The Effect of the Presence of a Crude Palm Oil Factory on the Settlement Environment in Winangun Village, Bukal District, Buol Regency

Nixon J. Sindua(✉) and Jolanda E. Kaihatu(✉)

Manado State University, Manado, Indonesia

Abstract. The development of infrastructure is one of the impacts of factory activities, besides the existence of the factory has a negative influence on the surrounding community such as environmental problems, roads that are always traversed by industrial cars causing damage, garbage which is always the main cause of various environmental and health problems. Environmental influences that have the potential to arise are not only from plantation activities, but also crude palm oil (CPO) mills due to the presence of waste. If not managed properly, the waste has the potential to pollute the environment. Of course, it must be studied further so that it can be identified how good management is, especially to reduce the impact on the environment. The purpose of this study is to find out what are the effects of the existence of a Crude Palm Oil Factory on the Settlement Environment in Winangun Village, Bukal District, Buol Regency. The research method used by the author in this study is a quantitative research method. From the results of the analysis of the influence of the palm oil industry on residential environmental conditions, it shows that the existence of the palm oil industry has a very positive impact on the solid waste indicator. After the activities of the palm oil industry, these two indicators are better than before. As for road and drainage indicators, the existence of the palm oil industry has a negative impact, this can be seen from the condition of roads that are still damaged, drainage is getting worse because it still causes flooding and there is no improvement in waste management. In managing the residential environment in Winangun village, it is necessary to build an asphalt road which is the main route for vehicles to industrial locations, the thickness of the road and the road foundation must be planned properly by considering the weight of the vehicles passing on it. Repair drainage channels to minimize flooding. Waste management is needed to keep the environment clean.

Keywords: Palm Oil Factory · Settlement Environment

1 Introduction

Palm oil is a vegetable oil derived from the fruit of the oil palm and is widely used for food and non-food consumption. Palm oil can be used for food and industry through the process of refining, purifying, and deodorizing or RBDPO (Refined, Bleached and

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Deodorized Palm Oil). Palm oil is one of the plantation commodities that produces crude palm oil (CPO) which is the mainstay of Indonesia's export commodities. Palm oil as one of the mainstay non-oil and gas agricultural commodities has good prospects as a source of foreign exchange income and taxes, in the production and processing process it can create job opportunities while improving people's welfare [1].

The development of oil palm has a fairly important role in Indonesia's economic activities, palm oil is also one of Indonesia's export commodities as a foreign exchange earner other than oil and gas. Palm oil is growing rapidly in both countries. Until now, crude oil produced from palm oil, or better known as Crude Palm Oil (CPO) has become the largest export commodity of Malaysia and Indonesia in the world market. Previously, Indonesia was a major producer of palm oil, but the number of exports was 13 lower than Malaysia. This is due to the high consumption of domestic palm oil due to the large population. Since 2008 Indonesia has been the second largest producer and exporter of palm oil after Malaysia [2].

Buol is one of the district governments in Central Sulawesi Province, Indonesia. The district capital is in Palu. Buol Regency is an area that relies on the palm oil industry as a mainstay commodity in its economic sector. In the economic field, Buol relies on the agricultural sector, plantations are the main driving force. The production of plantation crops in Buol Regency is very potential with oil palm commodities.

Judging from the location of the factory in Winangun Village. The environmental conditions of settlements, infrastructure in particular is very different, with the existence of palm oil mill activities the condition of infrastructure should support the quality of life of the community but the poor environmental conditions of settlements such as roads with potholes in the rainy season and very dusty in the dry season are a problem. And seen the piles of empty palm oil tiers that piled up and were not transported, drainage problems, poor drainage channels also resulted in flooding [3].

Based on the foregoing, the authors are encouraged to conduct research with the title "The Effect of the Presence of a Crude Palm Oil Factory on the Settlement Environment in Winangun Village, Bukal District, Buol Regency [4]."

Handling of crude palm oil mill waste and its impact on the environment is carried out.

The purpose of this study is to find out what are the effects of the existence of a crude palm oil factory on the residential environment in Winangun Village, Bukal District, Buol Regency.

2 Research Methods

The research method used by the author in this study is a quantitative research method. This study intends to determine the effect of the existence of a crude palm oil factory on the residential environment in Winangun Village, Bukal District, Buol Regency [5].

The variables used in this study include only one variable or mono variable, namely the effect on the residential environment. This study aims to determine the effect of the existence of a crude palm oil factory on the residential environment in Winangun Village, Bukal District, Buol Regency. Based on the research variables above, in this study there are 3 variable indicators as follows: 1) Road; 2) Drainage; 3) Trash.

The population in this study were all the heads of families living in Winangun Village totaling 469 families. Sampling in this study was based on purposive random sampling method.

As for determining the size of the sample selected, the author uses the formula Slovin (1960) contained in the research method.

$$n = \frac{N}{1 + Ne^2}$$

Information : n = sample size
N = population size
E = the critical value (limit of accuracy) desired.

The samples taken were 79 families. Sampling in this study was determined by the following criteria: a) Indigenous residents of Winangun Village; b) Residents aged between 25 - 60 years; c) Residents who are preparing to fill out the questionnaire; d) Residents who can communicate well; e) Residents whose homes are far away.

There are two types of data that researchers usually use in every research activity, namely primary data and secondary data.

a. Primary data is data obtained or collected directly from research respondents by using measurement tools or data retrieval tools directly as a source of information sought.

b. Secondary data is supporting data which is to complement primary data. The secondary data used in this study, such as observations, interviews, and documentation.

The data collection techniques carried out in this study were carried out in the following ways [6]:

a. Questionnaire
The questionnaires that will be distributed include 3 variables, namely: 1) Roads, the questionnaires that will be distributed include road conditions at the factory; 2) Drainage, questionnaires that will be distributed include water channels around the factory and community residences; 3) Waste, questionnaires that will be distributed include employees who process factory waste. In this study, questionnaires will be distributed to 53 respondents, namely employees at a crude palm oil factory in Winangun Village, Bukal District, Buol Regency.
b. Observation
In this data collection technique, the researcher will make direct observations at the research site.
c. *Interview*
In this study, researchers will conduct questions and answers related to road conditions, drainage, and waste variables to employees at a crude palm oil factory located in Winangun Village, Bukal District, Buol Regency.
d. Documentation
Documents in this study are in the form of pictures, namely photos during carrying out research in Winangun Village, Bukal District, Buol Regency.

3 Results and Discussion

The percentage value of the Settlement Environment condition variable before the industry was 1% and referring to the weighting method using the Likert scale, it was concluded that before the palm oil industry in Winangun Village was negative in the sense that the environmental conditions of the settlements were not significant for all indicators, all of which received their respective weighted values. Each 1 in other words negative. Meanwhile, the level of residential environmental conditions after the palm oil industry rose to 2.3% at 0–3.3 intervals or categorized as negative or stated that the improvement in the environmental conditions of the settlements towards the environmental conditions of the settlements increased after the palm oil industry, especially there was no increase in the solid waste indicator.

According to Law Number 32 of 2009 concerning the protection and management of the environment, the definition of environmental destruction is an action that causes direct or indirect changes to its physical and or biological properties which results in the environment no longer functioning in supporting sustainable development. Sectoral development so far has continued to increase the exploitation of natural resources, meanwhile the need for conservation and protection of natural resources cannot be carried out properly [7]. The result is the increasing number of environmental damages, water pollution and others.

Industrial development on the one hand provides changes that affect the socio-economic community but on the other hand also brings changes that have negative impacts, these negative impacts include damage and pollution to the residential environment around the industry such as road conditions, drainage, and solid waste [8].

To minimize the impact caused by the activities of the Palm Oil Industry at the research site, here are some alternative environmental arrangements that can be done:

a. Street

Based on the results of the previous analysis, the activities of the Palm Oil industry at the research site have an impact on the research location. This can be seen in the results of the analysis above where the road is increasing because of the expansion of roads and types of asphalt roads, although asphalt roads are only found on village axis roads. And also, with the improvement of road conditions, eventually the houses that were initially unorganized were finally arranged according to the existing road. And the residents' houses are arranged according to the arrangement of settlements such as alleys in Winangun Village. Roads are divided into 2 parameters, namely road conditions and road types. For road conditions, it has a positive impact, and for the type of road, it is negative. But still, industrial mobility activities continue to damage roads, especially in the rainy season, and during the dry season, such as dust on the road, it also pollutes the road. This is because the roads that are traversed by mobility are not only axis roads but also residential roads, and the existing asphalt roads have been partially damaged. Therefore, as an analysis of environmental management, it is better if in the future the road can be fully repaired, such as the construction of asphalt roads which become the main route for vehicles to industrial sites. The thickness of the road and the road foundation must be planned properly by considering the weight of the vehicles passing on it.

b. Drainage
Based on the results of the previous analysis, the activities of the Palm Oil industry at the research site have an impact on the research location. This can be seen in the results of the analysis above where the drainage that never increases because in Winangun village in every rainy season there is always flooding at some points of the residents' houses because of the overflow of river water in the village of Winangun [9] . Drainage is divided into 2 parameters, namely drainage conditions and types of drainage. For drainage conditions, it has a negative impact, and for the same type of drainage, it is moderate. As explained above for drainage conditions that are never good because it causes flooding. And for the type of drainage, the type of drainage in Winangun Village has been divided into 2 types, namely permanent and non-permanent, but for permanent drainage only most of them already have such as in front of the village office, clinic, and factory housing, and are not used properly. And others are non-permanent. And based on the results of the survey in Winangun Village, the type of non-permanent drainage is found on the main road or village main road, while for the same residents only partially have drainage. Therefore, as an analysis of environmental management, it is better in the future Winangun Village can work together to make drainage, even if it is only non-permanent or water flow channels, to minimize the occurrence of flooding. And also, the attention of the local government to build drainage or improve drainage.
c. Garbage
Based on the results of the previous analysis, the activity of the Palm Oil industry at the research site has a negative impact on the research location, this can be seen in the results of the above analysis where the condition of the waste is getting worse because of the large amount of waste from twigs, midribs, bunches that are just piled up, This is due to the absence of a temporary dumping ground for garbage, let alone a final disposal site in Winangun Village. Therefore, as an analysis of environmental management, it is better in the future for waste conditions there should be public awareness about environmental cleanliness or village involvement to work together to make trash bins for each resident's house. And the government's attention is to provide at least a container for temporary garbage disposal in Winangun Village.

4 Conclusion

Based on the results of the discussion above, it can be concluded that:

a. From the results of the analysis of the influence of the palm oil industry on residential environmental conditions, it shows that the existence of the palm oil industry has a very positive impact on the solid waste indicator. After the activities of the palm oil industry, these two indicators are better than before. As for road and drainage indicators, the existence of the palm oil industry has a negative impact, this can be seen from the condition of roads that are still damaged, drainage is getting worse because it still causes flooding and there is no improvement in waste management.
b. In managing the residential environment in Winangun village, it is necessary to build asphalt roads which are the main routes for vehicles to industrial locations, thick roads and road foundations must be planned properly by considering the weight of

vehicles passing on them. Repair drainage channels to minimize flooding. Waste management is needed to keep the environment clean.

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