

**NILAI TAMBAH IKAN DUWO KERING (*Awaous melanocephalus*) DI DISTRIK  
DONGGALA, SULAWESI TENGAH*****Added Value Of Dried Duwo Fish ( *Awaous melanocephalus* ) In Donggala District,  
Central Sulawesi***

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**ABSTRAK**

Perairan Selat Makassar di Kabupaten Donggala, Provinsi Sulawesi Tengah, yang berhadapan langsung dengan Ibu Kota Negara (IKN), memiliki potensi sumber daya ikan Duwo sebagai bahan pangan hewani. Ikan Duwo termasuk dalam famili Gobiidae, yaitu kelompok ikan dengan tingkat keanekaragaman tertinggi. Di Sulawesi, *Awaous melanocephalus* merupakan spesies asli di beberapa daerah, di Gorontalo dikenal dengan sebutan Nike, di Mamuju, Sulawesi Barat dikenal sebagai ikan Penja, dan di Sulawesi Tengah dikenal sebagai ikan Duwo. Ikan Duwo dapat dikonsumsi mentah dan umumnya dikonsumsi setelah melalui proses pengolahan dan pengeringan. Penelitian ini bertujuan untuk menganalisis nilai tambah ikan Duwo (*Awaous melanocephalus*) di Kabupaten Donggala, Sulawesi Tengah. Pengumpulan data diperoleh dari pelaku usaha pengolahan ikan Duwo di Kabupaten Donggala dengan menggunakan metode penelitian purposive sampling. Analisis data menggunakan metode Hayami untuk analisis nilai tambah. Hasil penelitian menunjukkan bahwa pengolahan ikan duwo kering menghasilkan nilai tambah sebesar Rp. 2.500/kg. Rasio nilai tambah yang diperoleh dengan output sebesar 33,33%, hal ini menunjukkan bahwa untuk setiap Rp. 100, nilai tambah ikan duwo kering adalah sebesar 33,33. Usaha pengolahan ikan duwo kering merupakan salah satu bentuk usaha yang dikembangkan oleh masyarakat pesisir Kabupaten Donggala, Sulawesi Tengah karena dapat memberikan sumber pendapatan yang menjanjikan.

**ABSTRACT**

The waters of the Makassar Strait in the Donggala Regency of Central Sulawesi, which is directly opposite the Capital City of the Archipelago (IKN), have the potential for Duwo fish resources as animal food. Duwo fish is included in the Gobiidae family, a type of fish with the highest diversity. In Sulawesi, *Awaous melanocephalus* is a native species in several areas, in Gorontalo it is known as Nike, in Mamuju, West Sulawesi it is known as Penja fish, and in Central Sulawesi it is known as Duwo fish. Duwo fish can be consumed raw and is generally consumed after being processed and dried. This study aims to analyze the added value of Duwo fish ( *Awaous melanocephalus* ) in Donggala Regency,

Central Sulawesi. Data collection was obtained from Duwo fish processing business actors in Donggala Regency using a purposive sampling research method. Data analysis used the Hayami method of added value analysis. The results of the study showed that the processing of dried duwo fish produced an added value of Rp. 2,500/kg. The ratio of added value obtained with an output of 33.33%, this shows that for every Rp. 100, the added value of dried duwo fish is 33.33. The processing business of dried duwo fish is one of the forms of business that is pursued by the coastal community of Donggala Regency, Central Sulawesi because it can provide a promising source of income.

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**Kata Kunci** *Ikan Duwo Kering, Donggala, Sulawesi Tengah*

**Keywords** *Dried Duwo Fish, Donggala, Central Sulawesi*

**Tracebility** Submission: 9/10/2025. Published : 27/12/2025

**Panduan** Mardjudo, A., Hartina, & Bayu, F. R. (2025). Nilai Tambah Ikan Duwo

**Kutipan** Kering (*Awaous melanocephalus*) di Distrik Donggala, Sulawesi

**(APPA 7<sup>th</sup>)** Tengah. *Jurnal Media Akuakultur Indonesia*, 5(4), 170-178.

<http://doi.org/10.29303/mediaakuakultur.v5i4.7184>

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## INTRODUCTION

The potential of marine fisheries including capture fisheries, marine cultivation and marine biotechnology industry is a very large asset for Indonesia's economic growth, but this asset has not been utilized optimally. The entire potential of capture fisheries is estimated to have an economic value of US\$15.1 billion. The potential of capture fisheries includes the Fisheries Management Area (WPP) of the Malacca Strait, South China Sea, Java Sea, Makassar and Flores Straits, Banda Sea, Seram Sea and Tomini Bay, Sulawesi Sea and Pacific Ocean, Arafura Sea and Indian Ocean (Ministry of Marine Affairs and Fisheries, 2014).

Shallow coastal waters are generally fertile habitats and are very good as *nursery grounds* for various fish species when they are in the juvenile stage (McConnoughey and Zottoli; 1983; Mardjudo A., 2002). Such ecological conditions have consequences for quite high aquatic biodiversity. Such fish concentrations are potential fishery resources that can be accessed relatively easily. One of the effective fishing gear used to utilize these resources is the beach *seine*.

The waters of the Makassar Strait in the Donggala Regency area of Central Sulawesi, which is directly opposite the planned Indonesian Capital City (IKN), have the potential for fish resources as animal food that has not been managed properly. The potential resource is the type of duwo fish in the local language of Central Sulawesi. Duwo fish belongs to the Gobiidae family, is a type of fish with the highest diversity. In Sulawesi, this *Awaous melanocephalus* is a native species in several areas, in Gorontalo it is known as Nike, in Mamuju, West Sulawesi it is known as Penja fish. According to Salindeho (2021) the duwo fish in Latin is *Awaous melanocephalus*, a fish from the Gobiidae family. In several areas, the *Awaous melanocephalus* fish is known by different names, one of which is the 'nike' fish in North Sulawesi and Gorontalo (Sahami, *et, al.*, 2019).

This type of animal food material, the Duwo fish, is expected to contribute to the needs of animal food for the people in the National Capital (IKN), this is because Central Sulawesi is a food buffer province for the IKN. Food materials from Duwo fish can be used in raw form and are generally used in dried processed form. In salted form, Duwo fish can be stored for a long time, up to months, in general people prefer it in salted form.

This type of Duwo fish is caught by fishermen in Donggala Regency using beach seine fishing gear ( krakat type *beach seine and skimming net* (local: sero / panjuyu) when the Duwo fish is still in the sea. But when it has entered the river, local fishermen catch it using bubu fishing gear (local : poka ). The uniqueness of this Duwo fish according to the experience of fishermen in the area can only be caught at the end of the Qamariah month on the 29th-30th while it is still in the sea, and at the beginning of the month on the 1st-2nd it has entered the river mouth.

Duwo fish resources in utilization for consumption generally through the drying process, this is done to provide aroma and taste for consumers. In addition, dried duwo fish can also be stored for a long time, even months. Based on this, so that duwo fish resources need to be promoted through scientific journals as animal food ingredients, and product diversification information that can provide added value for fishery business actors.

## METHODS

This research was conducted at the location of the capture and processing of duwo fish in Donggala Regency, Central Sulawesi. The research method developed was the survey method and case study. The survey results showed that every time there is a river connected to the sea, this duwo fish is along the coast and is caught by fishermen. Considering the length of the Donggala Regency coastline of approximately 400 km and the cost of the research, this research took place on the coast of Tibo Village and Kaliburu, Sindue Tombusabora District.

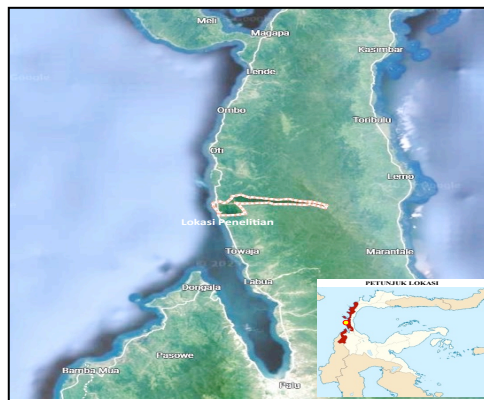


Image of Research Location: Tibo and Kaliburu Villages.

The selection of the research location of Tibo Village and Kaliburu Village, Sindue Tombusabora District is because fishermen and fishermen's mothers are actively catching and drying duwo fish. In this location, in addition to catching duwo fish which are sold in wet/raw conditions, fishermen and fishermen's mothers here dry duwo fish. The reason they dry duwo fish is because dried duwo fish is more expensive than wet/raw, besides it can be stored for quite a long time. Data collection in this study used the direct observation method in the process of catching duwo fish and the process of drying duwo fish.

Data analysis was carried out quantitatively using the Hayami value-added method. Added value is the increase in value that occurs because a commodity undergoes processing, transportation and storage in one production process with the use/provision of functional inputs (Hayami, *et.al.*, 1987; Intyas, CA, *et.al.* , 2020). The formulation of the added value analysis is presented in Table 1 below.

Table 1. Hayami Method Added Value Analysis Table

Variables	Sub Variables		Notation & Formula
Output, input and prices	1.	Output (kg)	A
	2.	Raw material input (kg)	B
	3.	Labor force (HOK)	C
	4.	Conversion factor	$D = A/B$
	5.	Labor coefficient (HOK/kg)	$E = C/B$
	6.	Output price (Rp/kg)	F
	7.	Average labor wages (Rp/HOK)	G
Income and added value	1.	Raw material price (Rp/kg)	H
	2.	Other input contributions (Rp/kg)	I
	3.	Output value (Rp/kg)	$J = D \times F$
	4.	Added value (Rp/kg)	$K = J - I - H$
	5.	Value added ratio (%)	$L = (K/I) \times 100\%$
	6.	Labor compensation (Rp/kg)	$M = E \times G$
	7.	Labor share (%)	$N = (M/K) \times 100\%$
	8.	Profit (Rp/kg)	$O = K - M$
	9.	Profit share (%)	$P = (O/K) \times 100\%$
Remuneration for Production Factors	1.	Profit margin (Rp/kg)	$Q = J - H$
	2.	Profit (%)	$R = O/Q \times 100\%$
	3.	Workforce (%)	$S = M/Q \times 100\%$
	4.	Other inputs (%)	$T = I/Q \times 100\%$

Source: Hayami, Mumpungningsih (2008) *in* Darmawan and Hajar, (2015)

#### Value Added Analysis Description:

- A = Output or total production of processed duwo fish produced;
- B = Input or raw materials used to produce dried duwo fish;
- C = The labor used in producing processed Duwo Kerin fish is calculated in the form of HOK (Man-Days Worked);
- D = Output or total production of dried duwo fish compared to input or raw materials used;
- E = HOK divided by input or raw materials used;
- F = Product prices applicable during an analysis period;
- G = The average amount of wages received by workers in one production period calculated based on per HOK (Person Days Worked);
- H = The input price of the main raw material, namely dried duwo fish per kilogram during the analysis period;
- I = Contributions or other input costs consisting of costs of auxiliary raw materials, depreciation costs;
- J = The value of the conversion factor is multiplied by the product price applicable in one analysis period;
- K = The output value is reduced by the contribution of other inputs and raw material prices;

L	=	Percentage of value added divided by output value;
M	=	Labor coefficient multiplied by the average wage of labor;
N	=	Percentage of labor compensation divided by value added;
O	=	Value added is deducted from labor compensation;
P	=	Percentage of profit divided by added value;
Q	=	Output value minus raw material prices;
R	=	Percentage of profit divided by profit margin;
S	=	Percentage of labor compensation divided by profit margin;
T	=	The percentage of other input contributions divided by the profit margin.

## **RESULTS AND DISCUSSION**

Fishing activities in the utilization of fishery resources by using various fishing efforts and processing fish caught by small fishermen. The form of fisheries business management carried out by fishermen is an individual business. Fishing business activities with individuals are mostly carried out along the coast of Donggala Regency with a system of going to sea at dawn around 03.00 and returning at noon at 14.00 WITA. With conditions like this, the catches of these small fishermen are generally sold around the area where they live at a relatively cheap price.

In terms of household member participation in managing fisheries, almost all fisheries involve household members. In the Bajo ethnic group, which generally uses traditional fishing gear, all family members, including those who have entered school age, are directly involved in fishing activities. In some Kaili ethnic groups, if women are not involved in fishing, then another role is to sell the catch to the market or in processing the results.

In the coastal areas of Donggala Regency, there is a pattern of work and business relationships, the dependence of fishermen on middlemen ("Padola or "Boss") is still very clear and dominant. The work relationship between capital owners (padola) and fishermen, appears as an unbalanced relationship that only strengthens the position and facilitates the capital owner who in this case is the employer. This relationship is influenced and formed by certain conditions that apply in the fishing community, which causes the position of the employer to be stronger and have greater power when compared to fishermen. This relationship can cause fishermen to become poorer. This kind of relationship needs attention from the government to break the chain between padola and small fishermen.

Various fishing businesses that carry out business activities along the coast of Donggala Regency from modern to small scale. The diversity of these types of businesses all depend on the capital capabilities owned by fishermen and business opportunities that can benefit them. The processing of fishery products, especially anchovies and duwo fish, has long been carried out by the community with the aim of extending the shelf life and will be expensive at certain times. Drying duwo fish is one form of preservation that is usually carried out by fishermen and fisherwomen in Tibo and Kaliburu Villages.





Picture of Dried Duwo Fish

Drying of Duwo fish ( *Awaous melanocephalus* ) is still done traditionally, namely drying on the beach or riverbank in a place where the sun shines long enough. The processing of drying dried Duwo fish provides added value economically because it does not require large costs. The calculation of the added value of dried Duwo fish is presented in Table 2 below.

Table 2. Table of Added Value Analysis of dried duwo fish per production.

Variables	Sub Variables	Mark
Output, input and prices	1. Output (kg)	A = 15
	2. Raw material input (kg)	B = 30
	3. Labor force (HOK)	C = 1
	4. Conversion factor	$D = A/B = 15/30 = 0.5$
	5. Labor coefficient (HOK/kg)	$E = C/B = 0.03$
	6. Output price (Rp/kg)	F = 15,000.
	7. Average labor wages (Rp/HOK)	G = 20,000.
Income and added value	1. Raw material price (Rp/kg)	H = 2,000.
	2. Other input contributions (Rp/kg)	I = 3,000.
	3. Output value (Rp/kg)	$J = D \times F = 0.5 \times 15,000 = 7,500.$
	4. Added value (Rp/kg)	$K = J - I - H = 2,500.$
	5. Value added ratio (%)	$L = (K/J) \times 100\% = 0.33 = 33.33$
	6. Labor compensation (Rp/kg)	$M = E \times G = 600.$
	7. Labor share (%)	$N = (M/K) \times 100\% = 24$
	8. Profit (Rp/kg)	$O = K - M = 1,900.$
	9. Profit share (%)	$P = (O/K) \times 100\% = 76$
Remuneration for Production Factors	1. Profit margin (Rp/kg)	$Q = J - H = 5,500$
	2. Profit (%)	$R = O/Q \times 100\% = 34.54$
	3. Workforce (%)	$S = M/Q \times 100\% = 10.9$
	4. Other inputs (%)	$T = I/Q \times 100\% = 54.54$

The calculation results of output, input and price variables against added value in Table 1 above, show that the production/output results in one production of dried duwo fish processing are 15 kg with the use of 30 kg of raw materials/production. Dried duwo fish production is carried out every duwo fish season caught by fishermen in the coastal

area of Donggala Regency. The output price obtained in one production is Rp. 15,000/kg/production. The output price is the price set by the dried duwo fish processor at the research location. The workforce in the process of making dried duwo fish is only 1 person or the processor himself with the assumption of wages of around Rp. 20,000/production. The amount of the conversion factor for each production is 0.5 which means that 1 kg of raw materials produces 0.5 kg of dried duwo fish. While the labor coefficient is the value of the division of the number of working hours for the labor used with the raw materials for each production. Making smoked anchovies with raw materials used in 1 kg of wet duwo fish requires 0.03 HOK.

The income and added value variables of dried duwo fish describe the input price ( raw materials ) used, which is fresh duwo basa fish caught by small fishermen with an average of Rp. 2,000./kg. Other input contributions issued amount to Rp. 3,000./production. Other input contributions consist of depreciation costs and auxiliary materials. The added value of the processing of duwo basa fish into dried duwo fish is Rp. 2,500./kg with a value added ratio of 33.33 % . The labor compensation given for each kilogram of raw material of duwo basa fish processed into dried duwo fish is Rp. 600., with a labor share percentage of 24%. The amount of profit obtained from the processing of duwo basa fish is Rp. 1,900.-/kg with a profit level of 76% .- of the product/output value. Meanwhile, the compensation variable for production factors explains that for every processing of 1 kg of duwo basa fish into dried duwo fish, a margin of Rp. 5,500.- distributed to each factor, namely labor income 10.9%. contribution of other inputs 54.54%.- and profit for processors of 34.54%.

Processing of duwo basa fish into dried duwo fish obtains an added value ratio of 33.33 % . According to Sudiyono (2004), if the added value obtained by an industry is more than 50% then the added value is said to be large and vice versa, if the added value obtained is less than 50% then the added value is said to be small. Based on this statement, the added value produced by dried duwo fish is still included in the small category because it is still less than 50%. According to Darmawan *et al.* , (2015), the added value of small businesses with simple technology is generally low. Dewanti (2016) *in* Darmawan *et al.* , (2015) compared two Small and Medium Enterprises that use manual (traditional) techniques using semi-modern equipment, where greater added value was obtained in Small and Medium Enterprises that use semi-modern equipment.

The approach in this study not only takes into account the added value of the product and the added value ratio, but also takes into account the value of the reward for the production factor. Hayami *et al.* , (1987) *in* Kustiari R. (2010) stated that changes in the value of raw materials that have undergone processing can be estimated. Thus, on the basis of the added value obtained, the margin can be calculated, and then the reward for the production factor can be known.

The results of the value-added analysis show the remuneration from the processing of dried duwo fish distributed to labor compensation, other input contributions, and profits. Each factor shows a value, namely, profit 34.54 % , labor 10.9% and other input contributions 54.54%. According to Hasanah *et al.* , 2015 *in* Hermanto *et al.* , 2019), if the level of profit obtained (in percent) is high, then the business can increase economic growth. On the other hand, the value of the remuneration for labor that gets a low value (10.9 % ), shows that the dried duwo fish drying business does not have an impact on labor income. This is in accordance with the reality at the research location, drying dried duwo fish only uses 1 worker with relatively low wages. Hasanah *et al.* , 2015 *in* Hermanto *et al.* , 2019 stated that the labor reward ratio shows a picture of the labor income in their work. If the ratio of labor compensation to added value (in percent) is

high, then the business plays a role in providing income for its workers, thus playing a greater role in overcoming the problem of unemployment through equal employment opportunities.

The added value of a commodity or product is the value attributed to the product as a result of a certain process, so that theoretically, the further downstream the process is applied, the greater the added value that can be formed (Bantacut, 2013). Analysis of added value using the Hayami method. Measurement of added value using the Hayami method is carried out by identifying the main components, such as inputs used, outputs produced, raw material prices, product selling prices, labor costs, and other input contributions. The Hayami method has the advantage of the large amount of compensation for owners of production factors (Suprpto, 2006).

## **CONCLUSION AND SUGGESTIONS**

### **Conclusion**

Based on the results of the study, it can be concluded that the processing of dried duwo fish produces an added value of Rp. 2,500 / kg. The added value ratio is obtained with an output of 33.33%, this shows that for every Rp. 100, the added value of dried duwo fish is 33.33 . With a value ratio of 33.33% <50%, it means that the added value ratio is relatively low because it is less than 50%, although the added value ratio of dried duwo fish is low, the community in the coastal area of Donggala Regency still pursues the business because it is one of the sources of family income and can support the household economy.

### **Suggestion**

1. For those processing raw duwo fish into dried duwo fish, production capacity needs to be increased because dried duwo fish has a long shelf life and the price can be even more expensive during the lean season.
2. For further researchers, it is hoped that they can conduct research on increasing the capacity from 30 kg of raw duwo fish from our research to 60 kg of raw duwo fish with an estimate of dried duwo fish reaching 30 kg to see the ratio of further added value.

## **ACKNOWLEDGEMENTS**

We would like to thank the fishing community and the women fishermen who process dried duwo fish in Tibo and Kaliburu villages, as well as the local village government who have granted research permits in the area. We would also like to thank the Head of the Research and Community Service Institute of Alkhairaat University who has provided financial support so that the research can be carried out according to the expected target achievements.

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