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OVERSUPPLY & PRICE VOLATILITY OF *LAWLAW* FISH IN THE MUNICIPALITY OF BULAN, SORSOGON, PHILIPPINES: A SUPPLY CHAIN ANALYSIS

Graham M. Naz[1], Bryan O. Fruto[2], Michael B. Bongalonta[3]
graham.naz@sorsu.edu.ph[1], bryan.fruto@sorsu.edu.ph[2], michaelbongalonta27@gmail.com[3]
Sorsogon State University – Bulan Campus[123]

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Abstract:
Oversupply and price volatility remain the perennial problems of the local fishing industry, which frequently results to the fishers' loss of income and wastage. Through the illustration of the supply chain of *lawlaw* in the municipality of Bulan, factors that contribute to oversupply and price volatility were identified. The study conducted interviews and focus group discussions to the entities involved in the supply chain, particularly the fishers and fish brokers and dealers. Participants held that factors contributing to oversupply are the instances of low demand from sardines' factories and overharvesting during peak seasons, while factors contributing to price volatility are the low demand from end-buyers, ice shortage, high cost of operation, and price manipulation of local brokers. Fishers recommend installation of cold storage and ice plant facilities, formation of active fisherfolks' organization and cooperative, and setting of price cap. Local brokers also recommend to regulate harvest during heydays and urge sardines' factories to increase order booking. Both entities recommend the expansion of market by inviting more buyers and investors through local government intervention. The study recommends the serious intervention of the local government through sound policies and economic plan. Through the identified factors and the suggestions provided by the entities in the supply chain, measures that can be provided to local policymakers were proposed in the study to address the problems of the local fishing industry.

Keywords: Oversupply factors, price volatility factors, sardines, fisherfolks, Bulan, supply chain

1. INTRODUCTION

The *sardinella lemuru*, or locally known as *lawlaw*, is endemic in the coastal waters of Bicol and Samar (Oceana Philippines, n.d.). Bulan, a coastal municipality of Sorsogon province in Bicol region, belongs to the fisheries management area 7 (FMA 7), where sardines, such as *lawlaw,* is very abundant, next to Zamboanga peninsula (Business Mirror, 2021). Further, it was found that 60% of sardines' production in the FMA 7 were landed in Bulan fish port (Miraflor, 2021). Annual sardines production record of Municipal Agriculture Office (MAO) of Bulan showed that peak season occurs on months of April and May, while its low season happens during the southwest monsoon, that is, July to October. And it will again be abundant in November (Municipal Agriculture Office, 2020).

With 20 coastal barangays, *lawlaw* fishing is an important source of income of many families in the municipality of Bulan (MAO, 2020). Municipal Agriculture Office (2020) has recorded a total of 4,930 fisherfolks, which includes fish crew (*umarabay*), gleanings (*paradagunhas*), laborers, vendors, traders & fishpond operators in the municipality, whose main source of income depends on fish production and trading, particularly *lawlaw*. As of 2020 Report, there are 368 municipal bancas, which has a capacity of below 3 gross tonnages, had been registered in the municipality; and 80% of which are registered as *lawlaw* catchers, or vernacularly known as *largarite*, a banca with equipment primarily used for *lawlaw* catching (Municipal Agriculture Office, 2020).

The *lawlaw* fishers trade their catch within the fish port in the municipality of Bulan, which is managed by Philippine Fisheries Development Authority (PFDA). They sold their harvest to a broker, who either sells them to the wholesale buyers or delivers directly to buyers, which are regularly the sardines' factories. Sardines' companies are the major destination or buyers of *lawlaw* fish in the municipality (Toledo, 2020).

This study employs the supply chain model to describe the flow of goods commencing from the supplier to their end-consumer. In the case of *lawlaw*, the supply chain starts from the fishers, who are the supplier, goes through intermediaries and ends with end-buyers (Future of Fish, 2021). This study focuses on the activities involved within the supplier and intermediaries. It explored on the intermediaries' involvement in the supply chain. Studies have different findings on the value of these intermediaries in the chain, Thuy et al (2019) finds them insignificant while Porras et al

(2017) finds it otherwise. The study aims to explore on the activities of the said entities within the supply chain, and eventually, determine the factors that contribute to the price volatility and oversupply of *lawlaw*.

Lawlaw's price in the local market is very volatile, as described by the Fisheries Coordinator of MAO, Ms Marites M. Gelua (personal communication, January 25, 2021). Price is generally high during lean season and drops during peak season. In 2020, the highest recorded price of *lawlaw* fish is at 40 pesos per kilo and the lowest recorded price is 2 peso per kilo. The price variation is dictated by supply and demand. However, the local market has the lowest selling price of *lawlaw* compared to many places in the country. In Iloilo, it is sold on about 40 pesos per kilo (Oceana Philippines, 2017), while in Cagayan de Oro, it ranges from 120 – 20 pesos per kilo (Salgados, 2020).

Oversupply happens during peak season, particularly when demand is not enough to match with the supply. Price volatility is the unstable value of *lawlaw* due to the complex variation of supply and demand. The problem of oversupply and price drop is a perennial struggle to the entire local fishing industry, particularly of the fishers, as it costs them a huge loss. And many of this fisherfolks are artisanal fishers, who are coming from the low-income to poor families, with low educational attainment and has larger household members. When this problem arises, they absorb the huge part of its financial and opportunity costs. Porras et al (2017), in his study, found that fishers, who are poor, less educated & in permanent debt, are the losers in the chain as they have no bargaining power.

The said problems had been several times reported by local and the national media, much less, on the social media. The price drop hurts the local fishing industry, specifically the fishers, while the overharvest is taking an immense toll on the environment. The harvested *lawlaw* are sometimes thrown in the ocean or in the shores due to huge price drop as keeping them would cost more than its buying price. The international NGO, Oceana, warns of the decline of sardines in Bicol-Samar fishing area due to overfishing, and urges the government that a sardines management plan must be implemented to manage the dangerous decline (Oceana Philippines, 2021)

This study aims to trace the factors that contribute to the problems of oversupply and price instability, through the accounts of the entities involved in the supply chain. The results of the study aim to contribute on the creation of a local ordinance that would address problems of oversupply and price volatility of *lawlaw*. This study hopes to provide research-based measures that can provide inputs to local policymakers to address the mentioned problems of fisherfolks and the entire *lawlaw* fishing industry in the municipality.

2. OBJECTIVES/PURPOSE OF THE STUDY

The study aims to explore on the factors that contribute to the oversupply and price volatility of *lawlaw* fish in the municipality of Bulan by investigating the activities within the supply chain. Specifically, the study will illustrate the *lawlaw* fish supply chain and identify the entities that adds value to the chain. It will determine the factors that contribute to the oversupply of *lawlaw* fish as well as its price volatility. The study gathers the recommendation of the entities/groups involved in the supply chain on how oversupply and price volatility can be addressed or managed. Furthermore, the study hopes to propose measures that may be provided to the policymakers of the local government to address issues on oversupply and price volatility.

3. METHODOLOGY

The study employs an exploratory case study design. Jimenez et al (2020) employed case study in the study of value chain dynamics of small-scale fisheries in the Amazon Coast. The locale of this study is the Bulan fish port, which is managed by PFDA, in the municipality of Bulan in Sorsogon province. The participants in the study are the identified entities in the supply chain, which are the supplier (the fishers and banca owner) and the intermediaries (fish brokers/dealers and small-time fish brokers). The other identified entity, the end-buyer (sardines' factory, wet market, fish processing plants and wholesale buyers), are no longer included as participant, since the study only focused on the entities in the supply chain who are operating within the municipality such as the suppliers and the intermediaries. Porras et al (2017) investigated the chain to determine the value of each entity and obtain evidence on processes, power and profit creation.

The study held interviews with three (3) fish brokers/fish dealers and two (2) focus group discussions with the fishers and banca owners. The department head of MAO, a representative from Bulan fish port, and a president of a small fisherfolks' association were interviewed as key informants. Field visits in the trading centers were also done, specifically during the time of unloading and trading. Data gathering took place in July-September 2021, which was still off-peak season. The interview data are collated and themed to provide an in-depth discussion of the research questions.

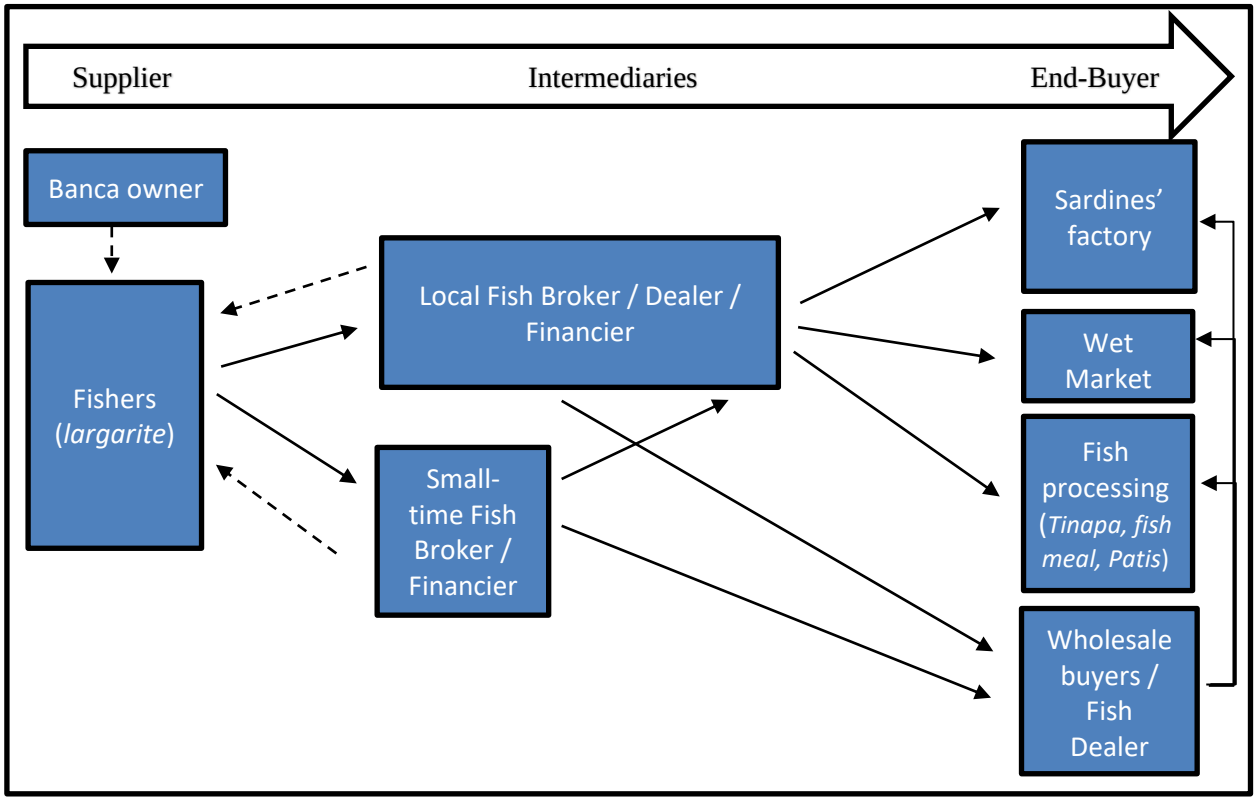
Ethical considerations were strictly observed during data gathering. Participants were informed of the study's objective and they were voluntary. Anonymity and confidentiality were strictly observed.

4. RESULTS

4.1 The Lawlaw Supply Chain

Figure 1 presents the simplified supply chain for the *lawlaw* fish trading in the municipality of Bulan. It has three main entities that are involved in the chain, before it goes to the end-consumer: 1) Supplier, where the chain starts and they are producer in the chain, 2) Intermediaries, who are the middlemen that facilitates the selling and distribution of the produce to the end-buyers, and 3) End-buyers, where the produce is sold and delivered on a wholesale level for product processing or further distribution. This study focused on the two entities in the supply chain, that are, supplier and Intermediaries, as they are the beneficiary of the outcome of this study

Figure 1. Supply Chain of lawlaw in the municipality of Bulan



4.1.1 Supplier

Fishers. As shown in Figure 1, the fishers are the first entity in the supply chain. They add value in the chain by providing the product in the chain through their skills and technical expertise. These people are small-scale fishers, who are traditional or artisanal fishers. They are engaged in passive fishing where they don't have sophisticated fishing equipment to catch *lawlaw*. They are coming from low-income to poor families. When these fishers unload their harvest in the fish port, they are now called in the vernacular, *ingresador*, the person who sells (*ingreso*) his harvest to the broker.

Within the port, fishers sell their harvest only to brokers and not directly to end-buyers. Further, they exclusively sell their harvest to a broker, who are usually their financier. The exclusivity was due to the loan granted by the broker to the fishers and the debt of gratitude of the latter. Moreover, even without an outstanding loan, fishers and their brokers still maintain trading exclusivity. In Bangaldesh, hilsa fishers loan money to intermediaries in exchange of right to the fish and when surveyed, 90% of fishers sells only their harvest to one middleman (Porras, Mohammed, Ali, Ali, & Hussain, 2017). The problem, however, with exclusivity is that fishers are left with no option to choose other broker or buyer. Whatever price that the broker would set (basing from the going market rate of that particular hour), the fishers accept regardless. In practice, fishers do not and cannot disregard the exclusivity with their broker, regardless of a higher offer from another broker and even without an outstanding loan, as it may harm their relation.

Fishers sell their harvest according to the price set by the broker. There is an automatic 5%-10% deduction to the selling price, upon payment. Regularly, there is a 5% deduction, particularly if the fisher has no outstanding loan from the broker; otherwise, 7%-10% is deducted. They called it broker's commission. If the tub of *lawlaw* (50kls) is sold at 700 pesos, net price ranges from 630 to 665 pesos.

Banca Owner. Some fishers would lease the fishing banca from its owner. But in most cases, banca owners are also fishers, who are part of the crew; and they are also coming from the low-income to lower middle-class families. The banca owner adds value to the chain by the technical and financial inputs he provides to the fisher. The owners shoulder the operation costs of the crew in each fishing or they stand as financiers. Operation costs usually include gasoline for the engine and power generator, food for the crew, and ice. They also include the purchase or repair cost of fishing gears, such as nets, ropes, torch lights, and basin tubs. The income distribution is divided between the owner and the fishers. After all operation costs are excluded, the net income is usually distributed 40/60 or sometimes 50/50. Forty percent (40%) goes to the owner, and 60% is divided among the fishers and the boat captain/steersman. It can be also 50-50, but the owner shoulders the fees for the boat captain and steersman. The scheme is usually set by the banca owner and up to the fishers to accept.

Majority of banca owners do not have steady funds to finance every fishing expenses. They, at several occurrences, loan funds from brokers, who in turn have the exclusive right to sell their fish crew's harvest. The commission scheme as mentioned above also follows.

4.1.2 Intermediaries

Brokers are the intermediaries in the supply chain as they facilitate the movement of *lawlaw* from the fishers to the end-buyers. They add value by ensuring that product reach its end-buyers according to the quality standard set by the buyers. They also add value by providing financial and technical inputs to the fishers. Brokers are also financiers, who are involved in loaning funds to the fishers. In Bangladesh, brokers also act as financiers, called *Aratdars,* and they sell the harvest to big-time wholesale buyers of *Hilsa* fish (Porras, Mohammed, Ali, Ali, & Hussain, 2017)

Local brokers classify themselves into 1) small-time brokers and 2) fish brokers/dealers. The difference is that fish brokers/dealers have two roles which is brokerage and dealership, while small-time brokers focus on one role, that is brokerage. All local fish dealers are also involved in brokerage, but not the other way around. In terms of their socioeconomic status, these intermediaries are coming from the middle-income to high-income families.

Small-time brokers/financiers. This intermediary is small-time, in a sense that they are not involved in dealership or in distribution. They don't have logistics business nor investments in such. Their role is solely to act as middlemen between fishers and wholesale buyers. Their buyers are the local fish dealers and external wholesale fish buyers. There are fish dealers and wholesale buyers from outside the town and region, and come to Bulan fish port for *lawlaw* trading. They usually trade with these kinds of brokers.

Brokers source their supply from fishers who sells exclusively to them. They are also financiers of their fishers. This exclusivity is practiced to ensure that their brokerage business will not run out of supply on a regular basis. Brokers also earn on a commission basis, and sometimes they earn more by selling the fish to their buyers higher than the market rate.

Fish broker/dealer/financiers. The local fish brokers/dealers have bigger investment and capital as their business takes dual functions. On brokerage functions, they do what the small-time brokers do. They also sell fishes to wholesale buyers and fish dealers. But occurs only when they have low demands from their regular buyers. However, on most occasions, they require more volume of fish than the small-time brokers. When they have high demand from their buyers, they buy fish from other brokers. On being fish dealer, they have more facility such as the delivery trucks for supply distribution, fish boxes for fish packaging. Some of them have ice plants or purchase agreement with local ice makers. Compared to the small-time brokers, they have more contacts and direct links to end-buyers. The lifeblood of their business is the sardines' factory. They estimated that 80%-90% of their deliveries are going to the sardines' factory; other delivery points are the wet markets (in Bicol and Metro Manila) and the food processing factories, such as the manufacturers of smoke fish, fish meal and fish sauce.

Fish brokers/dealers also have fishers who exclusively sell their harvest to them. They have more fishers who unloads their harvests than to the small-time brokers, considering that they require more volume of supply. Fishers explained that when they require more loans for the repair of their banca or purchase of high value fishing equipment, they go to fish broker/dealer, because the latter can afford high value loans.

In terms of earning, fish brokers/dealers earn from the commission obtained for trading the fishers' harvest, as well as, they also earn from the sale of the fish to their end-buyers. They have more opportunity to earn, compared to small-time brokers, much less to the fishers. They can maximize their earnings by buying the fish on a lowest price and selling it to the highest possible value. The kilo of *lawlaw* can be bought on a range of 4-20 pesos and can be sold at a range of 20-30 pesos at the sardines' factory in Metro Manila. However, fish dealers downplay these alleged excessive revenues as their distribution costs and trading risks are high, such as transport expenses and rejection of delivery from sardines' factories.

4.1.3 End-buyers

The end-buyers in the supply chain are generally the sardines' factory, wet markets, fish processing plants and the external wholesale buyers. At current, all these end-buyers are located and coming from different towns and provinces, and not located locally. Sardines' factories are mainly located in Metro Manila. The local sardines' factory was constructed few years ago, but remained on its soft-operation phase. The wet market destinations of *lawlaw* are in Sorsogon City, other markets outside the province and in Metro Manila. The fish processing plants who buy lawlaw are smoke fish, fish sauce and fish meal factories which are all located outside of the province. There are only backyard smoke fish and fish sauce makers operating in the locality. Among all these end-buyers, the lawlaw industry of Bulan depends heavily on the sardines' factory. Fish dealers estimate that 80%-90% of their traded *lawlaw* goes to sardines' factory, the rest goes to other end-buyers.

4.2 Factors that contribute to oversupply and price volatility of lawlaw

Oversupply and price volatility are interrelated and have causal relations. But, in this study, they were treated separately as oversupply concerns with the occurrence of surplus of harvest, while price volatility concerns with the excessive and sudden price movement.

4.2.1 Oversupply

Overharvesting during peak season. *Lawlaw's* peak season is during April to May and around November (MAO, 2020). During those months, the shoals of sardines are located in the municipal waters of Bulan and Ticao Island. What happens during peak season is, many fishers overharvest due to the proximity of the fishing location. In many instances, they can afford to return for another round of fishing within the same night. When there is an instance of

low demand or shortage of ice during the peak season, it results to oversupply. Price drops to its very low level. Worst case is harvests are thrown to the oceans or shores as keeping them would cost more, as *lawlaw* is a perishable kind of fish. Again, oversupply happens during peak season; fishers and brokers maintained that it never happens during lean season.

For fishers, the peak season is their time of the year to earn more; thus, they push for another round of fishing within the same night. *Lawlaw's* price is very volatile particularly during peak season. It is relatively high in the early evening of trading and drops every hour up to its lowest level possible. Therefore, fishers say that to address the price drop, they catch a little and unload their harvest as early as possible, in order to take advantage of a higher price. Despite their few harvests, they can already ensure that their operation costs are covered. Then, they return for another round to increase their revenue, despite their anticipation of price drop on their next unloading.

Low demand from end-buyers, particularly Sardine's factory. Oversupply occurs when Sardine's factories call for stop buying. According to fish brokers/dealers, this happens when some factories decide not to temporarily operate or manufacture. Although such only happens in a short period such as few days or weeks, but Sardines factories are the major destination of *lawlaw* fish. Fish dealers estimate that 90% of their demand are coming from Sardines factories. When stop buying occurs during peak season, oversupply happens.

4.2.2 Price volatility

Low demand from end-buyers. Price becomes more unstable when there are instances of low demand. When local fish dealers and outside wholesale buyers only require few volumes, price easily goes down as soon as their supply requirement is satisfied. This is mainly caused by reduced order booking of sardines' factories. Fish brokers/dealers explained that there are only few sardines' factories in Metro Manila that source their fish supply from Bulan fish dealers. Thus, when one or two of these factories reduce their demand, the overall demand of *lawlaw* in Bulan fish port is hugely affected. Another reason cited is a low demand from the wet market in Metro Manila due to high supply of other kinds of fish like *galunggong* and *tulingan*. Although, its impact is less, compared to the sardines factories'.

Shortage of ice. Ice is heavily used by fish dealers to package *lawlaw* for delivery, which is vernacularly called, *empake*. When there is shortage of ice, fish dealers choose not to purchase or lower their demand of *lawlaw* due to its highly perishable nature. In this case, local demand of *lawlaw* is affected and it results to price drop. At current, there are already four ice plants in town and shortage of ice occurs when there are power outages. Fishers say that the ice shortage is a strategy used by fish brokers/dealers to control price movement of lawlaw. Further, they say that fish dealers hoard ice or control ice distribution to manipulate *lawlaw's* price. On the other hand, local fish dealers explained that there is no ice hoarding nor steady shortage, but shortage is due to long power outages. They rebut that they can buy ice from other towns if needed.

Pricing is controlled by local brokers. Fishers view that price movement is controlled by local brokers. Local fish brokers operating within Bulan fish port have an organization and fishers believe that they are operating as a cartel to control *lawlaw* pricing. Fishers' selling price of *lawlaw* is based on the going market rate within the port. And the price moves on an hourly basis or it can be in a matter of minutes. The rate is set by the brokers. Although fishers have the option to not sell it on the ongoing selling rate, but it does not happen in actual transaction. Fishers have a trading agreement with their brokers, particularly when there is an outstanding loan. Disregarding the said agreement would hurt their relation and would cost much economic harm to the fisher. Thus, in practice, whatever is the ongoing rate of that particular moment, fishers are left with no option.

Fishers also believe that there are instances when local brokers deliberately employ strategies to stimulate price drop. They observed that during unloading of their catch, the local brokers would wait for hours to buy and sell their harvest. Fishers were told that there are no buyers as of yet. Then, that scenario stimulates price drop. Fishers find it undue when fish brokers who are also fish dealers would take a while to buy their harvest, when in fact they already have determined how much is their demand for that business day. Local brokers, on the other hand, rebut by explaining that they base their price on the buying rate of *lawlaw* in the sardine's factory, which also fluctuates. When price is still high, they don't buy it yet for delivery to sardines' factories, instead, they sometimes broker it to wholesale buyers, until the price drops to the most profitable rate.

High cost of operation during northeast monsoon season. During *habagat* or northeast monsoon season, *lawlaw* migrates to the southern part of the FMA 7, which is along the northwestern part of Samar province. During that season which is from June to October, fishers travel for three to five hours (depending on the type of banca's engine) to the said area to catch *lawlaw*. Expenses incurred for every fishing in that area increases from 200% to 250% more. Fishers said that they regularly spend about 2,000 – 2,500 pesos for food and gasoline in every fish catching, but during *habagat* season, they spend about 4,000 – 5,000 pesos. The season is also considered as lean season and expects that *lawlaw* costs higher, which ranges 20 – 40 pesos per kilo.

4.3 Recommendations provided by the entities on how to address problems on oversupply and price volatility

4.3.1 Supplier

Invite and open the market for external fish dealers and wholesale buyers. The expansion of the market creates demand and ensures that the high volume of supply during peak seasons are bought at a fair price. There are instances that the local fish dealers and brokers only require low volume of demand; then, the external wholesale buyers and fish dealers can fill in that gap. Expanding the market remains the win-win strategy in addressing problems of oversupply. Hossain & Masud (2012) recommended the importance of expanding the market in order to augment income of dried fish producers.

Allow fish trading out of fish port. This practice has been instigated by the monopolistic control of local brokers within the fish port. In some coastal barangays, fish trading occurred between fishers and external fish dealers/wholesale buyers, to which it takes away the intervention of brokers. Thus, fishers want this kind of direct trading to continue. The transaction boosted competition as many fishers trade their harvest outside the fish port, although fish brokers opposed it as their fishers do not sell or entirely deliver their harvest to them. Brokers lament that their fishers engaged in a clandestine trading outside the fish port, despite the latter's outstanding loan. Recently, the local government issued an executive order banning this practice, which fishers oppose. A study on dried fish supply chain has recommended the promotion of direct selling as it adds revenue to the poor producers (Hossain & Masud, 2012)

Organize active fisherfolks' association and cooperative. Fishers should establish a municipality-wide fisherfolks' organization that will help protect and advance their rights, sentiments, and issues such as their involvement in the price setting. At current, there are small organizations in each barangay, but their involvement in policymaking is unheard of. The fisherfolks' organization shall facilitate in handling disputes between and among fishermen and represents the organization in public dialogue and local policymaking. Further, the cooperative function may also be established to help fishers in funding their operation and maintaining their equipment. This alleviates fishers from taking loans from brokers and restrained them in freely trading their harvest.

Installation of cold storage facility. The facility can provide relief for fishers during low demands. Surplus fish can be stored in the facility during the time when buying rate is excessively low and it reduces the amount of loss among fishermen. However, fishers and brokers have opposing opinion on the utility of the facility. While fishers see the need of the facility, brokers explained that *lawlaw* is easily perishable, that the moment it gets out of the facility, it must be immediately processed or consumed. The management of PFDA, however, advised that the facility is expected to be installed by next fiscal year.

Set price cap. Fishers wish that price may be regulated by setting a price cap, particularly in preventing the price from dropping to its lowest level. They hope that local government intervene by legislating such regulation. Although, this policy requires further study as it may interfere with the principles of free market. But in the interest of the marginalized fisherfolks who absorbs the huge loss during the instance of price drop, a suitable version of price cap should be implemented.

4.3.2 Intermediaries

Regulate overharvesting. Local brokers suggested that there should be regulation imposed to fishers on the volume of harvest during peak season. The regulation through a legislation ensures that fishers shall not harvest more, specifically when demands are low. Fishers, on the other hand, opposes this as they also don't intend to overfish especially when they know that ongoing rate has already dropped. They explained that the reason they go for another round of fishing is due to price volatility. They hastily catch a little to take advantage of the higher price (to cover for operation costs) and return (for another round of fishing) to ensure revenue.

Invite more sardines' factories to buy from local dealers and urge to increase demand. Local brokers/dealers suggest that the local government must intervene in inviting more sardines factories to buy from the local brokers. They explained that there are other sardines' factories that are sourcing their fish supply from other suppliers and can be invited to buy from local market. Also, they hope that local government must also urge their existing buyers (sardines' factories) to increase their order demand, as they observe that their order booking has becoming less frequent than in the past.

4.4 Proposed measures to address the issues on oversupply and price volatility of *lawlaw* in the municipality of Bulan

Through the identified factors that were raised by the fishers and the local brokers/dealers and the recommendations they put forth, proposed measures were formulated and articulated by the researchers in aid of policymaking.

The Republic Act No. 7160, or the The Local Government Code of 1991 (LGC) mandates the local government Unit (LGU) of Bulan to provide assistance related to agriculture, fishery activities, development of local distribution channels, preferably through cooperatives and enforcement of fishery laws in municipal waters (Local Government Code, 1991).

LGUs are granted with the authority to exercise the powers for the promotion of the general welfare. It shall ensure and support the enhancement of economic prosperity and social justice, promote full employment among their residents, maintain peace and order, and preserve the comfort and convenience of their inhabitants (Local Government Code, 1991). LGUs are given the power establish its linkages with people and non-governmental organizations and may enter into joint ventures and such other cooperative arrangements, to engage in the delivery of certain basic services,

capability-building and livelihood projects, and to develop local enterprises designed to improve productivity and income, diversity agriculture, spur rural industrialization, promote ecological balance, and enhance the economic and social well-being of the people (Local Government Code, 1991). The provisions in LGC basically grants the LGUs the power to control and regulate the business operations of private enterprises within this territorial jurisdiction.

As provided by LGC of 1991, the LGU of Bulan has competent jurisdiction over the issues on the oversupply and price volatility of *lawlaw* within its dominion. The resolution of the identified dilemmas within the market arena falls exclusive within the control of the LGU being the entity mandated by law to promote general welfare and social justice of its people. The researcher being one of the constituents in the municipality, humbly offers the following measures that can be adopted or considered by the LGU of Bulan in crafting a policy that will eliminate inequity in the distribution of wealth within the area so as to protect both the rights of the fishermen and the fish-broker sectors

The proposed measures aim to regulate both the operation of fishermen and the activities of the fish brokers in the Municipality of Bulan as specified below:

4.4.1 Measures to counter the threat of Oversupply of *lawlaw* in the municipality

Policy Creation through issuance of a Resolution by the LGU of Bulan. One way to regulate the fish production is by means of formulating a policy that can be implemented through issuance of a resolution by the Sangguniang Bayan of the LGU of Bulan. Such policy shall specifically provide all the guidelines as may be deemed necessary for the purpose of monitoring the quantity of fish production as well the trends in the demand and supply gaps of *lawlaw* particularly during the peak season. The incorporation of these specific guidelines into a policy will give clear directions to fishermen to strategize the fish production, hence, avoiding fish harvest in excess of the demand for a particular period of time.

Most importantly, the issuance of a resolution to give effect to such policy must be coupled with the creation of a committee that will be solely in charge with the implementation of the policy so as to ensure the effective compliance of the concerned fishermen.

Interventions of LGU of Bulan via Providing Seminar and Training Programs to Educate the Fishers. The Local Government Unit may coordinate with other agencies such as the Philippine Fishery and Development Authority and Bureau of Fisheries and Aquatic Resources for the purpose of determining relevant seminar and training programs needed by the fishermen so as to enhance their fish production management. This is also in response to the National Sardines Management Plan of the national government. These programs will help to deepen the level of understanding of the fishermen of the relationship of supply and demand that will enhance their decision making particularly with respect to setting the maximum quantity of their expected fish harvest for a particular period.

The intervention of the Local Government Unit of Bulan shall include allotment of budget for such purpose so as to ensure the regular implementation of the seminar and training programs for the benefit of the fishermen.

4.4.2 Measures to Lessen the Threat of Price Volatility of *Lawlaw* in the Municipality of Bulan

Fish Broker Operation shall be Regulated by the LGU Bulan. The existence and intervention of the Fish Brokers in the fish market limits the opportunity of the fishers to dispose and sell their harvests at a higher and stable price. While it is true that fishers have the option not to sell their harvests to fish brokers, still the situation leaves the fishermen no other choice but to sell it directly to these middlemen due to call of necessity of avoiding possible additional loss due to spoilage of harvests as well as for obvious reason that fishermen have no access to fish buyers from other areas, supplemented by his debt of gratitude to the brokers.

The private businesses and operations of these fish brokers are within the ambit of dominion of the LGUs. As such, the LGU of Bulan, by virtue of its Police Power has the exclusive authority to regulate and control the operations of these fish brokers particularly if such business negates the promotion of the general welfare of a larger number. Hence, the activities of the fish brokers operating in the local fish port, including their acts of controlling the fish prices and all other operations which are determinative of price volatility to the disadvantage of the fish suppliers (fishers) within the municipality, may strictly be regulated.

Such may be done by means of passage of ordinance restricting the scope of discretionary powers of the fish brokers including the determination of fish prices and a municipal law imposing addition requirements for the issuance and renewal of the respective licenses of these business entities before they can legally engage in the said business activities. The ordinance shall impose additional requirements such as submission of lists of fish buyers whom they make regular transactions, written commitment from the licensee to assist fishers to have easy access to the identified buyers, written commitment to aid the LGU establish a wider market for *lawlaw* and an agreement that failure to perform the additional requisites redound to the revocation of their permits and licenses subject to the provision of the due process of law.

Economic Policy Plan to Expand the local market. The LGU may formulate an economic policy that provide provisions inviting potential investors to consider establishing sardines factory and other fish processing factories, such as smoke fish, fish sauce and fish meal factories, which have the capacity to maintain the demand of *lawlaw* in the municipality, hence, avoiding the possibility of unfavorable price volatility. Interested investors shall be given certain tax exemptions and incentives as identified by the LGU. The same policy shall also provide provisions inviting fish dealers

and wholesale buyers from other provinces and areas in the country to trade in the local market. This is to boost the competition in the local market and avoid the monopoly of price to few individuals.

Establishment of Fishers' Cooperative. The Local Fishers may facilitate the creation of a Cooperative intended for them with the assistance of the LGU. The LGU of Bulan shall support and give assistance, as one of its mandates under the LGC of 1991, that is, to facilitate the establishment of Cooperative for the fisherfolks. The cooperative will be managed by the fisherfolks' themselves but is under the supervision of the LGU. This cooperative may facilitate the management of *lawlaw* harvest by its member fishers from production up to its disposal. The cooperative may also facilitate the financial literacy training and fund assistance to the fishers.

Recognition of Fishers' Union. Fishers' Union may be formed by the fisherfolks or fishers' organizations within the municipality. This union shall be recognized by the LGU of Bulan as the sole negotiating body in the fisherfolks sector with respect to their rights and obligations. Further, the LGU may also consider, through an ordinance, the direct participation of the fisherfolks' sector in policymaking by providing a sectoral representative in the *Sangunniang Bayan*, pursuant to Section 41 (b) of LGC of 1991.

5. DISCUSSION

The entities in the supply chain, except for the end-buyers (who are not the focus of this study), are in the different socio-economic classes. Although not measured statistically but this description was according to participants. While fishers are generally coming from low-income to poor families, local brokers/dealers are from upper- or middle-class families. And this is true to many fishers in many parts of the country and in many developing countries. Fishers usually have bigger family size, lower income, and have little education (Jimenez, Amaral, Costa, Lira, & & Fredou, 2020; Porras, Mohammed, Ali, Ali, & Hussain, 2017; Muyot, Balunan, & Mutia, 2021)

It can be observed from the relations between the fishers and the brokers that the latter have influence over the former. Fishers are left with no choice but to sell their harvest to their brokers to the price set by the latter. Although brokers (particularly with fishers who have loans) have also the obligation to take the harvest, regardless demand is low, but the price would depend on the price set by the broker. Fishers don't have a say in pricing, but to take what is offered. In reality, refusing the offer of the broker, antagonizes their relation. Brokers, on the other hand, have the leeway to take time to sell the unloaded harvest until the price drops. *Hilsa* fishers in Bangladesh also experience powerlessness in trading their harvest with the middlemen (Porras, Mohammed, Ali, Ali, & Hussain, 2017).

Between the two entities in the supply chain, the supplier takes the more inevitable loss during the instance of oversupply and price volatility. When there is a low demand, a shortage of ice and during northeast monsoon season, fishers take the more risks of taking more losses. However, when there is high demand, they also don't enjoy the higher revenue as the brokers can manipulate pricing. In the value chain analysis study of *tawilis* fish found that fishers have the lowest value added to the product in the supply chain compared to the buyer and processing plants (Muyot, Balunan, & Mutia, 2021)

It can be observed that the poor and powerless fishers are left alone without any significant help from themselves, much less from the local government. It is important that there is an active and functional fisherfolks organization (municipality-wide) that directly participates in policymaking, so as their rights and interests are protected. Also, the organization may be involved in the trading of their harvest with either the broker or direct to the wholesale buyers, to get them off with the unilateral price setting. On the finance aspect, a cooperative should be explored to financially aid the fishers and prevent them from getting into tyrannical loans.

In the relation between the supplier and intermediaries, the intervention of the local government is very important. Measures proposed in the study are mostly directed to the LGU. The local government must take a serious intervention on the transaction between the fishers and the brokers. As provided in the LGC of 1991, the LGU has the jurisdiction over the price volatility and oversupply as its intervention is for the general welfare of its constituents. It can be observed from the assertions of the fishers during the FGD that the LGU provides no intervention in the ongoing problem. The free market continues at the expense of the poor fishers. Brokers and their brokerage, on the other hand, are business entities and established to earn revenue; thus, price manipulation may deem as part of their business sustainability. LGU, nevertheless, must interfere and study on how pricing can be regulated within the principle of free market economy.

Another significant intervention of the LGU is the expansion of the market as such is a win-win strategy for the entire fishing industry. Pump-priming the demand ensures that prices are maintained and wastage are prevented. This can be done by inviting more buyers and dealers and opening the market to external sardines' and wet market suppliers. Further, the LGU should also promote the market to the sardines' factories, fish processing plants such as smoke fish, fish meal and fish sauce factories, by inviting them to expand or put up their manufacturing plants in the municipality and enticing them with tax incentives. A sound economic policy plan can put this into realization.

Based on the recommendations provided, the installation of the facilities within the fish port must be available, such as cold storage and ice plant. The problem of oversupply can be addressed directly by those facilities. Although, there seem miscommunication between LGU and PFDA as the former expects that the facilities are to be provided by the latter. But for the last two years of operation, the facilities seem not to be available soon. The LGU, however, should be more proactive as the local fishers are the on the receiving end of the problem.

6. CONCLUSIONS AND RECOMMENDATIONS

The foregoing discussion of results conclude that the factors that contribute to oversupply are the low demand from sardines' factories in the Metro Manila and the overharvesting during the peak seasons, while factors that contribute to price volatility are the low demand from the end-buyers, high cost of operation during the *habagat* season, scarcity of ice, and the price manipulation of the local brokers. Within the supply chain, it was determined that fishers are absorbing the inevitable loss during the instances of oversupply and price drop. Fishers have no bargaining power in the trading within the supply chain. On the other hand, local brokers enjoy more leeway in maximizing revenue. Further, in the midst of the abovementioned problems, LGU takes no significant intervention.

The study proposed measures that can aid local policymakers in legislating policies that shall address problems with oversupply and price volatility in the local market. The study recommends serious intervention of the LGU in expanding the local market by inviting investors to put up sardines and fish processing factories and opening the market to more external wholesale buyers. The study also recommends the formulation of a fisherfolks' organization, that can represent the sector in policymaking process, and cooperative, that can aid the fishers in fund sourcing and in trading their harvest. Finally, the study recommends the formulation of policy that will regulate overharvesting during peak seasons and can provide fishers with alternative livelihood.

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