal and business profile of the participants, fishing assets or investment costs and activities, cost and returns, problems faced, and possible solutions. The survey instruments were pre-tested and validated following the content validation technique.

**Figure 2** Map of Camarines Sur highlighting the study sites




*Source:* Google Map

The interviews were done for an hour per participant and the questions asked depended on the role represented by the participant, be it a fisher, a wholesaler or retailer, or a processor. Moreover, representatives (key informants) from selected municipalities were interviewed on the fishing and business activities of the participants, as well as constraints and opportunities experienced. Observation was done to determine and

describe the factors that affect these value chain players' operations in the enabling environment.

The Lagonoy Gulf is one of the most prolific fishing grounds not only in the region but also in the country because of the abundance of commercially significant finfish such as tuna, tuna-like species, and billfish (Olaño et al., 2018). The study sites are the municipalities of Sagñay, San Jose, Lagonoy, Presentacion, and Caramoan along the Lagonoy Gulf. These are the areas where skipjack tuna is commonly caught and available to the value chain actors (Figure 2).

The value-adding activities in each level of the value chain were determined and examined using Michael Porter's value chain model (Porter, 1985). Value chain mapping was used to examine the dynamics of relationships, production, and marketing of skipjack tuna in Partido District. Cost-and-return analyses were also done on the players' weekly operations. These analyses led to the computation of cost per unit, value-added, and profit margin (Matias et al., 2018) following the equations below:

$$Value\ Added\ (VA) = selling\ \ price - cost\ incurred$$

$$Cost\ of\ \ Goods\ Sold\ \ (COGS) = DL + DM + FO$$

where

*DL* direct labour

*DM* direct materials

*FO* factory overhead.

$$Revenue\ /\ Sales = goods \times selling\ \ price$$

$$Gross\ \ Profit = sales - cost\ of\ \ goods\ sold$$

$$Net\ \ Profit\ \ Margin = net\ \ profit\ /\ sales \times 100$$

$$Gross\ \ Profit\ \ per\ Unit = gross\ \ profit\ /\ quantity$$

$$Net\ \ Profit\ \ (Fishers) = revenue - expenses$$

$$Net\ \ Profit\ \ (Wholesalers\ /\ Retailers\ /\ Processors) = gross\ \ margin - operating\ \ expenses$$

*Direct materials* are the cost of materials and supplies consumed while manufacturing the product. *Direct labour* is the labour cost of the production team. *Overhead costs* are those other than Direct Materials or Direct Labour, but are necessary for production. *Gross margin* is the amount that a business earns from the sale of its products and services before the deduction of any selling and administrative expense.

## 4 Results and discussion

### *4.1 Value chain map*

Figure 3 depicts the value chain map of skipjack tuna in Partido District. It establishes the links between the various actors involved in the chain as well as the numerous marketing channels. In this investigation, 11 extant skipjack tuna chains in Partido District were found. In addition, the Maritime Industry Authority (MARINA), Bureau of Fisheries and Aquatic Resources (BFAR), Local Government Units (LGUs), Department of Trade and Industry (DTI), Department of Labor and Employment (DOLE) and Department of Agriculture (DA) are the regulatory bodies or enabling environments that influence the productivity and efficiency of players in this value chain.

### *4.2 Value chain actors and their roles*

#### *4.2.1 Fishers*

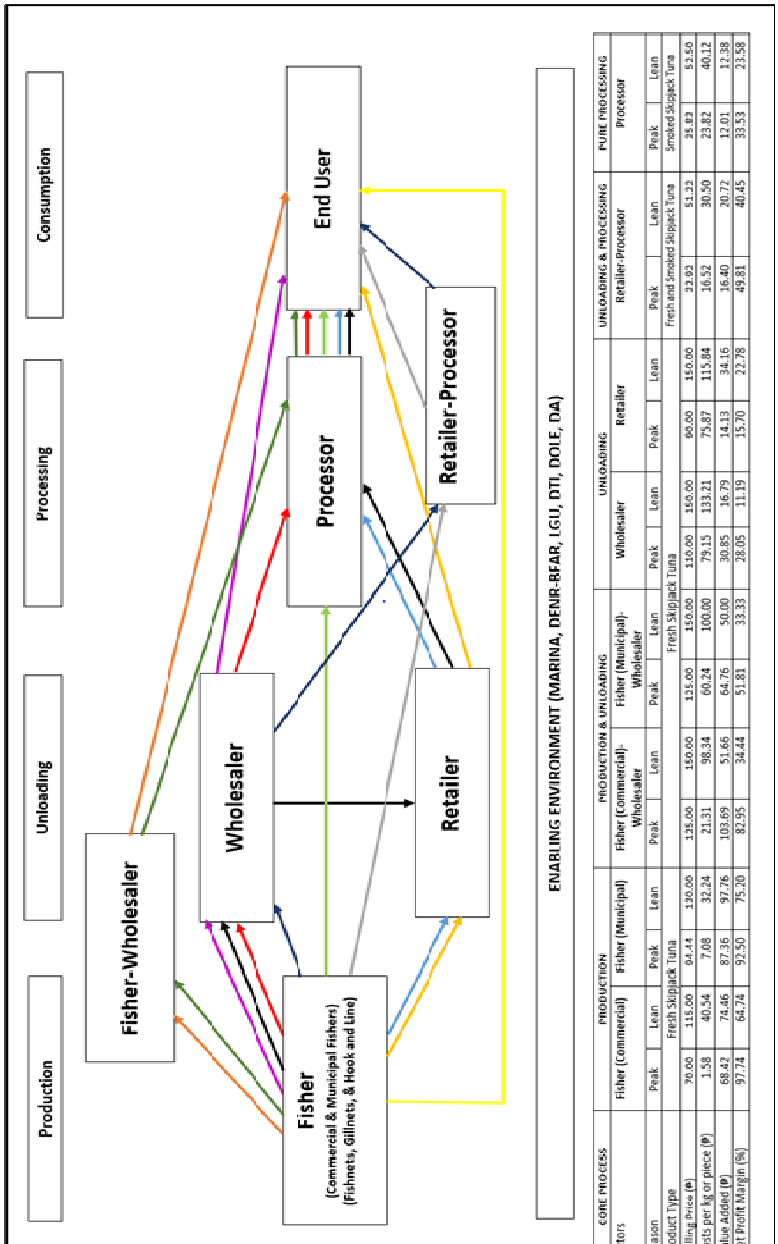
Fishers are the initial players in the skipjack tuna value chain, having the primary role of catching skipjack tuna in the Lagonoy Gulf. They are classified into two types: commercial and municipal fishers. Commercial fishers in the study area are 43 years old on average, with some having college and elementary school education. Their estimated average monthly income is PhP7,200 and length of business operation is less than 30 years. Commercial fishers must have a minimum initial capital of PhP500,000 to purchase materials for fishing vessels, engines, gear with an average length of 340 m and a depth of 30 ft, and other fishing equipment. The most used gear for purse seine fishing is the fishnet.

Municipal fishers, on the other hand, are 42 years old on average and most of them have undergraduate, high school, or elementary education. They have been in the fishing sector for 17 years and have been in business for 13 years, earning an average monthly income of PhP4,000. Their initial capital is PhP50,000, which is used to buy a fishing boat and other paraphernalia. Hook and line (handline) and gillnets are the most common fishing gear used by municipal fishers.

#### *4.2.2 Wholesalers*

Wholesalers supply and sell freshly caught skipjack tuna to marketplaces within and outside the Partido area by volume as part of the skipjack tuna value chain. Local wholesalers from the municipalities of San Jose, Caramoan, and Sagñay in Camarines Sur were identified for the study. The average amount of initial capitalisation necessary for wholesaling is less than PhP25,000. Fresh skipjack tuna caught in the Lagonoy Gulf by municipal or commercial fishers in Lagonoy, San Jose, Sagñay, and Caramoan are delivered directly to Legazpi City and Tabaco City in Albay; to the Goa, Tigaon, San Jose, and Sagñay markets in Partido District; and to the Naga City and Pili markets in Camarines Sur.

**Figure 3** Value chain map for skipjack tuna (see online version for colours)




| CORE PROCESS | PRODUCTION | | | | PRODUCTION & UNLOADING | | | | UNLOADING | | | | UNLOADING & PROCESSING | | PURE PROCESSING | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Actors | Fisher (Commercial) | | Fisher (Municipal) | | Fisher (Commercial)-Wholesaler | | Fisher (Municipal)-Wholesaler | | Wholesaler | | Retailer | | Retailer-Processor | | Processor | |
| Season | Peak | Lean | Peak | Lean | Peak | Lean | Peak | Lean | Peak | Lean | Peak | Lean | Peak | Lean | Peak | Lean |
| Product Type | Fresh Skipjack Tuna | | | | | | | | | | | | Fresh and Smoked Skipjack Tuna | | Smoked Skipjack Tuna | |
| Selling Price (₱) | 70.00 | 115.00 | 94.44 | 120.00 | 126.00 | 150.00 | 126.00 | 150.00 | 116.00 | 150.00 | 90.00 | 150.00 | 72.02 | 51.25 | 35.83 | 51.50 |
| Costs per kg or piece (₱) | 1.58 | 40.54 | 7.08 | 32.24 | 21.31 | 98.34 | 60.24 | 100.00 | 79.15 | 133.21 | 73.87 | 115.84 | 16.52 | 30.50 | 23.82 | 40.12 |
| Value Added (₱) | 68.42 | 74.46 | 87.36 | 97.76 | 103.69 | 51.66 | 64.76 | 50.00 | 30.85 | 16.79 | 14.13 | 34.16 | 16.40 | 20.72 | 12.01 | 12.38 |
| Net Profit Margin (%) | 97.74 | 64.74 | 92.50 | 75.20 | 82.95 | 34.44 | 51.81 | 33.33 | 28.05 | 11.19 | 15.70 | 22.78 | 49.81 | 40.45 | 33.53 | 23.58 |

Primary Routine
Secondary Routines

Non-routine

1 (Black Arrow) Fishers, Wholesalers, Retailers, Processors, End Users
2 (Red Arrow) Fishers, Wholesalers, Processors, End Users
3 (Dark Blue Arrow): Fishers, Wholesalers, Retailers-Processors, End Users
4 (Violet Arrow): Fishers, Wholesalers, End Users
5 (Dark Green Arrow): Fishers, Fishers-Wholesalers, Processors, End Users
6 (Golden Yellow Arrow): Fishers, Retailers, End Users
11 (Light Yellow Arrow): Fishers, End Users
7 (Gray Arrow): Fishers, Retailers-Processors, End Users
8 (Light Green Arrow): Fishers, Processors, End Users
9 (Light Blue Arrow): Fishers, Retailers, Processors, End Users
10 (Orange Arrow): Fishers, Fishers-Wholesalers, End Users

### *4.2.3 Fisher-wholesalers*

This value chain player embodies a combination of operations as a fisher and a wholesaler. The typical starting capital necessary for a wholesaling business is PhP10,000, whereas the beginning capital required for fishing is PhP400,000. These actors' main markets are both within and outside the Partido area. During peak months, fishers operate five (5) times a week on average, but only three (3) times a week in lean seasons. However, they work six (6) times a week as wholesalers, regardless of the season, and are dependent on the amount of skipjack tuna caught from the Lagonoy Gulf and those sold in other market outlets beyond the Partido area.

### *4.2.4 Retailers*

Retailers are an established actor in the skipjack tuna value chain in Partido. Their main role is to sell fresh skipjack, which they get from the wholesalers or directly from the fishers, to the town market via the *talipapa* (temporary fish market) or through house-to-house scheme. Their starting capital is PhP5,000 and they can only sell within the Partido District. Retailers operate six (6) times a week, typically charging their goods per kilo or slice of fish, which are paid either in cash or in cash and kind.

### *4.2.5 Processors*

In this value chain, the role of a processor is to facilitate the conversion of fresh skipjack tuna into other products. One such product is the smoked skipjack tuna, which is produced through a smoking process known as *pag-agon,* a technique that is commonly done in the Partido area. The identified processors in the value chain were from Lagonoy and Sagñay in Camarines Sur. They are 52 years old on average and have been in business for 26 years. They often do the processing activities at home, with an initial capital of at least PhP1,000, depending on the amount of fresh skipjack tuna they buy.

### *4.2.6 Retailer-processors*

Retailer-processors combine the roles of retailer and the processor in the value chain. These actors' attributes differ from those of either processors or retailers only because they integrate revenues and costs, as well as marketing and operations.

## *4.3 Value chain analysis*

### *4.3.1 Chain 1 (black arrow): fishers to wholesalers to retailers to processors, to end users*

The skipjack tuna are unloaded from fish landing ports at Lagonoy, San Jose, and Sagñay by wholesalers who distribute them to retailers and/or processors for selling to end consumers (see Figure 3).

The type of gear that fishers use has an impact on skipjack tuna productivity (Husna Naziratil and Anwar, 2020). Purse seines, gillnets, and handlines (hook and line) are the most common types of fishing gear. Purse seines can catch the most fish, which are sold wholesale to customers (wholesalers). A formal selling agreement between fishers and wholesalers is observed in this chain. The latter occasionally provides

financial support to fishing activities, particularly during the lean season when fishers struggle to earn because of the lack of available tuna fish in the gulf. The wholesaler's oligopolistic power is bolstered by this credit arrangement (Thuy et al., 2019).

Fishers and wholesalers agree on prices based on the quality of fish, the amount of catch, the level of competition, costs incurred, and pricing schemes used in the local market. The commodity is frequently sold through a cash or credit scheme with sales terms, as well as either silent or open bidding. Discounts, on the other hand, are limited because they are dependent on skipjack tuna availability and quality. Wholesalers in this chain, on the other hand, might develop market power over fishers, especially when the distance from the fishing ground to the shore and time constraints drive fishermen to sell their product rapidly (Thuy et al., 2019).

A similar formal sales and pricing agreement was also observed between wholesalers and retailers through either silent or open bidding on cash or credit terms. Their marketing outlets are mostly itinerant buyers, local markets, and provincial markets outside of Partido District. Moreover, favourable prices, *suki* (loyal customers) relationships, contracts, and their expenses all play a role in market selection. Discounts are given to *suki* retailers or to those who do not owe any money to wholesalers. In this case, wholesalers have the bargaining power in negotiations.

Fresh skipjack tuna is frequently purchased by processors from fishers, wholesalers, or retailers for conversion to another product. Retailers often establish prices based on the quality and quantity of fish, the level of competition, and the cost. Clearly, the retailer has the negotiating power. S*uki* buyers (processors) of skipjack tuna, on the other hand, receive discounts.

Lastly, the processors sell their by-products, known as *inagunan* (a Bicolano name for smoked skipjack tuna), to the end users (consumers) per piece with favourable prices. The price is decided on by the processors based on the product's quality, cost, and availability of raw material. Walk-in buyers, relatives, friends, and tourists are their primary markets. Since there is no formal agreement between processors and end users (consumers), the processors retain their bargaining power. Consumers or end users who want to acquire smoked skipjack tuna can place an order with the processors.

### *4.3.2 Chain 2 (red arrow): fishers to wholesalers to processors to end users*

Fishers and wholesalers have the same relationship as the preceding chain. The market linkage between the two actors is the same as the retailers. The fish is sold via an auction system, either silent or open bidding, and there is a formal and mutual agreement of sales. Payment method is either cash or credit; however, no discounts are granted to those who have documented payable amounts. Itinerant consumers, markets within and outside the Partido District, are often their marketing channels, which are attributed to favourable prices and *suki* relationships. The *suki* connection, which indicates that actors gain credit in all value chains, may be beneficial or exploitative depending on the situation (Rosales et al., 2017). Processors market their products to end users in the same way as in Chain 1.

### *4.3.3 Chain 3 (dark blue arrow): fishers to wholesalers to retailer-processors to end users*

In Chains 1 and 2, the business relationships between fishers and wholesalers, and wholesalers and retailer-processors are the same. The interaction between

retailer-processors and end users is the chain's only unique channel. A single actor with the combined roles and activities of a retailer and a processor was observed, selling both fresh and processed skipjack tuna. Retailer-processors can sell skipjack tuna at varied prices according to their production expenses. There is no formal arrangement between retailer-processors and end users, but there is a *suki* system and a first come, first served basis. As a result, the retailer-processors wield bargaining power in this chain.

### *4.3.4 Chain 4 (violet arrow): fishers to wholesalers to end users*

The previous chains had a similar link between fishers and wholesalers. The market dynamism between wholesalers and end users, on the other hand, is the unique channel in this chain where end users can purchase skipjack tuna directly from wholesalers. These two actors typically have no formal arrangement because of the different characteristics of their customers—a mix of itinerant buyers, friends, neighbours, relatives, and tourists. Clearly, the wholesalers still have the bargaining power in this negotiation.

### *4.3.5 Chain 5 (dark green arrow): fishers to fisher-wholesalers to processors to end users*

The interaction between processors and end users in this chain is similar to the previous chains discussed in this study. Because of the combined actions and functions of fisher-wholesalers, the relationships between fishers and fisher-wholesalers and between fisher-wholesalers and processors are the unique channels in this chain. Skipjack tuna sourced from other fishers and market outlets within and beyond the Partido area can be purchased and sold simultaneously by fisher-wholesalers through various routes. The fisher-wholesalers may have bargaining power among the actors in this chain due to the reasonable addition of value. In other words, the fisher-wholesalers will charge the same amount for their own catch as other wholesale catches. In this regard, wholesalers will receive higher than the anticipated revenue.

### *4.3.6 Chain 6 (golden yellow arrow): fishers to retailers to end users*

The connection between retailers and end users is similar to that described in the earlier chains. However, the interaction between fishers and retailers is distinct. During the lean seasons, this chain frequently happens, with fishers selling their catch to the small-scale retailers via silent or open bidding, with a structured arrangement and mutual understanding of the pricing and other distribution schemes. *Suki* retailers with unrecorded payables are usually given discounts. Fishers still have the bargaining power in this negotiation, but the retailers have a limited window of opportunity.

### *4.3.7 Chain 7 (grey arrow): fishers to retailer-processors to end users*

All of the channels in this chain have the same relationships as in the preceding chains. The market linkage between fishers and retailer-processors is similar to that in Chain 6, and the relationship between the retailer-processors and end users in Chain 3 is the same. Fishers have more bargaining power than other actors, although retailers have limited negotiation power.

### 4.3.8 Chain 8 (light green arrow): fishers to processors to end users

The processors and the end consumers of Chain 5 are comparable in this chain. Although the link between fishers and processors is the distinct channel, the system of these two actors is similar to the market relationship between fishers and retailers. The processors are the link in this chain that sells the commodity to the final customer. Fishers have more bargaining power in this chain.

### 4.3.9 Chain 9 (light blue arrow): fishers to retailers to processors to end users

This chain's market relationship is the same as in Chain 7 from fishers to retailers, Chain 1 from retailers to processors, and Chains 1, 5, 7, and 8 between processors and end users or retailers. The fishers have the most bargaining power in this chain.

### 4.3.10 Chain 10 (orange arrow): fishers to fisher-wholesalers to end users

The channels in this chain are all same as those in the preceding chains, such as Chain 5 from fishers to fisher-wholesalers, and Chain 4 from wholesalers to end users. The fisher-wholesalers follow the same procedure as the wholesalers.

### 4.3.11 Chain 11 (light yellow arrow): fishers to end users

Unlike other actors in this chain, the fishers and the end users (consumers or buyers) do not have formal purchasing arrangements. A basic trade link occurs since the end users are merely walk-in customers, mainly neighbours, friends, and relatives and, occasionally, tourists. The market linkage between them operates on a first come, first served basis and is highly reliant on product availability. Consumers are occasionally given purchase discounts or simply handed an extra kilogram of the commodity in a *suki* relationship transaction. As a result, if the fishers determine the price of the commodity based on the local market pricing structure and the quality of the skipjack tuna, the price will be similar whether acquired from wholesalers or retailers.

## 4.4 Cost and return analysis

Profits are derived from the interval value chain, which includes both primary and support activities, based on M. Porter's value chain theory. The cost-and-return analyses for the chain actors during peak and lean seasons are presented in Table 2 and Table 3.

### 4.4.1 Fishers

The fishers in this study are of two types: commercial and municipal fishermen. During the peak season, the weekly incurred cost of commercial fishers is PhP2,245.82, with an average catch of 1,416.65 kg of skipjack tuna and an average selling price of PhP70.00 per kg. The net profit of commercial fishers is computed to be PhP96,919.68. Municipal fishers on the other hand have incurred costs of PhP637.57 during the peak seasons, with an average catch of 90 kg of skipjack tuna. The average selling price is usually different from commercial fishers at PhP94.44. In peak season, the net profit of municipal fishers is computed at PhP7,862.03. Conversely, during the lean season, commercial fishers catch an average of 60 kg of skipjack tuna, with a total weekly incurred cost of

PhP2,432.49 and an average selling price of PhP115.00 per kg. The net calculated profit is PhP4,467.51. Municipal fishers on the other hand only capture an average of 21 kg of tuna, resulting in a total incurred cost of PhP777.12 and an average selling price of PhP130.00 per kg. Municipal fishers make a weekly profit of PhP2,052.88.

Not all revenues go to the owners because a profit-sharing arrangement exists among fishermen known as *tersyuhan* (divided by three). The owner receives 30% of the total revenue and the fishing crew receive 70%, which is divided among them based on their roles (e.g., manager) throughout the fishing operation. The higher the position in the crew, the more shares received. The personnel in these vessels are thus in the same financial situation as small-scale fishermen, making them more vulnerable, whereas the operators are well-off due to boat ownership and their rights to the lion's share of the catch (Jacinto, n.d.).

Municipal fishers are not subject to any profit-sharing scheme and are entitled to the entire profit.

**Table 2** Cost and return analysis of chain actors for the peak season

| *Chain Actors (1US$ = PhP 51.12)* | *Quantity (in kg)* | *Selling price (in PhP)* | *Revenue (in PhP)* | *Cost (in PhP)* | *Net profit (in PhP)* |
|---|---|---|---|---|---|
| Fishers | | | | | |
| Commercial | 1, 416.65 | 70.00 | 99, 165.50 | 2, 245.82 | 96, 919.68 |
| Municipal | 90 | 94.44 | 8, 499.60 | 637.57 | 7, 862.03 |
| Fisher-wholesalers | | | | | |
| Commercial | | 125.00 | 251,875.00 | 42,958.11* | 208, 916.89 |
| • Fishing | 1, 500 | | | | |
| • Wholesaling | 515 | | | | |
| Municipal | | 125.00 | 89, 375.00 | 43, 075.55* | 46, 299.45 |
| • Fishing | 200 | | | | |
| • Wholesaling | 515 | | | | |
| Wholesalers | 1, 343.33 | 110.00 | 147, 766.30 | 106, 319.94* | 41, 446.36 |
| Retailers | 396 | 90.00 | 35, 640.00 | 30, 045.30* | 5, 594.70 |
| Processors | 450*** | 35.83 | 16, 123.50 | 10, 716.84* | 5, 406.66 |
| Retailer-processors | | | | | |
| • Retailing | 540 | 30.00 | 26, 949.00 | 13, 873.62** | 13, 075.38 |
| • Processing | 300 | 35.83 | | | |

Notes: *Combination of cost of sales and operating expenses.
**Combination of sales/good sold and operating expenses.
***Quantity (in piece/kg).

### *4.4.2 Fisher-wholesalers*

Fisher-wholesalers are divided into two groups, that is, those who are engaged in either commercial or municipal fishing and wholesaling. During peak season, commercial fisher-wholesalers typically sell 1,500 kg of skipjack tuna from fishing and 515 kg from wholesaling for PhP125.00 per kg. They earn a total weekly revenue of PhP251,875.00, with incurred costs (i.e., combination of cost of sales and operating expenses) of

PhP42,958.11. The net weekly profit of commercial fisher-wholesalers is PhP208,916.89. On the other hand, municipal fisher-wholesalers, sell 200 kg of skipjack tuna from fishing and 515 kg from wholesaling for PhP125.00 per kg. They have a weekly revenue of PhP89,375.00, with incurred costs calculated at PhP43,075.55. The calculated net profit of municipal fisher-wholesalers is PhP46,299.45 per week.

**Table 3** Cost and return analysis of chain actors for the lean season

| *Chain actors (1US$ = PhP 51.12)* | *Quantity (In kg)* | *Selling price (In PhP)* | *Revenue (In PhP)* | *Cost (In PhP)* | *Net profit (In PhP)* |
|---|---|---|---|---|---|
| Fishers | | | | | |
| Commercial | 60 | 115.00 | 6, 900.00 | 2,432.49 | 4, 467.51 |
| Municipal | 21 | 130.00 | 2, 730.00 | 777.12 | 2, 052.88 |
| Fisher-wholesalers | | | | | |
| Commercial | | 150.00 | 31, 500.00 | 20, 652.51* | 10, 847.49 |
| • Fishing | 60 | | | | |
| • Wholesaling | 150 | | | | |
| Municipal | | 150.00 | 27, 000.00 | 21,044.13* | 5, 955.87 |
| • Fishing | 30 | | | | |
| • Wholesaling | 150 | | | | |
| Wholesalers | 370 | 150.00 | 55, 500.00 | 49, 286.84* | 6, 213.16 |
| Retailers | 90 | 150.00 | 13, 500.00 | 10, 425.30* | 3, 074.70 |
| Processors | 180*** | 52.50 | 9, 450.00 | 7, 221.84* | 2, 228.16 |
| Retailer-processors | | | | | |
| • Retailing | 240 | 50.00 | 21, 450.00 | 12, 813.60** | 8, 636.40 |
| • Processing | 180 | 52.50 | | | |

Notes: *Combination of cost of sales and operating expenses.
**Combination of cost of sales/good sold and operating expenses.
***Quantity (In piece/kg).

In the lean season, commercial fisher-wholesalers sell only a total of 60 kg of skipjack tuna from fishing and 150 kg from wholesaling, at a selling price of PhP150.00 per kg. Weekly revenue is PhP31,500, with total incurred expenses of PhP20,652.51 per week. Their weekly net profit is calculated at PhP10,847.49. For municipal fisher-wholesalers, an average of 30 kg of skipjack tuna from fishing and 150 kg from wholesaling are sold for PhP150.00 per kg in the lean season. Their total weekly earnings are PhP27,000, with total expenses at PhP21,044.13. The weekly net profit of municipal fisher-wholesalers during the lean season is estimated at PhP5,955.87.

### *4.4.3 Wholesalers*

During the peak season, wholesalers typically sell an average of 1,343.33 kg of skipjack tuna for PhP110.00 per kg. This actor makes a total weekly revenue of PhP147,766.30, with incurred expenses at PhP106,319.94. The wholesalers' net profit, calculated weekly, would be PhP41,446.36. Conversely, during the lean season, this actor sells an average of 370 kg of skipjack tuna at a selling price of PhP150.00 per kg. Weekly revenue is

PhP55,500.00, from which total incurred cost of PhP49,286.84 is subtracted. Consequently, computed weekly net profit of wholesalers is PhP6,213.16.

### *4.4.4 Retailers*

During the peak season, retailers usually sell 396 kg of skipjack tuna at PhP90.00 per kg. This player's revenue is PhP35,640.00. Minus the total incurred cost of PhP30,045.30 (a combination of cost of sales and operating expenses), net weekly profit is PhP5,594.70.

During the lean season, retailers sell 90 kg of the commodity for PhP150.00 per kg. Their weekly revenue is PhP13,500.00, less PhP10,425.30 in expenses. The weekly net profit of retailers in the lean season is estimated to be PhP3,074.70.

### *4.4.5 Processors*

For processors during the peak season, 450 pcs of smoked skipjack tuna are sold at a selling price of PhP35.83 per piece. Their weekly net profit is calculated at PhP5,406.66. This amount was calculated by subtracting their weekly incurred cost of PhP10,716.84 from the revenue of PhP16,123.50. During the lean season, these players only sell 180 pcs of smoked skipjack tuna for PhP52.50 each. As a result, the processors' weekly net profit is PhP2,228.16, which is taken by computing their weekly revenue of PhP9,450.00 minus the incurred cost of PhP7,221.84.

### *4.4.6 Retailer-processors*

During the peak season, retailer-processors typically sell 540 kg of skipjack tuna from retailing and 300 kg from processing at a selling price of PhP30.00 per piece for retailing and PhP35.83 for processing. Their net profit is PhP13,075.38, computing from their revenue of PhP26,949.00 less the incurred cost of PhP13,873.62. During the lean season, retailer-processors usually sell 240 kg of skipjack tuna from retailing and 180 kg from processing for PhP50.00 and PhP52.50 per piece, respectively. Their weekly net profit is PhP8,636.40, which is computed by subtracting the incurred cost of PhP12,813.60 from their total revenue of PhP21,450.00.

## *4.5 Value added and marginal analysis*

When it comes to value added per chain actor (Table 4 and Table 5), the findings suggest that commercial skipjack tuna fishers in Lagonoy Gulf have a good chance of earning a good living, but accurate and proper accounting skills are required, especially during the lean season, when profit margins are reduced by 33%. Indeed, if there is a large catch opportunity, the fishers have a significant net profit margin; otherwise, they have no revenue at all, particularly during the lean season, when they only have 2 to 3 fishing trips per week.

During this season, the fishers incur larger expenditures (see Table 3) due to their operating expenses and loans from their buyers (wholesalers), who frequently make offers to help with their operations (MCD, 2020; Thuy et al., 2019). This credit-driven relationship between fishers and buyers (wholesalers) unfortunately exacerbates poverty as the former end up as price takers instead of price makers, earning minimum income, particularly during the lean season (Rosales et al., 2017).

Furthermore, study data revealed that it is unlikely for fishers to set up a skipjack tuna wholesale firm because of the net profit margins of 28.05% and 11.19% during the peak and lean seasons, respectively. Because of the shortage in supply of skipjack tuna in the Lagonoy Gulf, wholesalers purchase the commodity outside of Partido, allowing them to continue operating and supplying even during the lean season. Despite this fact, these players still have a smaller net profit margin. Some of the reasons for this circumstance include high initial capital requirements, the competitive market for skipjack tuna in the area, the terms of sale to buyers or creditors, and other incurred operating expenses for starting up a business.

**Table 4** Summary of value added per chain actor for the peak season

| *Chain actors (1US$ = PhP 51.12)* | *Selling price (In PhP)** | *Costs per kg or piece (In PhP)* | *Value added (In PhP)* | *Net profit margin (%)* |
|---|---|---|---|---|
| Fishers | | | | |
| Commercial | 70.00 | 1.58 | 68.42 | 97.74 |
| Municipal | 94.44 | 7.08 | 87.36 | 92.50 |
| Fisher-wholesalers | | | | |
| Commercial | 125.00 | 21.31 | 103.69 | 82.95 |
| Municipal | 125.00 | 60.24 | 64.76 | 51.81 |
| Wholesalers | 110.00 | 79.15 | 30.85 | 28.05 |
| Retailers | 90.00 | 75.87 | 14.13 | 15.70 |
| Retailer-processors | 32.92** | 16.52 | 16.40 | 49.81 |
| Processors | 35.83** | 23.82 | 12.01 | 33.53 |

Note: *per kilo; **per piece.

**Table 5** Summary of value added per chain actor for the lean season

| *Chain actors (1US$ = PhP 51.12)* | *Selling price (In PhP)** | *Costs per kg or piece (In PhP)* | *Value added (In PhP)* | *Net profit margin (%)* |
|---|---|---|---|---|
| Fishers | | | | |
| Commercial | 115.00 | 40.54 | 74.46 | 64.74 |
| Municipal | 130.00 | 32.24 | 97.76 | 75.20 |
| Fisher-wholesalers | | | | |
| Commercial | 150.00 | 98.34 | 51.66 | 34.44 |
| Municipal | 150.00 | 100.00 | 50.00 | 33.33 |
| Wholesalers | 150.00 | 133.21 | 16.79 | 11.19 |
| Retailers | 150.00 | 115.84 | 34.16 | 22.78 |
| Retailer-processors | 51.22** | 30.50 | 20.72 | 40.45 |
| Processors | 52.50** | 40.12 | 12.38 | 23.58 |

Note: *per kilo; **per piece.

Commercial fishers and wholesalers, on the other hand, have a great opportunity during the peak season because of the volume of goods sold/caught and operating expenses incurred. Because of lower purchasing expenses, the actors have a high net profit margin of 82.95% during this season, particularly in the acquisition of direct materials (skipjack

tuna). They sell an average of 1,500 kg from fishing and 515 kg from wholesaling at a selling price of PhP125.00. The decreased purchasing costs are noted because, in this case, the actors do not purchase direct materials but instead sell their own captured skipjack tuna, resulting in lower expenses. Similarly, the combined responsibilities of municipal fishers and wholesalers have a lot of potential for gaining ample income. When it comes to sales terms, these actors have the same issues as commercial fisher-wholesalers, owing to debtors who have failed to remit the actual purchases they got from these players. The net profit margin of these players is affected by the fluctuating demand and supply of skipjack tuna in the public markets of Partido District.

Due to the reported modest net profit margins of 15.70% and 22.78% during the peak and lean seasons, respectively, pure retailers have a difficult time earning profits. Because of their low value addition earned at PhP14.13 and PhP34.16 (see Table 4 and Table 5), lack of capital, and pricing and sales terms with wholesalers or customers, these actors frequently find themselves in this scenario. Similarly, based on the data, skipjack tuna processors have a lower chance of profitability, with net profit margins of 33.53% and 23.58% during peak and lean seasons, respectively. This situation is caused by ineffective marketing strategies or plans, packaging, capitalisation, and the market itself. Moreover, during peak and lean seasons, the retailer-processors have value addition on skipjack tuna (fresh and processed) at PhP16.40 and PhP20.72, respectively. During the peak season, these actors sell fresh and processed smoked skipjack tuna for PhP32.92, whereas during the lean season, they sell it for PhP51.22. As a result, profit net margins of 49.81% and 40.45% are accumulated in these seasons.

However, the data imply that there is a reduced chance of earning high profit because of these players' limited initial resources, the limited skipjack tuna production in the Lagonoy Gulf, fluctuating demand and marketability of processed skipjack tuna in Partido, and the changes in commodity pricing. The volatility in the supply of skipjack tuna and other fresh fish products in the area has a direct impact on this condition (e.g., income; costs of raw materials purchased by processing businesses, retailers, and wholesalers) (Supriatna et al., 2015; Dobrzykowski et al., 2014; Guillotreau and Toribio, 2011). Furthermore, skipjack tuna production is limited due to the efficiency and marketability of the products. Nonetheless, this finding varies from Wardono et al. (2016), who showed that increasing value added and business margin can be done by enhancing processing business capacity, product diversity, market development in the locality, and the ability to export to international markets.

### *4.6 Challenges and opportunities*

The primary players in this value chain are highly dependent on one another. In other words, they share the same limitations and opportunities that can influence their relationships, activities, and operations. Because of the limitations encountered, this study found that if one of the players did not supply the market for skipjack tuna to the others, the distribution of the commodity is compromised. As a result, unrestrained conditions in all players' operations or activities have a potential to disrupt the entire value chain cycle. Based on the respondents' answers and on observation, the following constraints and opportunities were established.

1 *Strict and Inapt Implementation of RA 10654 and RA 8550 (Fisheries Code of the Philippines) at the Local Level*

The strict local implementation of Republic Act 10654, amended from Republic Act 8550, or the Fisheries Code of the Philippines, has limited fishers' capacity to gain greater income from fishing activities in the Lagonoy Gulf, particularly during the lean season. Because the skipjack tuna is a seasonal fishery product, the strict implementation of 15-km boundary lines in the municipal waters of each municipality along the Lagonoy Gulf is an additional burden to their livelihood. According to *Juan*, one of the commercial fishing vessel owners in Lagonoy, Camarines Sur, "*an* boundary lines *na tigpapatupad sa kada municipyo nagbabawas kan samong oportunidad na makapagsira sa haraning parte kan kadagatan sa* Lagonoy Gulf, *asin ini nagtatao samo nin karagdagang gastos sa paghanapbuhay"* (the boundary lines implemented by municipalities along Lagonoy Gulf lessen our opportunities to fish in the nearby municipal seaboard, and it gives additional expenses to our livelihoods). Additional problems develop as a result of this section in RA 10654 and 8550 since it promotes interest in illicit fishing activities rather than proper fishing practices. Moreover, some government personnel's unlawful means of imposing fines on the fishermen have made them more vulnerable, as their economic and psychological concerns have grown. The existence of these conditions has a negative impact on the fishermen's financial status because it can be an additional cost to them, reducing further their funds for fishing activity and daily necessities. Furthermore, because the Partido area is surrounded by a gulf, skipjack tuna productivity is seasonal, which is one of the fishers' major constraints.

2 *Seasonality of Skipjack Tuna in the Lagonoy Gulf*

Because of the seasonality of skipjack tuna in the Lagonoy Gulf, catching it from October to February, is difficult. Wholesalers purchase and supply skipjack tuna from other provincial and local markets outside of Partido during this season, which result in increased costs due to the limited supply. Similarly, because of the limited availability of skipjack tuna, all players are affected and, due to the non-distribution of fixed costs, all players may face increased expenses per unit.

3 *Profit losses due to weather condition*

Another constraint that the players in this value chain confront is a loss of profit owing to bad weather conditions. Because the Bicol Region is vulnerable to tropical storms and typhoons, fishers lose the potential to increase their catch because of frequent adverse weather conditions. In such times, they are not able to catch enough fish to sell to the market for processing and personal consumption. In this instance, because they are unable to distribute or sell their goods in some local or regional marketplaces, they lose income. In such a case, all players will be affected.

4 *Loss of reasonable price due to poor quality of skipjack tuna and post-harvest facilities*

Other obstacles faced by fishermen include post-harvest activities and facilities, which affect the competitiveness of the skipjack tuna in the supply and value chains in Partido. Due to the lack of cooling storage facilities, the quality of skipjack tuna captured by the fishers has influenced pricing and, thus, the revenue produced. Due

to poor quality of skipjack tuna, wholesalers also set a lower price, causing fishers to lose fair prices (Rosales et al., 2017).

5 *Limited financial access or capital for business operation*

In addition to the problems stated in this value chain, the limited financial access or capital for business operations is considered. Some respondents, especially the retailers and processors, obtain credit from relatives and friends as well as from informal lenders. This situation is generally observed because they want to circumvent the many requirements and processing forms of formal funding institutions. Some of the wholesalers in this chain, on the other hand, have the capacity to borrow funds from authorised lending institutions to support their day-to-day operations. In fact, this wholesaler application is intended not only to aid their business operations, but also to provide a modest amount of credit to their *suki* retailers and processors. Some fishers seek out their contracted buyers (wholesalers) to help finance their fishing operations, particularly for fuel and other operating costs. This move prevents fishers from selling their catch to other traders, lowering their prospects of earning higher or getting a better rate than those offered by their contracted wholesalers.

6 *Lack of equipment or advanced technologies for processing skipjack tuna*

This constraint applies to processors who traditionally produce smoked skipjack tuna using the smoking method. There may already be a technology that can be employed in the production of smoked skipjack tuna. This will help in increasing production, resulting in increased revenues. The quality of these players' products that may be introduced and exported to overseas markets may be influenced by the creation or distribution of technology to them.

7 *Debtors or partial remittances*

According to the fishers and wholesalers, one of their problems is the debts incurred by retailers or processors. Due to the minimal profits that they earn, many retailers and processors do not pay or remit the full amount of their credit, making it difficult for the wholesalers or fishers to obtain the payables from them (retailers or processors). This has an impact on the sustainability of the business activities of fishers and wholesalers. For the players in this value chain to carry out their business operations, they must have a mutual understanding.

8 *Health crisis (e.g., COVID-19 pandemic)*

Health has now become the world's most pressing concern especially in the last couple of years (e.g., COVID-19 Pandemic). The entire operation of all the players in the value chain is affected by pressing health issues. Currently, fishermen may engage in commercial and recreational fishing activities, catching fish such as skipjack tuna for economic and consumption purposes, but only under certain conditions. The mobilisation of products and actors involved in this value chain is also limited, which affects the supply chain.

### 4.6.1 Opportunities

Skipjack tuna is one of the goods available in Partido District, a fish that has long been a part of international cuisine. Its use in the tuna canning business is widely regarded as acceptable. However, traditionally processed products such as smoked skipjack tuna may be improved and offered as a local special to national and even international markets. This opportunity will allow stakeholders, particularly processors, to produce high-quality local skipjack tuna products and improve their financial situation.

Moreover, the findings in this study can help business enthusiasts to understand the potential risks and opportunities associated with working in the skipjack tuna industry. Perhaps this analysis can help the sector fill the gaps discovered in the value chain by proposing appropriate activities, services, or initiatives that could greatly improve the efficiency of the local skipjack tuna industry.

## 5 Conclusions and limitations

Based on this study, different actors are involved in the supply, production, distribution, and marketing of skipjack tuna products in this value chain. The actors play specific roles or functions in the skipjack tuna industry in the Partido area, contributing to the 11 existing chains that have a dynamic relationship with one another. This value chain found that all actors have a reasonable profit or income in both peak and lean seasons. Being a fisher has an immense potential to earn high income or have high opportunities and earn more benefits. During the lean season, however, there is limited or lower potential for profit because of certain limitations. Several constraints have been identified, including the strict local implementation of RA 10654 or RA 8550, the seasonality of skipjack tuna in the Lagonoy Gulf, profit losses due to bad weather conditions, limited financial access to capital, lack of equipment or advanced technologies for processing, debtors and partial remittances, and the health crisis (e.g., COVID-19 Pandemic). An opportunity was also identified to help these value chain players in the Partido area improve their condition.

As this study primarily focused on the analysis of key players in the skipjack tuna value chain, other researchers may conduct studies on the influence or impact of enabling environments or support services, especially from the government, in this chain. Furthermore, studies may be done on the entire value chain of skipjack tuna, including gender participation in the same locality or in the Philippines as a whole.

## Acknowledgements

The researcher wishes to extend his sincerest gratitude to Partido State University headed by Dr. Raul G. Bracedina, for funding this study. He would also like to recognise the participation of the Local Government Units and participants (fishers, wholesalers, retailers, and processors) along the Lagonoy Gulf (Caramoan, Presentacion, Lagonoy, San Jose and Sagñay).

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