

## **INCOME DETERMINANTS OF FISHERMEN IN NUNUKAN**

### **Author's Name and Affiliation**

**Witri Yuliawati, S.E., M.Si. (Universitas Borneo Tarakan)**  
**Prof. Dr. I Made Benyamin, M.Ec. (Universitas Hasanuddin)**  
**Prof. Dr. Ngakan Putu Oka, M.Sc. (Universitas Hasanuddin)**  
**Dr. Madris. DPS, S.E., M.Si. (Universitas Hasanuddin)**

### **Abstract**

This study aims to find out the effect of (i) the sailing duration of the fishermen towards profit by revenue both directly and indirectly, (ii) fishermen's capital towards profit by revenue both directly and indirectly, and (iii) fishermen's constant revenue towards profit. The study plan consists of field observation, literature review and survey. A number of 162 samples were obtained from 1.363 populations by using purposive sampling method in Nunukan. Besides using primary data, this study is also using secondary data. The technique used in this study is structural model. The result of the study shows that the sailing duration and capital significantly affect profit by revenue variable, both directly and indirectly. Revenue variable significantly affect the fishermen's profit.

Keywords: sailing duration, work capital, revenue, and profit.

## INTRODUCTION

Indonesia is a marine country with 75 percent of its region is ocean and beach length of 81,000 Km. Indonesia also has Exclusive Economic Zone along 5,800,000 Km<sup>2</sup>. With a huge ocean and abundant fishery products, the fishermen depend their life on this. In fact, fishermen are precisely included in the group category of poor society (Hamdani and Wulandari, 2013).

Recent natural resources of coastal and marine have been known by most people that these resources are the promising potential in promoting the level of society economic especially for the fishermen. The logic consequences of the coastal and marine resources are that this resources is a common property and open access so that the utilization of the coastal and marine resources increase in almost of the entire region.

In general, the society in the coastal is fishermen which identically related to the poverty caused by many things such as the lack of capital owned by the fishermen, limitation of the technologies, poor access to the market and the poor society awareness in processing natural resources sustainably. There is another non-economic factor or it is commonly known as social factor such as high population growth, lower education level, and lower health level or another reason such as public infrastructure at the coastal. The lack of spatial planning which causes overlapping sectors regarding the region, pollution and environmental damage is also another reason.

Main issue faced by the fishermen in Nunukan is the constant income level in every year and hardly increase. According to Purwanti (in Primyastanto, 2013), “economic activities of fishermen household are affected by four factors, those are working hours, total production, income, and expenses or consumption.” The age or experiences of a fisherman can affect the income level. It is because the more hours the fishermen work; the more experience they are in catching fishes. Therefore, the income earned by the fishermen increase.

Regarding the background above, the problem formulation of this study are:

1. Does the sailing duration of the fishermen in Nunukan affect the fishermen profit by the revenue directly as well as indirectly in Nunukan?
2. Does the fishermen capital in Nunukan affect the fishermen profit by revenue both directly in indirectly in Nunukan?
3. Does the fishermen revenue in Nunukan affect the fishermen profit?

## LITERATURE REVIEW

### Fishermen

According to Imran in Mulyadi (2005), fishermen are “a community which depend their life on marine products, it is done both by sailing or cultivation. They commonly live in the seashore, a settlement which is near with their activity location.”

### Capital

Jhingan (2008) argues that capital is a stock of production factor which physically can be reproduction. Capital stock increases within a certain time limit, it is called as capital accumulation. If the capital theory related to the income, there will be a relationship between them, because to

obtain high-value catches, it needs a huge capital. So, it can be assumed that capital for fishermen has implication toward high-value of the catches.

### **Sailing Duration**

Generally, offshore fish catching conducted within a longer time and further from the target area of fishing ground, the more production they will obtain and surely the more income they will earn compared with fish catching done near the beach (Masyhuri, 1999). The sailing duration is a time needed by the fishermen to reach the target area of the fishing ground. It is strongly affected by the time when the fishermen are in the ocean to search for the ideal place.

### **Revenue**

Revenue is a terms to indicate amount of money earned by the company. This amount is a gross amount, or often known as profit.

### **Income**

According to Kadarsan (1995), net income is the difference between total revenue and total expenditure. This revenue comes from marketing result or sales of the operation result, while expenditure is a total cost used during the production process. Income can be defined from two approaches, that is: income in terms of economic defined as maximum value that can be consumed by individual within a period as its original condition. This definition emphasizes on total quantitative expenditure towards consumption during one period.

### **Hypothesis**

1. Sailing duration positively and significantly affect fisherman profit by revenue both directly and indirectly in Nunukan.
2. Capital positively and significantly affects fishermen profit by revenue both directly and indirectly in Nunukan.
3. Revenue positively and significantly affects fishermen profit in Nunukan.

## **RESEARCH METHOD**

### **Research Type**

This study uses combination of qualitative and quantitative approach, where the qualitative approach is used to obtain data related to society roles towards maintenance of mangrove forests on coastal area in Nunukan, while quantitative approach is used to obtain data related to sailing duration variables; capital; potential of marine resources; revenue; sailing cost and fishermen profit. The data collection process was conducted by observation method, literature study and survey. This study was conducted in coastal area of mangrove in Nunukan.

The population of the study is fishermen which are operating in coastal area of mangrove in Nunukan and institution which related to the utilization of the mangrove ecosystem in Nunukan both directly and indirectly.

### Data Analysis Method

To provide answer to the determinants of the study variables, the model adopted from Goloba and Hensher (1997) is used, that is a model which uses structural equation (Structural Model) in analyzing variables in the model.

Based on conceptual model, the functional equation in the model is formulated as follows:

$$Y_1 = f(X_1, X_2, \dots)$$

$$Y_2 = f(X_1, X_2, Y_1)$$

Where:

$X_1$  = Sailing duration in rupiah

$X_2$  = Capital in weekdays

$Y_1$  = Revenue in rupiah

$Y_2$  = Fishermen profit in rupiah

## RESULT

### Economic Condition in Nunukan

Economic growth in 2014 reached 9.05 percent. Mining and agriculture sectors are still the main sectors in leading the economic in Nunukan. Here is the table about PDRB distribution in Nunukan in 2014.

**Table 1 PDRB Distribution in Terms of Sectors (2014)**

Explanation	Composition (%)
Mining and Excavation	55,07
Agriculture	20,10
Processing Industry	6,73
Construction	5,86
Trade, Hotel and Restaurant	4,56
Transportation and Warehousing	1,66
Information and Communication	1,24
Government	1,96

Source: Nunukan Dalam Angka, 2015

Capital is capital goods that is used by fishermen in Nunukan for sailing and can be used repeatedly, which is measured by rupiah. The result of the observation stated that the average capital needed by the fishermen when sailing is above Rp 300,000 (three hundred thousand rupiah). The need of financial capital of the fishermen is increasing every year. This is caused by the rising cost of the capital goods. The other capital needed by the fishermen besides financial capital is equipment such as sampan, motorboat, trawl, paddle, fishing rod etc. The result of the observation shows that the availability of the sailing capital and the marketing of fishery which is appropriate with the standard become classic problems faced by the fishermen. The description of the capital variable is presented below.

**Table 2 Fishermen Distribution Based on Working Hours**

<b>Working Hours (Hour/Week)</b>	<b>Frequency</b>	<b>Percentage</b>
24 – 40	20	12,35
41 – 50	108	66,67
> 50	34	20,99
<b>Total</b>	<b>162</b>	<b>100,00</b>

Source: Primary Data, 2015

In table 2, it is explained that the sailing duration condition of the fishermen in Nunukan ranged from 24 to 60 hours per week. The result of the frequency in the table above shows that the sailing duration between 48 hours and 50 hours is more dominant. Therefore, the longer the fishermen is sailing, the more fishes they catch.

**Table 3 Fishermen Distribution Based on Capital**

<b>Work Capital (million)</b>	<b>Frequency (person)</b>	<b>Percentage</b>
6 – 10	18	11,11
>10 – 20	143	88,27
≥ 20	1	0,62
<b>Total</b>	<b>162</b>	<b>100,00</b>

Source: Primary Data, 2015

In table 3, the amount of capital used by the fishermen in Nunukan ranged from Rp 6,000,000.- to more than Rp 20,000,000.-. The result of the frequency in the table above shows that the capital between Rp 10,000,000.- and Rp 20,000,000.- is more dominant.

**Table 4 Fishermen Distribution Based on Amount of Revenue**

<b>Revenue (rupiah) per month</b>	<b>Frequency</b>	<b>Percentage</b>
≤100.000,- s/d 1.000.000,-	4	2,47
>1.000.000,- s/d 2.000.000,-	103	63,58
> 2.000.000,-	55	33,95
<b>Total</b>	<b>162</b>	<b>100</b>

Source: Primary Data, 2015

In the table 4, it is explained that the revenue of the fishermen in Nunukan ranged from Rp 100,000.- to Rp 2,520,000.-. The result of the frequency in Table above shows that the revenue between Rp 1,000,000.- and Rp 1,900,000.- is more dominant. The revenue of the fishermen is also related to the boat type used by the fishermen. The fishermen who use boat without motor have average ability to catch fish as many as 214,921 fishes per year.

Cost is a total expenditure of the fishermen in Nunukan for sailing which consists if cost variable and depreciation cost of capital goods for sailing owned by the fishermen in the process of

catching fishes which is measured in rupiah. The interval costs to be incurred by the fishermen when sailing is between Rp 250,000.- and Rp 3,000,000.-.

The fuel oil (BBM) becomes one of the main expenditure needed by the fishermen when sailing. When the weather becomes extreme like the high sea waves, the boats of the fishermen require much fuel oil. Besides, the catch is reduced due to weather factors. The description of the sailing cost is presented in the table below.

**Table 5 Fishermen Distribution Based on Sailing Cost (Rupiah)**

<b>Explanation (million)</b>	<b>Frequency</b>	<b>Percentage</b>
1.- 2	0	0,00
≥ 2 – 3	82	50,00
> 3	80	50,00
<b>Total</b>	162	100

Source: Primary Data, 2015

In the table 5, it can be explained that the sailing cost condition in Nunukan ranged from Rp 2,000,000.- to Rp 3,000,000.- The result of the frequency in the table above shows that the revenue between Rp 2,000,000.- and more than Rp 3,000,000.- is more dominant.

The profit earned by the fishermen in Nunukan is measured in rupiah. The profit of the marine fishery, in this case, is based on the profit in every month. The description of the profit variable of the fishermen is presented in the table below.

**Table 6 Fishermen Distribution Based on Profit**

<b>Explanation (rupiah)</b>	<b>Frequency</b>	<b>Percentage</b>
50.000 – 99.000,-	2	1,23
>Rp. 100.000,- s/d Rp. 1.000.000	28	17,28
>Rp. 1.000.000,-	132	81,48
<b>Total</b>	162	100

Source: Primary Data, 2015

In the table 6, it can be explained that the profit of the fishermen condition in Nunukan ranged from profit category between Rp 50,000.- and more than Rp 1,000,000.- The result of the frequency in the table above shows that the profit more than Rp 1,000,000.- is more dominant which earned by the fishermen in Nunukan.

### **Analysis Result of Impacts of Each Variable**

The table above is to make it easy in analyzing functional relationship between exogenous variable and endogenous variable. Exogenous variables are capital ( $X_1$ ) and sailing duration

(X<sub>2</sub>). Endogenous variables are revenue (Y<sub>1</sub>) and profit (Y<sub>2</sub>). Then, the coefficient values are arranged in the table below:

**Table 7 Functional Relationship among Variables**

Variables Affecting	Variables Affected	Estimation	Significance	Note
Sailing Duration	Revenue	0.301**	0.006**	Significant
Capital	Revenue	0.462***	0.000***	Significant
Sailing Duration	Profit	0.240*	0.046*	Significant
Capital	Profit	0.260*	0.038*	Significant
Revenue	Profit	0.464***	0.000***	Significant

Note: Significant in the level of < 0.001\*\*\* in the level of < 0.01\*\* in the level of < 0.05\*

Source: Run Data Result

**Table 8 Indirect Influence**

No.	Explanation	Value
1.	Sailing duration towards profit by revenue	0.116
2.	Capital towards profit by revenue	0.184

Source: Run Data Result

## DISCUSSION

### The Influence of Sailing Duration towards Fishermen Profit by Revenue Variable

The sailing duration variable towards fishermen profit by revenue variable is positively and significantly affected. With the rising of sailing duration followed by the rising of the fishermen profit by revenue variable with the assumption of other factors which affected the size of fishermen profit is considered constant. There are some patterns in catching fish. Firstly, catching pattern is more than one day. This kind of catching pattern is offshore catching. The much nearby of the catching area and the size of the boat used determine the sailing duration.

### The Influence of Sailing Duration towards Fishermen Profit

The sailing duration variable towards fishermen profit by revenue variable is positively and significantly affected. With the rising of sailing duration followed by the rising of the fishermen profit by revenue variable with the assumption of other factors which affected the size of fishermen profit is considered constant. Sailing activity is part of economic activities of the fishermen. Prior studies related to this which are stated by Olaoye et al (2013), Oguoma et al (2010), Mafimisebi and Okunmadewa (2005) show that catching fish in a huge quantity need relatively long sailing duration.

Every fisherman boat has operational area appropriate with the fishing ground of the target caught. The further the operation area, the longer the sailing time needed to catch fish. The

operational time is related to the number of the catch. The big size of the boat usually has longer operational time. This is emphasized by the study of Adami et al (2013).

### **The Influence of Fishermen Capital towards Fishermen Profit by Revenue Variable**

Capital variable towards fishermen profit by revenue variable is positively and significantly affected. With the rising of capital followed by the rising of the fishermen profit by revenue variable with the assumption of other factors which affected the size of fishermen profit is considered constant.

Besides work capital, there are some factors affect fishermen income, according to Rahmawati (1990): (i) investment capital, the catch is strongly related to the fishermen ability in putting effort to catch fish in the sea. In other words, catching capital in marine is a factor which cannot be apart in the fishermen life. The bigger the investment capital level in catching fish, the more chance the fishermen get to increase the productivity in catching fish.

### **The Influence of Fishermen Capital towards Fishermen Profit**

Capital variable towards fishermen profit by revenue variable is positively and significantly affected. With the rising of capital followed by the rising of the fishermen profit by revenue variable with the assumption of other factors which affected the size of fishermen profit is considered constant. Work capital is an important element in sailing activity. The bigger capital will give more profit chances to the fishermen (Charitou et al, 2010; Agha, 2014).

Physical capital and financial capital as a source of economic viewed as the physical production capacity: the ability of fishermen to turn a profit. In general, the current capital required for regular and ongoing operating activities of fishermen. Similarly, the fixed capital, this capital is also very important for production activities due to the absence of equipment, machinery, and others, there will be no production activities in fishing activities.

### **The Influence of Revenue towards Fishermen Profit**

Revenue variable towards fishermen profit is positively and significantly affected. With the rising of revenue followed by the rising of the fishermen profit with the assumption of other factors which affected the size of fishermen profit is considered constant. This is in line with research of Saeidi (2012) who argued in his research that the increase in profits is directly proportional to the addition of revenue. Dahuri (2003) explained, fishermen are categorized as workers who perform production activities with a hunting fish in the sea or sailing. Generally they have main production equipment such as ships, fishing rods, nets, charts, etc.

Based on the techniques and tools of his catch, traditional fishermen are fishermen who still maintain the way of his catch by boat without motor (KTM), without technological innovation, without the support of strong capital, with no institutional effort established, tends to be a subsystem, and genealogy has engaged the activities hereditary. Different from the modern fishermen, their catch techniques are adopted from the development of the technology, such as motorboat to the satellite image technology with the primary objective is to maximize profit.



## **CONCLUSION AND RECOMMENDATION**

### **Conclusion**

1. Fishermen capital plays an important role in increasing fishermen profit. The testing result indicates that fishermen capital has a strong relationship towards profit by revenue variable.
2. The long sailing duration of the fishermen has been proven empirically can affect fishermen profit. The impact towards the profit both directly and indirectly by the revenue variable. The longer the sailing duration of the fishermen, the more amounts of catches the fishermen obtain.
3. Revenue affects towards fishermen profit in Nunukan. The more revenue earned by the fishermen, the more profit the fishermen earned.

### **Recommendation**

1. It is important to conduct counseling sustainably in order to increase their revenue. This is very urgent since the fishermen still implement traditional way of sailing.
2. It needs government support in allocating technologies to support fishermen operational activities, so that it helps fishermen to increase their profit.
3. The use of cost during sailing is better reviewed to reduce any cost which is not relevant, so that it can minimize the fishermen expenditure.
4. It is important to develop and to improve fishermen competencies.
5. It is expected the participation of any parties (bank or non-bank) to cooperate with the Fishery Department in supplying capital for the fishermen.
6. The implication of the theory that can be stated in this study is that to increase fishermen profit; the combination of old sailing method, capital, and the potential of marine resources, revenue and the sailing cost can be used.
7. The potential of marine resources strongly affect the increasing of fishermen profit. The lack of the potential of marine resources can be evaluation materials along with the whole parties regarding to find out concrete and systematic solution in order to affect the improvement of fishermen income sustainably. In this study, the model proposed is limited only on the old way of sailing, capital, potential of marine resources, revenue and sailing cost. The domain of this study is limited only in Nunukan. These obstacles can be a reference for the future researcher in developing related topic.

---

**REFERENCES**

- Adami Roberta, 2013, *The Effect of Labour Earnings on Post Retirement Income*, Journal of Economic Studies, Vol. 40 Iss 3 pp. 284 – 297
- Dahuri, R, 2003, *Keanekaragaman Hayati Laut*, Gramedia Pustaka Utama, Jakarta.
- Hamdani, H., Wulandari, K, 2013, *Faktor Penyebab Kemiskinan Nelayan Tradisional. Artikel Ilmiah Hasil Penelitian Mahasiswa.*
- Jhingan, M.L, 2008, *Ekonomi Pembangunan dan Perencanaan*, PT. Raja Grafindo Persada, Jakarta
- Kadarsan, H., 1995. *Keuangan Pertanian dan Pembiayaan Perusahaan Agribisnis*. Cetakan kedua. PT. Gramedia, Jakarta
- Mafimisebi, T, Okunmadewa, *Comparative Yield Performance of Upland and Mangrove Aquacultural Farms In selected Maritime States of Southwest Nigeria*, Department of Agricultural Economics and Extension.
- Mulyadi S, 2005, *Ekonomi Kelautan*, Raja Grafindo Persada, Jakarta
- Oguoma, *Performance of Small-Scale Fish Farm Operators in Resources- Use in IMO State Nigeria*, Department of Agricultural Economics, Federal University of Technology, Owerri, P.M.B 1526, OwerriImState, Nigeria.
- Olaoye, 2013, *Assessment of Socio-Economic Analysis of Fish Farming in Oyo State Nigeria*, Global Journal of Science Frontier Research Agriculture and Veterinary Volume 13 Issue 9 Version 1.0
- Primyastanto, 2005, *Perencanaan Usaha (Business Plan) Sebagai Aplikasi Ekonomi Perikanan* PT. Bahtera Press .ISBN : 979-99974-2-9. Malang