Increased Effectiveness of Conservation the Coastal Environment through Cleaner Production and Work Motivation of Fish Processors

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Abstract. The coastal area has developed into a center for the fish processing industry, which has an impact on environmental problems in the form of liquid waste and odors. To overcome these environmental problems and carry out cleaner production such as processing and implementing environmental sanitation, work motivation is needed. Because of this, research was conducted to determine the increase in the effectiveness of preserving the coastal environment through cleaner production and work motivation in salted fish processors in the Tangerang Regency. A quantitative study was conducted on 96 respondents drawn from 2,298 salted fish processors populations. To get the correlation between cleaner production and work motivation on the effectiveness of preserving the coastal environment, the path analysis method was used, which resulted in an increase of 52.7% of cleaner production and work motivation, while the remaining 47.3% resulted from other variables. The conclusion obtained from this research shows that the increase in the effectiveness of coastal environmental conservation can be done by increasing the work motivation of salted fish processors to carry out cleaner production in fish processing.

1. Introduction
Coastal development in Tangerang Regency is growing rapidly. Environmental pollution control in the coastal areas of Tangerang Regency has not been carried out properly by the salted fish processing community [1]. The problem of pollution due to salted fish processing waste is a problem in the coastal area of Tangerang Regency [2]. Traditional processed products have had a bad image due to their low quality and nutritional value, inconsistent functional properties, low application of environmental sanitation systems for processing and unhygienic processing methods so that there is no guarantee of quality and safety for consumers [3].

Salted fish is one of the products of the fish processing industry which is carried out by residents using simple equipment and methods. Salted fish processing is done by collecting fresh fish caught by fishermen. The fish is put into the soaking barrel container by mixing salt and fish, left for 1 night. The fish are then washed to remove the salt that is still attached to the body of the fish, then weed. After finishing weeding, then the fish are washed again and drained, then dried on a para-para in the sun for one to two days [2]. Waste generated from salted fish processing can be in the form of solid waste...
weeding the entrails and scales, liquid waste soaking, washing, and draining, and (odor) air waste from the fish drying environment caused by evaporation from the fish body by drying in the sun. This is what causes environmental pollution and environmental sanitation on the coast. One way to control this pollution is to do cleaner production [4]. Cleaner production is generally carried out in industrial activities with the aim of increasing efficiency and profits, but still preserving the environment. This environmental pollution causes problems in the sanitation of the fish processing work environment with side effects that cause health complaints to the workforce and the environment. Because of this, the role of cleaner production is very much needed to maintain a sustainable coastal environment.

The definition of organizational effectiveness according to Robbins et al. [5] is the level of organizational achievement that is influenced by individuals, groups, and structures within an organization defines effectiveness as an effort to achieve predetermined goals and objectives with three perspectives, i.e., individual, group and organizational effectiveness. Effectiveness is a measurement of the achievement of a goal that has been carefully planned in advance, which is the target that has been set by a group or organization [6]. According to Mullins [7], the effectiveness of an organization is influenced by several factors within the organization itself, i.e., leadership, work motivation, work environment, and relationships between groups. Salted fish processors have the goal of carrying out activities to preserve the coastal environment, through the application of cleaner production by increasing the work motivation of fish processors and reducing waste.

Environmental conservation is a series of efforts to maintain the sustainability of the carrying capacity and capacity of the environment from damage and unfavourable impacts, in another word, managing natural resources from the resulting damage. This conservation must ensure the balance of natural resources. According to [8], environmental conservation is an effort to protect the environment from pollution, destruction, or pollution resulting from human activities, and to improve the attitude of an individual in preserving the environment. Coastal and marine areas are examples of aquatic environments which are easily affected by the presence of waste from land areas[9].

A fisherman is a term for people who do the work of catching fish and other aquatic animals that live at the bottom of the column and the surface of the waters[10]. The results of the catch of fish and other aquatic animals greatly determine the level of welfare of fishermen [11]. Fishermen are included as agents of change that affect changes in the coastal environment, their role is very substantial [12]. Women fishermen, not just fishermen's wives, but fishermen who work directly from the sea to play an important role in the domestic and public spaces. According to [13] These women fishermen play an important role in the fishery production chain, starting from fish collectors, fish processing and marketing According [14], most of the economic activities in coastal areas that involve women are salted fish processing, shrimp paste making, smoked fish processing, food processing from seaweed and fish, and as laborers in the fish processing industry. These roles show that fisherwomen have a great contribution to the preservation of a sustainable coastal environment. This statement concludes that the preservation of the coastal environment is to work together to care for, protect, maintain, utilize and reuse, making things remain as they were, in order to obtain survival.

Cleaner production is an environmental management strategy that aims to reduce risks to humans and the environment, is preventive and integrated that needs to be applied continuously to the production process and product life cycle. [15] mentions that waste prevention is a goal of cleaner production. Some examples of these cleaner production efforts are reducing sources of raw materials, reducing waste at each stage of the process, and recycling. [16] states that cleaner production in environmental sustainability is an environmental management strategy, which is applied in the production and product life cycle to reduce the risk of harm to humans and the environment. According to [17] , cleaner production is a sustainable, integrated, and efficient environmental strategy to reduce waste. From the research that has been done mentioned, it can be concluded that cleaner production is a work environment where workers can work on every process to reduce waste and pollution.

The term work motivation is often used to refer to motivation in the work environment. Motivation is a driving force, which will create a habit, in order to achieve the goal of self-development. Work motivation is related to a person's wants, needs and expectations to achieve goals. According to [18]
motivation is something that creates enthusiasm or work motivation, where the strength or weakness of the motivation also determines the level of work performance. Luthans [19] suggests that individual work motivation is an action that is done because they want to do it. If the individual is motivated, the individual will make a positive choice to do something, because it can satisfy his desire. According to [20], work motivation is the driving force of an individual to make a major contribution to help the organization achieve its goals. Work motivation according to [3] is the result of a collection of internal and external forces that cause an individual to choose the appropriate action and determine the right attitude. According to Robbins et al. [5], work motivation is the willingness of individuals to sacrifice other priorities in order to achieve organizational goals. Work motivation according to [21] is an encouragement, energy, or condition contained in a human being. This is described as an expectation, direction, or encouragement that arises in an individual that leads to an attitude and behaviour. Motivation can also be interpreted as a condition that encourages or causes someone to do an activity.

Based on the motivation concept mentioned above, it can be concluded that the work motivation of fish processors, is a strength and enthusiasm to work, with the efforts from an individual or a group, according to standards and procedures, to achieve organizational goals, related to the preservation of the coastal environment.

There are two hypotheses. First, cleaner production and work motivation have a direct effect on the effectiveness of preserving the coastal environment. Second, cleaner production and work motivation have an indirect effect on the preservation of the coastal environment.

2. Research Methodology

This research started from January 2019 to June 2019 in Tangerang Regency. The method employed in this research is a descriptive method, with a survey and causal approach. The data analysis technique was carried out using a path analysis model[22], with the variables used in the study being cleaner production (X1), work motivation of salted fish processors (X2), and the effectiveness of coastal environmental conservation (X3). A sample of 96 respondents was taken from a population of 2,298 female salted fish processors in Tangerang Regency, by purposive sampling. The data in this study were obtained using a questionnaire.

![Research analysis model](image)

**Figure 1.** Research analysis model; cleaner production (X1), work motivation (X2) effectiveness of conservation the coastal environment (X3).

2.1. Test of classical assumption instruments

2.1.1 Normality test.

In a regression model, a normality test was carried out to determine whether the independent, dependent or combined variables have a normal distribution or not. For the residual normality test, the non-parametric Kolmogorov Smirnov statistical test can be employed.

2.1.2 Linearity test.

To find out whether each independent variable has a linear relationship to the dependent variable, it can be done by using a regression test.
2.1.3 Regression Analysis
Regression analysis of the independent variables was done using the double regression model below:

\[ X_3 = p_1 X_1 X_3 + p_2 X_2 X_3 + \epsilon \]

Using this model, X3 is directly affected by X1 and X2. Other unmeasured causes affecting the model are described as \( \epsilon \). In this model, X3 is the dependent variable of the effectiveness of coastal environmental conservation, X1 is the independent variable of cleaner production, X2 is the work motivation of salted fish processors.

3. Result and Discussion

The research was conducted using a survey method, with 3 types of data, i.e., cleaner production (X1), work motivation of salted fish processors (X2), and the effectiveness of coastal environmental conservation (X3). The instrument used in the study was a questionnaire form. According to [23], the classical assumption test of the linear regression model needs to be done in order to know whether the regression model is good or not. Frequency distribution is a series of numerical data based on its quantity and/or quality (category). A series of numerical data based on their quantity is referred to as a quantitative frequency distribution as the below

| Table 1. Frequency distribution table statistics |
|-----------------------------------------------|
|                                           | effectiveness of conservation the coastal environment | cleaner production | Work motivation of salted fish processor |
| N Valid Missing                             | 96 96 96                                               |                   |                                      |
| Mean                                        | 83.43 81.68 87.13                                     | 2.108             |
| Std. Error of Mean                          | 1.352 1.873 2.108                                     |                   |
| Median                                      | 87.00 89.00 94.00                                     |                   |
| Std. Deviation                              | 13.242 18.355 20.658                                  |                   |
| Variance                                    | 175.363 336.916 426.742                               |                   |
| Skewness                                    | -.747 -.381 -.247                                    |                   |
| Std. Error of Skewness                      | .246 .246 .246                                       |                   |
| Kurtosis                                    | -.052 -1.164 -1.056                                  |                   |
| Std. Error of Kurtosis                      | .488 .488 .488                                       |                   |
| Range                                       | 60 65 85                                             |                   |
| Minimum                                     | 45 45 40                                            |                   |
| Maximum                                     | 105 110 125                                         |                   |
| Sum                                         | 8009 7841 8364                                      |                   |

3.1. Normality Test
Before analysing the data, the data obtained need to be tested for their normal distribution. This test was carried out using the Kolmogorov Smirnov test method. If the significance result obtained is more than 0.05, then the data tested does not have a significant difference from the standard normal data. A good regression model is a model that has a normal or close to normal data distribution.
Table 2. Normality test

| One-Sample Kolmogorov-Smirnov Test | Unstandardized Residual |
|-----------------------------------|------------------------|
| N                                 | 96                     |
| Normal Parameters^a,b              |                        |
| Mean                              | .0000000               |
| Std. Deviation                    | 13.79539389            |
| Absolute                          | .063                   |
| Most Extreme Differences          |                        |
| Positive                          | .040                   |
| Negative                          | -.063                  |
| Kolmogorov-Smirnov Z              | .622                   |
| Asymp. Sig. (2-tailed)            | .834                   |

Based on Table 2 above, the significance value obtained is 0.622, greater than 0.05. According to [22], if p > 0.05, then the data obtained is normally distributed so that the normality requirements in the regression model have been met.

3.2 Linearity Test

Linearity test is used in regression to determine whether each independent variable has a linear correlation to the dependent variable. A significance value smaller than 0.05 in this test indicates that the independent variable has a linear correlation to the dependent variable [24].

Table 3. Linearity test between X1 and X3:

| Sum of Squares | df  | Mean Square | F    | Sig. |
|----------------|-----|-------------|------|------|
| Between Groups | (Combined) | 11397.644 | 39  | 292.247 | 3.110 | .000 |
| Linearity Deviation from Linearity | 7249.077 | 1  | 7249.077 | 77.149 | .000 |
| Within Groups | 4148.568 | 38  | 109.173 | 1.162 | .300 |
| Total          | 5261.845 | 56  | 93.962 |

Based on Table 3, the linearity significance value obtained is 0.000 less than 0.005, it can be concluded that there is a significant linear correlation between the cleaner production variable (X1) and the effectiveness of coastal environmental conservation (X3).

Table 4. Linearity test between X2 and X3:

| Sum of Squares | df  | Mean Square | F    | Sig. |
|----------------|-----|-------------|------|------|
| Between Groups | (Combined) | 11410.593 | 35  | 326.017 | 3.727 | .000 |
| Linearity Deviation from Linearity | 7474.849 | 1  | 7474.849 | 85.445 | .000 |
| Within Groups | 3935.745 | 34  | 115.757 | 1.323 | .170 |
| Total          | 5248.896 | 60  | 87.482 |

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Based on Table 4, the linearity significance value obtained is 0.000 less than 0.005, it can be concluded that there is a significant linear relationship between the work motivation of salted fish processors (X2) and the effectiveness of coastal environmental conservation (X3).

3.3 Path Coefficient Analysis

Hypotheses are assumptions about the state of the population that are still temporary or weak in truth, so testing is needed to find out the truth. The procedure for testing hypotheses is based on sample evidence and the opportunity to test statements about the characteristics of one or more populations. Hypothesis testing was conducted to determine the effectiveness of coastal environmental conservation (X3) through cleaner production (X1) and work motivation of salted fish processors (X2).

| Model | R     | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------|----------|-------------------|---------------------------|
| 1     | .726  | .527     | .517              | 9.200                     |

a. Predictors: (Constant), Work motivation of fish processor, cleaner production

Based on Table 5, the coefficient of determination obtained is 0.527 or 52.7 %, which means that the cleaner production (X1) and work motivation of salted fish processors (X2) variable can increase the effectiveness of coastal environmental conservation (X3). While the remaining 0.437 or 43.7% were obtained from other variables that are outside the scope of this research. The results of path coefficient analysis show that cleaner production and work motivation of salted fish processors have a major effect in increasing the effectiveness of coastal environmental conservation.

| Model | Unstandardized Coefficients | Standardized Coefficients | t     | Sig.  |
|-------|-----------------------------|---------------------------|-------|-------|
|       | B                           | Std. Error                | Beta  |       |
| (Constant) | 37.953                   | 4.574                     | 8.297 | .000  |
| Cleaner production | .275                     | .070                      | .381  | 3.937 | .000  |
| Work motivation of fish processor | .264                     | .062                      | .412  | 4.263 | .000  |

a. Dependent Variable: effectiveness of conservation of the coastal environment

Table 6 is the result of the regression equation which shows whether or not the cleaner production (X1) and work motivation of salted fish processors (X2) variable partially influence the effectiveness of coastal environmental conservation (X3).

| Variable | Path coefficient | simultaneous effect | Residual effect |
|----------|------------------|---------------------|-----------------|
| Cleaner production (X1) | p_{X1X3} = 0.381 |                     |                 |
| Work motivation of salted fish processors (X2) | p_{X2X3} = 0.412 | 0.527              | 0.437           |
According to the table above, the equations obtained from the path coefficient analysis equation are:

\[ X_3 = 0.381 \times X_1 + 0.412 \times X_2 + 0.437 \times \epsilon \]

Based on the equation, it can be seen that the cleaner production variable has an effect of 0.381 or 38.1% on the effectiveness of coastal environmental conservation. While the work motivation of salted fish processors has an effect of 0.412 or 42.1%. The total effect of the cleaner production and work motivation on the effectiveness of coastal environmental conservation is 0.527 or 52.7%, while the remaining error (\( \epsilon \)) 0.437 or 43.7% is the influence of other factors.

The results of the path analysis test explain that there is a significant direct effect between cleaner production and the effectiveness of coastal environmental conservation. The path coefficient obtained is 0.381, with a t count (3.937) which is greater than the t table (1.987). Because the significance value of the p-value (0.000) is less than 0.05, then H0 is rejected, meaning that cleaner production affects the effectiveness of preserving the coastal environment.

Cleaner production is an effort to minimize wastes at the beginning which is expected to reduce the occurrence of pollution [25]salted fish processing businesses, workers are often unaware of the environmental impacts of their activities. This is according to research [26] due to the low level of education of salted fish processors, namely the number of salted fish processing workers of 46.7% who did not graduate from elementary school. This is related to the way of working as the results of research by [21]where workers are less careful in cleaning weeding in fish washing tanks. The solid waste left over from weeding the fish will dissolve in the wastewater during washing. Then the wastewater is without any treatment, so the water is black and smells bad. Turbid wastewater indicates that dissolved organic matter is still high. [27] Most of the liquid waste from the production process is not managed properly and is directly discharged into water bodies, causing foul odors and pollution of rivers and seas.

[16]search that the company has committed to reducing the impact on the environment through prevention solutions, namely Utilizing raw materials with minimal waste. This is supported by [28]stating that the residual material from fish canning production can be further processed, with product diversification, in the form of fish oil, which has a better economic value and the use of waste materials will help reduce the problem of environmental pollution. This is supported by [29] that in carrying out clean production, waste reduction is carried out, so that benefits are obtained in the form of saving raw materials, water, energy and increasing productivity, as well as controlling environmental pollution. [30] Liquid waste generated from the processing of salted fish is still not resolved and it is feared that it will further aggravate the surrounding environmental conditions. The cleaner production approach that can be done is with appropriate pollution prevention efforts to reduce waste accumulation and strive for the output of the process to produce new products that have better economic value. [31] delivered on the process of fish stalls on the coast of Bantul, the fishermen’s mothers contributed their energy and thoughts to reduce fish processing waste. This will reduce pollution and help manage the coastal environment.

The results of the path analysis test explain that there is a significant direct effect between the work motivation of salted fish processors on the effectiveness of preserving the coastal environment. The path coefficient obtained is 0.412 with a t count (3.937) which is greater than the t table (1.987). Because the significance value of the p-value (0.000) is less than 0.05, then H0 is rejected, meaning that the work motivation of salted fish processors influences the effectiveness of preserving the coastal environment.

According to [32] motivation is a concept that we use when we explain the forces that influence individuals or within the individual that directs behavior. [33] Motivate is the driving force from within to carry out activities to achieve goals. Furthermore, Herzberg's theory in [3] motivation is classified into 2 parts: (1) Intrinsic motivation, is the pure motivation that arises from within a person to achieve real goals, and (2) Extrinsic motivation, is the motivation that arises thanks to encouragement from outside one's self.

The results of the research [34] showed that intrinsic motivation (from within the individual fisherwomen) and extrinsic motivation (environmental factors) had a positive and significant effect on the social and economic conditions of fisherwomen. This is in line with the research of [35], many of
The wives of fishermen in the village of Kabongan Lor do side jobs to help their husbands as crab peelers and salted fish processors. The fishermen's wives in this village actively carry out social activities such as group activities to clean the environment. The need for family life gives birth to motivation. The work motivation of fishermen tends to be a basic need. Characteristics (internal and external factors) of fishermen affect the work motivation of fishermen to meet the needs of family life. The work motivation of fishermen on the need for achievement is very significantly related to the behavior of fishermen on profit sharing and cooperating in groups.

The work motivation of salted fish processors is to reduce the effects of decomposing waste around the waste treatment plant, there are piles of used industrial waste and household waste, the impact of the smell can result in shortness of breath in the short term because of Ammonia in smelly air. Research on motivation, communication, and leadership affect the effectiveness of Tangguh Coastal Village Development activities in West Kotawaringin Regency, and motivational variables are the most prominent factors affecting the effectiveness of Tangguh Coastal Village Development activities. Community empowerment that appears among the people of Kwala Lama Village shows that the community also has the motivation and ability to plan and organize environmental management activities in their area. That most of the damage to the coastal environment is caused by human activities, but the people in Purworejo village have a high motivation to work together in efforts to preserve or save the coastal environment.

From the results above, it can be seen that to increase the effectiveness of coastal environmental conservation, it is more influenced by the work motivation of salted fish processors (0.412) than cleaner production (0.318). This means that either directly or indirectly, the work motivation of salted fish processors has a more significant effect than cleaner production on the effectiveness of conservation of the coastal environment.

Work motivation is an individual's willingness to make efforts to achieve organizational goals that have been set. To achieve the goal of increasing the effectiveness of conservation of the coastal environment, it is demonstrated through behavior related to the behavior of work motivation of salted fish processors. The effectiveness of conservation the coastal environment with fish processing can increase group work motivation which leads to the effectiveness of achieving group goals. Increasing the effectiveness of conservation of the coastal environment, can be done by motivating salted fish processors, to build group cooperation, to carry out cleaner production stages, by reducing waste in the salted fish processing process.

4. Conclusion
Cleaner production and work motivation have a direct effect on the effectiveness of preserving the coastal environment. Increasing the effectiveness of environmental conservation can be done together through the work motivation of salted fish processors and cleaner production.

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