



African Journal of Biological Sciences



Research Paper

Open Access

Study of Local Wisdom in the Tradition Operating System and Market Share of *Flying Fish Roe* in South Sulawesi, Indonesia

Nadir¹, M. Saleh S. Ali², Andi Adri Arief³, Letty Fudjaja⁴

Graduate School, Hasanuddin University, Makassar, Indonesia

Corresponding Author: Nadir

Article Info

Volume 6, Issue 8, April 2024

Received: 12 Feb 2024

Accepted: 13 March 2024

Published: 07 April 2024

ABSTRACT: Flying fish is the livelihood of most fishermen in Takalar Regency. This study aims to analyze the operating system for catching and marketing flying fish roe. This research uses a case study approach with a qualitative descriptive analysis. The research was conducted in the coastal area of the Patorani fishing community in Galesong District, Takalar Regency, South Sulawesi. Research data analysis used qualitative data analysis by collecting data systematically, reducing the data, then selecting, focusing, simplifying, and abstracting the data according to the field notes obtained. Then the presentation of the data is classified, and the last step is drawing conclusions or interpretations. The results showed that fishermen started their activities in March and October. Catching flying fish roe consists of several stages, from checking the fishing boat to preparing flying fish roe-catching equipment made of coconut leaves and bamboo called *pakkaja* or *balla-balla*. Fishermen catch fish in the sea around the Pangkajene Islands and return to the coast to give or sell the flying fish roe they catch to investors or traders. In contrast, *patorani* fishermen operate around the waters of Fak-Fak, West Papua, because of the long distance. The catch will be sent to Papalele in Makassar if it is large. Fish roe is marketed by fishermen who give their catch to the *papaleles* (owners of capital). The *papaleles* sell it to wholesalers, and before being sold, the wholesalers process it first for export.

Keywords: Flying fish roe, market share, tradition, wisdom, and visualisation

© 2024 Nadir, This is an open access article under the CC BY license (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made

Introduction

Flying fish is a small pelagic fish that can fly above the sea surface. Flying fish are rarely caught by fishermen because this fish has a low selling value compared to its roe. Flying fish (Exocoetidae) are found globally in tropical and sub-tropical seas, live in offshore surface and coastal waters, and are a pelagic ecosystem food chain component (Arda & Alyürük, 2019).

The flying fish roe owned by Indonesian waters are an important resource for the community, especially fishing communities because it is a source of animal protein. In Eastern Indonesia, the waters of South Sulawesi are quite extensive because it has a coastline of about 2,500 km with a fishing area of 12 miles from the sea and public waters of about 144,425 ha (Capron, nd) Effective fisheries management allows

sustainable utilization of marine ecosystems while providing an important source of food and income (Rinaldi et al., 2021).

Flying fish is an export commodity that is a source of foreign exchange for the country. The marketing of fish roe has penetrated international markets such as Japan, China, Korea, Sweden, and Lithuania, with prices reaching \$30–\$40 per kilogram. The price range of \$30–\$40 is not fixed because it follows the rupiah exchange rate. Fly fishing is a source of livelihood for most fishermen in Takalar Regency. This fishery includes around 20,000 fishermen, retainers, papalele, day laborers, and intermediaries along the Galesong coast of Takalar District. Flying fish has the advantage of being an economically important fish, where its roe are an export commodity and Flying fish is a consumable fish that is also delivered in the region (Tishyn, 2021).

The utilization of flying fish roe is a source of income for patorani fishers and plays an important role in the economy of South Sulawesi. Flying fish roe are one of the most important export commodities in the fisheries sector. Some export destinations for Torani roe are Japan, Korea, and Taiwan. On the other hand, despite being an export commodity, the share received by fishermen is very small (Riaz, 2022).

Takalar is one of the districts in South Sulawesi Province and one of the fly fish roe-producing areas. This fishery commodity is one of the mainstays supporting local revenue. Catching flying fish and rowing is a family business, with the number of workers in a gill net-catching business ranging from 2–3 people, while the flying fish roe-catching business can reach 4–7 people (Kushner, 2019).

Many people in Galesong Subdistrict, especially men, work as ordinary fishermen and fishermen who only catch flying fish roe. In early March, coastal communities prepare everything to catch flying fish roe. Furthermore, in April, patorani fishermen prepare to go to sea and will return if they have caught enough fish roe to sell on land (Sharma et al., 2022). Flying fish roe obtained by patorani fishermen in Takalar Regency's unstoppable diaspora tickles some experts to study more deeply under their expertise and disciplines.

Flying fish roe is one of the most promising export commodities in the fisheries sector. However, it is inversely proportional to the level of income and welfare of fishermen, especially crew members. The economic situation obtained is different from what is gained by the stakeholders involved in the flying fish roe business, especially the owners of capital or entrepreneurs.

Fishermen Patorani is one of the fishermen's communities in South Sulawesi whose realities to this day are managing, preserving, and exploiting the marine biological resources based on norms and cultural values through the use of software technology as well as hardware technology, which is participatory, associative, analogical, and orientation and is upheld and preserved through social control by every citizen (Arief, 2008). In addition to using technology, the implementation of flying fish roe catch still uses local wisdom preserved from landing encounters, which is an obligation for fishermen before leaving sailing.

The role and status of local wisdom as a law or rule enforced in these coastal regions are paramount because of their historical aspects, acquired in a very long process and delivered orally by a decreasing population. Moreover, in terms of the purpose of its application, which is to control human nature, whose unlimited needs and desires enable the existence of local wisdom, it greatly affects the sustainability of the human environment as a place of residence, especially in coastal areas (Squeo, 2021).

Local wisdom is the system of life values inherited from one generation to the next in the form of religious, cultural, or customary customs that are generally in the oral form in some form of a social system of a society. The presence of local intelligence in a society results from a declining process of adaptation over a very long period to an environment that is typically inhabited or where there is frequent interaction within it (Lahiri et al., 2023).

Studies of local wisdom and catch activities in fishing communities are prominent concerning natural and human resources. In the traditional community, man and nature are one because the same God created them. Therefore Reinecke., & Noll (2023) Fishermen have local knowledge that they use to carry out their activities as fishermen. They are still believing and carrying on that knowledge to this day. This

local knowledge was used as a principle for developing fishing empowerment. The local knowledge that fishermen possess is the knowledge of ancestral heritage to survive. In that context, why is local wisdom inseparable from community life.

Special studies are needed to look at local wisdom in traditional forms in the operating and marketing systems of flying fish roe that can be used to gather accurate data for formulating risk reduction policies against the impact of efforts carried out by fishermen. Various studies of patorani fishermen have been carried out on various components and scopes. However, only some studies have taken the three problems as the object of study.

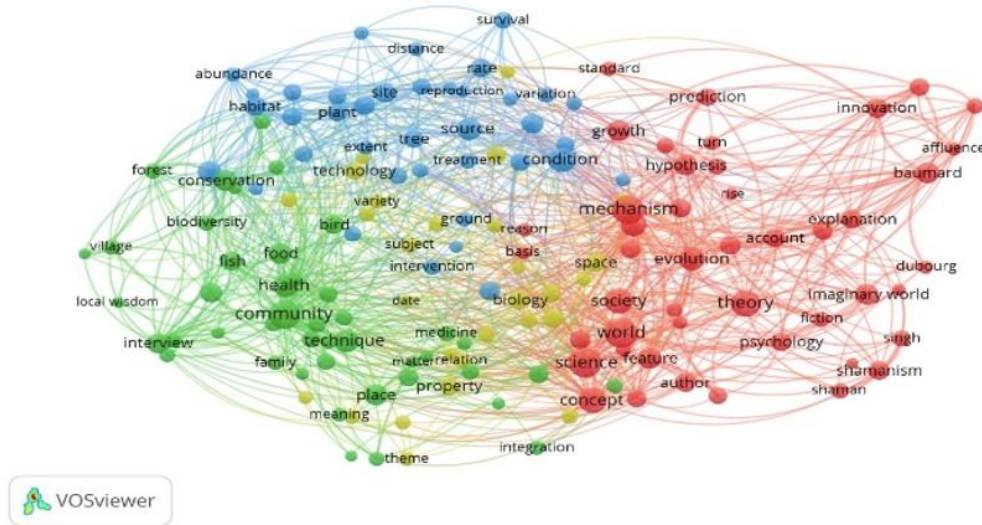


Figure 1. Vosviwer Identification and Analysis of Relevant and Related Reserch.

Source: *Analysis Using Vosviwer (2023)*

Operating system and marketing flying fish roe and related contributions. Many research topics are born from these three keywords, some of which include research conducted by (Gómara & Marina, 2019), on Fishermen's perceptions of coastal fisheries management regulations: Key factors for rebuilding coastal fisheries resources in Taiwan (Rossignol, 2023), with the title of discussion on management disputes arising from the repeated utilization of flying fish resources in Taiwan and suggested preventive measures, "A Review of Traditional Ecological Knowledge and its Role in Natural Resource Management: Northeast India, a Cultural Paradise", (Smith, 2020), next Seasonal Abundance and Reproduction of Fourwing Flyingfish, *Hirundichthys affinis*, off Barbados, Sustainable fishing of flying fish (*hirundichthys oxycephalus*) with drift gillnets in Makassar Strait, Indonesia Caletrió (2022), on System Development of the Flying Fish Fishery in Perikanan Nusantara Port Tual, (Prager, 2021). Then like a supplier issue (Ward, 2021; Sun et al., 2020; Anderegg, 2020; Chatterjee et al., 2023; Stoops & Stoops, 2019; Kaldheim & Nordbotn, 2019; Ye et al., 2023; Singh et al., 2023; Messersmith-Glavin, 2022).

Most of the research focuses on explaining the development and breeding of flying fish, and there needs to be more research that thoroughly discusses the problems of flying fish fishermen. Research has yet to focus on assessing local wisdom in flying fish roe operation and marketing systems. In line with this information, research was needed that provides information on how local wisdom influences the operation and marketing system of flying fish roe by Patorani fishermen.

Therefore, this study will analyze local wisdom in the operation and marketing of flying fish roe for Patorani fishers. The results of this study were needed in determining the right target for development program intervention, especially in fisheries resource management for flying fish roe fishermen in Takalar Regency.

Materials and Methods

This research uses qualitative data analysis techniques using the Nvivo 12 Plus tool, which begins at the start of the research by collecting data and processing it systematically, which is carried out by data reduction, where the data obtained is selected, focused, simplified, and abstracted according to the field notes obtained. Then the presentation of the data is classified according to categories based on the variables seen, and the last is drawing conclusions or interpretations and verifications of the data from the results of presenting the classified data. (Schwandt, 1996; Woolf & Silver, 2017) explain that data activities in qualitative data analysis were carried out continuously.

The types and sources of data in this research were obtained by conducting a literature study through secondary data obtained from various places, such as data from government agencies, and then primary data was obtained from interviews with research informants who had been determined to be related to local wisdom, channels, and roes’ business marketing margins. Patorani fishermen's flying fish.

Local Wisdom

Local wisdom is a system of life values inherited from one generation to the next in the form of religion, culture, or customs, which are generally in oral form in a social system in a society. In the Patorani fishing community, forms of local wisdom are carried out in two stages: Before and during the fishing location, Patorani fishermen, before and during the fishing location at sea, carry out a series of preparatory activities. These activities are local wisdom that has been carried out for generations. In this section, the data obtained is analysed qualitatively using the Nvivo 12 Plus tools.

Marketing Channels

Distribution and marketing channels are financial organisation tools that are useful for making the production of goods or services available for consumption or use by consumers. Marketing channels were analysed using qualitative analysis based on the results of interviews with informants.

Marketing Margin

Marketing margin is the difference between prices at the farmer level and prices at the retailer level. Systematically, it can be formulated as follows:

$$Mp: Pr-Pf$$

Information:

Mp: Marketing margin for flying fish roe (Rp/kg)

Pr: Price of pepper at retail level (Rp/kg)

Pf: Price of flying fish roes at fisherman level (Rp/kg)

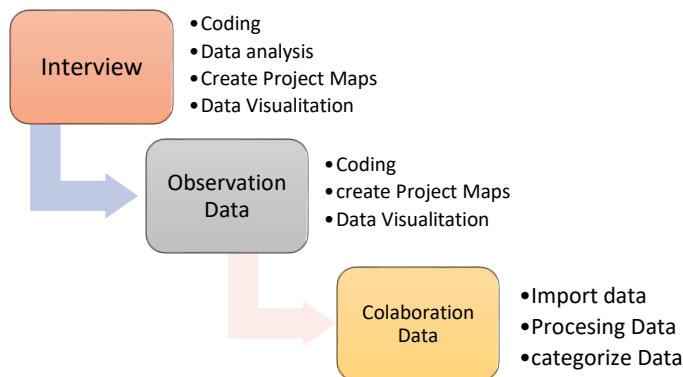


Figure 2. Kualitatif Nvivo 12 Plus Reserch Process Method

Source: Miles dan Haberman (1984) dan Wolf and Silver (2017).

Figure 2 shows the data analysis technique used in this research: data collection, divided into three stages: data import, data processing, and data categorization. The next stage is data observation and interview transcripts, divided into five stages: data categorization, coding, matrix coding query, data visualization, and preview results. The last stage is documentation, divided into four stages: coding, data analysis, creating project maps, and data visualization. These steps are assisted by Nvivo 12 Pro as a qualitative data analysis tool Woolf & Silver (2017) to get the best findings through matrix coding analysis.

Results and Discussion

Local Wisdom in the Tradition of Flying Fish Roe Catching Operation System

Patorani fishermen are one of the fishing communities in South Sulawesi whose reality conditions to date have managed, maintained, and utilized marine biological resources based on cultural norms and values through the use of software and hardware technologies that are participatory, associative, analogic, and orientation, which are institutionalized and maintained through social control by each of their citizens (Nair, 2023).

The term Patorani in the life of the Galesong community is known as a fisherman who focuses on catching flying fish in addition to the search for flying fish roe. However, Patorani is generally more concerned with finding tuing-tuing (flying fish) roe than catching tuing-tuing itself. The value or price of fish roe, significantly more profitable than the price of tuning-tuning (flying fish), impacts this tendency. Patorani, as a traditional organization, is different only in terms of terminology because the completeness of the formal organization, such as chairman, secretary, treasurer, and members, can be identified or equated with the terms appalled, ponggawa, and saw. The principle of cooperation is similar; the only difference is the container; some work procedures are at sea, and some are on land.

Patorani comes from the word "Torani", which is the name of a type of fish to be caught. Torani means tuing-tuing or flying fish. So, the word torani gets the prefix "pa," which means "the person who." Thus, patorani means "one who goes to catch torani, or flying fish." The word torani comes from the word Tobarani, which means brave person. Torani, the person who can catch this type of fish must be brave. The fish can only catch with guts and courage because the place and area are far from the sea. Then the word Tobarani changed because, in the word, there was a removal of one of the syllables, namely "ba" so that the word Tobarani became Torani. The word Torani comes from the composition of two words, Toa' and Rani, namely Toa'rani. This type of fish is called Daeng Rani by the fishing community. Then the nickname changed because it was considered a grandmother's (toa'). So Toa'rani means grandmother of Rani. In later developments, Toa and Rani changed by omitting one phoneme, namely the phoneme /a/, so they became Torani. However, what is certain is that patorani has existed since a long time ago since humans recognized Torani fish.

Fishermen start their activities from March to October. Starting with preparing all the needs that will be used in one season, this preparation includes equipment, repairing or rejuvenating boats, and making flying fish roe made of coconut leaves and bamboo called pakkaja or balla-balla before leaving. Before leaving, fishermen usually repair their boats by repairing several damaged parts of the ship. In addition, they prepare all their needs while at sea, such as fuel oil and daily provisions.

The following is a series of activities carried out by Patorani fishermen, which are local wisdom that becomes traditions that must be carried out from generation to generation by Patorani fishermen. Talking about Tradition, of course, cannot be separated from the context of local cultural wisdom. Based on the belief in ancestors and previous ancestors, Tradition comes from the Latin word tradition, which means everything inherited from the past. Tradition is the creation and work of human material objects, beliefs, fantasies, events, or institutions that are passed down from one generation to the next, such as customs, arts, and properties, which are used. Something inherited does not necessarily have to be accepted, cherished, assimilated, or kept until death. For the inheritors of each, what they inherit is not seen as "tradition." An accepted tradition becomes a living element in the lives of its supporters. It has become a part of the past that has been maintained until now and has the same status as innovations.

The patorani Tradition describes human attitudes and behaviors that have been in process for a long time and carried out for generations.

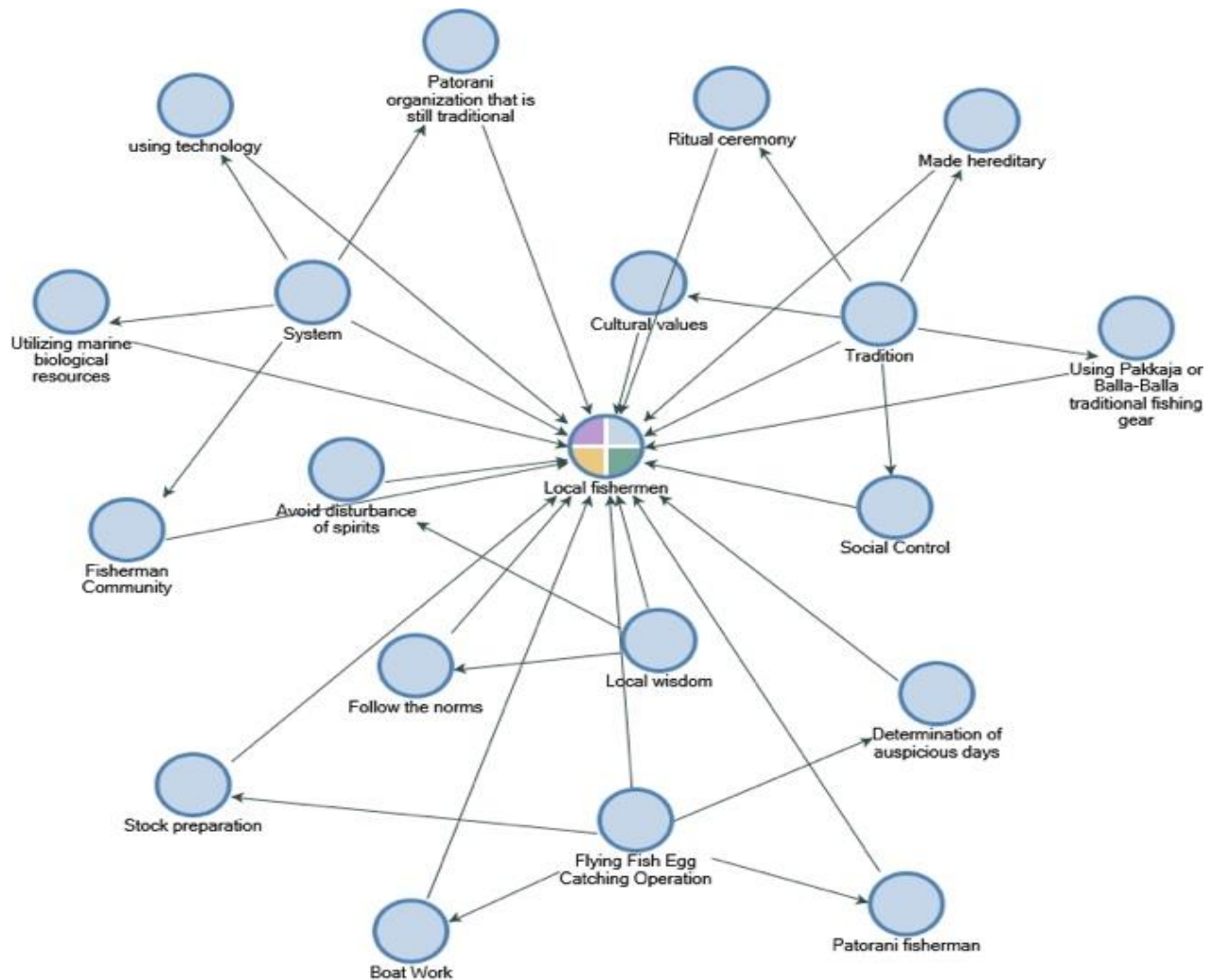


Figure 3. Network visualization Local Wisdom in the Tradition of the Flying Fish Roe Catching System

Source: Analysis Using Nvivo 12 Plus (2023).

Figure 2 shows that the concept of local wisdom in the Flying Fish roe Catching Operation System Tradition in Takalar district is closely related to local fishermen, which has a close impact on local handling of biological natural resources, especially flying fish roe. Based on network visualization, it shows that local wisdom is very close to patorani fishermen. Therefore, in this research, local knowledge is obtained from generation to generation. This inherited knowledge may have seemed very simple at first. However, with time and experience, their knowledge develops and increases from time to time; even the specific knowledge may change due to changes in the situation of the place or circumstances. This statement is also in line with other research, which says that in terms of local knowledge, there are certainly developments that are influenced by the times and technology (Jewell & McRae, 2020; Fernandez, 2019; García Cardiel & Olmos Romera, 2021).

Preparation for Departure to Catch Flying Fish Roe.

Finding torani fish and torani fish roe in the ocean is challenging. So several things need to be done by the patorani. The things that need to be done are related to the preparation of the boat that will be used and also a patorani ritual ceremony. Before leaving for the sea, patorani fishermen usually carry out various activities to prepare for departure, including when to start working on the boat and preparing

all other needs such as necessities, fuel oil, and departure ceremonies preparation for departure to catch flying fish roe.:

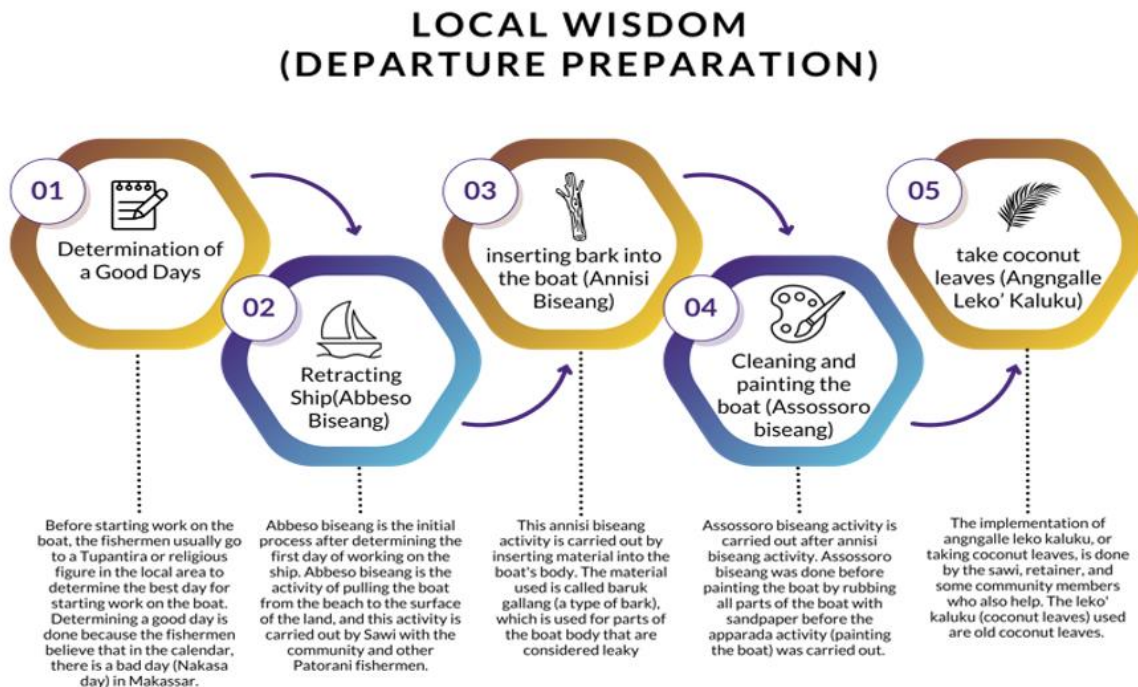


Figure 4. Local Wisdom (Departure Preparation) the Flying Fish Roe Catching System.

Based on the picture above, it is explained that Patorani fishermen have a tradition before they leave:

Determination of a Good Day for the Start of Boat Work

Before starting work on the boat, the fishermen usually go to a Tupantira or religious figure in the local area to determine the best day for starting work on the boat. Determining a good day is done because the fishermen believe that in the calendar, there is a bad day (Nakasa day) in Makassar. According to the fishermen, Nakasa (bad days) are bad days, and if the starting activities were carried out on that day, the fishermen may get bad luck and fail to find flying fish roe. The fishermen believe that everything that starts well will affect the implementation of Patorani activities during the season.

This tradition is a custom of the fishing community in the form of a ceremony that must be carried out when starting a flying fishing operation at sea. For Patorani, catching Torani fish and collecting their roe at sea is a hefty job that requires wading through the ocean, which can endanger their lives at any time. The Patorani has led to his assumption that subtle creatures with supernatural powers can sink his boat and fail his efforts in the sea dwell. The determination of the first day of work has become a part of the life of human creation in developing its potential as a creature of Allah SWT on this earth and carrying out its duties as a human caliph in managing its life.

The following is an interview quote from one of the Patorani fishermen informants at the research location:

"A'cini allo untuk boya allo baji ka anne pattoraniang jamang battala jari abboyaki pakarammula baji a'minasa nabaji ngaseng sa'genna ammari tawwa torani". (DS Punggawa Patorani, 54thn).

"Seeing the good times is done because Patorani fishermen consider work as a fisherman to be an easy job. So, he thought that seeing a good time for a good start and while going to sea was good until it was finished". (DS Punngawa Patorani 54thn).

Retracting Ship (Abbeso Biseang)

Abbeso biseang is the initial process after determining the first day of working on the ship. Abbeso biseang is the activity of pulling the boat from the beach to the surface of the land, and this activity is carried out by Sawi with the community and other Patorani fishermen. The boat is pulled to the beach to make it easier for fishermen to work on the ship and to carry out further activities such as annisi biseang, assossoro biseang, and apparada, which are carried out on the beach for several days.

Inserting Bark into to Boat/Annisi Biseang

This annisi biseang activity is carried out by inserting material into the boat's body. The material used is called baruk gallang (a type of bark), which is used for parts of the boat body that are considered leaky. The aim is to prevent water from entering the boat safely and catching flying fish roe later. In addition to this annisi biseang work, an inspection is also carried out on other boats that are thought to be damaged because they have been used in the previous fishing season. In addition to preventing boat leaks, the activity is also intended so that all people involved later, such as the retainer and the sawi, are not exposed to danger at sea when catching fish and flying fish roe.

Cleaning and Painting the Boat/Assossoro Biseang dan Apparada

Assossoro biseang activity is carried out after annisi biseang activity. Assossoro biseang was done before painting the boat by rubbing all parts of the boat with sandpaper before the apparada activity (painting the boat) was carried out. Assossoro biseang is usually done within a day by the sawi. Then the apparada activity is carried out, painting the boat to renew the faded color. The process of painting the boat takes three days to dry. This apparada is done so that the sawi are more enthusiastic about looking for torani fish by using a boat that already looks new again.

Take Coconut Leaves/Angngalle Leko' Kaluku

The implementation of angngalle leko kaluku, or taking coconut leaves, is done by the sawi, retainer, and some community members who also help. The leko' kaluku (coconut leaves) used are old coconut leaves. Then the sticks from these coconut leaves are discarded and made into brooms by the community, and coconut leaves are used only for the leaves that are still fused with the stalk and coconut leaves, with the intention that when these coconut leaves are lowered, fish and roe can be integrated into the rompong or balla-balla that has been made, and indirectly, the results obtained are many.

The following is a quote from one of the Punggawa Patorani informants:

"Biasana leko kalu nipakea 200-250 palapa selama tawa torani." (DA Punggawa Patorani, 49thn).

"Usually, coconut leaves are used during one flying fish roe season, between 200 and 300 fronds" (DA Punggawa Patorani 49thn).

After all the preparations for catching Torani fish and Torani roe are made, a patorani ceremony tradition is carried out. This patorani tradition is a custom of the fishing community, especially fly fishermen, in the form of a traditional ceremony that cannot be carried out at any time. However, this ceremony must be carried out at the right time, which is considered reasonable by the patorani. The Patorani look for a good day according to the calculation of Makassar people's time (pitika). As already known, this patorani tradition is a sacred ceremony filled with symbols that have meaning in each symbol. It also contains cultural values and some reasonable expectations. Before leaving, fishermen first carry out an event or ritual—a traditional event carried out every year, a type of traditional event in marine fisheries production. This traditional ceremony has been assimilated into Islamic cultures, such as the songkabala ceremony (tolak bala) and the ceremony of reading safety prayers called pammaca doangan.

Similar to the research conducted by Demmalino et al., the Galesong fishing community consists of *erang pa'boyaboyang* (livelihood science) and *erang passimombalang* (fishing science). *Erang passimombalang* is not fully grouped into the occult. However, its implementation begins with magical rituals, especially those intended to protect the voyage from unexpected danger. Symbolically, the magical ritual in erang passimombalang begins during departure preparation at the beginning of ship repair and renovation activities. This ritual begins with "cutting straight bamboo" at a time that is considered a good day (allo baji) to be used as material for making or repairing *pakkaja* and shipping tools; this is followed by

assorong maca (recitation of prayers), especially in the courtiers' homes. In the pre-Islamic tradition, *assorong maca* activities were usually led by Pinati (spell readers). However, since the arrival of Islam, *assorong maca* activities have been led by teachers (ustadz) or village Imams. In the course of *assorong maca*, offerings are presented, including umba-umba cakes (floating cakes) and other cakes and other fruits that are considered important, such as bananas (Demmallino & Ali, 2018).

After all the preparations for catching torani fish and torani fish roe have been made, a patorani ceremony tradition is carried out. This patorani tradition is a custom of the fishing community, especially fly fishermen, in the form of a traditional ceremony that cannot be carried out at any time. However, this ceremony must be carried out at the right time, which is considered reasonable by the patorani.

Departure of the Patorani Fishermen

After all the preparations for catching torani fish and torani fish roe are done, a patorani ceremony tradition is carried out. This patorani tradition is a custom of the fishing community, especially fly fishermen, in the form of traditional ceremonies that cannot be carried out at any time. However, this ceremony must be carried out at the right time, which is considered reasonable by the patorani. The implementation of this patorani ceremony is carried out on a boat. The patorani ceremonies are *parenta pakkaja*, *appassili biseang*, *parenta pocci kappala*, *accaru-caru*, *anggalle gosse*.

Then the fishermen will go to the fishing location to carry out the capture of flying fish roe. Flying fish roe was caught using *balla-balla*. The *balla-balla* that has been made is then lowered in the afternoon and starts to be lifted in the morning after dawn prayer. The roe obtained is then separated from the coconut leaves attached to the roe and dried on the boat. Catching flying fish roe in the sea is done uniquely with local traditions and wisdom. Flying fish roe are caught by singing songs. These songs are believed to be able to attract flying fish to lay roe in the *balla-balla*. The following song is sung by Patorani Fisherman when he wants to carry out the capture of flying fish roe.

“Pole-sipoleeee, ipole sirenreng mako maeeee siamunnna turania itimboro iwara, iraya ilau irate irawa tulunglah toraniii kuparoroe. Empole sirampe-rampeee kemi mae ibondeng, jaiya na aero takbalaka namangamaseang tambung loroa tulunglah toraniii kuparoroeeee. Empole sirampe-rampeee kemi mae ibondeng, jaiya tallona kaburusang ri anak turunglah torani kuparoroe”, (JT 72 thn Punngawa Patorani).

Flying fish roe will be caught using fishing gear that has been made from bamboo called *bale-bale* or *balla-balla*, then formed into a square box, then tied coconut leaves along the sides. Fishing gear is usually made by fishermen between 200 and 250 *bale-bale*, depending on the fishing location. The fishing gear that has been made is lowered at 11:00 in the afternoon, and then the *bale-bale* is pulled at 06:00–08:00. Usually, flying fish roe is obtained in one catch between 20 and 40 kg, but if the fortune is good, the flying fish roe catch can reach 70 to 100 kg. Furthermore, the roe that have been obtained are dried on the boat using a rope that is stretched along the boat. The length of drying depends on the weather at that time. Drying flying fish roe takes 2–3 days. The dried flying fish roe is then put into sacks for storage while maintaining humidity to maintain the quality of the roe.

The flyfishing roe system still uses simple tools and is carried out traditionally by the community. Torani fishermen use boats and drift gillnets. The net used is made of *tasi* and other supporting tools such as buoys, ropes, tin, and *cobang* and has a mesh size of $\frac{1}{2}$ or $\frac{1}{4}$ inch unit, depending on the needs of the fishermen. Making one piece with a net size of 20 m x 2 m takes about two to three weeks. In fly-fishing activities, fishermen usually use 8–12 pieces, which take about five to six months to make (Woolf & Silver, 2017).

Patorani fishermen are divided into two groups based on the search location for flying fish roe. The search for flying fish roes is carried out around the waters of West Papua Province in the Fak-Fak archipelago and the Pangkajenne Islands area. Fishermen who operate around the waters of the Pangkajenne Islands will return to the coast to give or sell their flying fish roe to the capital provider. In contrast, patorani fishermen operate around the waters of Fak-Fak, West Papua, because the long distance makes it challenging to return home, so fishermen store their catch. The catch will be sent to the

ship owner or capital owner in Makassar if it is large. Then the owner of this capital sells it to large traders to be exported to countries such as South Korea, Japan, Taiwan, and China.

The development of the flying fish roe business must receive special attention to encourage and maximize the potential of Torani fishermen. The fishing system that is still very traditional with simple equipment is the cause of the exploitation of flying fish resources. Fishing systems with modern technology approaches that are environmentally friendly must begin to be considered to streamline the fishing system. The modern technological approach must be able to maintain the community-owned local wisdom system in addition to being environmentally friendly.

Marketing System of Patorani Fishermen's Flying Fish Roe

The marketing system is a series of marketing activities by stakeholders involved in the flying fish roe business. The marketing system includes institutions, distribution, and marketing margins for the flying fish roe business in Takalar Regency. Marketing is an important system in the fishing business. Good marketing is an activity that is influenced by various social, cultural, political, and managerial factors (Yu et al., 2021).

The development of activities in the fisheries sector certainly requires the intervention of parties who actively facilitate the production process. The marketing process of fishery products is very vital to the sales process. Marketing channels are a series of ownership changes and economic processes where a product is transformed from the first producer to the final consumer (Rogers & Giannasio, 2020).

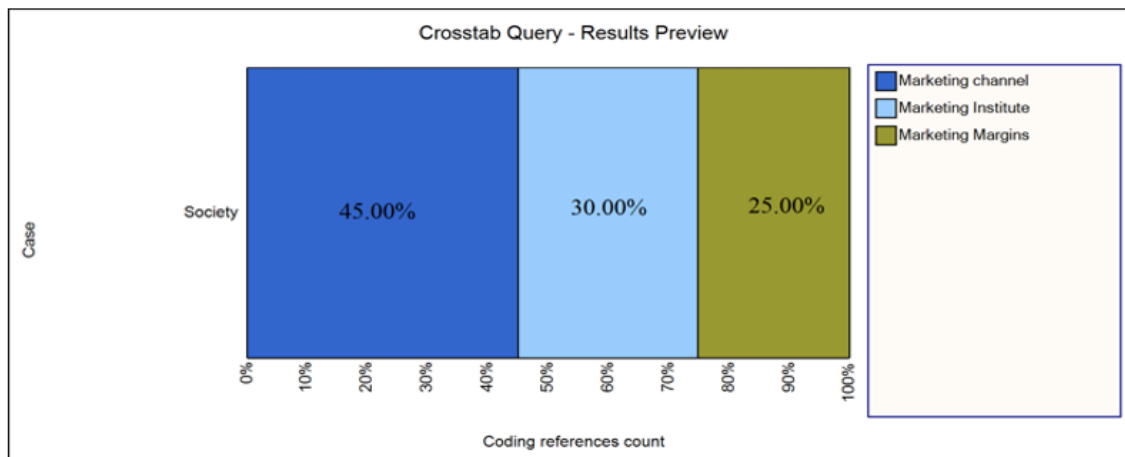


Figure 5. Crosstabulation Flying Fish Roe Marketing System.

Source: Analysis Using Nvivo 12 Plus (2023).

The results of data analysis using the Nvivo 12 Plus application with crosstabulation techniques obtained the results that the influence of marketing institutions on income and ease of distribution of flying fish roe has an enormous impact, namely 30.00%, which affects other indicators, namely marketing margins with a figure of 25.00%, while other indicators, namely marketing channels, have the highest impact with a figure of 45.00% on income and ease of marketing, so that it can be concluded that the importance of reasonable marketing efforts can be seen in the quality of products that consumers will receive. Their perishable nature and characteristics need to be considered in marketing fishery products. Marketing efforts are the marketing logic of a business that hopes to achieve its goals, consisting of decisions about marketing costs from the marketing mix and allocation. Marketing is carried out to achieve objectives by developing a sustainable competitive advantage through the markets entered and the marketing programs used to serve these target markets (Munekata et al., 2021; Morris, 2019; Berg, 2019).

Flying Fish Roe Marketing Institution

The marketing institutions involved in the marketing process of flying fish roe in Takalar Regency can be identified as follows; (1) Papalele (capital owners) are marketing institutions directly related to

fishermen. Papalele has the right to transact with fishermen in cash or purchase contracts; (2) Collecting traders are marketing institutions that buy flying fish roe sold by papalele from fishermen; (3) Large traders are marketing institutions that buy flying fish roe collected from collecting traders. Because the distance to large traders is quite far and takes a long time, when it reaches the hands of large traders, it involves other marketing institutions, such as transportation companies; (4) Processing traders are marketing institutions that buy flying fish eggs that have not or have undergone processing at the wholesaler level. These sales-processing traders usually buy commodities owned by large traders in large quantities; (5) Exporters are marketing institutions that deal directly with consumers. This exporter is the spearhead of a commercial production process, meaning that the continuation of the production process carried out by marketing institutions is highly dependent on the activities of exporters in selling their products to consumers.

Flying Fish Roe Marketing Channels

The distribution or marketing channel is an organization's valuable device for making the production of goods or services available for consumption or use by consumers. There are three distribution channels: direct, semi-direct, and indirect. Direct distribution is a distribution system carried out directly from producers to consumers. Meanwhile, semi-direct distribution is usually done using agents who are experts in the field. Based on the results in the field, it can be explained that the flying fish roe marketing channel in Takalar Regency has three marketing channel patterns, namely as follows:

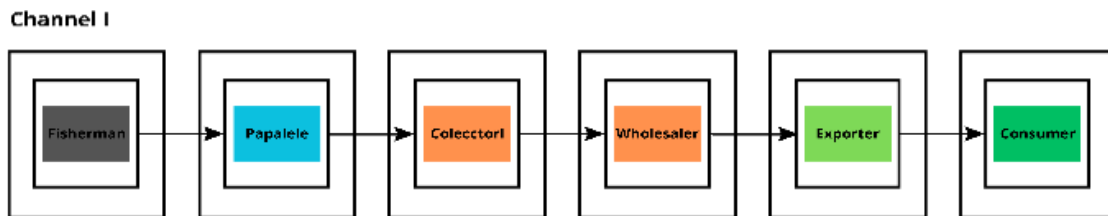


Figure 6. Marketing Channel I of Patorani Fishermen's Flying Fish Roe Business.

Based on the marketing channels above, it can be seen that: Marketing channels I; Fishermen with papalele (owners of capital) will directly give the catch of flying fish roe obtained to papalele. The flying fish roe in papalele is then sold to intermediary traders, large traders, and exporters to be marketed to consumers.

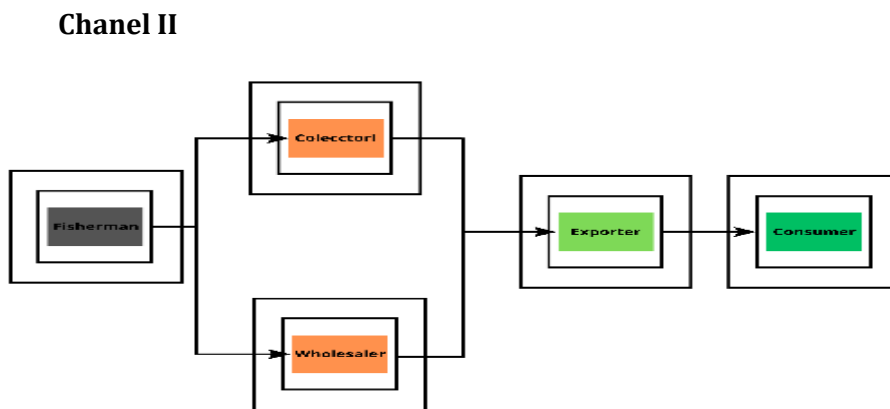


Figure 7. Marketing Channel II of Patorani Fishermen's Flying Fish Roe Business.

Marketing channels II; Fishermen who use their capital will sell the catch of flying fish roe to collectors. In using this capital, there is no discount on papalele / capital owners, from collectors to large traders through exporters and consumers.

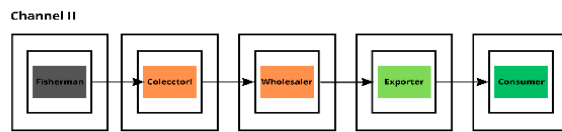


Figure 8. Marketing Channel III of Patorani Fishermen's Flying Fish Roe Business

Marketing channels III; Fishermen will sell to wholesalers and then resell to exporters after the flying fish roe has been processed. Finally, exporters sell abroad, depending on the contract with buyers outside the country.

Based on the marketing channel pattern above, the longer the marketing channel, the more marketing institutions are involved. It is just that for fishermen, the length of the marketing channel results in lower prices received due to the margins incurred by each marketing institution involved in the marketing of flying fish roe. Fishermen can get a higher price if they sell it directly to the processing fishermen. However, because there is no access to the collecting traders, the fishermen must sell their catch to the intermediary traders involved.

It can be seen in the three marketing channel patterns in this study that most of the patorani fishermen in Takalar Regency use marketing channel pattern I. Based on field conditions, the use of the dominant channel pattern is caused by the absence of sufficient costs in the process of catching flying fish roe. The expensive process of catching flying fish makes most Patorani fishermen experience capital difficulties. Hence, the solution chosen by patorani fishermen is to borrow capital from papalele. Marketing channels II–III are good and profitable for fishermen. It is just that the government must provide capital with low interest so that fishermen will be freer to sell their flying fish roe, which will affect fishermen's economic income.

The findings of the research conducted by Fernandez (2019) showed that the distribution pattern of the flying fish roe business is one-way following coworkers where fishermen market to papalele, then to intermediary traders, and intermediary traders to exporters. Additionally, each season's marketing of flying fish roe in marketing institutions is uneven due to shifts in how each institution cooperates. The distribution of fishery products is generally short, but this does not rule out the possibility of problems in the distribution process. The distribution channel's short length benefits the marketing institutions involved. However, it does not rule out the possibility of problems encountered in the process of marketing flying fish roe that affect the level of income in each marketing institution, with Brandišauskas (2020) stating that the distribution pattern of the flying fish roe business is one-way by coworkers, where fishermen market to papalele, then to collecting traders, and collecting traders to exporters. In general, the marketing channel in the research location is one-way, according to the partners or partnerships built by themselves. The penetration of capitalist modes of production in fisheries activities causes the articulation of modes of production (production power and production relations). It changes the social formation in the socio-economic life of the Patorani community in Takalar Regency (Lau, 2019).

Marketing Margin

Marketing margin is the difference between the price at the retailer (end consumer) level and the price at the farmer (producer) level (Nghia, 2020; Di Martino et al., 2019; Locke (nd). Marketing margin can be defined in two ways: 1) marketing margin is the difference between the price paid by consumers and the price received by fishermen. 2) marketing margin is the cost of marketing services required due to the demand and supply of marketing services. This component of the marketing margin consists of a) costs required by marketing institutions to perform marketing functions, called marketing costs or functional costs; b) the profit of marketing institutions.

Research results indicate that the marketing margin arising from marketing activities carried out at the research location can be seen in Table 1 below:

Table 1. Marketing Margin of Fly Fish Roe by Patorani Fishermen in Takalar Regency.

Marketing Institution	Channels I (Rp/kg)	Channels II (Rp/kg)	Channels III (Rp/kg)
1. Fisherman's Selling Price	1.000.000	1.030.000	1.050.000
Papalele/ owners of capital)			
• Purchase price	1.000.000		
• selling price	1.030.000		
• Margins	30.000		
2. Collector			
• Purchase price	1.030.000	1.030.000	
• Selling price	1.050.000	1.050.000	
• Margin	20.000	20.000	
3. Wholesaler			
• Purchase Price	1.050.000	1.050.000	1.050.000
• Selling Price	1.100.000	1.100.000	1.100.000
• Margin	50.000	50.000	50.000
Total	100.00	70.000	50.000

Source: Secondary Data After Processing (2022)

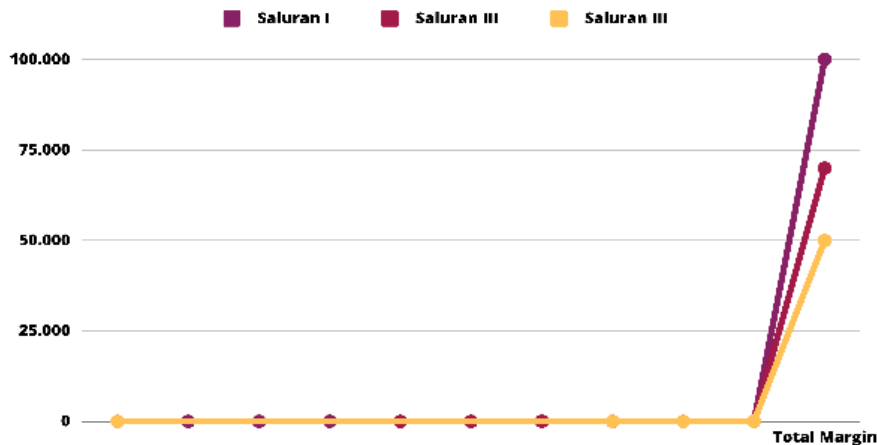


Figure 9. Marketing margin Flying Fish Roe

Source: Secondary Data After Processing

Based on Table 1 above, it can be seen that in marketing channel pattern I, fishermen sell their catch of flying fish roe to papalele for Rp. 1,000,000. The price received by fishermen has a price cut as a profit for papalele outside, with a deduction for profit sharing that has been agreed upon before leaving and going to sea. Papalele sells it back to the collecting traders at a price of Rp. 1,030,000. The collecting traders sell to large processing traders at a price of Rp. 1,050,000, and the large traders sell to exporters at a price of Rp. 1,030,000. The table above shows that there is a marketing margin of 100,000 in marketing channel I, and in channels II and III, as much as 70,000 and 50,000, respectively. Existing marketing channels influence the size and size of marketing margins; long marketing channels result in large marketing margins, and vice versa. Short marketing channels result in minimal margins. Furthermore, the shorter the marketing chain, the more profitable it will be for fishermen, and the more effective and efficient the existing flying fish roe marketing process will be.

The number of buying and selling sequences experienced by a commodity from when it is produced to the final consumer also affects the marketing efficiency of the products concerned. The greater the number of transactions experienced by an item before it reaches the final consumer, the greater the

marketing costs it incurs because each transaction is used as a source of profit for the perpetrator. The higher the marketing costs, the lower the efficiency of the marketing system (Kinsella, 2020).

Other research shows that a long marketing chain causes marketing margins to be large, so that marketing is inefficient or the competitive market mechanism is imperfect, so that the price share obtained by small fishermen (Khan, 2021). The longer the marketing chain or the large number of traders, the greater the marketing costs, so the price received by producers is getting smaller. In addition to these facts, the characteristics of fresh fishery products are quickly damaged or destroyed, and the lack of price information also causes fishermen's bargaining position to be weak in determining prices, so that fishermen can only act as price takers while marketing institutions act as price makers (Rojas Cabrera, 2019).

Marketing is considered efficient when two things are fulfilled: being able to convey the results of producers to consumers at the lowest possible price and providing a fair share of the overall price paid by the latter to all parties participating in the production process (Staff, 2012).

An efficient marketing system will benefit business actors involved in the production process from the production stage to the final sale. Marketing activities will run smoothly if high consumer purchasing power and proper distribution are supported. A long chain will result in high marketing costs. After all, each intermediary trader wants to make a profit to cover the marketing costs that have been incurred, which are a component in determining prices at the consumer level, thus affecting prices at the producer level because consumer purchasing power is still limited (Campbell, nd).

Conclusion

The fishermen's flying fish roe business is still identical to local wisdom framed in traditions that have been carried out for generations and are carried out before leaving and after catching flying fish roe. The operating system of patorani fishermen in Takalar Regency has two types of systems: fishermen operating around the waters of the Makassar Strait will return to the coast to give or sell their flying fish roe to the capital provider, or papalele, while patorani fishermen operate around the waters of Fak-Fak West Papua because the long distance does not make it easy for fishermen to return home, so fishermen deviate their catches; if the catch is a lot, then it will be sent to papalele in Makassar. The marketing of flying fish roe is carried out using three marketing channels. Fishermen provide catches to papalele (capital owners). Papalele sells to large traders, and large traders process them first for export to countries such as South Korea, Japan, Taiwan, and China. Furthermore, the marketing margin for marketing channel pattern I amounted to 100,000, and in channels II and III, as much as 70,000 and 50,000, respectively.

References

- Anderegg, J. (2020). *Role of the microbial community in production of biogenic amines in fermented foods and characterisation of a tyramine-reducing Lactobacillus plantarum strain* (Doctoral dissertation, ETH Zurich). [Online]. Available: https://www.research-collection.ethz.ch/bitstream/handle/20.500.11850/416694/4/Abstract_26532.pdf
- Arda H. & Alyürük, G. (2019). Effect Of Imazamox Usage On Phytohormone Levels In Sunflower (*Helianthus Annuus L.*) Cultivation," *Science Congress*. researchgate.net. [Online]. Available: https://www.researchgate.net/profile/Yalcin-Kaya/publication/367240686_BIALIC_2019_Full_paper_proceeding_book/links/63c83c9ad9fb5967c2e76da2/BIALIC-2019-Full-paper-proceeding-book.pdf#page=125
- Arief, A. A. (2008). Studi Mengenai Pengetahuan Lokal Nelayan Pattorani di Sulawesi Selatan. *Jurnal Hutan dan Masyarakat*, 3(2), 8208.
- Berg, I. (2019). *The Cycladic and Aegean islands in prehistory*. Routledge. [Online]. Available: <https://books.google.com/books?hl=en&lr=&id=T8yGDwAAQBAJ&oi=fnd&pg=PT16&dq=marketing+of+flying+fish+roe&ots=csjcf7xrn5&sig=r5Rbls-tvgRK19ZWaiogLIbsAM>
- Brandišauskas, D. (2020). Living with Reindeer Thirty Years After Socialism: Land Use and Large

- Reindeer Herding Among the Evenki of Southeast Siberia. *Journal of Ethnology and Folkloristics*, 14(1), 65-84. [Online]. Available: <https://www.ceeol.com/search/article-detail?id=936893>
- Caletrío, J. (2022). *Low-Carbon Birding*. Pelagic Publishing Ltd. [Online]. Available: <https://books.google.com/books?hl=en&lr=&id=GLSSEAAAQBAJ&oi=fnd&pg=PT8&dq=marketing+of+flying+fish+roe&ots=81tImMoK-9&sig=HGfaZhRo2bdPHQBeskmb412CZc0>
- Campbell, K. (nd). In the Victorian seafood industry. *Making the most of the catch...*, 151. [Online]. Available: <https://www.frdc.com.au/sites/default/files/products/1992-125.30-DLD.pdf#page=159>
- Capron, L. (nd) "The Spanish Dance," *stars.library.ucf.edu*. [Online]. Available: <https://stars.library.ucf.edu/cgi/viewcontent.cgi?article=1157&context=fhqRinaldi>, A. M., Yulianti, T., & Riandi, S. Z. (2021). Characteristics of Fish Protein Concentrate (FPC) of Marine Fish. *Asian Journal of Fisheries and Aquatic Research*, 13(1), 1-11.
- Chatterjee, N. S., Uchoi, D., Kishore, P., Nadella, R. K., & Panda, S. K. (2023). Orientation to hazards-Chemical-II (Contaminants & Pesticide). ICAR-CIFT. [Online]. Available: <https://krishi.icar.gov.in/jspui/handle/123456789/78397>
- Demmallino, E. B., & Ali, M. S. S. (2018). Patorani: Occultness, Religiosity, and Environmentally Friendly Technology of The Flying Fish Hunters. *Journal of Asian Rural Studies*, 2(1), 73-84.
- Di Martino, J., Nanere, M. G., & DSouza, C. (2019). The effect of pro-environmental attitudes and eco-labelling information on green purchasing decisions in Australia. *Journal of Nonprofit & Public Sector Marketing*, 31(2), 201-225, doi: 10.1080/10495142.2019.1589621.
- Fernandez, D. G. (2019). Food and Flavors. In *Tikim: Essays on Philippine Food and Culture* (pp. 6-59). Brill, [Online]. Available: <https://brill.com/view/book/9789004414792/BP000013.xml>
- García Cardiel, J., & Olmos Romera, R. (2021). The Pozo Moro reliefs (Chinchilla, Spain): A Mediterranean hero between east and west. *Oxford Journal of Archaeology*, 40(3), 250-267.
- Gómara. B., & Marina M. L., (2019). *Advances in the Determination of Xenobiotics in Foods*. books.google.com. [Online]. Available: https://books.google.com/books?hl=en&lr=&id=5409DwAAQBAJ&oi=fnd&pg=PP1&dq=marketing+of+flying+fish+roe&ots=NE_P6g5dpL&sig=utw0AdM00eSJG5MC_I2FdhZ5a_g
- Jewell J. & McRae W. C., (2020). *Moon Oregon*. books.google.com,. [Online]. Available: https://books.google.com/books?hl=en&lr=&id=cK6nDwAAQBAJ&oi=fnd&pg=PT5&dq=marketing+of+flying+fish+roe&ots=ONWamuZzRG&sig=4XLV32--_6H-tYyfzLZxDivCOAg
- Kaldheim, O., & Nordbotn, S. (2019). *Quantifying the Economic Impacts of Sea Lice and Sea Lice Mitigation Efforts on Norwegian Salmonid Aquaculture* (Master's thesis, University of Stavanger, Norway). [Online]. Available: <https://uis.brage.unit.no/uis-xmlui/handle/11250/2627754>
- Khan, B. Z. (2021). History Matters. *The Battle Over Patents: History and Politics of Innovation*, (28774), 319., [Online]. Available: <https://books.google.com/books?hl=en&lr=&id=nA3EAAAQBAJ&oi=fnd&pg=PA319&dq=marketing+of+flying+fish+roe&ots=OPuC7DQPLS&sig=R988YM-kkz9mFS3LY4bPtHKGtL0>
- Kinsella, J. (2020). The Fever Chart. *CounterText*, 6(1), 116-164., doi: 10.3366/count.2020.0185.
- Kushner. D., (2019). *The Players Ball: A Genius, a Con Man, and the Secret History of the Internet's Rise*. books.google.com,. [Online]. Available: <https://books.google.com/books?hl=en&lr=&id=39CMDwAAQBAJ&oi=fnd&pg=PA1&dq=marketing+of+flying+fish+roe&ots=wkg2wlN2yN&sig=60GOpnrK5PM-qNJ9IHfu52AfhNE>
- Lahiri, A., Daniel, S., Kanthapazham, R., Vanaraj, R., Thambidurai, A., & Peter, L. S. (2023). A critical review on food waste management for the production of materials and biofuel. *Journal of Hazardous*

- Materials Advances*, 100266. Available: <https://www.sciencedirect.com/science/article/pii/S2772416623000372>
- Lau, J. (2019). *The reef is our garden'expanding analysis of ecosystem services in coastal communities* (Doctoral dissertation, James Cook University). [Online]. Available: <http://researchonline.jcu.edu.au/60754>
- Locke J. M., (nd). "the new ham. pshire," *scholars.unh.edu*. [Online]. Available: https://scholars.unh.edu/cgi/viewcontent.cgi?article=4026&context=tnh_archive
- Messersmith-Glavin L., (2022) *Spirit Things*. books.google.com,. [Online]. Available: <https://books.google.com/books?hl=en&lr=&id=RD9zEAAAQBAJ&oi=fnd&pg=PP8&dq=marketing+of+flying+fish+roe&ots=nFnBEtP1Vd&sig=5qui8cB2JFPfjbtYw0tAeIv5aeI>
- Morris, P. A. (2019). Taxidermy undertaken by Sheals of Belfast. *Archives of Natural History*, 46(2), 332-346.
- Munekata, P. E., Domínguez, R., Pateiro, M., & Lorenzo, J. M. (2021). Introduction to food fraud. In *Food toxicology and forensics* (pp. 1-30). Academic Press.
- Nair. C., (2023). *Emerging Defence, Maritime and Aerospace Technologies by DRaS*. books.google.com. [Online]. Available: <https://books.google.com/books?hl=en&lr=&id=V3HBEAAAQBAJ&oi=fnd&pg=PR5&dq=marketing+of+flying+fish+roe&ots=F8qMBGAYj1&sig=bwyc3rLHWYw7USR5p81ikiI97Wg>
- Nghia, N. D. (2020). Seafood by-products: a new way from waste to high added value in pharmaceuticals and cosmetics. *Encyclopedia of Marine Biotechnology*, 2961-2986, doi: 10.1002/9781119143802.ch132.
- Prager, J. (2021). *The Family Roe: An American Story*. WW Norton & Company. [Online]. Available: <https://books.google.com/books?hl=en&lr=&id=EBg1EAAAQBAJ&oi=fnd&pg=PT185&dq=marketing+of+flying+fish+roe&ots=nDCwTKBjeR&sig=3hc-7bJYm1x48qQRcQHK2xQTeJI>
- Reinecke., S. & Noll L. J., (2023). Active Price Management. alexandria.unisg.ch. [Online]. Available: <https://www.alexandria.unisg.ch/bitstreams/e21a1a1d-f6f0-45c4-a814-338af63c332e/download>
- Riaz, S. (2022). *Arctic char-fisheries on land*. brage.inn.no, [Online]. Available: <https://brage.inn.no/inn-xmlui/handle/11250/3019299>
- Rogers, P., & Giannasio, M. (2020). On Wine and Food, Together. Available: <https://arrow.tudublin.ie/dgs/2020/Drinks/1/>
- Rojas Cabrera, A. E. (2019). Analysis of Economically and Environmentally Feasible Treatment for Giant Squid (*Dosidicus gigas*) Waste in Chile. [Online]. Available: <https://tsukuba.repo.nii.ac.jp/record/50816/files/DA09094.pdf>
- Rossignol L. J., (2023). Sargassum Systems: A Comparative Analysis of Policy Responses to the New Caribbean Seaweed Crisis," *William & Mary Environ. Law.*, [Online]. Available: <https://scholarship.law.wm.edu/wmelpr/vol47/iss2/10/>
- Schwandt, T. A. (1996). Qualitative data analysis: An expanded sourcebook. *Evaluation and Program Planning*, 1(19), 106-107.
- Sharma. Y., Mago. Y., & Rawal. V. (2022). The dynamics of the first wave of COVID-19 on environment and wildlife—a boon or a bane?," *Environ. Conserv.* ..., [Online]. Available: <https://journal.envirocnj.in/index.php/ecj/article/view/905>
- Singh, P. J., Batta, A., & Srivastava, S. K. (2023). Prospecting of Anti-Cancer Peptides (ACPs) from proteome of muscle tissue from Indian walking catfish, *Clarias magur* (Hamilton 1822) by Mass spectrometry and in silico approaches. *Food Chemistry Advances*, 2, 100200. [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S2772753X23000205>

- Smith P, (2020). "Year of the Monkey." Bloomsbury Publishing.
- Squeo A, (2021). Mending Fragments of the Self. The Bildungsroman as Kintsugi in Jack Maggs and Mister Pip," *Prospero. Riv. di Lett. e Cult. straniere*, [Online]. Available: <https://www.openstarts.units.it/items/0575a9de-6e31-40a5-bd31-a180b6eb94be>
- Staff, D. E. (2012). The Daily Egyptian, February 13,. [Online]. Available: https://opensiuc.lib.siu.edu/cgi/viewcontent.cgi?article=1003&context=de_February2012
- Stoops, P. J., & Stoops, B. S. (2019). *Texas Seafood: A Cookbook and Comprehensive Guide*. University of Texas Press. doi: 10.7560/318034.
- Sun, H., Song, Y., Zhang, H., Zhang, X., Liu, Y., Wang, X., ... & Xue, C. (2020). Characterization of lipid composition in the muscle tissue of four shrimp species commonly consumed in China by UPLC– Triple TOF– MS/MS. *LWT*, 128, 109469., [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S0023643820304588>
- Tishyn, I. (2021). *Organization of cargo handling at cargo terminal of Boryspil airport*. dspace.nau.edu.ua., [Online]. Available: <https://dspace.nau.edu.ua/handle/NAU/56754>
- Ward Sr, M. (2021). Gendering by design: The visual language of essentialism in evangelical material culture. *Interdisciplinary Journal of Research on Religion*, 17. [Online]. Available: <https://www.religjournal.com/pdf/ijrr17003.pdf>
- Woolf, N. H., & Silver, C. (2017). *Qualitative analysis using NVivo: The five-level QDA® method*. Routledge.
- Ye, H., Yang, J., Xiao, G., Zhao, Y., Li, Z., Bai, W., ... & Dong, H. (2023). A comprehensive overview of emerging techniques and chemometrics for authenticity and traceability of animal-derived food. *Food Chemistry*, 402, 134216. [Online]. Available: <https://www.sciencedirect.com/science/article/pii/S0308814622021781>
- Yu, X., Wang, Q., Lu, W., Zhang, M., Chen, K., Xue, J., ... & Shen, Q. (2021). Fast and specific screening of EPA/DHA-enriched phospholipids in fish oil extracted from different species by HILIC– MS. *Journal of Agricultural and Food Chemistry*, 69(28), 7997-8007.