Tuna Fisheries *Thunnus albacares* Small Scale In Kei Islands Moluccas Province

1Asri Sutanti 1Rachman Saleh 1Tual Surveillance For Marine and Fisheries Resources Base Ministry of Marine and Fisheries Affairs

**Abstract.** Potential of tuna fisheries in the Kei Islands is a source of livelihood for the local community. Studies on tuna fishing, processing techniques, fish processing units (UPI) and productivity of catches in the Kei Islands were analyzed descriptively so as to provide useful descriptions and information. Fishermen use vessels measuring less than 5 GT (Gross Tonnage) and hand line fishing gear. Tuna fishermen in the Kei Islands are fishermen of one day fishing. Tuna fishes are distributed to UPI which processes tuna to be tuna loin. The number of UPI tuna loin in the Kei Islands is 3 units. Processing techniques are carried out with very simple methods and equipment. Based on assets and turnover owned, it is categorized as small scale UPI. The UPI's compliance based on the provisions of fishery and marine legislation is categorized as a compliant UPI. The productivity of tuna caught by Kei Islands fishermen is 6.55 tons /ship /year. It's mean that in one year every Kei Islands tuna fishing vessel is able to produce 6.32 tons of tuna or 6,550 kg to be distributed to UPI tuna loin.

1 Introduction

Indonesia is a country that has very potential tuna resources. Tuna has a high economic value so it is used as one of the mainstay products of non-oil exports from the fisheries sector. Increasing demand for tuna in the world market provides opportunities for several regions in Indonesia to produce tuna in both fresh and processed products. One of the regions in Indonesia which has the potential potential of tuna fish resources is Maluku, especially in the Kei Islands. The Kei Islands include Tual City and Southeast Maluku Regency which have a positive impact on the economic wheels of the fishing community in Tual City and Southeast Maluku Regency, Maluku Province Kei Islands.

Considering the large number of tuna fisheries businessmen in the Kei Islands, it is necessary to conduct periodic monitoring of the fishing and processing activities of the tuna in each business location so that businessmen are always in accordance with the provisions of the fisheries applicable laws and regulations. In carrying out its supervisory duties in accordance with Law No. 45 of 2009 concerning Fisheries, Fisheries Supervisors have the duty and authority to oversee fishery product processing activities. Furthermore, the supervision of the fishery processing business unit is regulated through Decree of the Director General of Maritime and Fishery Resources Supervision Number: KEP.42 / DJ-PSDKP / V / 2010 concerning Technical Guidelines for Operational Supervision of Fish Processing, Transportation and Marketing Supervision.

2 Methodology

Implementation of data collection at the tuna processing unit in Tual City was conducted in 2018 on 3 tuna processing units.

Author provides an overview about tuna fishing activities of small fishermen catches that develop around the Kei Islands which include Tual City and Southeast Maluku Regency - Maluku Province covering tuna processing techniques, the level of compliance of tuna processing businesses in Tual City and Maluku Regency Southeast - Maluku Province and the productivity of tuna fish which are distributed out of the area based on the results of the supervision activities of the Tual PSDKP Base.
The equipment used in data collection and paper preparation is digital cameras, GPS, laptops, stationery, and transportation vehicles such as cars.

The material used in this paper is the result of surveillance activities of marine and fisheries resources carried out by the Tual Maritime and Fisheries Resources Supervision Base especially in Supervision of fisheries product processing activities in 2018. In addition, references are obtained from literature studies and Additional data from interviews with businessmen.

The writing method used is to collect primary and secondary data. Primary data were obtained from the results of supervision activities of the Tual Maritime and Fisheries Resource Supervision Base, especially Supervision data on the fisheries processing business unit in 2018 and direct survey methods in the field through interviews with fisheries businessmen who processing tuna fish. While secondary data was obtained from reports on the monitoring of fisheries processing business units around Tual City and Southeast Maluku Regency and information from the internet (website) and tuna distribution data from BKIPM Tual City.

Data analysis method used is descriptive method. Descriptive method is a method of writing that explains in detail the results of observations objectively then compared with the relevant literature.

3 Results And Discussion

Based on the types of tuna that exist in the world, tuna catches of fishermen who are distributed in fish processing units in the Kei Islands are classified as yellow fin tuna species Thunnus albacares.

Tuna is generally marketed as a fresh (chilled) product in the form of fresh whole gilled and gutted; as frozen products in the form of whole weed (frozen whole gilled and gutted), loin (frozen loin) and steak (frozen steak); and canned tuna products.

The process of processing tuna by the fish processing unit in the Kei Islands is in the form of tuna loin. The technique used in the processing uses technology and very simple methods. The equipment used is also very simple. The equipment used includes: manual scales of 100 kg capacity, cut / fillet knives, wooden tables, styrofoam.

The processing of tuna fish into loin through several stages as follows: a. Acceptance and weighing of fresh tuna raw material. The raw material of tuna catches of fishermen who have been loined into 4 parts per tail there are still some that still have skin and red meat so they must be processed further. Before the process loinning tuna, the raw material of tuna is weighed first so that its size is known and its quality checked to determine the purchase price of tuna to tuna fishermen. b. Tuna Loining Process. Tuna loining is a process of removing black meat and skin and tuna bones and spines. Tuna loin yield is the final result of processing tuna from the fish processing unit. c. Packaging of tuna loin products. The tuna loin product packaged in clear plastic for each piece of tuna loin. Tuna loin which has been packed in clear plastic is stored in a cool box which is chilled with crushed ice cubes. Tuna loin will then be sent and packaged again in styrofoam containing 25-30 kg per styrofoam. d. Storage of tuna loin products and tuna loin are ready to be shipped outside the region. The styrofoam delivery method is carried out because it makes it easy to disassemble and transport and does not change the chemical and microbiological characteristics of tuna loin during shipping.
Figure 1. Tuna Fish Processing Process at UPI Loin Tuna

(a) Weighing

(b) Remove bloodmeat and skin

(c) Packaging

(d) Storage
Receiving raw materials is done by fishermen after returning from fishing around 3am. Raw materials are directly processed into loin and will be shipped the same day. If raw materials are sent during the day, they will be processed and stored, and then distributed out of the area on the following morning. The distribution of tuna loin outside the Kei Islands region uses aircraft cargo facilities at Langgur Airport, Southeast Maluku Regency.

The Fish Processing Unit (UPI) is a place that is used to process fishery products, both those owned by individuals, or legal entities. The Fish Processing Unit that processes tuna catches by fishermen in the Kei Islands consists of 3 processing units. The data on the compliance of Tuna Fish Processing Unit in Kei Islands in 2018 are presented in Table 1 as follows:

Table 1. Data of Tuna Fish Processing Unit obedience in Kei Islands

| Address                                      | Piani/Sujono’s UPI (1) | La Hama/Hendra’s UPI (2) | Musaidin’s UPI (3) |
|----------------------------------------------|------------------------|--------------------------|-------------------|
| Address                                      | Jl. M. Ali Tamher       | Jl. Kiom Bawah Rtn       | Jl. Koom Tanjung Rtn |
| Subdistrict, City of Tual, Maluku Prov.     | 017/Rw 001 Tual         | 020/Rw. 001 Tual         | 020/Rw. 001 Tual   |
| SIUP number                                  | 02/IUP.B-C/II/19K       | 07/IUP.B-C/II/19K        | 24/IUP.B-C/II/19K  |
| The validity period of SIUP                  | During business         | During business          | During business    |
| SIUP Issuing Agency                          | Dinas Penananan Modal   | Dinas Penananan Modal    | Dinas Penananan Modal |
|                                             | dan Pelayanan Terpadu   | dans Pelayanan Terpadu   | dines Pelayanan Terpadu |
|                                             | Satu Pintu Maluku Prov. | Satu Pintu Maluku Prov.  | Satu Pintu Maluku Prov. |
| Issue Date of SIUP                          | January 8, 2019         | January 10, 2019          | January 23, 2019   |
| Number of Workers (People)                  | 5                      | 4                        | 8                 |
| Business Scale                              | Kecil                   | Kecil                    | Kecil             |
| Origin of Raw Materials                     | Traditional Fishermen   | Traditional Fishermen    | Traditional Fishermen |
| Use of Hazardous Food Additives              | No                      | No                       | No                |
| Types of Processed Products                 | Loin Tuna               | Loin Tuna                | Loin Tuna         |
| Purpose of Distribution of Processed Products| Makassar                | Makassar                 | Makassar          |

Based on table 1 number of fish processing units that process tuna processing with tuna the final product of tuna loin in the Kei Islands consists of 3 individual business units namely Piani / Sujono, La Hama / Hendra, and Musaidin. The three UPIs have been equipped with Fisheries Business Permit (SIUP) issued by the Investment Office and One Stop Services of the Maluku Province each with Number: 02 / IUP.BC / I / 19K; 07 / IUP.B-C / I / 19K; 24 / IUP.BC / I / 19K. In the process of processing tuna tuna loin not found the use of food additives that are dangerous and prohibited their use. The three UPIs have fulfilled the provisions of laws and regulations in the field of fisheries. Based on the provisions of Law Number 45 of 2009 concerning Amendments to Law Number 31 of 2004 concerning Fisheries Article 26 paragraph (1) that "Everyone who does fishing business in the field of catching, cultivating, transporting, processing, and marketing fish in the management area fisheries of the Republic of Indonesia are required to have a SIUP
(Fisheries Business Permit)”; it is further explained by article 92 that "Every person who intentionally in the territory of the Republic of Indonesia fisheries management carries out a fishery business in the field of catching, cultivating, transporting, processing and marketing of fish, who do not have SIUP as referred to in Article 26 paragraph (1), convicted with imprisonment a maximum of 8 years and a maximum fine of Rp. 1,500,000,000 (one billion five hundred million rupiah).

The tuna UPI in the Kei Islands is categorized as a small-scale UPI based on assets and turnover that is owned accordingly. The criteria for determining the scale of this business refer to the Minister of Maritime Affairs and Fisheries Regulation No. 37 / PERMEN-KP / 2016 concerning Business Scale of Fish Processing. Based on Article 5 (b) reads: Small-scale Fish Processing Business has a turnover of more than 300,000,000.00 (three hundred million rupiah) up to Rp. 2,500,000,000.00 (two billion five hundred million rupiah) every year.

The raw material for making tuna loin in the form of fresh tuna is obtained from the catch of traditional fishermen from the Kei Islands. These are one-day fishing or fishermen who carry out fishing operations 1-2 days departing to catch at night and return the next afternoon or evening. The vessels used for fishing operations are also small sized vessels <5 Gross Ton (GT) with tools catching trolling or stalling fishing. According to the Law of the Republic of Indonesia Number 45 of 2009 concerning amendments to the Law of the Republic of Indonesia Number 31 of 2004 concerning Fisheries that small fishermen are people whose livelihood is fishing to meet the needs of daily life that using fishing vessels with the largest size of 5 (five) gross tons (GT), so that fishermen in the Kei Islands are managed as a small fisherman.

Between the Fish Processing Unit and the traditional fishermen there is a partnership in the form of a group of fishermen. The form of this relationship is where the catch of tuna from fishermen is distributed directly to each UPI partner. UPI contributed to making FADs as a fishing tool for tuna fishing with a certain percentage according to the agreement between the UPI owner and a group of fishing partners. The number of fishing vessels that partner in each fish processing unit in the Kei Islands can be seen in table 2 below:

| No | UPI                  | Number of Partner Fishermen (Ships) |
|----|----------------------|-------------------------------------|
| 1  | Piani/Sujono’s UPI   | 13                                  |
| 2  | La Hama/Hendra’s UPI | 3                                   |
| 3  | Musaidin’s UPI       | 6                                   |
|    | Jumlah               | 22                                  |

Based on table 2 the total number of vessels that partnered with UPI in the Kei Islands were 22 fishing vessels measuring <5 GT. Consisting of 13 ships in partnership with UPI owned by UPI Piani / Sujono, 3 ships at UPI owned by La Hama / Hendra, and 6 ships at UPI owned by UPI Musaidin.

Loin Tuna is processed from fresh tuna by UPI in the Kei Islands. The marketing area for tuna loin is Makassar. Tuna loin is a raw material for companies in Makassar where the final product will be exported to Asia and Europe.
The amount of tuna loin distributed fluctuates depending on season and weather conditions. The facilities used to distribute tuna loin are air or cargo delivery services.

Table 3. Number of Tuna Fish Catches of Fishermen Distributed in the Tuna Fish Processing Unit in 2018

| No | Month | Number of Tuna Fish Results of Fishing Catches Distributed at UPI 2018 (Kg) | Amount (Kg) |
|----|-------|---------------------------------------------------------------------------|-------------|
|    |       | Piani/Sujono (1) | La Hama/ Hendra (2) | Musaidin (3) |              |
| 1  | January | 7,300 | 0 | 200 | 7,500 |
| 2  | February | 3,304 | 4,500 | 1,260 | 9,064 |
| 3  | March | 7,110 | 6,000 | 200 | 13,310 |
| 4  | April | 11,792 | 14,580 | 796 | 27,168 |
| 5  | May | 8,648 | 16,196 | 650 | 25,494 |
| 6  | June | 6,804 | 16,196 | 780 | 23,780 |
| 7  | July | 2,136 | 686 | 770 | 3,592 |
| 8  | August | 1,164 | 0 | 690 | 1,854 |
| 9  | September | 1,648 | 3,328 | 620 | 5,596 |
| 10 | October | 4,902 | 5,720 | 1,604 | 12,226 |
| 11 | November | 1,180 | 2,444 | 1,290 | 4,914 |
| 12 | December | 1,200 | 7,800 | 624 | 9,624 |
|    | Jumlah (Kg) | 57,188 | 77,450 | 9,484 | 144,122 |

Results of catching products of catching results of catching results of Tuna is the total amount of tuna by fishermen distributed to the fish processing unit. The tuna catches during the 2018 period can be seen in table 3.

The number of tuna fish distributed at UPI during 2018, especially at UPI in the Kei Islands reached 144,122 kg. As for the distribution in UPI owned by Piani / Sujono at 57,188 kg, UPI owned by La Hama / Hendra by 77,450 kg, and UPI owned by Musaidin by 9,484 kg (table 3)
Within 2018 tuna catches fluctuated each month. High catches were obtained in April, May, June, (figure 10). This is because in that month the fish stocks that migrated in the Kei Islands waters were quite high and the weather was in good condition so that many fishermen were carrying out tuna fishing operations. In April-June the Kei and surrounding areas are entering the west season, namely the wind coming from the west of the continent. [1] the number of longline tuna catches in one year fluctuates depending on the size of the boat GT and the price of fuel.

Productivity is the ability to produce something. Capture fisheries productivity is capture fisheries (ship / boat) productivity. Productivity in this case is the productivity of fishing boats in the Kei Islands that distribute tuna catches to fish processing units in 1 year.

Tuna productivity distributed in fish processing units is calculated using the following formula:

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\text{Productivity} = \frac{\text{Production (Tons)}}{\text{Number of Ships}}
\]

During 2018 the productivity of tuna distributed to fish processing units in the Kei Islands is 6.55 Tons / Ships / Year meaning that in one every year the Kei Islands tuna fishing boat is able to produce 6.55 tons of tuna or 6,550 kg to be distributed to the tuna loin processing unit. With a fleet of fishing boats were very traditional. Kei Islands have the potential water high enough to catch tuna.

4. Conclusion
Based on the results of the monitoring and discussion of small scale tuna fisheries in the Kei Islands of Maluku Province, it can be concluded that the Fish Processing Unit (UPI) in the Kei
Islands processes fresh tuna become to tuna loin. There are 3 units of UPI in the Kei Islands which will operate in 2018.

Compliance with tuna processing business in the Kei Islands is a obedient UPI because it has fulfilled the provisions of the legislation with SIUP ownership and found no dangerous food additives and their use is prohibited.

Tuna catches distributed at UPI in the Kei Islands in 2018 amounted to 144,122 kg or 144 tons. The productivity of fishermen's catch in one year for each fishing boat is obtained 6.55 tons / vessel fishing.

References
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