

Original Research Article

Economic Mapping of Small Fisherman In Dadap Village, Juntinyuat District, Indramayu Regency

ABSTRACT

Research on economic mapping aims to describe the economic condition of the community based on data to support the development of small-scale fishermen in Dadap Village. This research was conducted in Dadap Village, Juntinyuat District, Indramayu Regency. The research implementation started from March 12, 2023 to April 15, 2023. The method used in this research is a quantitative method using a questionnaire as the main data collection tool. The technique for taking respondents used purposive sampling with several criteria and the number of respondents was 36 people including fishermen and stakeholders in Dadap Village. The data analysis method used is quantitative descriptive analysis. The economic variables found were small fishermen using boats measuring 2GT–10GT with fishing gear including arad, rajungan nets, white pomfret nets, purse seine, gill nets, and gemplo. The cost of supplying fishermen at sea is 316,000 - 3,500,000 rupiah with income ranging from 650,000-14,200,000 rupiah according to fishing gear, length of time at sea, ship size, modern tools, and season. Economic factors that can support the development of small fishermen in Dadap Village are fish catches and fish auction facilities.

Keywords: Small Fishermen, Fishing Gear, Supplies Cost

1. INTRODUCTION

Economic mapping is a picture of the economy in a region. Economic mapping aims to determine the potentials that exist in the region. Knowledge of local potential will help in maximizing and improving the regional economy. Local economic potential, namely identifying sectoral economic potential, so that it can be utilized in the development of each sector or region [23].

The economic activities of coastal communities are dominated by capture fisheries activities based on their geographical position. Common occupations carried out in capture fisheries activities, namely fisherman. Article 1 paragraph (10) of the Fisheries Law Number 45 of 2009 states that fishermen is a person whose livelihood is fishing [32]. The definition of small fishermen is stated in article 1 paragraph (4) in Law Number 7 of 2016 which states that small fishermen are fishermen who catch to fulfill their daily needs, both those who do not use fishing boats and those who use large fishing vessels with a maximum size of 10 Gross Tonnage (GT) [33].

Indramayu is a regency in West Java Province which is located on the north coast of Java Island with a coastline length of 147 km². Indramayu contributes greatly to capture fisheries

with a total percentage reaching 40%. Indramayu Regency has 4 fish auction sites (TPI), namely TPI Dadap is located in Juntinyuat District, TPI Eretan Kulon and TPI Eretan Wetan are located in the Kalianhaur District, and finally TPI Karangsong is located in Indramayu District. There is a place to be brought ashore. Through this auction mechanism, the fishermen's catch price is more guaranteed and recorded.

Dadap Village is one of the villages in Juntinyuat District with an area of 2,418 km². Dadap Village has a population of 6,558 people (Dukcapil. Indramayu 2022). The majority of people in Dadap Village work as fishermen with a total of 4,964 people (2016 Village Data). According to the chairman of the Joint General Group (KUB) Mina Mandiri, Mr. Sui, as many as 535 of them work as boat owner fishermen.

Small fishermen carry out fishing activities to meet their daily needs. The shipping system in Dadap Village is one day fishing or shipping activities that are carried out once a day. The catch of small fishermen is given to customers who will buy it. The results of selling the catch of small fishermen to customers or middlemen (intermediary traders) has a negative impact on recording fishery production in Village Unit Cooperatives (KUD). This has become one of the factors that has unrecorded of capture fisheries production by small fishermen due to sales transactions conducted outside TPI. Inappropriate capture fisheries production data has had an impact on the input of fish resource allocation on the productivity of boats and fishing in Dadap Village. Besides that, it also has an impact on the uneven distribution of small fishermen, where there is a difference in the number of small fishermen between Technical Implementation Unit (UPTD) of Juntinyuat district and the Join Buseness Group (KUB).

2. METHODOLOGY

2.1 Research Methods

The research method used is survey method through quantitative data analysis. The survey method is a form of research approach activity with respondents to obtain some data, not in the form of the author's opinion but natural data [29]. Generally, the collection of this information is limited to a sample that can represent the entire population by using a questionnaire as a means of collecting data on the required variables. The type of data required includes primary data and secondary data.

The sampling technique to fulfill primary and secondary data is using purposive sampling. According to Sugiyono (2017), purposive sampling is a data sampling technique based on certain considerations [29]. Respondent criteria include "Fishermen": (1) Residing in Dadap Village, (2) Working as small fisherman owners or crew members (3) Ships operated with sizes ≤ 10 GT (4) Owner fishermen or labor fishermen, (5) Want to be interviewed and fill out a questionnaire Criteria for respondents. "Stakeholders": (1) Community heads or staff in the management sector (Dadap Village stakeholders, managers and port administrators), (2) Willing to be interviewed and fill out a questionnaire.

2.2 Data Analysis

The data analysis used in this research is quantitative descriptive analysis. Quantitative descriptive is done to find out the value of the independent variable without making comparisons using numbers, starting from data collection, data interpretation, and data appearance [13]. Analysis of research on economic mapping using descriptive analysis. Descriptive analysis is a description of the situation of phenomena including natural phenomena, and man-made phenomena in the form of activities, forms, changes, relationships, characteristics, similarities, and differences between one phenomenon and

another [28]. The descriptive method is used to describe the general economic condition of small fishermen in Dadap Village, Juntinyuat District, Indramayu Regency.

Research analysis to determine the economic factors that influence the development of small-scale fishermen using a quantitative approach is carried out by giving an assessment of the results obtained. Assessments can be given by people who are considered experts at the research location in order to strengthen the results of the researcher's observations. Assessment of the measurement scale using a Likert scale.

The Likert scale according to Sugiyono (2017), the Likert scale is a scale used to measure attitudes, opinions, and perceptions of individuals or groups related to phenomena that occur somewhere [29]. There are two forms of questions on the Likert scale, namely positive and negative questions with the following scores: positive questions are given a score of 4, 3, 2, 1 while negative questions are given a score of 1, 2, 3, 4. The answer form consists of strongly agree choices, agree, disagree, and strongly disagree.

Determination of scoring criteria using the following formula:

- a. Determine the highest percentage

$$\text{Highest percentage} = \frac{\text{Highest Score}}{\text{Highest Score}} \times 100\%$$

- b. Determine the lowest percentage

$$\text{Lowest percentage} = \frac{\text{Lowest Score}}{\text{Highest Score}} \times 100\%$$

To find out the response or assessment of respondents using the following formula:

- a. Determine the maximum total score = Highest score x Number of respondents

- b. Determine the minimum total score = Minimum score x Number of respondents

- c. Score presentation = $\frac{\text{Obtained total score}}{\text{Maximum total score}} \times 100\%$

Furthermore, after obtaining the score results, an interpretation of the score is carried out which includes each analysis of the data obtained from the respondents as follows:

Table 1. Percentage of scoring

intervals (%)	Criteria	
	Positive	Negative
0-25	Very Unsupportive	Very Inhibiting
26-50	Does not support	Hinder
51-75	Support	Not Inhibiting
76-100	Very Supportive	Very Uninhibited

2.3 Validity Test

In this study, the concept of credibility (internal validity) was applied with the aim of obtaining a level of confidence in the suitability between data and facts in the field. Testing the credibility of the data is done by extending observations, increasing persistence in research, and triangulation.

Triangulation is a technique of checking the validity of data by utilizing a multiple method approach or the presence of other data collection (various paradigms). In principle, triangulation is used to determine whether a data is appropriate in describing a phenomenon in a study. The type used in this triangulation method is the data collection technique. According to Bahri (2020) the data collection triangulation technique is as follows in Figure 1.

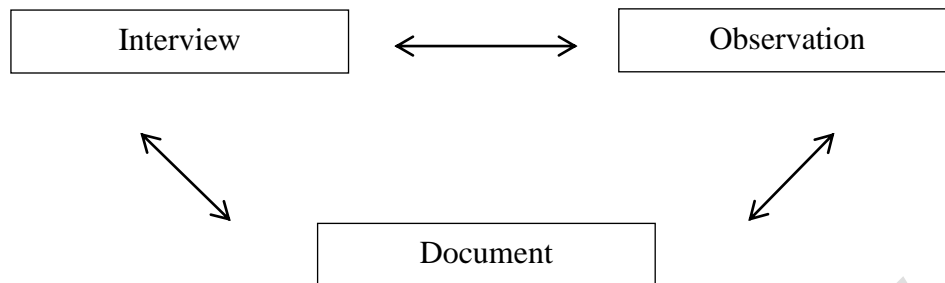


Fig 1. Triangulation with three data collection techniques

Transferability (external validity) is a research finding carried out in a group or area that can be applied to other groups. High transferability can be seen from the understanding of other people in reading research reports both in obtaining an overview and a clear understanding of the contents of the report [26].

3. RESULTS AND DISCUSSION

3.1 General Condition of Research Area

Geographically, Dadap Village is located between 6.436173'-6.450860' South Latitude and 108.452640'-108.473261' East Longitude (Figure 2). Administratively, Dadap Village is included in the Juntinyuat District, Indramayu Regency, with a village area of \pm 215 Ha and is located between the boundaries of the government administrative areas as follows:

- North : Bordered by the Java Sea
- East : It borders Sendang Village, Karang Ampel District
- South : It is bordered by Benda Village, Karang Ampel District
- West Side : It borders with Junti Kebon
- To the northwest : It borders with Juntinyuat Village

(2022 Village Profile Data)

The northern area of Dadap Village which borders the Java Sea has had a positive impact on activities in the fisheries sector. The Java Sea area (WPP NRI 712) is one of the fishing areas with the most dense number of small-scale fishing fleets [2]. This location supports Dadap Village to develop existing fishery activities, especially small-scale capture fisheries.

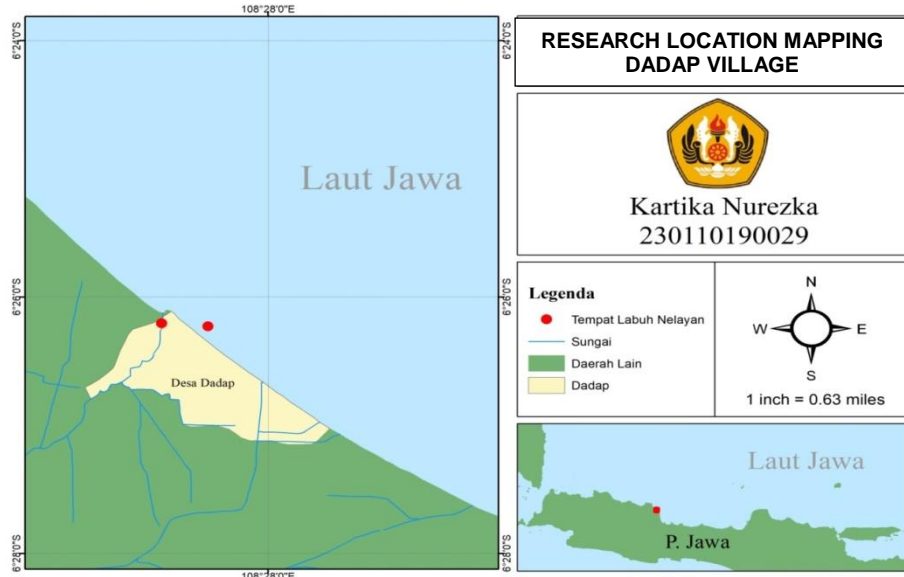


Fig 2. Location Map

3.2 Characteristics of Small Fishermen

According to respondents, the characteristics of small fishermen in Dadap Village include age, education level, employment status, fishing experience, number of family members, and work outside fishermen.

Table 2. Data on the characteristics of small fishermen respondents

No	Characteristics of Small Fishermen	Amount	Percentage (%)
1	Age (years)		
	15-24	1	3.33
	25-34	7	23.33
	35-44	5	16.67
	45-54	10	33.33
	55-64	6	20
	≥ 65	1	3.33
2	Level of education		
	SD	21	70
	JUNIOR HIGH SCHOOL	1	3.33
	SENIOR HIGH SCHOOL	7	23.33
	S1	1	3.33
3	Job status		
	crew	12	40
	Ship Owner	18	60

No	Characteristics of Small Fishermen	Amount	Percentage (%)
4	Sea Experience		
	0	2	6.67
	6-20	11	36.67
	21-35	7	23.33
	36-50	8	26.67
5	Number of Family Members		
	1-2	3	10
	3-4	14	46.67
	5-6	13	43.33
6	Jobs outside Fishermen		
	There isn't any	21	70
	Chairman of the organization	2	6.67
	Laborer	7	23.33

Source: Researcher Questionnaire Data 2023

a. Fisherman Age

The age of small fishermen in Dadap Village who are of productive age aged 20 to 54 are 23 people (76.6%), followed by fishermen aged 55 to 64 years who are 6 people (20%), and finally 1 person (3, 33%) of fishermen who are no longer productive (Table 2). According to Astiyani's statement (2022) ages 20 to 54 years are considered to have excellent physical condition and ability so they can work optimally [8].

b. Fisherman Education Level

The level of education influences the fishermen's mindset [22]. There were 70% of the small fishermen who graduated from elementary school (21 people), 23.33% junior high school graduates (7 people), 3.33% high school graduates (1 person), and 3.33% bachelor graduates (1 person) (Table 2).

Judging from the existing data, the education of small fishermen in Dadap Village is classified as low. The low education level of fishermen has an impact on the mindset and quality of fishermen who are less than optimal. This can affect fishermen's understanding of receiving the latest information and using the latest technology. [12].

Fishermen's understanding of determining the selling price of fish in the market is still low because fishermen are based on prices that have been determined by customers. This resulted in fishermen having difficulties in obtaining profits commensurate with the effort expended. In accordance with Astiyani's statement (2022), where the level of education is an indication of the level of poverty in society [8].

c. Job status

Employment status affects the position and income of fishermen [9]. Fishermen in Dadap Village are divided into three groups, namely business fishermen (langgan), mixed fishermen (labor fishermen or ABK), and full-time fishermen (owner fishermen).

Based on the employment status, many small fishermen rely on customers as the main support for fishing activities, due to the high cost of fishermen's supplies. In line with Muninggar's statement (2013) the dependence of fishermen on customers is one of the facts found in fishing ports and almost all traditional fishermen experience a lack of capital [16]. So many of the small fishermen or ship owners make loans to customers.

d. Sea Experience

Sea experience becomes an influence on the performance of fishermen in fishing. The longer the experience of going to sea, the more knowledge and skills fishermen will have in getting to know the characteristics of fish and the terrain at sea [14]. Most of the small fishermen have been fishing for more than 21 years (Table 2). This explains that the small fishermen in Dadap Village are very experienced in fishing.

The length of experience that fishermen have can affect the catch of fishermen. In accordance with Indara's statement (2017) the longer the fisherman's experience, the greater the fish catch and income earned [11]. Judging from the catches of fishermen at the study site, it is clear that boats measuring 2-6 GT can bring home catches of up to 300 kg as listed in the data in the appendix.

e. Number of Family Members

The large number of family members influences the fishermen's household economy. From Table 2, of the 30 respondents, 3 fishermen have 1-2 family members, 14 fishermen have 3-4 family members, and 13 fishermen have 5-6 family members. The number of small fishermen's family members is relatively large, so that it affects the expenditure of money in fulfilling daily life. The biggest monthly expenditure for small fishing families is up to 4,500,000 rupiah according to the results of interviews with fishermen and fishermen's wives.

The more the number of family members, the greater the responsibility of the household. This makes it difficult for fishermen to save money. Vice versa, the fewer family members are able to provide smaller dependents so there is an opportunity for fishermen to set aside money or savings. In line with Adiana's statement (2012) that the larger the household size, the more household members are able to increase the burden on the household in meeting their daily needs.

f. Jobs outside Fishermen

Work as a fisherman is often not able to meet the needs of daily life. Many of the labor fishermen do more than one job to meet their needs. Most of the owner fishermen do not work outside fishermen (Figure 3), while labor fishermen choose to look for other jobs.

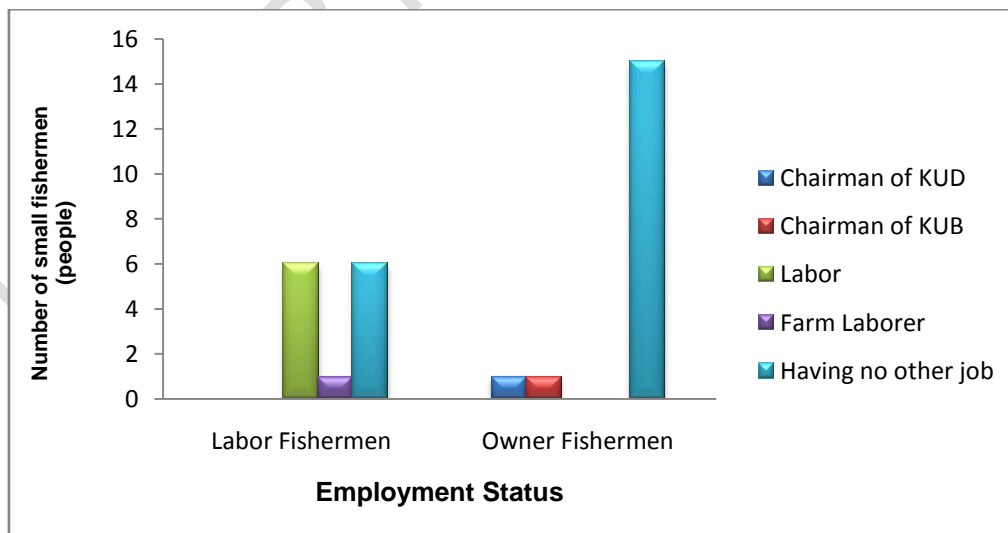


Fig 3. Bar diagram of work outside fishermen

The search for another job is a form of business carried out by fishermen in fulfilling their daily needs. As many as 7 out of 12 crew members do other jobs as farm laborers and casual laborers. This shows that small fishermen in Dadap Village have strategies to fulfill their lives by utilizing their physical strength and skills. As stated by Tambulon (2022) that the basic perspective of human adaptation strategies is being able to manage life to deal with various possibilities of everyday life [31].

3.3 Dadap Village Economic Mapping

The economy in Dadap Village is dominated by fishing activities, especially capture fisheries because of the village's position on the coast. The village community utilizes existing resources to fulfill their daily lives by doing work as fishermen. Economic mapping includes fishing infrastructure and fishing productivity.

3.3.1 Fishing Facilities

Fishing facilities are supporting tools used in fishing activities. Fishing facilities include the type of vessel, size of vessel, type of fishing gear, and fishing technology

a. Ship Type and Size

The type of vessel has a positive and significant effect on fishermen's production [35]. The types of ships in Indramayu are divided into 4 types, namely sope types, jegong types, dorit types, and asko types. Small fishermen in Dadap Village use the sope type. The sope ship is a type of wooden ship with a short and slightly rounded shape.

Fishermen in Dadap Village have two small fisherman groups based on the size of the vessel, namely 2-4 GT boats (small fishermen) and 5-10 GT boats (medium fishermen) (Table 3).

Table 3. Ship Type and Size

Ship Type Sope	Ship Size	
	2-4 GTs	5-10 GTs
Type of Fishing Gear	Arad Rajungan nets Gemplo Gillnets(gill net)	White Pomfret Nets Purse Seine(Ring Seine)
Distance and Sea Area	± 4 miles (Indramayu Area)	<ul style="list-style-type: none"> • ± 37 miles (sledding range) • ± 27 miles (Cirebon Area)

Source: Researcher Questionnaire Data 2023

Table 3 shows that vessels measuring 5-10 GT have long fishing distances. The larger the boat will affect the ship's ability to carry nets and the fishing ground range will expand [30]. A 5 GT boat with white pomfret fishing gear is the ship that has the farthest sea distance, namely ± 37 miles in the Eretan area. Vessels measuring 2-4 GT make the closest fishing at a distance of ± 4 miles in the Indramayu area. The choice of fishing location is one of the reasons fishermen choose long distances to go to sea. Each WPP has different characteristics in fish resources based on the environment [1].

b. Type of Fishing Gear

Based on observations, the types of fishing gear used in Dadap Village were arad, white pomfret nets, rajungan nets, purse seine, gill nets, and gemplo used by vessels <10 GT (Table 4). Most of the small fishermen in Dadap Village use three different fishing gears. The

fishing gear used is selected based on the most types of fish in a particular season according to Mr. Su'l as chairman of KUB.

The fishing gear used by fishermen has different mesh sizes and shapes. The size of the mesh and the length of the net can have an effect on the catch [4] [27]. Generally, the nets carried by fishermen are adjusted to the catch target and the size of the boat. Fish catches based on the fishing gear used are shown in Table 4.

Table 4. Fish catches based on fishing gear

Catching tool	Gear Size (meters)	Catch
Arad	15-20	Squid (<i>Loligo</i> sp.), Cuttlefish (<i>Sepia</i> sp.), and Shrimp (<i>Caridea</i>)
White pomfret net	2000-2500	White pomfret (<i>Pampus argenteus</i>), Pari (<i>Urogymnus polulepis</i>), and Kuro (<i>Polydactylus Octonemus</i>)
Rajungan nets	100-500	Rajungan (<i>Portunus pelagicus</i>), Cuttlefish (<i>Sepia</i> sp.), and Anchovies (<i>Stolephorus tri</i>)
<i>Purse seine</i> (ring seine)	180-400	Tembang (<i>Sardinella fimbriata</i>), Cob (<i>Euthynnus affinis</i>), Kuro (<i>Polydactylus Octonemus</i>), Talang (<i>Scomberoides lysan</i>), and Mackerel (<i>Scomberomorini</i>)
<i>Gill net</i> (gill net)	1500-2100	Kuro (<i>Polydactylus Octonemus</i>), Mackerel (<i>Scomberomorini</i>), Cob (<i>Euthynnus affinis</i>), and Talang (<i>Scomberoides lysan</i>)
Gemplo	100	Anchovies (<i>Stolephorus commersonnii</i>), anchovies (<i>Stolephorus indicus</i>), and gutters (<i>Scomberoides lysan</i>)

Source: Researcher Questionnaire Data 2023

The fishing gear that is widely used by small fishermen in Dadap Village is the Gemplo fishing gear with catches such as Anchovy (*Stolephorus commersonnii*), Anchovy (*Stolephorus indicus*), and Talang (*Scomberoides lysan*) according to port data for 2022. Anchovy is one of the catch commodities for small fishermen in Dadap Village because the catch is always available. Anchovy is a fishery commodity that has production availability throughout the year [6].

c. Arrest Tool

Fishing aids are tools used to facilitate the fishing process [25]. The implementation of fishing for small fishermen in Dadap Village still relies on instinctual abilities based on experience, such as determining where to catch fish, weather conditions, wind conditions, and what types of fish will appear in a certain month. Fishermen's knowledge is derived from the ability of their ancestors which facilitates and harmonizes fishermen with natural phenomena and symptoms when fishing [21].

Small fishermen in the river flow use tools in the form of boat engines (Dongfeng) and net pulling machines. The ship's engine used is a diesel engine with a power capacity of 24 PK (Figure 4).



Fig 4. Small fishing boat technology (2-4 GT)
(Source: Personal documentation)

Unlike the small fishermen (5-10 GT) who are at the port, many are already using technology such as GPS and Yukom. GPS is a satellite navigation system that can help find the exact geographical position of objects and show directions to coordinate locations that have been recorded [24]. GPS makes it easier for fishermen to find and catch fish without destroying the marine ecosystem.

Yukom is a useful tool for providing information on fishing grounds. In addition, yukom can function to inform weather conditions, send emergency signals, and can record fishermen's catches in the form of a digital logbook [10]. The following is the GPS and Yukom documentation attached in Figure 5.



Fig 5. Small fishing boat technology (5-10 GT)
(Source: Personal documentation)

The lack of technology used by small fishermen in Dadap Village has resulted in frequent catches that do not match the targets set prior to departure. It is not uncommon for fishermen who own boats to experience losses due to fishing income that does not cover departure capital. Of course, the development of modern technology is very helpful for small fishermen in achieving the desired target. In accordance with Yasrizal's statement (2017) the use of modern technology is very supportive in earning more catches [34].

3.3.2 Capture Productivity

Fishing productivity is a measure of the production capacity of a fishing gear against fishing effort [17]. The fishing productivity that will be explained is trips and length of time at sea, supplies costs, total income, and the selling price of the catch.

a. Trip and Long Fish Catching

Many sea trips undertaken by small fishermen are determined by the boat owner. The number of trips carried out was reviewed from several aspects including the provision of capital, ship condition, crew condition, and weather conditions according to the ship owner's statement. The following is the average monthly trip implementation according to the research results shown in Figure 6.

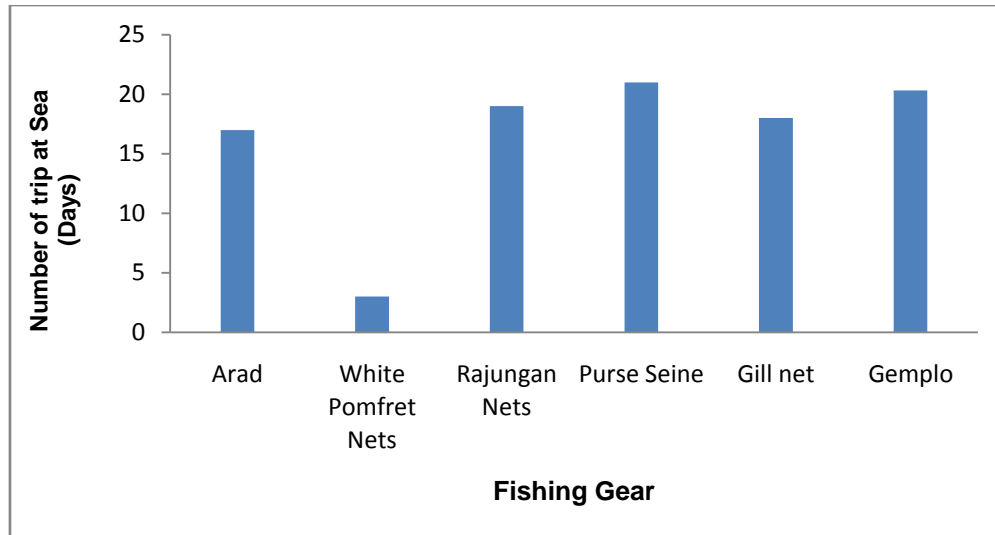


Fig 6. Average fishing trips for small fishermen

Fishermen with purse seine (ring seine) fishing gear are the most active fishermen in fishing with an average of 21 trips per month, followed by fishermen using gemplo fishing gear with an average of 20 trips per month. The number of trips made by small fishermen illustrates that fishing activities in Dadap Village apply a one day fishing system or a daily go system. Fishing time is done in the morning (05.00 – 16.00 WIB) or afternoon (17.00 – 04.00 WIB).

b. Supplies Cost

The cost of supplies is often a problem for some ship owners. The cost of supplies can be seen from the number of fishermen who sail, the amount of diesel fuel needed, and the need for ice cubes. The following is the average cost of supplies in terms of fishing gear and vessel size, shown in Table 5.

Table 5. The average cost of equipping small fishermen in Dadap Village

No	Catching tool	Ship Size (Gross Tonnage)	Average Supplies Cost (Rp)
1	Arad	2	316,666.67
		3	316,666.67
		5	3,500,000
2	White Pomfret Nets	2	175,000
		3	237,500
3	Rajungan nets		

No	Catching tool	Ship Size (Gross Tonnage)	Average Supplies Cost (Rp)
4	Purse Seine (Pukat Ring)	5	375,000
		6	525,000
5	Gill net	3	300,000
		4	325,000
		5	350,000
6	Gemplo	3	350,000
		4	425,000
		5	400,000

Source: Researcher Questionnaire Data 2023

The data attached in table illustrates that the larger the size of the ship, the more supplies costs that must be prepared, such as fuel requirements, consumption, and clean water requirements on board [7]. White pomfret net fishermen in Dadap Village spend a very large fee in one trip to sea, the cost of supplies that are spent reaches 3,500,000 rupiah. This happens because the duration of going to sea is quite long, namely 5-7 days. The high cost of supplies at sea reflects the length of time at sea [18].

c. Total Revenue and Selling Price of the Catch

The total income from sales of fishermen's catch varies according to the commodity caught and the place where the catch is sold. Dadap village has two locations for selling catches, namely at the customer base and TPI. Generally the selling price of fish at customers is cheaper when compared to the selling price at TPI.

According to KUB chairman Mr. Su'i's statement "The difference in the selling price between customers and TPI is only about one thousand to three thousand rupiahs". The selling price of the catch can be different because sales at TPI use an auction system where the selling price of fish can increase from the initial selling price that has been set. Following are details of the selling price of fishermen's catch to customers and TPI, presented in Table 6 below.

Table 6. The selling price of fishermen in Dadap Village

No	Catch Commodity	Selling Price (Rp/kg)
1	Subscribe	
	Squid	35,000
	Cuttlefish	52,000
	Rajungan	78,000
	Shrimp	30,000
	White Pomfret	270,000
	Pari	5,000
	Mackerel	62,000
Cob	16,000	

No	Catch Commodity	Selling Price (Rp/kg)
	Kuro	30,000
	Gutters	20,000
	Teri Nasi	37,000
	Teri Jengki	13,000
2	Fish auction	
	squid	58,500
	Cuttlefish	-
	Rajungan	-
	Shrimp	-
	Bawal/lowang	38,000
	Pari	-
	mackerel	35,500
	Cob	19,000
	Kuro	-
	Gutters	-
	Anchovy Rice	-
	Teri Jengki	16,500
	song	5,000
	Pepetek	3,000
	Ask	3,500
	Petek / petek	3,000
	Three Faces/drop	8,140

Source: 2023 Researcher Questionnaire Data and March 2023 Catch Production Data

Based on the results of interviews, different fishermen's income is influenced by several factors, namely fishing gear and weather conditions that occur during the implementation of fishing activities. In line with Lukum's statement (2023) that seasonal changes often hinder fishermen from achieving maximum income [15].

The income once out to sea for small fishermen with arad fishing gear ranges from Rp. 870,000 to Rp. 5,050,000, rajungan fishing gear ranges from Rp. 650,000 to Rp. 2,650,000, purse seine fishing gear ranges from Rp.1,774,000 to Rp.2,645,000, gill net fishing gear ranges from Rp. 780,000 to Rp. 2,650,000, and gemplo fishing gear ranges from Rp. 1,426,000 to Rp. 2,000,000. Meanwhile, income with white pomfret nets is approximately Rp. 14,200,000, a very significant difference in income occurs due to the length of time fishermen have been at sea. In line with Aryanto's statement (2017) that the variables of work experience, working hours, and mileage have a significant effect on fishermen's income [5].

3.3.3 Economic Stratification

Stratification based on wealth is seen from the economic aspect owned by the fishing community in Dadap Village (Figure 7). People with high incomes can be seen from the type of vehicle and the size of the house. The position of the top fishermen's wealth stratification is occupied by customers with an income of more than 60 million per month. At the middle level, fishermen who own boats measuring 2-4 GT with monthly income range from IDR 6,500,000 to IDR 50,500,000. The last position was occupied by crew members with a

monthly income ranging from IDR 450,000 to IDR 14,500,000. according to the statements of 30 respondents from owner fishermen and labor fishermen (ABK).

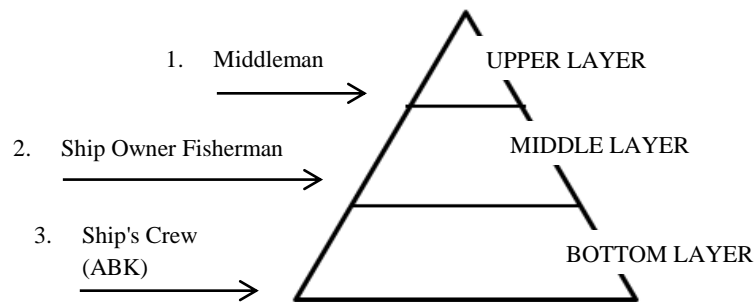


Figure 7. Wealth stratification pyramid

Figure 7 presents social stratification based on fishermen's income or wealth. The difference in the element of wealth among fishing communities causes a very visible difference in lifestyle. In accordance with Alfian's statement (2015) the level of wealth of community members shows quite clear differences [3].

3.3.4 Social Economic Conflict

The system for selling catches in the small fishing environment in Dadap Village begins with an agreement between the boat owner and the customer. This agreement gave rise to the emergence of power in the fishing trade sector. The emergence of customer power in the Dadap Village environment has an impact on the sales of fishermen's catches. The fixing of the selling price of fish is based on the number of fish caught by fishermen. One example of a case that occurs is when there is a harvest on one of the commodity catches resulting in an abundance of catches of that type. The abundance of a type of commodity resulted in a decrease in the selling price, this was due to the rejection of customers from outside Dadap Village who wanted to buy the catch by the original customers of Dadap Village through village government staff statements.

3.4 Supporting and Inhibiting Factors for the Development of Small Fishermen

Social and economic conditions in an area can be influenced by cultural conditions, religion, behavior, and community priority goals. Social and economic conditions can support or inhibit the development of small fishing communities in Dadap Village.

Several factors that support or inhibit the development of fishing communities can be caused from within the fishing community (internal) or from outside the fishing community (external). Based on the results of research in Dadap Village, there are several influencing factors listed in Tables 7 and 8.

3.4.1 Supporting Factors for Small Fishermen Development

Factors supporting the development of small fishermen according to research results seen from the economic factors of small fishermen. According to the results of interviews and observations, the economic factors that can support the development of small fishermen in Dadap Village are fish catches and fish auction facilities.

1) Fish Catch

The catch of small fishermen in Dadap Village can reach 300 kg for one trip. This illustrates that small fishermen in Dadap Village are able to get large catches only by using boat

engine technology. The fish catches of small fishermen in Dadap Village will be maximized if they use the latest technology. In line with Yasrizal's statement (2017) that the use of modern technology supports more catches [34].

2) Fish Auction Facility

The fish auction facility provided by the government helps to collect data on the production of fish catches in Dadap Village. Of course this can help the development of fishermen through economic growth of fishermen. In line with Palilah's statement (2020) that economic growth can advance people's quality of life [20]. So that the existence of a fish auction has an effect on the development of small fishermen in Dadap Village.

The following are 18 points of effort that can support development according to researchers based on the results of observations that have been made in the field. The number of points listed is an assessment given by government staff of Dadap Village, extension workers of Juntinyuat District and Indramayu Regency, Head of TPI business development sector of Indramayu Regency, and Head of KUD Dadap Village are shown in Table 7.

Table 7. Assessment of efforts that can support the development of small fishermen in Dadap Village

Code	Efforts That Can Support Development According to Research Observation Results	Criteria Score
FM1	Production of catches by small fishermen in Dadap Village	3.8
FM2	Performance of small fishermen in Dadap Village	3.6
FM3	The quality of the catches of small fishermen in Dadap Village	3.4
FM4	Income from the sale of fish caught by small fishermen in Dadap Village	3
FM5	Fishermen capacity building Improving fishermen's skills in carrying out fishing	3
FM6	Fishermen capacity building Increasing knowledge of fishermen on fisheries and trade	2.8
FM7	Fishermen capacity building Increased motivation to work fishermen	3.2
FM8	Improvements to fisheries systems in achieving existing policies	3
FM9	Improvement of fishing activity facilities in Dadap Village	3
FM10	Improved condition of the fishing fleet	3.4
FM11	Use of fishing technology	3
FM12	Improving fishery business services	3.4
FM13	Increasing access to information for small fishermen in Dadap Village	3
FM14	Management of Fish Resources (SDI)	2.8

Information:

- 4) Highly Supportive,
- 3) Support,
- 2) Not Support,
- 1) Highly Unsupportive.

In Table 7, through the calculation of the Likert scale, it is stated that the attempt at code FM1 is the most supportive first rank, followed by FM2, then in third place, namely FM3; FM14; FM16, in fourth place is FM10. In the fifth rank, there are 6 efforts that can support, namely FM4, FM8, FM11, FM13, FM15, and FM17. For efforts that are considered not very supportive, there are the last rankings, namely FM9 and FM18.

The production of fishermen's catches is considered to be the main factor that can support the process of efforts to develop small fishermen in Dadap Village. The higher the catch of fishermen, the higher the income of fishermen. Fishermen's income has a positive effect on increasing fishermen's economic activities [19]. The performance of fishermen is the second point that is considered important in the process of developing small fishermen. The quality of fishermen's work is one of the factors that can increase catches, one of which is the fishing experience of fishermen. The longer the experience the fisherman has, the greater the fish catch obtained [11].

3.4.2 Factors Inhibiting the Development of Small Fishermen

The inhibiting factors for the development of small-scale fishermen according to the results of the research and the number of points from the assessment of the government staff of Dadap Village, extension officers of Juntinyuat District and Indramayu Regency, Head of TPI business development sector of Indramayu Regency, and Head of KUD Dadap Village are shown in Table 8.

Table 8. Assessment of the inhibiting factors for the development of small fishermen in Dadap Village

Code	Development Inhibiting Factors According to Research Observation Results	Criteria Score
FP1	Selling the catch of small fishermen outside the Fish Auction Place (TPI)	1.8
FP2	Sales of fishermen's catch to customers or subscribers	1.4
FP3	The education of small fishermen is still low	1.8
FP4	Lack of technology used by small fishermen	1.6
FP5	Agreement to loan money to customers to meet the needs of sea supplies	1.8
FP6	Consumptive behavior of small fishermen	2
FP7	The condition of the fishing fleet is small	2.6
FP8	Occupational status of fishermen (between fisherman owners and fisherman workers)	2.6
FP9	Prohibition of entry of customers from outside Dadap Village by local customers	2.6

Information:

- 1) Very Inhibiting,
- 2) Inhibit,
- 3) Not Inhibit,
- 4) Highly Non-Inhibitory.

In Table 8, through the calculation of the Likert scale, it is stated that the factor in the FP3 code is ranked first, which is the most inhibiting, followed by FP5, then in third place, namely FP2; FP4; FP6, in fourth place, namely FP7. For factors that are considered not too inhibiting are in the last ranking, namely FP8, FP9, and FP10.

According to the results of the assessment in Table, the sale of fish catches to middlemen is considered to be very detrimental to small fishermen. This is because the sale of fishermen's catch outside TPI does not exist in port production data and the selling price of fishermen's catch at customers is below the TPI's price. The relationship between small fishermen and customers creates a sense of dependence on fishermen for loans that are easy to get [16]. So that the attachment between fishermen and customers is difficult to break.

4. CONCLUSION

Small fishermen in Dadap Village have two divisions of small fisher groups based on vessel size, namely 2-4 GT boats (small fishermen) and 5-10 GT boats (medium fishermen). The fishing gear commonly used are arad, rajungan nets, white pomfret nets, purse seine, gill nets, and gemplo. Small fishermen in Dadap Village are one day fishing fishermen (once a day sailing). The technology used by fishermen with boats measuring 2-4 GT boat engines (24 PK) and net towing machines, while many vessels > 5 GT already use GPS or Yukom. Operational or supply costs for fishermen at sea are 316,000–3,500,000 rupiah with income ranging from 650,000-14,200,000 rupiah according to fishing gear, length of time at sea, ship size, technology, and season.

Factors supporting the development of small-scale fishermen in Dadap Village are based on economic factors, namely the catch of fishermen and the existence of fish auction facilities. The main inhibiting factors that occur are the sale of catches by small fishermen to customers and the lack of technology used.

REFERENCES

1. Adam, L. 2017. Yellowfin Tuna Fishing Prohibition Policy: Impact Analysis and Solutions. *Journal of economics & public policy*, 7 (2), p. 215-227.
Available : [10.22212/jekp.v7i2.577](https://doi.org/10.22212/jekp.v7i2.577)
2. Akbar, MA, Kasim, K., Faizah, R., Suryanto, S., Nurulludin, N., and Hargiyatno, IT 2021. Utilization Status and Dynamics of the Java Sea Anchovy Ring Purse Fishery Based at TPI Pulolampes Brebes, Central Java. *Indonesian Fisheries Research Journal*, 27 (4), p. 217-227.
Available : <http://ejournal-balitbang.kkp.go.id/index.php/jppi/article/view/10735/7737>
3. Alfian. 2015. Social Stratification in Sekip Village, Limapuluh Kota Pekanbaru District. *Journal of Jom FISIP*, 2 (2), p. 12.
Available : <https://www.neliti.com/id/publications/32647/stratifikasi-social-di-kelurahan-sekip-kecamatan-limapuluh-kota-pekanbaru>
4. Anggrayni, FD, and Zainuri, M. 2022. The Effect of Differences in Mesh Size on Catches in Gill Net Capture Fisheries in the Waters of Sedayulawas Village, Lamongan Regency. *Juvenil: Scientific Journal of Marine Affairs and Fisheries*, 3(3), Pp. 85-92.
Available : <https://doi.org/10.21107/juvenil.v3i3.17073>
5. Aryanto, DA, and Sudarti, S. 2017. Analysis of the factors that affect the income of fishing workers at Sendangbiru Beach, Tambakrejo Village, Malang Regency. *JIE Journal of Economics*, 1 (1), Pg. 16-29.
Available : <https://doi.org/10.22219/jie.v1i1.5405>
6. Asfar, AMIA, Rifai, A., Nurdin, MI, Damayanti, JD, and Asfar, AIT 2021. Dried Anchovy Processing into Salted Gammi Floss. *DYNAMISIA: Journal of Community Service*, 5(1)
Available : <https://journal.unilak.ac.id/index.php/dinamisia/article/download/4488/2633>
7. Astarini, JE, Simbolon, D., and Indrayanto, A. 2020. The Need for Sea Supplies on the Bouke Ami Ship at the Nizam Zachman Ocean Fishing Port, Jakarta. *ALBACORE Journal of Marine Fisheries Research*, 4(3), Pp. 315-330.
Available : <https://doi.org/10.29244/core.4.3.315-330>

8. Astiyani, WP, Baswantara, A., and Alamsah, S. 2022. Socio-Economic Conditions of Bagan Fishermen Stepping on the East Coast of Pangandaran Waters, West Java. *Marlin: Marine and Fisheries Science Technology Journal*, 3 (1), Pg. 27-33.
Available : <http://ejournal-balitbang.kkp.go.id/index.php/marlin/article/view/10700/7729>
9. Bhaskara, AY, Wardana, IG, and Marhaeni, AAIN 2019. Effects of Education, Gender, and Employment Status on Workers' Income in Bali. *E-Journal of Development Economics*, 8(9), Pg. 1947-1976.
Available : <https://erepo.unud.ac.id/id/eprint/30745>
10. Farhum, SA, Paradhita, L., and Ihsan, YN 2020. Utilization of vessel multi aid (VMA) as a smart fishing technology for small scale fisheries. In *IOP Conference Series: Earth and Environmental Science*, 564 (1).
Available : <https://doi.org/10.1088/1755-1315/564/1/012081>
11. Indara, SR, Bempah, I., and Boekoesoe, Y. 2017. Factors Affecting Fishermen's Income in Bongo Village, Batudaa Pantai District, Gorontalo Regency. *AGRINESIA: Scientific Journal of Agribusiness*, 2 (1), Pg. 91-97.
Available : <https://doi.org/10.37046/agr.v2i1.2443>
12. Indasari, N. Factors Affecting Income Levels of Outboard Motor Boat Fishermen in Tamasaju Village, North Galesong District, Takalar Regency. Thesis. State Islamic University UIN Alauddin Makassar: 2017
13. Jayusman, I., & Shavab, OAK 2020. Quantitative descriptive study of student learning activities using Edmodo learning media in history learning. *Artifact journal*, 7(1).
Available : <https://doi.org/10.25157/ja.v7i1.3180>
14. Konoralma, S., Masinambow, VA, and Londa, AT 2020. An analysis of the factors affecting the income of traditional fishermen in the Tumumpa Village, Tuminting District, Manado City. *Efficiency Scientific Periodic Journal*, 20 (2).
Available : <https://ejournal.unsrat.ac.id/v3/index.php/jbie/article/view/30230/29226>
15. Lukum, R., Hafid, R., and Mahmud, M. 2023. The Effect of Seasonal Changes on Fishermen's Income. *Journal of Economic and Business Education*, 1 (1), Pg. 115-123.
Available : <https://doi.org/10.37479/jebe.v1i1.18687>
16. Muninggar, R., and Anggara, C. 2013. Factors Influencing Fishermen Selling Their Catch Outside Tpi Lampasing: A Policy Review. *PSP Bulletin*, 21(2).
Available : <https://journal.ipb.ac.id/index.php/bulpsp/article/view/25286>
17. Nelwan, AF, Zainuddin, M., and Kurnia, M. 2015 . Productivity of Catching Large Pelagic Fish Using Handline Based in Majene District (Large Pelagic Fisheries Productivity by Using Handline Based in Majene District). *Marine Fisheries: Journal of Marine Fisheries Technology and Management*, 6 (2), p. 129-142.
Available : <https://doi.org/10.29244/jmf.6.2.129-142>
18. Nugroho, I. 2017. Patterns of Interaction and Pluralism in the Life of the Sisters of the Franciscan Sisters of St Elisabeth (FSE) with the Karangasem Caturtunggal Santren Society. *E-Societas*, 6(2).
Available : <https://journal.student.uny.ac.id/ojs/index.php/societas/article/view/9086>
19. Nurbaya. The Effect of Fishermen's Income on Economic Improvement in Wewangriu Village, Malili District, East Luwu Regency, South Sulawesi. Thesis Faculty of Economics and Business, University of Muhammadiyah Makassar: 2019.
20. Palilah, IR Analysis of the Influence of Fishery Production, Cultivator Welfare, and Fish Consumption Figures on the GRDP of the fisheries sector (Case Study: Aquaculture in Six Provinces of Sulawesi Island Period 2014-2018). (Bachelor's thesis, Faculty of Economics and Business, Uin Jakarta): 2020.
21. Pamungkas, MI, Iftita, N., Salu, TI, Riefad, F., and Wijaya, Y. 2022. Knowledge of Palanra Fishermen in Catching Fish. *Anthropology Student Journal*, 1 (1), p. 1-12.
Available : <https://doi.org/10.31947/jma.v1i1.20196>

22. Parma., Hos, HJ, and Sarpin, P. Changes in the Mindset of Fishermen Communities towards Education (Study in Panimbawang Village, Bungku Selatan District, Morowali Regency) (Doctoral dissertation, Haluoleo University): 2018.
23. Prasetyaningsih, EDW 2015. Local Economic Development Strategy Based on Salakdi Commodities, Madukara District, Banjarnegara Regency. *PWK Technique (Urban Area Planning)*, 4 (4), Pp. 514-529.
Available : <https://doi.org/10.14710/tpwk.2015.9812>
24. Rianandra, R., Arsali, A., and Bama, AA 2015. Comparative Study of Determining Geographical Position Based on Measurements with GPS (Global Positioning System), Google Earth Map, and Navigation. *Net. Science research journal*, 17(2).
Available : <https://doi.org/10.56064/jps.v17i2.54>
25. Riswandi. Auxiliary Equipment for Fishing on the Purse Seine Ship KM. Mickey 207 Operating in Almahera Waters. Final Project, State Agricultural Polytechnic: 2020.
26. Rokhani, R. Qualitative Research: Case-Based Learning for Agricultural Extension Students. Faculty of Agriculture. UNEJ Press: 2023.
27. Rumpa, A. (2018). The Effect of Design Model and Capacity of Purse Seine Fishing Gear on Types of Fish Catches in FADs (Case Study of Bone Bay Waters). *Agrominansia*, 3(1), p. 30-40.
Available : <https://doi.org/10.34003/272000>
28. Rusli, M. 2021. Designing Basic/Descriptive Qualitative Research and Case Studies. *Al-Ubudiyah: Journal of Islamic Education and Studies*, 2(1), pp. 48-60.
Available : <https://doi.org/10.55623/au.v2i1.18>
29. Sugiyono. *Quantitative Research Methods, Qualitative, and R&D*. Bandung, Alfabeta, CV: 2017
30. Suryana, SA, Rahardjo, IP, and Sukandar, SS The Influence of Net Length, Ship Size, Machine Pk and Number of Crew on Fish Production in Purse Seine Fishing Gear in Prigi Waters, Trenggalek Regency – East Java (Doctoral dissertation, Brawijaya University): 2013
31. Tambulon, NSL, and Bathara, L. 2020. Adaptation Strategies of Traditional Fishermen in Fulfilling Family Needs in Kepenghuluan Panipahan, Pasir Limau Kapas District, Rokan Hilir Regency, Riau Province. *Journal of Coastal Socio-Economy*, 3 (3), p. 42-51.
Available : <https://sep.ejournal.unri.ac.id/index.php/jsep/article/view/111>
32. Law of the Republic of Indonesia Number 45 of 2009, concerning Amendments to Law Number 31 of 2004, regarding Fisheries. State Gazette of the Republic of Indonesia of 2009 Number 154. Supplement to State Gazette of the Republic of Indonesia Number 5073. 53 p.
33. Law of the Republic of Indonesia Number 7 of 2016, concerning the Protection and Empowerment of Fishermen, Fish Farmers and Salt Farmers. State Gazette of the Republic of Indonesia of 2016 Number 68. Supplement to the State Gazette of the Republic of Indonesia Number 5870. 62 p.
34. Yasrizal, Y. 2017. Analysis of traditional and modern fishermen's income in South Aceh District. *Journal of Tropical Fisheries*, 4(1), pp 23-32.
Available : <http://jurnal.utu.ac.id>
35. Yuliana, NNR, and Budhi, MKS 2021. The Influence of Number of Vessels, Types of Vessels, and Frequency of Going to Sea on Production and Income of Fishermen in Denpasar City. *Journal of Development Economics*, 10 (4), P. 1624-1655.
Available : <https://ojs.unud.ac.id/index.php/eep/article/view/56494>