*Original Research*

# Factors Affecting Income from Fish Pindang Businesses in Mlaten and Kedawang Villages, Pasuruan Regency, Indonesia

Ade Herawan, Agnes Quartina Pudjiastuti[1] , Nur Ida Iriani
Department of Agricultural Economics, Tribhuwana Tungga Dewi University, Malang, Indonesia

## Abstract

People of Pasuruan Regency seize market opportunities for fishery commodities by conducting fish pemindangan (processing) businesses. The study aims to analyze factors that affect income of the fish pindang business in Mlaten and Kedawang Village, Pasuruan Regency. The research respondents were all fish processing business actors, totaling 24 business actors in Mlaten Village and 26 business actors in Kedawang Village. Data collected through interviews with respondents, and analyzed with multiple linear regression models. The results showed that income of the business in Mlaten Village was simultaneously influenced by price of raw materials, business experience, number of workers, education, processing facilities, firewood, and amount of salt. Partially, the income was significantly influenced by business experience, number of workers, and processing facilities. In Kedawang Village, simultaneously, all of these variables also have a significant effect on the income. But partially, business experience, processing facilities, and the amount of salt have a significant effect on the income. Most dominant factor is processing facilities.

**Keywords:** Pemindangan (processing), fish, income, SMEs.

[1] *Corresponding author's Email: agnespudjiastuti@yahoo.com*

## Introduction

Potency of the Indonesian fishery sector is the largest in the world, both capture fisheries and aquaculture with a sustainable production potential of around 67 million tons/year. East Java has the largest and most diverse fishery resource potential in Indonesia (Rosana & Prasita, 2016) with a production of 362,624 tons/year (Norromadani et al., 2016), of which consist of pelagic and demersal fish (Rosana & Prasita, 2015). Opportunities for export and import of these commodities are also large so it is necessary to observe their development from year to year because of their positive and negative impacts on the trade balance (Pudjiastuti, 2014; Pudjiastuti et al., 2013; Pudjiastuti & Kembauw, 2018). The export value of Indonesian fishery products in 2020 reached USD 5.2 billion or grew positively by 5.7% compared to 2019. In contrast to Indonesia, most of the world's main exporters of fishery products experienced a significant decline compared to 2019, such as China, which fell 7.8%. , Norway 7.5%, Vietnam 2.1%, India 15.1%, Thailand 2.2%, and Ecuador 1.5%. In 2022, the value of Indonesia's fish imports was recorded at 11.37% of its export value, which implies that Indonesia is called a net exporter of fish commodities. However, not all types of Indonesian fish are sold in the international market. Main export commodities include tuna, skipjack, squid, octopus, seaweed, and crabs (Suhana, 2020).

This shows that fishery products have potential market opportunities for business actors in the fisheries sector. Fishery products were marketed in various types of processing because of their perishable nature. There are many processed fish products currently developing, where the sustainability of the business is highly dependent on the behavior of entrepreneurs (Arnis et al., 2018), technical skills availability, capital availability and culture (Nuh. et al., 2018), consumer preferences such as taste, price, product color, packaging color (Yanfika et al., 2020), and distribution (Christian et al., 2021). Nevertheless, it should be understood that the changes in chemical composition, physicochemical parameters, microbiological quality and sensory properties associated with fish salting and storage periods (Hafez et al., 2019).

Availability of large fish because East Java as one of the centers of capture fish production in Indonesia, is well utilized by people in Pasuruan Regency, especially in Mlaten and Kedawang Villages. Due to the perishable nature of this commodity, so that it can be consumed by people in the form of a safe product, curing must be carried out. There are many fish preservation activities that are commonly carried out, including pemindangan.

Pemindangan of fish is one of the traditional processing techniques by means of a combination of boiling/cooking and salting. Considering the simple nature of the transfer business, the costs incurred only include three items, namely fish raw materials, other raw materials and fixed costs (Fitrianingsih et al., 2021). Pemindangan is a processing and preservation technique by boiling/cooking fish in a salty atmosphere for a certain period of time in a container and then the process of reducing the water content to a certain extent occurs (Pandit, 2016). Fish pemindangan businesses have sprung up in various regions because they are very profitable, including in Magelang City (Hardjanto & Windoatmoko, 2021), Musi Banyuasin Regency (Wahyuni et al., 2018), Lombok Timur Regency (Subhan, 2018), Trenggalek Regency (Purnadwiyanti et al., 2017), Situbondo

Regency (Junianingsih, 2015). The business continues even though it causes environmental pollution (Astuti, 2018) and faces risks in the form of fluctuations in production and prices (Talakua, 2014).

Some results of empirical studies show that there are many factors that affect the income obtained from fish processing business. These factors include: raw materials (Lubis & Ginting, 2020; Maringka et al., 2021), and social demographics (Anom et al., 2017), while other fish processing incomes are influenced by age and business scale (Wulandari et al., 2020). The results of another study also found that socio-demographic variables also affected the welfare of fish-fishing entrepreneurs in Tabanan Regency (Anom et al., 2017). One of the proxies of welfare is income.

In Pasuruan Regency, pemindangan business is carried out by community individually and in groups. Types of fish considered are scad, salmon, tuna, zero, perkak, mackerel, selar, tembang, and milkfish. Pindang of layang and salmon fish have a relatively high market demand compared to other types. Pindang fish was marketed to Bojonegoro, Sidoarjo, Malang, and other areas around Pasuruan. Emergence of MSMEs in the fisheries sector is a positive impact of the economic role of fishery sector. Based on the Fisheries Service of Pasuruan Regency, there are 125 MSMEs that specifically carry out fish processing business. Therefore, the business has become a leading processed business and is one of the main sources of income by people in this region. Based on the description that has been explained, this study aims to analyze factors that influence income of fish pemindangan business in Mlaten Village and Kedawang Village, Pasuruan Regency.

## Methodology

The research had been carried out in Mlaten Village and Kedawang Village, Nguling District, Pasuruan Regency. Location was chosen purposively with consideration that the two villages are centers of fish processing business. In addition, it is also a priority in the economic development of the Pasuruan Regency.

Population were all fish pemindangan entrepreneurs in Mlaten Village and Kedawang Village. Census method was used because there were only 24 fish processing business actors in Mlaten Village and 26 business units in Kedawang Village. Data were collected through interviews with a questionnaire instrument. Primary data collected includes factors that affect income of entrepreneurs, price of raw materials, business experience, number of workers, education, processing facilities, firewood, and the amount of salt.

After data were edited in the field, compiled and tabulated, then it was analyzed using multiple linear regression models. Prior to the regression analysis, validity and reliability tests were first performed. Validity test is used to assess accuracy of the instrument in measuring data. Validity testing is done by calculating correlation between each statement/indicator with total score using Product Moment (r) correlation. The correlation formula can be written as follows:

$$r_{xy=} \frac{n(\sum xy) - (\sum X \sum y)}{\sqrt{[n\sum x2 - (\sum x)2][n\sum y2 - (\sum y)2]}} \qquad (1)$$

where: rxy = correlation coefficient, n = number of samples, x = score of each statement item, y = total score of statement items, x = total score of statement items, y = total score of statement items, $\sum xy$ = number of multiplication x and y. If r count > r table, then the instrument is said to be valid.

Reliability test is used to determine consistency of measuring instrument, whether measuring instrument used is reliable and consistent if the measurement is repeated. The test uses the Cronbach's Alpha method with formula:

$$r_{11} = \left[\frac{k}{(k-1)}\right]\left[1 - \frac{\sum \sigma_b^2}{\sigma_t^2}\right] \qquad (2)$$

where: $r_{11}$= instrument reliability coefficient, k = number of item variants, $\sum \sigma_b^2$ = number of item variants, $\sigma_t^2$ = total score variance. If r count > r table 5%, then the instrument is said to be reliable.

To analyze factors that affect income of fish pemindangan business, a multiple linear regression equation is used which is mathematically written as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 \qquad (3)$$

where: Y = fish pemindangan business income, $\alpha$ = constant, $\beta_{1\text{-}7}$ = regression coefficient, $X_1$ = price of raw materials, $X_2$ = business experience, $X_3$ = number of workers, $X_4$ = education, $X_5$ = processing facilities, $X_6$ = firewood , $X_7$ = amount of salt.

To find out the factors that affect income of the business, the following series of steps are carried out:

1) Classical assumption test, is a statistical requirement that must be met in multiple linear regression analysis based on ordinary least squares (OLS). The tests used are heteroscedasticity, normality, and multicollinearity. Heteroscedasticity test aims to prove whether in the regression model there is an inequality of variance from residuals of one observation to another observation. If variance of those residuals is different, it is called heteroscedasticity. Decision making for heteroscedasticity test: (a) If there is a certain pattern, such as the points that form a certain regular pattern (wavy, melted and then narrowed), it indicates that heteroscedasticity has occurred; (b) If there is no clear pattern, and the points spread above and below the number 0 on the Y axis, then there is no heteroscedasticity.

Normality test of data is based on the following criteria: (a) If data spreads around diagonal line and follows direction of the line or histogram graph shows a normal distribution, then regression model is said to meet assumption of normality; (b) If data is spread far from and/or does not follow direction of the diagonal line or the histogram graph does not show a normal distribution, then regression model is said to not meet assumption of normality.

Decision-making criteria for the multicollinearity test are: (a) If the independent variables have a correlation number above 0.90, then it is an indication of multicollinearity; (b) Multicollinearity can also be seen from VIF number, if VIF < 10, there is no multicollinearity.

2)  Goodness of fit model, carried out to determine ability of variations in raw material prices, business experience, number of workers, education, processing facilities, firewood, amount of salt to explain variations in fish processing business income. It can be seen from the coefficient of determination ($R^2$). If the coefficient is close to 1, more appropriate regression model has been formulated.

3)  F test, it was conducted to determine effect of the factors simultaneously on income. To test the hypothesis, a decision-making criterion based on significance probability is used. If the probability of significance < 0.05, then simultaneously, factors of raw material prices, business experience, number of workers, education, processing facilities, firewood, amount of salt have a simultaneous effect on income. If the results are obtained, then a partial test (t test) can be applied.

4)  Partially, t-test was made to determine effect of factors on business income. Decision making criteria in the test are also based on the probability of significance. If the probability of significance < 0.05, then factors of raw material prices, business experience, number of workers, education, processing facilities, firewood, amount of salt have partially effect on income.

## Result and Discussion

Pasuruan is one of the regencies in East Java Province with regional boundaries: Sidoarjo Regency in the north, and the Java Sea, in the east with Probolinggo Regency, Malang Regency in the South, Batu City in the Southwest and Mojokerto Regency in the West. Geographically, this regency consists of mountains, lowlands and coastal areas with an area of 1,474 km2. The potential for marine and fisheries in Pasuruan Regency includes marine waters and coastal areas that stretch for ± 48 km from Nguling to Bangil District. In addition, this area also has areas of lakes, freshwater fisheries and brackish water fisheries that are very potential to be developed. Therefore, there are many fish pemindangan businesses in Pasuruan Regency, as the main livelihood of the people in Mlaten and Kedawung Villages. One of these fish preservation activities, apart from extending the shelf life of fresh fish with abundant production, also increases added value of fish. The following is a profile of the business actors and factors that affect the income obtained from the activity.

### *Profile of Fish Pemindangan Business Actors in Mlaten and Kedawung Villages*

Profiles of business actors based on age, education level, number of family members, experience and business experience are presented in detail in Table 1. Age can affect productivity and technology adoption. There is a difference in the age range between the villages. In Mlaten Village, pindang fish entrepreneurs are 20-69 years old, while in Kedawang Village are 40-69 years old. It indicates that business regeneration has been carried out in the fish processing industry in Mlaten Village, although it is only 29%

recorded. On the other hand, the majority of entrepreneurs (96% in Kedawang Village and 87% in Mlaten Village) are of productive age.

Family members are people who eat and live in the same house with pindang fish entrepreneurs. There is a difference in the number of dependents of the entrepreneur. In Mlaten Village, the number of family members ranges from 2-7 people per household, while in Kedawang Village, they have a larger burden of 2-10 people. Most (67% in Mlaten Village and 65% in Kedawang Village) pindang entrepreneurs have 5-7 family members. It indicates that this business is able to support a household with a large number of family members.

Education in this case is intended to provide an overview of the last formal education taken by business actors. Most (96%) of the pindang fish business actors in the two villages have studied from elementary school to high school. This shows that this business does not require higher education. New business actors can enter this job market as long as they have the capital and knowledge of fish processing business. However, there are also entrepreneurs who have pursued higher education.

Table 1. Characteristics of fish processing entrepreneurs in Mlaten and Kedawang villages

| Kedawang Village | | Description/Category | Mlaten Village | |
|---|---|---|---|---|
| Frequency (person) | Percentage (%) | | Frequency (person) | Percentage (%) |
| | | Age (year) | | |
| - | - | 20-29 | 1 | 4 |
| - | - | 30-39 | 6 | 25 |
| 15 | 58 | 40-49 | 7 | 29 |
| 10 | 38 | 50-59 | 7 | 29 |
| 1 | 4 | 60-69 | 3 | 13 |
| 26 | 100 | Total | 24 | 100 |
| | | Family members (person) | | |
| 8 | 31 | 2-4 | 8 | 33 |
| 17 | 65 | 5-7 | 16 | 67 |
| 1 | 4 | 8-10 | - | - |
| 26 | 100 | Total | 24 | 100 |
| | | Education | | |
| 10 | 38 | Elementary School | 18 | 75 |
| 7 | 27 | Junior High School | 1 | 4 |
| 8 | 31 | Senior High School | 4 | 17 |
| 1 | 4 | College | 1 | 4 |
| 26 | 100 | Total | 24 | 100 |
| | | Business experience (year) | | |
| 11 | 42 | 1-9 | 9 | 38 |
| 11 | 42 | 10-19 | 13 | 54 |
| 4 | 16 | 20-29 | 2 | 8 |
| 26 | 100 | Total | 24 | 100 |

Based on their business experience, business actors have business experience of 1-29 years. Most (62% in Mlaten Village and 58% in Kedawang Village) perpetrators have more than 10 years of experience. This shows that this business is attractive to be chosen as a source of income because of various considerations such as the availability of raw materials, easy transfers to do, the prices of raw materials and the relatively suitable prices of imports, and the availability of the market.

*Research Instrument Test*

Research instrument is feasible to be used to collect data because it is valid and reliable. The results of the validity and reliability test can be read in Table 2. Validity decision criteria are based on the r-count value greater than r-table. Reliability test was carried out using the Cronbach alpha value as an indicator. The instrument is declared reliable if it has a minimum Cronbach alpha value of 0.6 (Ghozali, 2012).

Table 2 shows that each variable starting from price of raw materials to the amount of salt has an r-count > r-table. It proves that the instrument was valid. In addition, reliability analysis refers to Cronbach alpha value. As a result, this parameter in both villages has a number greater than 0.6 so it can be concluded that the instrument is reliable. These results become the starting point that data that has been collected through questionnaire can be used in further analysis.

Table 2. Parameters of instrument validity and reliability

| Variable | Mlaten Village | | Kedawang Village | |
|---|---|---|---|---|
| | r-stat | r-table | r-stat | r-table |
| Raw material prices | 0.529 | | 0.675 | |
| Business experience | 0.531 | | 0.551 | |
| Manpower | 0.598 | | 0.828 | |
| Education | 0.505 | 0.4044 | 0.636 | 0.3882 |
| Processing facilities | 0.693 | | 0.650 | |
| Firewood | 0.617 | | 0.500 | |
| Amount of salt | 0.557 | | 0.615 | |
| | *Cronbach Alpha:* 0.651 | | *Cronbach Alpha:* 0.724 | |

*Factors Affecting Fish Pemindangan Business Income*

The influence of the factors on fish processing business income was analyzed simultaneously (F test) and partially (t test). The results of this analysis can be seen in Table 4. Before presenting and discussing the tests, it is necessary to first describe the fulfillment of classical assumptions and goodness of the regression model.

Classic assumption test

As in general regression analysis with cross section data, classical assumption test is intended to detect multicollinearity, heteroscedasticity, and normality of data (Gujarati, 2012). Presence of multicollinearity is known by comparing tolerance value and VIF

analysis results provided that tolerance value is > 0.10 and VIF is < 10.00. Table 2 shows the parameters has met provisions that there is no multicollinearity.

Table 3. Classical assumption test parameters

| Variable | Mlaten Village | | | Kedawang Village | | |
|---|---|---|---|---|---|---|
| | *Tolerance* | VIF | Sig | *Tolerance* | VIF | Sig |
| Raw material prices | 0.221 | 8.175 | 0.537 | 0.272 | 3.671 | 0.521 |
| Business experience | 0.766 | 1.305 | 0.256 | 0.481 | 2.077 | 0.396 |
| Manpower | 0.156 | 6.430 | 0.763 | 0.136 | 7.366 | 0.698 |
| Education | 0.696 | 1.437 | 0.263 | 0.614 | 1.627 | 0.424 |
| Processing facilities | 0.236 | 4.230 | 0.358 | 0.334 | 2.994 | 0.543 |
| Firewood | 0.188 | 9.389 | 0.372 | 0.394 | 2.539 | 0.245 |
| Amount of salt | 0.453 | 2.209 | 0.386 | 0.424 | 2.361 | 0.432 |
| asymp. Sig. (2-tailed) = 0.200        asymp. Sig. (2-tailed) = 0.200 | | | | | | |

Heteroscedasticity test is carried out to determine whether in a regression model there is an inequality of variance from the residuals of one observation to another. A good regression model is a model with homoscedasticity or no heteroscedasticity. The test is carried out using the glejser method, where basis for decision making is, if significance value is greater than 0.05, then there is no heteroscedasticity. Table 3 shows that each variable has a significance value > 0.05 so it can be proven that there is no heteroscedasticity in the regression model.

Normality test is performed to measure whether a data has a normal distribution or not. If data is normally distributed, then it can be used in parametric statistics. Kolmogorov-Smirnov method was used to determine normality of data. Decision making on the data normality test is to compare it with significance values. If significance value is > 0.05, it can be stated that the data obtained has a normal distribution. Table 3 lists asymp. Sig. (2-tailed) = 0.200 which is > 0.05, meaning that it has a normal distribution.

Goodness of fit model

The appropriate regression model is very important in this analysis because the ability of raw material prices, business experience, manpower, education, processing facilities, firewood and amount of salt in explaining the variation in fish processing business income in the villages, must be high. Coefficient of determination (R2) of regression model for Mlaten and Kedawang Village is 0.922 and 0.911, respectively (see Table 4). That is, 92.2% of income from fish processing business in Mlaten Village and 91.1% of income in Kedawang Village are explained by variations in raw material prices, business experience, manpower, education, processing facilities, firewood and amount of salt. Because the number is close to 1, so the regression model is appropriate to analyze the determinants of income for the fish pemindangan business.

Simultaneous influence test (F test)

Price of raw materials, business experience, manpower, education, processing facilities, firewood and amount of salt, have a simultaneous effect on income. Conclusion

is drawn based on the results of F test by comparing calculated F value and F table or its significance. Table 4 shows Fstat > F table (126,998 > 2.66) in Mlaten Village and (126.348 > 2.58) in Kedawang Village. This figure shows that those variables have significant effect simultaneously on the income of fish pemindangan business.

Partially influence test (t test)

After it was proven that simultaneously, the price of raw materials, business experience, number of workers, education level, processing facilities, firewood and the amount of salt, had a significant effect, then continued with a partial test (t test). This step is intended to identify of the seven independent variables, which one has a significant influence individually.

Table 4 shows that there are three factors that have a significant effect on the business income in Mlaten Village, namely business experience, manpower, and processing facilities. Meanwhile, in Kedawang Village, there are also three factors that have a significant effect on the entrepreneur income, namely business experience, processing facilities, and amount of salt. These results are similar with previous research (Sumolang et al., 2019) (Fitria & Ariva, 2018).

Table 4. Factors that influence fish pemindangan business income

| Variable | Mlaten Village | | Kedawang Village | |
|---|---|---|---|---|
| | Regression coefficient | sig | Regression coefficient | Sig |
| *Constant* | 4.686 | 0.000 | 4.995 | 0.000 |
| Raw material prices | -0.186 | 0.442 | -0.147 | 0.185 |
| Business experience | 0.018 | 0.071 | 0.019 | 0.040 |
| Manpower | 0.229 | 0.050 | 0.088 | 0.396 |
| Education | -0.022 | 0.573 | -0.004 | 0.903 |
| Processing facilities | 0.541 | 0.001 | 0.583 | 0.000 |
| Firewood | -0.029 | 0.883 | -0.050 | 0.637 |
| Amount of salt | 0.022 | 0.127 | 0.030 | 0.052 |
| $R^2$ | 0.922 | | 0.911 | |
| F Statistik | 126.998 | | 126.348 | |
| F Table | 2.66 | | 2.58 | |
| Sig. F | 0.000 | | 0.000 | |

Mathematically, the factors that affect the income of the fish processing business can be stated as follows:

(1) Fish pemindangan business in Mlaten Village

$$Y_1 = 4,688 - 0,186X_1 + 0,018X_2 + 0,229X_3 - 0,022X_4 + 0,541X_5 - 0,029X_6 + 0,022X_7 \qquad (4)$$

(2) Fish pemindangan business in Kedawang Village

$$Y2 = 4,995 - 0,147X1 + 0,019X2 + 0,088X3 - 0,004X4 + 0,583X5 - 0,050X6 + 0,030X7 \qquad (5)$$

The effect of each factor on the income of the fish processing business is described below.

### a. Price of raw material

In Mlaten Village, regression coefficient of raw material prices is -0.186, meaning that the increase in raw material prices is IDR 1000, will reduce income by IDR 186. In Kedawang Village, regression coefficient of the variable is -0.147, meaning that the increase in raw material prices is IDR 1000, will reduce income by IDR 147. This finding is in accordance with theory that higher raw material prices will increase costs and of course will reduce net profit (income) of a business.

Price of raw materials in this case is a proxy for total costs incurred by entrepreneurs to purchase fish raw materials (price per unit times amount of fish raw materials purchased). Inventory of raw materials is an important factor to support the process of pindang production. Control of raw materials was carried out to reduce errors that can cause losses. If supply of raw materials is too large compared to the need, it will increase interest expense, maintenance and storage costs in the warehouse, and allow for depreciation and the quality of raw goods. It can reduce profit of the business owner, as well as if the raw material is too small it can hold up production process and cause losses to the business owner (Maringka et al., 2021). The owners of fish processing businesses in Mlaten and Kedawang villages have partnered with the Bahari Indah Perkasa cooperative to reduce the cost of providing raw materials. Existence of cold storage machines is very helpful for business owners to minimize cost of providing raw materials.

### b. Business experience

Business experience is a description of the length of time a business owner has in carrying out transfer activities. The longer of experience, the higher of knowledge and skills of business owners in managing their business. Regression coefficient of business experience is 0.018 for Mlaten Village and 0.019 for Kedawang Village. The coefficient is positive, indicating that the longer of business experience, the income from the pemindangan business will also increase. Experience can affect knowledge and ability of business actors in managing their business. Increased knowledge can support creativity in innovation. These innovations include creating new product variants, opening up markets and improving technology (Harahap & Faizien, 2021). Most of pindang fish entrepreneurs in Mlaten and Kedawang Village have more than 10 years of experience in the business.

### c. Manpower

In Mlaten Village, labor regression coefficient is 0.229, meaning that every additional labor outpouring of one HOK will increase income by IDR 299. In Kedawang Village, the regression coefficient is 0.088, meaning that each additional labor force of one HOK will increase income by IDR 88. Generally, the businesses use family and non-family workers. One working day (HOK) consists of 7 hours of work, with a wage of IDR 70,000 for male workers and IDR 60,000 for female workers.

Labor is the main factor in production activities, but the amount of its use needs to pay attention to the conditions of a business. If the use of labor exceeds production capacity, it increases production costs unnecessarily. Business actors are expected to be able to allocate the optimal number of workers by considering production capacity and profits (Agam et al., 2022). Fish pemindangan activities that require labor in Mlaten and Kedawang Village, include fish selection/sorting, cleaning, salting, boiling, cooling, and packaging.

d. Education

Education is a process of changing one's attitudes and behavior through teaching and training efforts. The regression coefficient for education level in Mlaten Village is -0.022, and in Kedawang Village is -0.004. A negative value indicates the higher of education, the lower of income earned. However, this factor has no significant effect on income. A negative relationship occurs due to the time spent in transfer business tends to decrease because business actors allocate more time in taking education. This can be seen from the profile of the respondent's business actors. Entrepreneurs who graduated from elementary school tend to have longer experience compared to entrepreneurs who graduated from high school/bachelor. This finding is similar with the study by (Iskandar et al., 2020) which revealed that the higher the level of education, the lower the performance.

e. Processing facilities

Processing facilities are very supportive of the process of pemindangan production. If there are more processing facilities, the income will also increase. Regression coefficients of this variable in Mlaten and Kedawang Village are 0.541 and 0.583, meaning that each additional one unit of processing facility will increase income by IDR 541 and IDR 583. Processing facility has a significant effect on the income of pindang fish business in those villages.

Processing facilities used in the fish pemindangan process begin from weeding and washing. Then the fish were washed again and again until completely clean. Fresh fish that have been washed are arranged in pots/boxes/containers according to their type and size. After the fishs were arranged, then salting was done. If the salting process is complete, container was closed with a lid equipped with a ballast, then continued under boiling activity as far as the fish was cooked. Boiling process is carried out using firewood as a heat source. The last activity carried out is packaging. During the activity, entrepreneur used facilities that include pots, containers, besek (packaged from woven bamboo), fish baskets, and firewood.

f. Firewood

Firewood serves as a source of heat needed in the boiling process. Fish processing is an effort to preserve and process fish using salting and smoking techniques. Regression coefficient of the firewood variable in the fish processing business in Mlaten Village is -0.029 and in Kedawang Village is -0.050. A negative value indicates a negative relationship between firewood and income variables. If the use of firewood increases, the

income obtained will decrease. It shows that the current use of firewood is too much and should be reduced. However, the factor has no significant effect.

g.  Amount of salt

Salt serves to provide a savory taste to fish, reduce water content and inhibit the growth of spoilage bacteria in fish. Salt also acts as a preservative, so the fish can last a long time during marketing. In Mlaten Village, regression coefficient of the variable is 0.022 and in Kedawang Village it is 0.030. Regression coefficient has a positive value, meaning that an increase in the amount of salt, will increase income of the business. It shows that the amount of salt can be increased in number yet. In Mlaten Village, this factor has a significant effect, but in Kedawang Village it is not significant.

## Conclusion

Income of fish pemindangan business in Mlaten and Kedawang Village is simultaneously and significantly influenced by price of raw materials, business experience, manpower, education, processing facilities, firewood, and amount of salt. Partially, business income in Mlaten Village is significantly influenced by business experience, manpower, and processing facilities. Meanwhile, business income in Kedawang Village is significantly influenced by business experience, processing facilities, and amount of salt. The most significant (dominant) variable in the both villages has something in common, i.e. processing facilities.

Government or private parties with an interest in the pemindangan business will contribute to efforts to increase the income of pindang entrepreneurs by: 1) providing training aimed at improving their technology and capabilities in the pemindangan process, 2) providing assistance in the form of processing facilities or soft loans for procurement. It is still possible for pindang entrepreneurs in Kedawang Village to increase the amount of salt, while in Mlaten Village it is still possible to increase the use of labor. Limitation of this research is that it has not explored in detail the natural conditions (weather for example) and pemindangan process in the both villages, so that there are differences regarding the factors that have a significant influence.

### Author Contributions

The first author is in charge of collecting and analyzing data, as well as compiling a draft manuscript. The second author is in charge of compiling tabulation results and data analysis, revising draft articles, adjusting templates, submitting and correspondence. The third author collects articles for reference.

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