

# Distribution Patterns and Household Food Security Fishermen in the Village Sengkol

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**Abstract:** *In detail, this study aims to: 1) describe patterns of distribution and allocation of working time, patterns of production and consumption patterns of households of fishermen; 2) to test the effect of the determining factors of the household food security of fishermen. This research use descriptive method and is designed in the form of survey. The study area is from 11 coastal villages there been one village in Sub Pujut ie Sengkol village. Determination of the village is deliberately based on coastal areas of potential for the development of seaweed. Households fishermen into the sample were selected by random sampling of 30 households of fishermen. The data have been collected and then classified for further analysis: 1) To determine the pattern of distribution and allocation of working time, patterns of production (income) and the pattern of consumption (expenditure) of households were analyzed descriptively. 2) To estimate the influence of the independent variables on household food security of fishermen analyzed by logit regression. The study concluded the following: 1) The distribution pattern of working time used for activities Household fishermen catch fish in the sea, as a trader, as labor or services. The average working time devoted during the year totaling 1,348 hours or days 192.57 or 3.69 hours per day. 2) The pattern of the distribution of household income derived from the activities of fishermen looking for fish in the sea, trade, and labor or services. The average household income of fishermen during the year amounted to Rp 24.212.533,33. 3) The distribution pattern of household expenditure fishermen divided into expenditure on food and non-food. Average household expenditures during the year amounted fishermen Rp19.663.700,00. 4) Determinants of household food security is a household income of fishermen household*

**Keywords:** working time, production, consumption, the determinant factor, spending Description: 1) 2) 3) = Researchers and institution

## 1. Introduction

Although the potential for coastal and marine resources in Central Lombok regency is relatively large, but the carrying capacity to obtain catches are still very limited. Moreover Peppermint Marine and Fisheries No. 1 2015 has been limited in catching some fish species such as lobster, crab, and crab. This of course will further reduce the catch of the fishermen. Most fishermen use fishing gear that is still modest, especially means of transportation such as boats or motor boats. According to data from the Department of Marine and Fisheries of the Province of West Nusa Tenggara (2012) states that the number of households of fishermen in Central Lombok regency which use a boat without a motor as much as 842 pieces, then the use of the outboard as many as 658 pieces, and the use of motor boats as much as 9 pieces, the remaining 55 pieces without a boat.

This condition indicates that the fishermen's ability to generate income from the fishing industry is still relatively low. Low income is also due to the limited time at sea for fishing time, which is approximately 9 months of the year. Report of Fisheries and Maritime NTB in 2012 mentioned that production of fish caught in Central Lombok regency achieved at 1645.75 tons, the income of fishing communities in Central Lombok regency is still relatively low. With the income of the shows fishermen in Central Lombok regency classified as poor. This is made clear by Pambudy et al (2000) which states that most coastal communities are socio-economic in poor and disadvantaged compared to other people, whereas the potential of marine resources owned generally relatively rich.

In structural fishing communities and economic activities of fisheries, such as those described in Heliyana and Husni Firth (2007) has similarities with the economic system farmers. The fundamental characteristics of Community producers are small-scale nature of its business with the equipment and organization of the market are simple, mostly relying on subsistence production, and has a style and a level of diversity in its economic behavior. Although the characteristics of the production activities of fishermen and farmers are different, but in some ways there are similarities that are common. Both communities are economically vulnerable to the onset of the uncertainty related to income and household food security.

Results Suparmin study (2014) revealed that the factors that affect household food security of farmers is household expenditures, education housewives, and household income. This means increasing household income will affect the resilience of households. To earn the extra income households have to look for another job outside the main job. The study results Suparmin and Siddik (2010) also revealed that the farmer household member who works as a Labor Indonesia have caused expenditure and household income increases. This means that with the economic conditions limited housekeeping caused household members to look for work outside their farming activities, so that work outside of the main activities contributing to changes in behavior and spending and household income.

Research on the program increased income and household food security through the application of models fishermen seaweed cultivation will be approached with the theory of subjective equilibrium (subjective equilibrium theory). This

theory was first proposed by Nakajima (1969) using farm household as the unit of analysis. In theory, it is assumed that labor could be traded, allowing fishermen to work out the business of fishermen. The job market is assumed in a state of perfect competition. Fishing effort is considered as companies seeking to maximize profits, and labor is considered as workers who are trying to maximize the satisfaction or utility. Utility is defined as a function of the amount of household labor time within a certain time and the income earned in the same period with obstacles income earned from work. Subjective equilibrium is reached when the marginal product of labor in fishing effort and marginal product of labor outside of fishing effort equal to the wage rate.

Model subjective equilibrium Nakajima above, further developed by other experts, such as Kuroda and Yotoupoulos (1980) by separating the sides paoduksi the consumption side. On the production side, efforts to maximize benefits to reduce supply on output and demand for labor. Both are a function of the level of wages, the prices of goods, capital. From the consumption side, the effort to maximize the utility to reduce the supply of labor is a function of the level of wages, output prices, profits, number of family members working, the number of family members and income from outside the shedding of labor.

Reynolds (1978), suggests that the allocation of working time is influenced by many factors, including by: (a) the pattern of life, (b) ownership of productive assets; (C) socio-economic conditions; (D) the wage rate; and (e) the inherent characteristics of each individual. The pattern of life implies a very wide and was formed by a variety of conditions attached, such as the factor of ethnicity, religion and how neighbors. The inherent characteristics of each individual can be reviewed on the age, level of education or expertise.

According to Evenson et.al. (1980) working time allocation of household members in addition affected by the level of wages, the price of raw materials purchased in the market, .The price of production factors in the household, such as skills, capital and technology are also income households outside working hours. Revenue from outside of the outpouring of the workforce, according to Shand (1986) comes from property rental income from assets such as land, houses or goods; and can also transfer income, such as subsidies, gifts.

According Sudibyo (1995), production or productivity is a function of labor, capital and skills. For poor households, the capital of which is owned only labor, so it can hardly be expected to compete with households that controls capital and skills. Therefore, the results of work outside the fishing is expected to boost domestic economic activity.

As a fisherman's household is certainly a decision to take chances and opportunities to increase productivity and family income is highly dependent on the behavior of households own and the value system that has developed in the middle of society. According to King in Halide (1981) in the theory of household economy (household economics theory) considers that the activities performed by each member of the household is the decision household and each

member of the household in the allocation of time faced with three options, namely the time to work in the market, the time for action household and time for the physiologic activities.

It is relevant for further investigation is whether the available labor in the household fishermen will optimally utilize the time or not, and how income influences on economic activity and household food security? To answer these problems will be approached with the theory of subjective equilibrium, which is to see behavioral changes and incomes and household food security

In detail, this study aims to: 1) describe patterns of distribution and allocation of working time, patterns of production and consumption patterns of households of fishermen; 2) to test the effect of the determining factors of the household food security of fishermen.

## 2. Research Methods

This research uses descriptive method. Research with a descriptive method that is designed in the form of survey research. The data collection was done by using triangulation, ie by marrying three research techniques together, namely: (1) interview (interviews) with the respondent; (2) observation field (field observation); and (3) literature (desk study). The study area is the District Pujut Central Lombok regency. Of the 11 coastal villages there been one village in Sub Pujut ie Sengkol village. Determination of the village is deliberately based on coastal areas of potential for the development of seaweed. Furthermore, the household survey on fishermen. Households fishermen into the sample were selected by random sampling of 30 households of fishermen.

The main variables in this study is related to three aspects, namely: (1) the pattern of distribution and allocation of work time member of the household; (2) the pattern of production or household income; (3) the pattern of consumption or household expenditures, and 4) independent variables that determine household food security

The data have been collected and then classified for further analysis: (1) To determine the pattern of distribution and allocation of working time, patterns of production (income) and the pattern of consumption (expenditure) of households were analyzed descriptively. (2) To estimate the influence of the independent variables on household food security of fishermen analyzed by logit regression analysis of quantitative data descriptively through cross-tabulation. Because the dependent variable in the form data is the dichotomy that is food secure and food insecurity as well as the binomial distribution is not a normal distribution, then to analyze the effect of several independent variables used logistic regression models (Nachrowi, N.D. et al, 1999). The logistic regression model as follows:

$$Y = \text{Log} \frac{F}{1-F} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Information: F = Cumulative Function (status of household food security or food insecurity)  
X1 = per capita income per month

X2 = Number of household members  
 X3 = Education of household head  
 ε = error

### 3. Results and Discussion

#### 3.1. Characteristics of Respondents

##### 3.1.1. Number of household members

According Suhardjo (1989), large and small household depending on the number of household dependents itself, which is a burden for the household. The greater the number of family members, the greater the amount of food that should be available in the household and the greater the household expenses so that food can be provided and consumed according to the level recommended sufficiency. Furthermore Khomsan (1996) states that a large family is very important from a lack of food. Large families will affect the distribution of food consumption in families, especially in poor families, meeting food needs will be easier if that should be fed small amounts. Food is available for a large family may be just enough for a family that is half the size of the family. Such situation is clearly not enough to prevent interference with food security and nutrition in a large family.

**Table 1:** Distribution of Households by Categories Number of household members

Category Number of Members Household (person)	Number of Household	
	N	%
Small: 1 – 2	8	26,67
Medium: 3 – 4	14	42,66
Large ≥ 5	8	26,67
Total	30	100,00

Sources: Primary data is processed, 2016.

The results showed that the number of household members / families in the study area ranged between 1-7 people with an average family size of 4 people. If the number of household members are grouped, namely small household (1-2 persons); household's (3-4 people) and large households (≥ 5), then obtained a small percentage of households in the study area amounted to 26.67%, currently amounting to 42.66% of households and large households amounted to 26.67%. Based on these categories, the majority of the number of household members of fishermen in the area of research includes medium and large households. Distribution of households according to the category of the number of household members in the study are presented in Table 1.

##### 3.1.2. Age and Education Level Head Household

Age head of household is closely related to the productivity of the labor force, because of age influence on a person's physical ability in managing their business. Once past a certain age, the ability to work relatively decreased. Age productive or labor are people aged 15-64 years (Simanjuntak, 1985).

The results showed that the age of the household head in the study area ranges from 20-80 years with an average age of 50 years. If it is assumed that for productive work until age 36, then The Head of household in the study area still has

the potential for an average of 14 years. Based on the productive age, almost all the Head of Household (90.00%) in the study area included in the productive age. Distribution of Households by age grouped by age group in the study are presented in Table 2.

**Table 2:** Distribution of Households by Age Group Head of Household

Age Group (year)	Group Head of Household	
	N	%
20 – 64	27	90,00
> 64	3	10,00
Total	30	100,00

Sources: Primary data is processed, 2016.

**Table 3:** Distribution of Households by Level of Education Head of Household

Education Level	Household Head	
	N	%
No School	15	50,00
Primary school	8	26,67
Junior high school	5	16,67
Senior High School	1	3,33
Diploma	1	3,33
Total	30	100,00

Sources: Primary data is processed, 2016.

The level of education is a general overview to see the quality of human resources in an area. This is because education positively affects one's knowledge and skills as well as adaptability to new technologies. Performance of education head of household in the study area, which is not school, elementary, junior high, high school, and diploma are presented in Table 3 below.

Performance of education of head of household in the study area showed the majority (76.67 percent) elementary school education and not school. Performance of this study indicate that the quality of human resources (HR) fishermen households in the study area is still relatively low. The low level of education is also a barrier for households to work in other sectors.

#### 3.2. Distribution of Working Time Allocation, Income and Household Expenditure Fishermen

##### 3.2.1. Household Time Allocation Work Fisherman

Allocation of working time referred to in this study is the number of hours devoted by members of fishing households for productive purposes or to earn income, either prior to seaweed farming activities and after conducting seaweed cultivation. Therefore, theoretically the addition of fishing activities in the household will increase working hours for household fishermen.

The results showed that before any additional umput marine aquaculture, the average working time devoted by households of fishermen at 1348 hours. When measuring the number of working days has been devoted by households of fishermen, the number of working days devoted as many as 192.57 a day (1348 divided by 7) assuming fishing households use the time to 7 hours a day. This means that during (before their seaweed farming activities) fishing

households use their time to find fish by the time average of 192.57 days. When compared with the available time or normal time that is equal to 240 hours per day, it is still time enough. Therefore, there is still ample time for fishermen to increase activities outside the daily activities as fishermen in order to supplement their household income.

### 3.2.2. Household Income Fishermen

The income of fishermen is determined by the household working hours are concerned, especially households that do not have the capital and skills in addition to skills as a fisherman. Revenue derived from working hours in this study is referred to as labor income. Besides the household income is determined by the income derived from outside the outpouring of labor referred to as non-labor income, such as transfers from other parties, leasing of capital assets including interest.

In Table 4 indicated that the household income of fishermen depend on general that catches from fishing in public waters, the catch is usually in the form of tuna, oil sardine, octopus, squid and anchovies. While catches of the net results obtained in the form of a crab and anchovies. The catch is that the other is in the form of seeds lobster. The catch is pulled from mostly fishermen, because you install a simple fishing equipment will be obtained substantial income, but this time the price began to fall due to the prohibition to export shrimp seed. Other terms of activity catch lobster seedlings are catching pearly white because of the shape that resembles a lobster seed pearls.

**Table 4:** Average Income Fishermen in the village Sengkol 2016

No.	Source of Income	Value (Rp)
1.	Fisherman:	15,686,200.00
	a. catches Fish	6,107,200.00
	b. Lobster catches Seed	7,935,000.00
	c. Seaweed	1,644,000.00
2.	Outside the Fisherman:	8,526,333.33
	a. Trade	2,373,333.33
	b. Worker / Services	3,646,333.33
	c. livestock	2,506,666.67
	Total	24,212,533.33

Average revenue per household in a year before the fishermen seaweed cultivation Rp24,212,533.33, -. While the average income of the fishing sector itself is Rp 15,686,200, -. Additional revenue from outside the fishing sector as of labor and services, trade, and farmers, sufficient help to meet the needs of everyday life.

### 3.2.3. The Fishermen Household Spending

Fishermen household routine expenditure is determined by household income and consumer behavior of households concerned. Household expenditure fishermen can be broadly divided into two, namely the expenditure for food and non-food expenditure. The fishermen household expenditure is on food and the greatest expenditure of this food is for rice and side dishes. This suggests that households fishermen still relatively poor, because according to the law Engel (Engels Law), the greater the proportion of household spending on groceries, the more poor households concerned. It is increasingly clear that domestic fishermen who make their livelihood in the fishing sector mostly have weak

economic conditions. It is mostly due to the more limited work opportunities are visible from the limited livelihood and working time household members is low and leads to lower household income and expenditure.

**Table 5:** Average Expenditure Fishermen in the village Sengkol 2016

No.	Type of Expenditure	Value (Rp)
1.	Food:	11,021,750.00
	a. Rice	5,715,750.00
	b. Side dishes	5,256,000.00
2.	Not Food:	8,641,950.00
	a. Fuel oil	1,800,000.00
	b. Electricity	739,333.33
	c. Water	1,019,300.00
	d. Soap	703,666.67
	e. Cellphones	456,800.00
	f. Clothes	979,500.00
	g. cigarette	2,943,350.00
	Total	19,613,700.00

### 3.3. Determinants of Household Food Security Fishermen

To view the decisive factor household food security of fishermen do with logit regression analysis approach. Logit regression analysis provides information gradually, starting from the number of cases analyzed in this study in which there are 30 respondents sampled, so the number of cases totaled 30. Table 6 shows the number of cases that were analyzed were 30 cases with no missing.

**Table 6:** Case Processing Summary

		Unweighted Cases <sup>a</sup>	N	Percent
Selected Cases	Included in Analysis		30	100.0
	Missing Cases		0	.0
	Total		30	100.0
Unselected Cases			0	.0
Total			30	100.0

The second stage saw the suitability of the model used in the analysis. Table 7 shows the suitability of models where the significant value of 0.776 is greater than 0.05. Means that the model used in this analysis are appropriate. This was further reinforced by the Contingency table Table for Hosmer and Lemeshow test showed the number of cases that were analyzed were 30.

**Table 7:** Hosmer and Lemeshow Test

Step	Chi-square	Df	Sig.
1	1.805	8	.986

**Table 8:** Contingency Table for Hosmer and Lemeshow Test

		Food Security = Food Insecurity		Food Security = Food security		Total
		Observed	Expected	Observed	Expected	
Step 1	1	3	2.941	0	.059	3
	2	2	2.751	1	.249	3
	3	3	2.398	0	.602	3
	4	1	1.387	2	1.613	3



5	1	.375	2	2.625	3
6	0	.127	3	2.873	3
7	0	.020	3	2.980	3
8	0	.001	3	2.999	3
9	0	.000	3	3.000	3
10	0	.000	3	3.000	3

The next stage is to test the influence jointly independent variable on the dependent variable, where this is indicated by the coefficient of determination (R square). Table 9 (Model Summary) shows that the effect is jointly variable income and number of dependents and education level of the household food security of fishermen. Where the coefficient of determination (R square) of 0.538, which means that 53.80 percent of the variation of the variable income, number of dependents, and education level affect the resilience of households of fishermen.

**Table 9: Model Summary**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	25.990 <sup>a</sup>	.403	.538

The next stage of how to predict the variable accuracy of food security. Table 10 (Classification) shows the prediction of household food security fisherman correct overall by 80 percent. Predicted household food security as much as 87.50 percent of the 16 households, and also predicted that household can not stand the food as much as 71.4 percent of the 14 households.

**Table 10: Classification Table<sup>a</sup>**

		Observed	Predicted		Percentage Correct
			Food Insecurity	Food Security	
Step 1	Food Security	Food Insecurity	10	4	71.4
		Food security	2	14	87.5
Overall Percentage					80.0

The last stage is to see the influence of independent variables individually against the dependent variable. Table 10 (variable in the equation) shows the effect on an individual basis of household income variable (X1) and the number of family members (X2), and education level (X3) on household food security of fishermen. Where one of the independent variables significantly influence the household food security is household income. It can be seen from the significant value that is less than 0.05. For variable income that any increase in revenue to Rp1,000,000, - it will allow the increase in household food security better one, in the sense that the household food security of fishermen has increased with the addition of household income. Then for variable number of dependents and no significant education, but of a sign indicates that any increase in the number of family members will reduce household food security. While the level of education shows that those who have better education than those who are not enrolled in household resilience, meaning that households where the household head 4 times better educated than the head of household is not been to school in achieving household food security. Logit regression equation:  $Y = -3.007 + 0.000 X1 - 0.403 1.380 X2 + X3 + e$

**Table 10: Variables in the Equation**

Step 1 <sup>a</sup>		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
								Lower	Upper
Step 1 <sup>a</sup>	X1	.000	.000	3.840	1	.050	1.000	1.000	1.000
	X2	-.403	.323	1.565	1	.211	.668	.355	1.257
	X3	1.380	1.033	1.783	1	.182	3.975	.524	30.130
	Const	-3.007	1.852	2.637	1	.104	.049		

So we can conclude that the decisive factor household food security in the fishing village of Sengkol is household income. If returning to Engel's Law became clear that a person's income is crucial food security. According to Engel, the share of expenditure of poor households is greater than wealthier households. The share of food expenditure to total expenditure can be used as indirect indicators of the welfare (Deaton and Muellbauer, 1980). In other literature such as in the Keynesian consumption theory states that the rate of household consumption is strongly influenced by household income (Branson, 1972 and Mankiw, 2000). So when the household will increase household resilience also means she will either increase their spending on food and non-food. Increased household expenditure is highly dependent on household income. So happens in the fishing village Sengkol households where household food security is highly dependent on the income of the household income of fishermen.

If viewed from the aspect of income level, the higher the income level of the relationship has declined consistently good on model of energy and model protein, decreasing. This means that the high-income groups of food security is not dominated by the influence of the share of food expenditure that reflects the level of income. But is also determined by other factors such as level of education, awareness of healthy living better and availability of food that is more diverse and consumption patterns, making it easier for them to choose food according to the rules of nutrition, preferences and fulfillment of social (prestige) and flavors (Ilham Dan Sinaga, 2005).

#### 4. Conclusion

Limited of the basic data used in the discussion of these results, we can conclude the following matters:

- 1) The distribution pattern of working time for activities-utilized fishing among other activities to catch fish at sea, working as traders, laborers or services. The average working time devoted during the year amounted to 1,348 hours, or 192.57 days
- 2) The pattern of the distribution of household income comes from fishing activity as fishermen are finding fish in the sea, and fishing activities outside such as trade, labor or services. The average household income of fishermen during the year amounted to Rp 24,212,533.33
- 3) The pattern of the distribution of household expenditures fishermen divided into expenditure on food and non-food. Average household expenditures fishermen during the year amounted to Rp 19,663,700.00
- 4) Determinants of household food security is a household income of fishermen

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