



# **Social and Economic Analysis of Gillnet Fishermen in Karangsong, Indonesia**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

Indonesia is an archipelago with a diversity of sustainable fishery resources with economic value. This research was carried out in Karangsong village, Indramayu district, from September to October 2022 to analyze the welfare level of gill net fishermen in Karangsong village, Indramayu district. The method used is a descriptive case study with a quantitative approach. Data collection techniques were carried out by direct observation, and interviews were completed by filling out questionnaires of 30 respondents. Respondents were taken using a purposive sampling technique. The research parameters include ten welfare indicators summarized by the Central Statistics Agency (2015). The results of the research show that based on the welfare indicators according to the Central Statistics Agency (2015), it is known that the income of labor fishermen comes from wages from the fishery profit sharing system and other jobs with an average total income of IDR 5,086.667 per month. Meanwhile, total expenditures came from food and non-food spending, with an average of IDR 3,792,667 per month. Gill net fishermen in Karang song village are classified as

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having a high level of welfare, between a score of >2.31 and a total score of 2.76. Labor fishermen classified in high welfare were 27 respondents, while labor fishermen classified in moderate welfare were 3 respondents.

*Keywords: Welfare; labor fishermen; gill net; fisheries.*

## 1. INTRODUCTION

Indonesia is an archipelago with a very high diversity of aquatic biological resources. The sustainable potential reaches about 6.5 million tons per year with a utilization rate of 5.71 tons per year. Indonesia's marine economic potential is predicted to reach USD 1,338 billion annually [1]. One of the productive waters in Indonesia is the northern waters of the island of Java. Indramayu district is an area known as the highest fishing activity in the North of Java Island. In general, Indramayu district is an agricultural area and a fishing or maritime area. Fishermen supply more than 45% of West Java's marine fishery production in Indramayu district [2]. The length of the beach is 114 km, with the potential with important fishing potential [3]. In 2015, 61.50% of West Java's total marine fishery production came from Indramayu district [4]. According to the Department of Fisheries and Maritime Affairs of West Java Province, in 2015-2016, in Indramayu district reached 290.933.80 tons can be seen in Table 1[5]. The production is obtained from fishermen's catches, amounting to 40,545 fishing household (as many as 14.94% owners and 85.06% fishery workers) [6].

According to West Java Central Statistics Agency (WJCESA), the production data of captured fisheries products in Indramayu district in 2019 reached 167,474 tons can be seen in Table 2 [7].

Karangsong village, one of the top fish producing villages of Indramayu district is ± 4.5 km from the center of the capital city of Indramayu district. The fish landing site in Karangsong village is located around the coast of the Java Sea, which is located inside the shoreline. Karangsong village has fish production dominated by gill net fishing gear output. Approximately 80% of the total fishing units in Karangsong village are gill net fishing units [8].

Labor fishermen mostly use gill net fishing gear in fishing operations, the number of catches is one of the main factors in the income of labor fishermen in meeting their daily needs. Thus, the high fishing volume determines the payment of labor fishermen in Karangsong village. The low income of fishermen is caused by the dependence of labor fishermen on fishing activities; the selling price of fish received by labor fishermen is not large or very far from the market price [9].

**Table 1. Comparison of district capture fisheries production and fishing sites in West Java Province (tons)**

No.	District	Marine Fisheries		Public Waters		Total
		2015	2016	2015	2016	2015 - 2016
1.	Indramayu	136.048,30	139.048,20	7.259,70	8.577,60	290.933,80
2.	Cirebon	27.506,80	30.128,40	25,70	36,90	57.697,80
3.	Subang	14.879,20	23.428,30	428,90	191,00	38.927,40
4.	Sukabumi	14.913,70	10.236,10	211,30	381,00	25.742,10
5.	Karawang	7.369,80	4.588,30	486,40	52,40	12.496,90

*Source: Department of Fisheries and Marine Affairs of West Java Province (2016)*

**Table 2. Fishery production (tons)**

No.	District	Marine Fisheries	Public Waters	Total
1.	Indramayu	159.920	7.554	167.474
2.	Cirebon	30.399	14	30.413
3.	Subang	21.678	159	21.838
4.	Sukabumi	10.523	84	11.365
5.	Karawang	8.791	207	8.998

*Source: West Java Central Statistics Agency (2019)*

According to data from the West Java Central Statistics Agency (WJCESA), 2014-2016. Indramayu district is recorded as a population that has low welfare. The poverty percentage in West Java, Indramayu district, was 14.29% in 2014, 14.98% in 2015, and 13.95 in 2016. This condition of labor fishermen must be resolved to create equitable welfare and eradicate poverty. With this regard, this research aims to analyze the welfare level of gill net fishermen in Karangsong village, Indramayu district.

## 2. MATERIALS AND METHODS

This research was carried out in Karangsong village, Indramayu district, from September to October 2022. The research objective is to analyze the welfare level of gill net fishermen. The research method used is a descriptive case study with a quantitative approach. Data collection techniques were carried out by direct observation, and interviews were completed by filling out questionnaires of 30 respondents. Respondents were taken using a purposive sampling technique. The respondents' criteria fishermen groups who live in Karangsong village, labor fishermen groups who own or operate gill net fishing gear, labor fishermen groups who have families (consisting of wives or children), labor fishermen groups who sail outside Java Island, a group of labor fishermen who have >5 years of experience, a group of labor fishermen who are willing to be interviewed and can communicate well. The research parameters include ten welfare indicators summarized by the Central Statistics Agency (2015). The data used in this study are primary and secondary data. Primary data were obtained using interviews and questionnaires to get information on household income, household consumption and expenditure, living conditions, housing facilities, the health of family members, ease of obtaining health services from medical personnel, ease of enrolling children in education, ease of access to health care services, access to information and communication technology, quality of education of family members, children's sense of crime disturbance. Meanwhile, secondary data collected in the form of several previous research journals, data from related agencies or institutions, internet search results, the Department of Fisheries and Marine Affairs in Indramayu District and West Java Regencies, the Central Statistics Agency for Indramayu District and West Java Regencies, and other media information related to research.

## 3. RESULTS AND DISCUSSION

Data analysis includes classifying data based on variables and respondents, tabulating data based on variables from all respondents, presenting data for each variable studied, performing calculations to answer the problem formulation, and performing calculations to test the hypothesis proposed by Sugiyono [10]. Data analysis in this research uses ten welfare indicators summarized by the Central Statistics Agency (2015), including:

### 3.1 Household Income

Household income can be calculated by the following formula [11]:

$$TPRN = PN + PAN + PIN$$

Information:

TRPN = Household income (Rp/month)  
PN = Husband's income (Rp/month)  
PAN = Wife's income (Rp/month)  
PIN = Income from other sources (Rp/month)

The formula above concludes that household income is generated from three sources: husband's, wife's, and other sources.

### 3.2 Household Expenses

Household expenditure can be calculated by the following formula [12]:

$$Ct = C1 + C2$$

Information:

Ct = Total household expenditure (Rp/month)  
C1 = Household expenditure on food (Rp/month)  
C2 = Household expenditure on non-food (Rp/month)

The formula above concludes that household expenditure is generated from two sources, including household expenditure on food and non-food.

The following indicators that will be used as measurements of the welfare level of gill net fishermen can be seen in Table 3, with the determination of the level of welfare based on the final score, including the following [13]:

1. Score > 2.31 (high welfare level)
2. Score between 1.65 – 2.3 (medium welfare level)
3. Score between 0.99 – 1.64 (low welfare level)

**Table 3. Welfare indicators according to the Central Statistics Agency in 2015**

No	Welfare Indicator	Criteria	Score	Weight
1.	<b>household income</b>			
	a) Income is greater than the Regional Minimum Wage	Not poor	0.75	25%
	b) Income equal to the Regional Minimum Wage	Poor	0.50	
	c) Income is less than the Regional Minimum Wage	So poor	0.25	
2.	<b>Household consumption and expenditure</b>			
	a) Expenditure is less than income	Not poor	0.75	25%
	b) Expenditure equals income	Poor	0.50	
	c) Expenditure is more significant than income	So poor	0.25	
3.	<b>Condition of residence</b>			
	a) Roof: tiles (5)/asbestos (4)/zinc (3)/shingle (2)/leaf (1)	Permanent (score 15-21)	0.3	10%
	b) Room: wall (5)/half wall (4)/wood (3)/bamboo wood (2)/bamboo (1)	Semi-permanent (score 10-14)	0.2	
	c) Owned status: own (3)/rent (2)/ride (1)	Nonpermanent (score 5-9)	0.1	
	d) Floor: porcelain (5)/tile (4)/plaster (3)/wood (2)/earth (1)			
	e) Area: wide > 100 m <sup>2</sup> (3)/medium 50-100 m <sup>2</sup> (2)/narrow < 50 m <sup>2</sup> (1)			
4.	<b>Residential facilities</b>			
	a) Yard: spacious>100m <sup>2</sup> (3)/enough 50-100 m <sup>2</sup> ( 2)/narrow < 50 m <sup>2</sup> (1)	Complete (score 21-27)	0.12	4%
	b) Entertainment: Video (4)/TV (3)/ <i>tape recorders</i> (2)/radio (1)	Enough (score 14-20)	0.08	
	c) Cooling: AC (4)/refrigerator (3)/fan (2)/natural (1)	Less (score 7-13)	0.04	
	d) Source of electric lighting: electricity (3)/petromak (2)/lamp paste ( 1 )			
	e) Fuel: gas (3)/kerosene (2)/coal (1)			
	f) Water source: PAM (6)/bore well (5)/well (4)/spring (3)/rainwater (2)/river (1)			
	g) MCK: own KM (4)/public KM (3)/river (2)/garden (1)			
5.	<b>Health of family members</b>			
	Number of sick family members in one month	Fine (< 25% sick)	0.3	10%
		Enough (25-50% pain)	0.2	
		Less (> 50% sick)	0.1	
6.	<b>Ease of getting health services from personnel medical</b>			
	a) Distance to nearest hospital: 0 km (3)/0.01-3 km (2)/> 3 km ( 1 )	Easy (score 17-23)	0.15	5%
	b) Distance to polyclinic: 0 km (3)/0.01-2 km (2)/> 2 km (1)	Enough (score 12-16)	0.1	
	c) Cost of treatment: affordable (3)/reasonably affordable (2)/difficult affordable (1)	Difficult (score 7-11)	0.05	
	d) Treatment treatment: good (3)/enough (2)/poor (1)			
	e) Contraceptives: easy to get (3)/quite easy (2)/difficult (1)			

No	Welfare Indicator	Criteria	Score	Weight
	f) Family planning consultation: easy (3)/enough (2)/difficult (1)			
	g) Drug price: affordable (3)/enough (2)/difficult to reach (1)			
7.	<b>Ease of entering children into education level</b>			
	a) Tuition fees: affordable (3)/reasonably affordable (2)/difficult affordable (1)	Easy (score 8-9)	0.15	
	b) /0.01-3 km (2)/> 3 km (1)	Enough (score 6-7)	0.1	5%
	c) Admission procedure: easy (3)/enough (2)/difficult (1)	Difficult (score 3-5)	0.05	
8.	<b>Ease of accessing information and communication technology</b>			
	a) Ease of access: easy(3)/enough (2)/difficult (1)	Easy (score 6)	0.06	
	b) Access device: computer (3)/mobile phone(2)/public telephone (1)	Enough (score 4-5)	0.04	2%
		Difficult (score 2-3)	0.02	
9.	<b>Quality of education of family members</b>			
	a) Number of family members who can read and write: all(3)/some (2)/ none (1)	Good (score 6)	0.3	
	b) Number of family members who can complete basic education: all(3)/partial (2)/ none (1)	Enough (score 4-5)	0.2	10%
		Less (score 2-3)	0.1	
10.	<b>A sense of security from the interference of crime</b>			
		Safe	0.09	
		Safe enough	0.06	3%
		Not safe	0.03	

Source: Central Statistics Agency (2015)

### 3.3 Fisherman Characteristics

The characteristics of fishermen obtained in this research include:

#### 3.3.1 Fisherman status

Gill net fishermen in Karangsong village are divided into two categories: skipper fishermen and labor fishermen. Skipper fishermen are fishermen who have capital, ships, machines, and fishing gear. The skipper fishermen employ labor fishermen to operate the boat. Labor fishermen are fishermen who work as crew members (Children of the Ship). The skipper fishermen and labor fishermen generally share the results with 60% for skipper fishermen and 40% for labor fishermen. The skipper fishermen mostly do not live in Karangsong village, while labor fishermen live in Karangsong village and come from Indramayu district.

#### 3.3.2 Age group

Based on the data in Fig. 1, it can be seen that the age group of gill net fishermen is 19-28 years old with a percentage of 33%, 29-38 years old with a percentage of 33%, 39 -48 years old with a percentage of 30% and 49 - 58 years old with a percentage of 3%. The age group of gill net fishermen in Karangsong village is dominated by the age group of 19-38 years which means all fishermen are productive.

#### 3.3.3 Level of education

Based on the data in Fig. 2, it can be seen that the education level of gill net fishermen, gill net

fishermen with education not completed elementary school with a percentage of 10%, elementary school with a percentage of 67% and junior high school with a percentage of 23%. The education level of gill net fishermen in Karangsong village has low education, with dominant fishermen taking six years of education or elementary school.

#### 3.3.4 Number of family dependents

A large number of dependents in household life can affect the level of consumption that must be issued by the household concerned because it is related to its increasing needs [14]. The data in Fig. 3 shows that the number of dependents gill net fishermen with 1-3 dependents has a percentage of 77% and 4-6 dependents has a percentage of 23%. The number of dependents gill net fishermen in Karangsong village has several dependents.

#### 3.3.5 Work experience

Based on the data in Fig. 4 it can be seen that the work experience of gill net fishermen with 5-14 years of work experience has a percentage of 50%, 15-24 years of work experience has a percentage of 33%, 25-34 years of work experience has a percentage of 13% and 35-44 years of work experience has a percentage of 3%. The work experience of gill net fishermen in Karangsong village has a long work experience with an average experience of 5-14 years. The longer the work experience of fishermen, the more trained and skilled fishermen are in the fishing process.

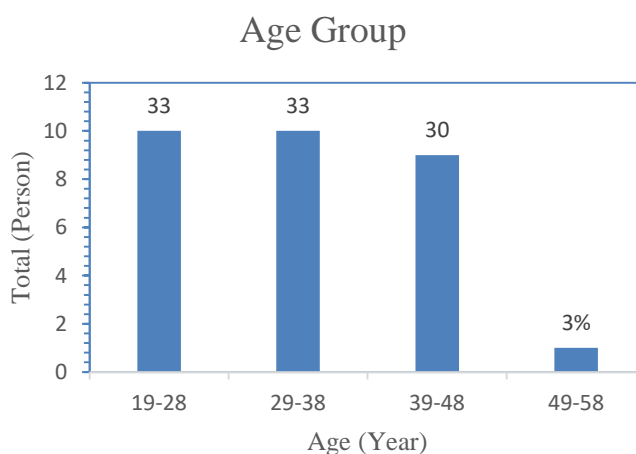
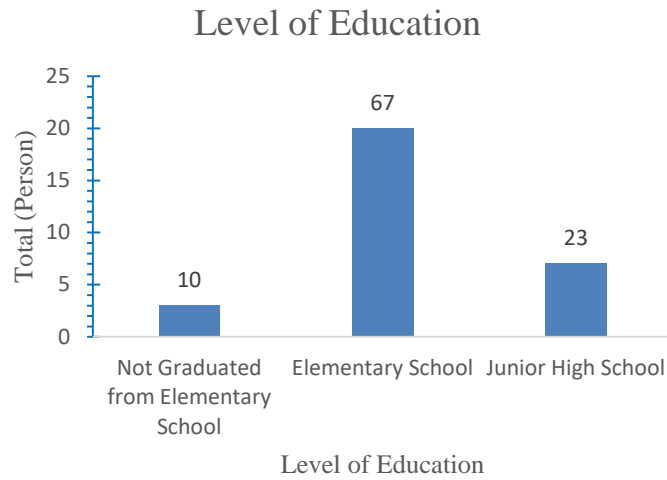
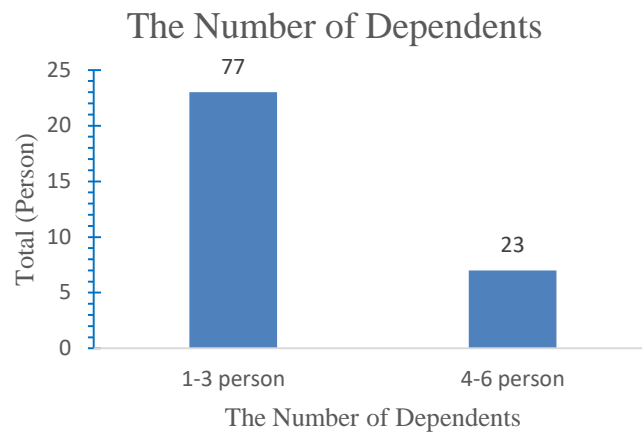


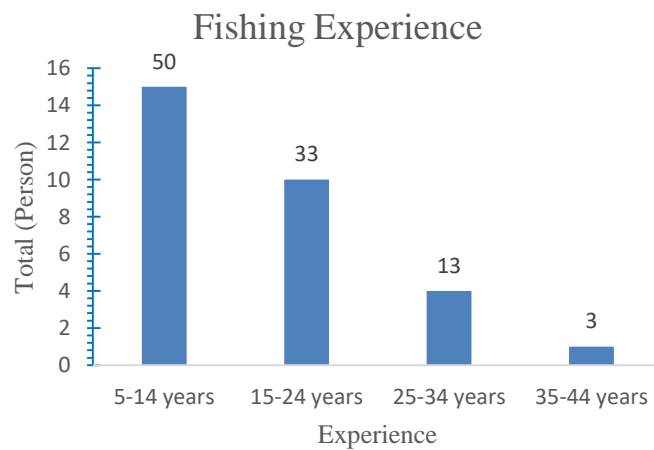
Fig. 1. Age group of gill net fishermen in Karangsong village



**Fig. 2. Education level of gill net fishermen in Karangsong Village**



**Fig. 3. Number of dependents gill net fishermen in Karangsong Village**



**Fig. 4. Work experience of gill net fishermen in Karangsong Village**

### 3.4 Central Statistics Agency Criteria

#### 3.4.1 Household income

Fishermen's income is the main source to meet their daily needs. Based on the research results, Table 4 shows the average monthly income of gill net fishermen in Karangsong village is IDR 5.086.667, so the income of gill net fishermen is higher than the Regional Minimum Wage of Indramayu district of IDR 2.391.567.

#### 3.4.2 Household expenditure

Household spending is grouped into two categories: expenditure on food and non-food. Based on the research results, Table 5 shows the average monthly expenditure of gill net fishermen in Karangsong village is IDR 3.792.667. In this case, total food expenditure is more significant than non-food expenditure.

#### 3.4.3 Residential status

Status of the residence is one indicator of the assessment of the level of welfare seen from the roof, property status, floor, cubicle, and area and then classified into three, namely permanent, semi-permanent and non-permanent. Based on the research results, gill net fishermen in Karangsong village have criteria for permanent residence in each of 28 families with a percentage of 93% and semi-permanent in each of 2 families with a rate of 7%.

#### 3.4.4 Residential facilities

Residential facilities are one of the indicators for assessing the level of welfare seen from the area of the yard, entertainment, cooling, water sources, toilets, sources of lighting, and fuel and then classified into three, namely complete,

sufficient and less. Based on the research results, gill net fishermen in Karangsong village have full housing facilities criteria in each of 26 families with a percentage of 87% and sufficient in each of 4 families with a rate of 13%.

#### 3.4.5 Health of family members

Health of family members is one of the indicators for assessing the level of welfare. The criteria for household health are seen from the number of household members who often experience illness in one month [15]. Based on the research results, gill net fishermen in Karangsong village have good family health. Unfavorable conditions will result in the disruption of every activity carried out.

#### 3.4.6 Ease of getting health facilities from medical personnel

Ease of getting health facilities from medical personnel is one of the indicators for assessing the level of welfare seen from the distance to the nearest hospital, distance to the polyclinic, treatment costs, drug handling, contraceptives, family planning consultations, and drug prices and then classified into three, namely easy, moderate and difficult. Based on the results of the research, gill net fishermen in Karangsong village have criteria for accessible health worker facilities in each of 16 families with a percentage of 53%, sufficient in each of 13 families with a rate of 43% and difficult in 1 family with a ratio of 3%. This is due to the distance between the local hospital and the polyclinic. The cost of treatment, handling, and the price of drugs vary as well as the use of different contraceptives and family planning consultations.

**Table 4. Average monthly income of gill net fishermen in Karangsong Village**

No.	Income	Unit	Value (IDR)
1.	Husband's income	Rp	4.450.000
2.	Wife's income	Rp	503.333
3.	Other income	Rp	133.333
	<b>Total income</b>	<b>Rp</b>	<b>5.086.667</b>

Source: Processed Primary Data

**Table 5. Average monthly expenditure of gill net fishermen in Karangsong Village**

No.	Expenditure	Unit	Value (IDR)
1.	Food expenditure	Rp	2.625.667
2.	Non-food expenditure	Rp	1.167.000
	<b>Total pengeluaran</b>	<b>Rp</b>	<b>3.792.667</b>

Source: Processed Primary Data



**Table 6. Recapitulation of welfare indicators for gill net fishermen in Karangsong Village**

No	Indicator	Average Score
1.	Household income	0.733
2.	Household expenses	0.658
3.	Residential status	0.293
4.	Residential facilities	0.115
5.	Health of family members	0.300
6.	Ease of getting health facilities from medical personnel	0.125
7.	Ease of entering children to education level	0.118
8.	Ease of accessing information and communication technology	0.041
9.	Quality of family education	0.290
10.	A sense of security from evil interference	0.090
<b>Total</b>		<b>2,764</b>

Source: Processed Primary Data

**3.4.7 Ease of entering children to education level**

Ease of entering children to education level is one of the indicators for assessing the level of welfare seen from school fees, distance to school, and admission procedures and then classified into easy, moderate, and challenging. Based on the results of the research, gill net fishermen in Karangsong village have the criteria of ease of entering children into education with easy criteria in each of 11 families with a percentage of 37% and sufficient in each of 19 families with a rate of 63%.

**3.4.8 Ease of accessing information and communication technology**

Ease of accessing information and communication technology is one indicator of the level of welfare assessment seen from the ease of accessing information and communication technology and the access tools used and then classified into three, namely easy, moderate and difficult. Based on the research results, gill net fishermen in Karangsong village have the criteria for easy access to information and communication technology with easy criteria in each family with a percentage of 3% and sufficient in each of 29 families with a rate of 97%.

**3.4.9 Quality of family education**

Quality of family education is one indicator of the level of welfare assessment seen from families who can read and write and families who complete basic education—then classified into three, namely good, sufficient, and less. Based on the research results, gill net fishermen in Karangsong village have family education quality

criteria with good criteria in each of 27 families with a percentage of 90% and sufficient in each of 3 families with a rate of 10%.

**3.4.10 A sense of security from evil interference**

A sense of security from evil interference is one indicator of the assessment of the level of welfare. They were then classified into three: safe, moderately safe, and unsafe. All criminal acts in terms of body, soul, property, honor, and others are threatened with imprisonment and confinement [15]. Based on the research results, gill net fishermen in Karangsong village have never experienced a crime or are categorized as safe from criminal interference.

Table 6 shows the recapitulation of welfare indicators for gill net fishermen in Karangsong village, which are included in the high welfare group with an average welfare level score of 2.76. This is based on calculations in the ten welfare indicators according to the 2015 Central Statistics Agency.

**4. CONCLUSION**

The income of labor fishermen comes from wages from the fishery catch-sharing system and other occupations, with an average total income of IDR 5.086.667 per month. Meanwhile, total expenditures came from food and non-food spending, with an average of IDR 3.792.667 per month. Labor fishermen in Karangsong village, Indramayu district, belong to the high welfare level with a score of 2.76. Labor fishermen classified in high welfare were 27 respondents, while labor fishermen classified in moderate welfare were 3 respondents.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Ministry of Marine Affairs and Fisheries. KKP Estimation Data. Ministry of Maritime Affairs and Fisheries. Jakarta; 2020.
2. Department of Fisheries and Marine Affairs of Indramayu District. Study of Demersal and Small Pelagic Fishing Areas. Indramayu: DKP Indramayu; 2014.
3. Darmadi. Qualitative Research Methodology. Bandung: PT. Youth Work; 2013.
4. West Java Central Statistics Agency. West Java in Figures in 2015. West Java Central Statistics Agency. Bandung; 2015.
5. West Java Central Statistics Agency. Fisheries Production Data (Tons). West Java Central Statistics Agency. Bandung; 2019.
6. Indramayu District Central Statistics Agency. Indramayu District in 2015 Figures. Indramayu District Central Statistics Agency. Indramayu; 2015.
7. West Java Fisheries and Marine Service. Comparative Data on District/City Capture Fisheries Production and Fishing Places in West Java Province (Tons). Indramayu: DKP Indramayu; 2016.
8. Department of Fisheries and Marine Affairs of Indramayu District. Fleet Potential Data. Indramayu: DKP Indramayu; 2010.
9. Anisa Y, Zulfikar A, Raza'i TS. Fishermen's Income in Indramayu District, West Java Province. 2015;2(1):1-11.
10. Sugiyono. Quantitative Research Methods. Bandung: Alfabeta; 2017.
11. Central Statistics Agency. Indicators of Household Welfare. Central Statistics Agency. Jakarta; 2015.
12. Irawan, B. Analysis of Farmers' Household Income and Welfare Levels in Marginal Agroecosystems of Rainfed and Dry Land Types in South Lampung District. Thesis. Lampung University: Bandar Lampung; 2014.
13. Firdaus M, Apriliani T, Wijaya RA. Fisherman's household expenditure and its relation to poverty. Journal of Fisheries and Marine Social Affairs. 2013;8(1).
14. Lestari WP. Analysis of Factors Affecting Household Consumption of PNS Elementary School Teachers in Kota Anyar District, Probolinggo District. Article. Brawijaya University. Poor; 2016.
15. Central Statistics Agency. Household Welfare Indicators. Central Statistics Agency. Jakarta; 2015.

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