



Affirming logistics activities toward minimizing waste in marine products based on women role in Tegal, Indonesia

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ABSTRACT

Women have an important role in economic development in coastal areas. One of the roles is to process the remaining marine products which are used as side activities to increase the family' incomes. The processing activities is realized to produce added value products by minimizing marine products waste. this research aims to observe the women role in minimizing of marine products waste based on logistics activities. It is due to limited study mentioned about marine products waste assessment. The used method is quantitative with statistical test is ANOVA. The results show there is significant factor that has correlation with logistics activities. The factors are estimated amount of processed marine products and the daily income. The estimated amount of processed marine products has significant with unsold product that is given to nearest neighbor. Daily income has significant with storage, decrease the products quality, and bad weather. Moreover, by gaining appropriate storage, women have role to add their knowledge about inventory. They can collaborate with interested party to provide sufficient storage. In addition, the good storage can keep the processed marine product quality. The appropriate storage especially cold storage can keep the raw material inventory during bad weather.

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1. INTRODUCTION

Every human being wants to live a prosperous life, the needs of life are fulfilled so that they can live happily. However, what is happening at this time is that there are still many families who have not been able to feel a prosperous life with adequate living needs due to low family income or husbands (Susanti & Patonah, 2020). The existence of women has an important role both in the domestic (family) sphere and public sphere (society). They can manage family finances from their husband to improve the economy in the family (Susanti & Patonah, 2020). However, there are many families that have low income. Low family income and poverty are factors that make the family's economy difficult. Therefore, it needs women role in activities to meet family's economic requirements (Kristina, 2010).

Women have an important role in economic development especially in coastal areas. They have a very strategic social potential in supporting fisherman community at survival time (Djunaidah & Nurmalia, 2019). One of the role is to process the remaining marine products which are used as side

activities to increase the family' incomes (Setyawati & Ningrum, 2018). Women has significance role especially in processing marine products (Setyawati et al., 2018). These marine products include unsold fish such as non-fresh fish, damaged fish, missed fish that unmet fish standard. Therefore, the anticipation is needed to gain the caught fish are not wasted (Kristiyanti & Siswadi, 2018).

Most of women in coastal area work to support their husband. They conduct processed products such as salted fish, shrimp paste, *rempeyek*, and *petis*. Those product is conducted to minimize the marine product losses by fishermen (Kristiyanti & Siswadi, 2018) instead of throwing away (Tugiyono et al., 2020). The processing activities is realized to produce added value product and also to gain more social and economic capabilities (Putra et al., 2020). In the situation, women role has important role to help fisherman income, especially when it is not the fishing season (Setyawati et al., 2018).

Therefore, this research is conducted to more observe the women role in minimizing of marine products waste based on logistics activities. It is due to limited study mentioned about marine products waste assessment based on logistics perspectives. Marine product waste or similar with food waste is defined as food that cannot be consumed (Nafiroh & Fuad, 2019) or the rest marine products or unsold products by fishermen. (Chaerul & Zatadini, 2020). The aim of this study is to elaborate the mitigation practices use as a reference to determine the activity-based food waste levels. Furthermore, Tegal Regency, Indonesia is chosen as the research subject because of the many women who are active in processing unsold marine products (Zulham et al., 2020).

2. RESEARCH METHOD

This research was conducted in the coastal area of Tegal Regency, Indonesia. Respondent was women with the total is 110. The method used was quantitative. The data collected included women's demographics and activities. Demographic data included respondent's age, type of processing, daily income, and estimated number of processed. The described activities of women can be seen in TABLE 1.

Table 1. Questionnaire Attributes

Activity	Code	Attribute
Production	P1	Selling fish will get leftovers and it shall be consumed personally
	P2	The duration of processing marine products greatly affects the quality of processed products
	P3	Large fishes are only taken for the body, not for the head
	P4	Unsold processed marine products are given to the surrounding community
	P5	Procurement of raw materials is taken directly from the rest of the fishermen's catch
Storage	P6	Storage of processed products in a place that is not cold will affect the quality of the fish
	P7	Raw materials that do not have a storage area or storage will make the raw material self-life decrease
	P8	The soaring price of processed marine products on market has a great influence on the supply of raw materials
Procurement/Purchasing	P9	Weather factors can result in inadequate transportation so that it affects the availability of fish
	P10	Ordering too much fish causes the quality of processed marine products decrease
	P11	Need an innovative selling strategy
Communication	P12	Poor communication with consumers can affect income
	P13	Lack of coordination with fishermen, resulting in less qualified marine product delivery
	P14	Packaging using newspapers can affect processed marine products

Handling	P15	Packaging using plastic can affect processed marine product
	P16	Very tight packaging can affect processed marine product
	P17	Inadequate tools during the processing of raw materials can affect quality of processed marine products
	P18	Environmental impacts at sea can affect the quality of processed products
	P19	Estimated number of processed marine product to be reprocessed

Data collection was done by distributing questionnaires. The measurement used Likert scale from one to five where, 1) strongly disagree, 2) disagree, 3) quite agree, 4) agree, 5) strongly agree. Then, collected data will be tested normality, validity, and reliability. After gaining those results, data were tested using ANOVA and the software is Minitab 19. The hypothesis is set below,

H_1 = The demographics of women affects the logistics activities toward minimizing marine products waste

3. RESULTS AND DISCUSSIONS

3.1 Respondent Demographics

Respondents in this study amounted to 110 people. The demographics of the respondents can be seen in table 2.

Table 1. Demographics of the Role of Women in Processing Fishermen's Catch

User Variables	Distribution (%)	
Age	26-35 Years	6
	36-40 Years	36
	41-45 years old	45
	>55 Years	13
Processed Type	Salted fish	55
	Shrimp paste	16
	<i>Rempeyek</i>	5
	<i>Petis</i>	5
	Fillet	16
	Smoked Fish	3
Daily Income (IDR)	<99,000	23
	100,000-199,000	14
	200,000-299,000	32
	300,000-399,000	23
	>400,000	8
Estimated Processed Amount	<20kg	47
	21 kg – 40 kg	47
	41 kg – 60 kg	5
	61 kg – 80 kg	1

According TABLE 2, the majority of respondent age is between 41-45 years old (45%) followed 36-40 years old (36%), higher than 55 years old (13%), and between 26 and 35 years old (6%). Most of marine processed product is salted fish (55%). Furthermore, the daily income is around IDR 200,000-299,000 (32%), followed by less than IDR 99,000 and IDR 300,000-399,000 (23%). The last is estimated processed amount is less than 20 Kg and between 21-40 Kg are 47%.

3.2 Validity, Reliability, and Normality Test Results

The results of the validity, reliability, and normality tests can be seen in table 3.

Table 3. Validity, reliability, and normality test results

Code	Pearson Correlation	P-value	Code	Pearson Correlation	P-value	Cronbach's Alpha	Skewness	Kurtosis
P1	0.374	0.000	P12	0.352	0.000	0.6698	0.4624	0.8189
P2	0.236	0.013	P13	0.325	0.001			

P3	0.236	0.013	P14	0.313	0.001
P4	0.085	0.377	P15	0.362	0.000
P5	0.364	0.000	P16	0.466	0.000
P6	0.241	0.011	P17	0.286	0.002
P7	0.180	0.060	P18	0.221	0.027
P8	0.159	0.097	P19	0.391	0.000
P9	0.201	0.035	P20	0.507	0.000
P10	0.274	0.004	P21	0.400	0.000
P11	0.362	0.000			

According to TABLE 3, most of data are valid except P4, P7, and P8. Those data are not valid because the p-value is greater than 0.05. The reliability test shows the data are reliable with Cronbach' Alpha value is greater than 0.06 (0.6698). Furthermore, in the normality test shows skewness and kurtosis value is 0.4624 and 0.8189, therefore data is normally distribution.

3.3 ANOVA Test Results

The ANOVA test was used to determine the relationship between the demographics of the respondents and women's logistical activities. The ANOVA result can be seen in table 4.

Table 4. ANOVA Test Result

Response	Significance factor	p-value
P3	Estimated amount of processed marine products	0.021
P4	Daily Income	0.038
P7	Daily Income	0.012
P10	Daily Income	0.037
P18	Daily Income	0.001

There is a significant correlation between estimated amount of processed marine product and number of processed fish heads (P3). This shows that the greater the amount of waste obtained, the greater number of processed fish produced. In addition, the daily income factor affects the response of P4, P7, P10, and P18.

Response P4 shows that the amount of daily income per day has significant correlation with unsold processed marine product are given to the surrounding community. It means the unsold product will be effect to the decreasing of daily income. At this situation, women role is important to think the production scale. They have to focus on production planning and prepare for mini warehouse at their home. Donation is good but they have to concern about empowering their surrounding community to increase the income by cooperative working in processing marine products.

Response P7 has significant correlation with daily income. It means no storage will be effect to decreasing marine products shelf-life. If many marine products qualities are decrease, their daily income will be decrease also. Therefore, women need to provide storage or storage area to keep their raw material quality such as providing cold storage. Response P10 has significant correlation with daily income. It means ordering too much marine product will decrease the quality of processed marine products. Saludung (2009) mentioned the number of processed marine products capacity will affect to economic and environment. Therefore, at the situation, the women shall improve their production performance in order to gain more revenue and minimize the marine product waste (Karina et al., 2018).

Response P18 show significance with daily income. It means sea weather impact affects the quality of processed products. The bad weather impact on the sea results in delays in taking fish so that processed marine product traders get less products. It needs the collaboration among stakeholders from fishermen, women, and trader or buyer to gain collaborative action to prevent the situation. The women can find another resource to increase their production capacity. Overall, the women shall consider storage, quality of processed marine products, and bad weather to increase their income.

The women role in logistics activities has a major contribution to minimize marine products waste by processing the into some added value products. It is shown by their involvement to increase household income (Widodo, 2012). By gaining appropriate storage, women have role to add their

knowledge about inventory. They can collaborate with interested party to provide sufficient storage. In addition, the good storage can keep the processed marine product quality. The appropriate storage especially cold storage can keep the raw material inventory during bad weather which fishermen cannot go fishing. It will show their role as an decision makers in business (Nurlaili & Muhartono, 2017). Sometimes, they can add more household income in which they have made a moderate contribution of additional household income around 25%-50% (Laila & Amanah, 2015).

In addition, the higher of life expectation makes women have to be more progressive in their works. It will drive national development process more quickly. It shows that women have a role to participate in family economic activities (Bertham et al., 2011). It is expected that the greater contribution of women in improving the family economy along with the increasing economic conditions that reflect to their children's education and access to health (Nurhaliza et al., 2020).

Moreover, the women role shall be improved by adding some knowledge such as production planning, storage, and marketing. Those skills shall be adopted to gain better marine product waste management. Moreover, non-edible marine product waste can be managed properly such as making souvenirs. Women role can be optimized by making an organization or cooperative to collect and accommodate their products. The cooperative can be a warehouse to collect not only processed marine products but also raw material. Women role in establishing cooperative can be maintained well if interested party can work together such as academia, government, and industry.

4. CONCLUSION

This study aims to gain new perspective about women role in minimizing marine products waste based on their logistics activity. Most of caught marine product are under quality or unsold in order that make waste. Therefore, it needs a women role to minimize the waste and change it into added value product. The added value product will be gain more additional income for their household. The findings show that there is significant factor that has correlation with logistics activities. The factors are estimated amount of processed marine products and the daily income. The estimated amount of processed marine products has significant with unsold product that is given to nearest neighbor. Furthermore, daily income has significant with storage, decrease the products quality, and bad weather. The approached solution is to collaborate with interested party to provide storage. The storage can keep their finished goods and raw material especially in bad weather condition. Moreover, they have to improve their logistics management skill or knowledge, in order that their roles can be more significance to increase their household incomes. Recommendations for further research is to explore additional aspect such as organization, government regulation, and economic perspective to be more comprehensive. It also can be done by discovering the effect the logistics activities toward their income to gain more understanding in terms of women roles.

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