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Sustainability Analysis of Oil Palm Business *(Elaeis Guineensis)* In District Of Sebatik, Nunukan Regency North Kalimantan, Indonesia

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Abstract

Palm oil is one of the most strategic commodities because it is exports and has a high selling value so that it can improve the economy regions and reduce poverty. Smallholder oil palm plantations as part of the palm oil agribusiness supply chain which is slowly being required to implement aspects continuity. This study aims to analyze the sustainability status of farming palm oil based on index assessment using the Rapfish method through Multidimensional Scaling (MDS) approach. Multidimensional analysis of MDS used are ecological, economic, social, technological and institutional dimensions as the aspects studied in this research. This research was conducted in Sebatik District, North Kalimantan, Indonesia. The data used are primary and secondary data. Primary data obtained from interviews with farmers while secondary data was obtained from the statistical center, plantation service and supporting literature in this research. Respondents in this study were farmers who were selected through quota sampling have certain criteria totaling 50 respondents. The results of analysis for multidimensional index of oil palm sustainability in Sebatik District is 51.01 including in the moderately sustainable category. While the results of the analysis of the sustainability index for five dimensions are 76.57 (ecological), 50.63 (economic), 24.03 (social), 37.12 (technology), 63.49 (institutional). The entirety of each entry dimension includes in the category of "sufficiently sustainable" except for the social and technological dimensions with category "less sustainable". Sustainability of oil palm farming in each dimension have different sustainability indices so that a different policy is needed to evaluate the sustainability of oil palm farming in Sebatik District, North Kalimantan, Indonesia.

Keywords: Palm oil, Sustainability index, Sustainability status

A. Introduction

Palm oil is one of the most strategic commodities because it is export-oriented and has a high selling value so that it can improve the regional economy and reduce poverty, in addition to getting financial benefits, another advantage of palm oil is high employment, for example for five million hectares of oil palm plantations require 2 million workers (Sari, 2009). The development of the palm oil industry in Indonesia is currently very fast where there is an increase in both the area and production of palm oil along with the increasing needs of the community. In Indonesia, the area of oil palm plantations in 2018 was recorded at 14,326,350 hectares, Sumatra Island has the largest oil palm plantation area with a total area of 8,047,920 hectares in 2018, Kalimantan Island is the second island with oil palm plantations in Indonesia with a total area of 8,047,920 hectares. plantation area of 5,488,075 hectares. The production of crude palm oil (CPO) in Indonesia in 2018 was 42.9 million tons in the last 4 years. Sumatra Island in particular Riau province is the province with the highest CPO production, which is 8,540,182 tons or 21.47% followed by Central Kalimantan 15.46%, North Sumatra 13.74%, South Sumatra 8.88%, East Kalimantan 7.94%, West Kalimantan 7.17%, Jambi 5 ,77%, South Kalimantan 3.95%, and West Sumatra 3.08%. (Directorate General of Plantations, 2018).

Nunukan Regency is an area that has abundant natural resource potential, especially from the agricultural and plantation sectors. The area of non-rice field land in Nunukan Regency is used for oil palm which every year has increased by 23.7 thousand square meters. This increase occurred due to the increasing number of community lands being converted into oil palm plantations (BPS, Nunukan Regency, 2015). Problems that often occur in this border area according to Previous research is a lot oil palm farming unsustainable in terms of institutional and road assets, in addition to the fluctuating price of palm oil (Ngadi and Noveria, 2017).

In the year of 2017-2019 there was a decrease in the price of FFB from Rp. 1,683 in 2017 to Rp. 1,213 in 2019. This drastic drop in FFB prices has discouraged farmers from harvesting their oil palms, especially for plantation areas that are difficult to access by transportation. Prices that occur at the farm level can go down to Rp. 750 - Rp. 900 for the price of an area that is far from the palm oil mill, so it does not cover the operational costs of harvesting (Department of Agriculture and Food Security of Nunukan Regency, 2019). This study aims to assess sustainability based on five dimensions, namely, economic, ecological, social, technological and institutional. This dimension is used to see the condition of the sustainability of oil palm plantations as the livelihood of the community in Sebatik District, Nunukan Regency.

B. Methodology

Research Design

This research was conducted in Sebatik District, Nunukan Regency, North Kalimantan Province. The selection of the location was based on the consideration that there are many farmers of palm oil plantation. Palm oil plantations are processed by people's plantations or company. The time for the implementation of the activity is from September 2020 to February 2021.

Population and Sample

Determination of the number of samples in this study using quota sampling. Quota sampling is a technique to determine a sample from a population that has certain characteristics to the desired number (quota) (Sugiyono, 2011). 50 respondents were selected according to the criteria determined by the researcher. The criteria are: (1) Oil palm farmers, (2) The location of oil palm farming is in Sebatik District, Nunukan Regency (3) have experience in farming of palm oil plantation, (4) has a land area of 1 ha or more, (5) has produced at least 1 time.

Technique of Data Analysis

Data analysis used in this research is qualitative and quantitative data analysis. To analyze the sustainability of oil palm farming, the MDS or multi-dimensional scaling approach is used with the RAPFISH method (Rapid Assessment Techniques for Fishers) to assess the sustainability of coconut farming palm.

C. Findings and Discussion

Overview of Research Sites

The Sebatik District area is located on Sebatik Island, where Pulau Sebatik is an island which is part of Indonesia's territory (Nunukan Regency), and part of it is the territory of East Malaysia (Sabah). Sebatik District is bordered by East Sebatik District in North Sumatra to the north, to the east by the waters of the Sulawesi Sea, to the to the south by the Nunukan Strait, and to the west by West Sebatik District. Sebatik District has an area of 51.07 km2, is located at an altitude between 0 m to 500 m above sea level. Sebatik District has a topography the earth's surface that is not too high because most of its area located at an altitude of 0-100 m above sea level. District air temperature Sebatik is quite high because it is close to the beach area.

RAPFISH Analysis Result

Rapfish analysis using the multidimensional scaling method resulted in the sustainability index value of oil palm plantations in Sebatik District of 51.01 on a sustainability scale of 0-100, including in category of "fairly sustainable", with an S-Stress value of 0.12 and R2 of 0.95. This analysis is a combination of all dimensions (ecological, economic, social, technological, institutional)

which is called multidimensional analysis. Each dimension has attributes that become a benchmark for the sustainability of oil palm plantations in Sebatik District.

Sustainability of Oil Palm Farming From Each Dimension

Ecological Dimension

The value of sustainability on the ecological dimension is 76.57 with a sustainability status of "very sustainable. Attributes that affect this dimension are 1) Land area, 2) Soil type, 3) Land condition, 4) Pest/disease attack level, 5) Use of fertilizers, 6) Use of pesticides, 7) Availability of drainage channels. The value of the sustainability index and the sustainability status of the ecological dimension are influenced by the above attributes with different effects on each attribute. The results of the leverage analysis on the ecological dimensions are follows:

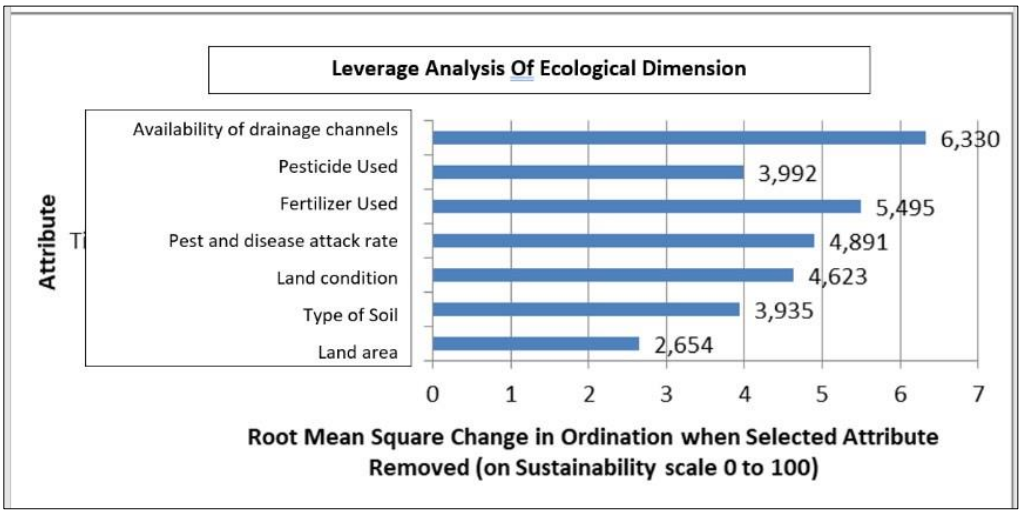

Figure 1. Leverage Analysis of Ecological Dimension

Economic Dimension

The value of the sustainability index and sustainability status on the economic dimension is 50.63 in the sense that the index value on the economic dimension is included in the "fairly sustainable" category. The attributes that sensitive to affect the sustainability of oil palm on this economic dimension, namely, 1) the amount of production, 2) the selling price, 3) Reception, 4) market chain, 5) marketing. The index value and sustainability status are influenced by the above attributes with different effects for each attribute. The results of leverage analysis on each attribute are as follows:

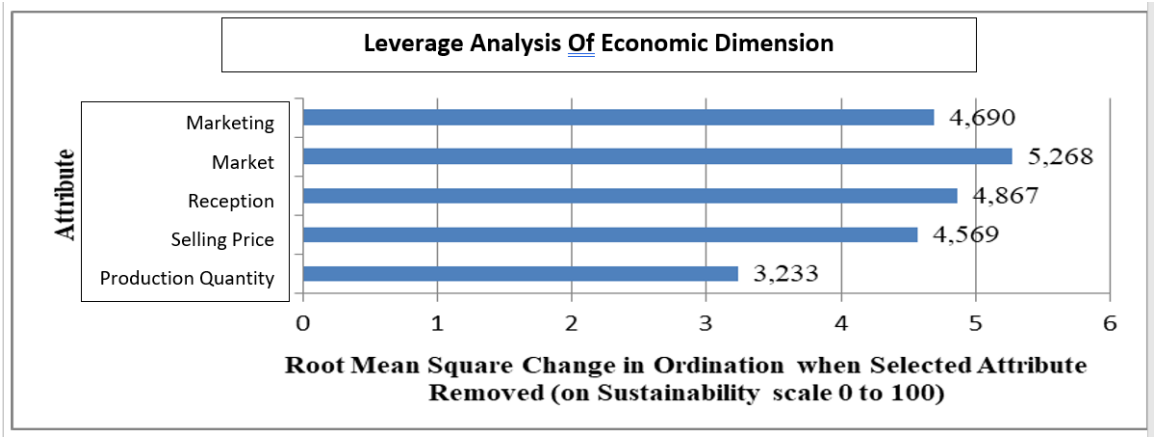

Figure 2. Leverage analysis of Economic Dimension

Social Dimension

The index value and sustainability status of oil palm farming on the social dimension is 24.03 with the meaning that the sustainability status of oil palm on the social dimension is in the “unsustainable” category. The sensitive attributes that affect the sustainability of oil palm farming are 1) education level, 2) family participation, 3) number of workers, 4) side jobs. Theindex value and the sustainability status of oil palm in the Sebatik sub-district are influenced by the above attributes with different effects on each attribute. The results of the leverage analysis on the social dimension are:

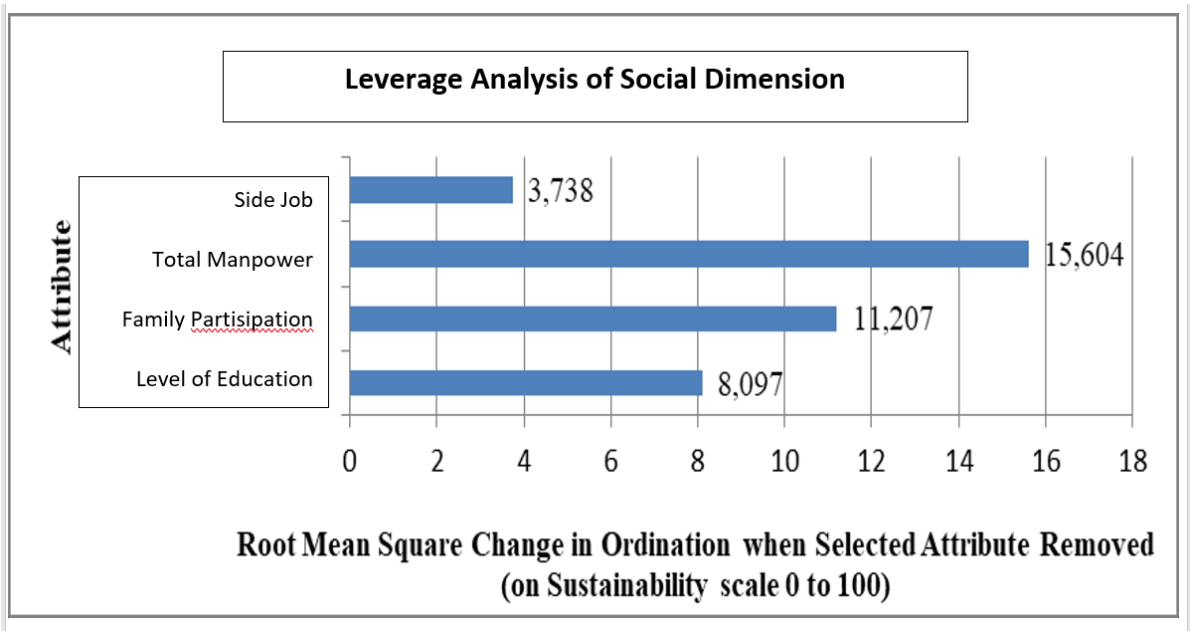

Figure 3. Leverage Analysis of Social Dimension

Technology Dimension

The value of the sustainability index and sustainability status on the technology dimension is 37.12 in the sense that the index value on this economic dimension is included in the "less sustainable" category. Attributes that are sensitive affect the sustainability of oil palm in this technological dimension, namely, 1) processing industry, 2) road facilities, 3) cultivation techniques and 4) technology used by farmers. The index value and sustainability status are influenced by the above attributes with different effects for each attribute. The results of leverage analysis on each attribute are as follows:

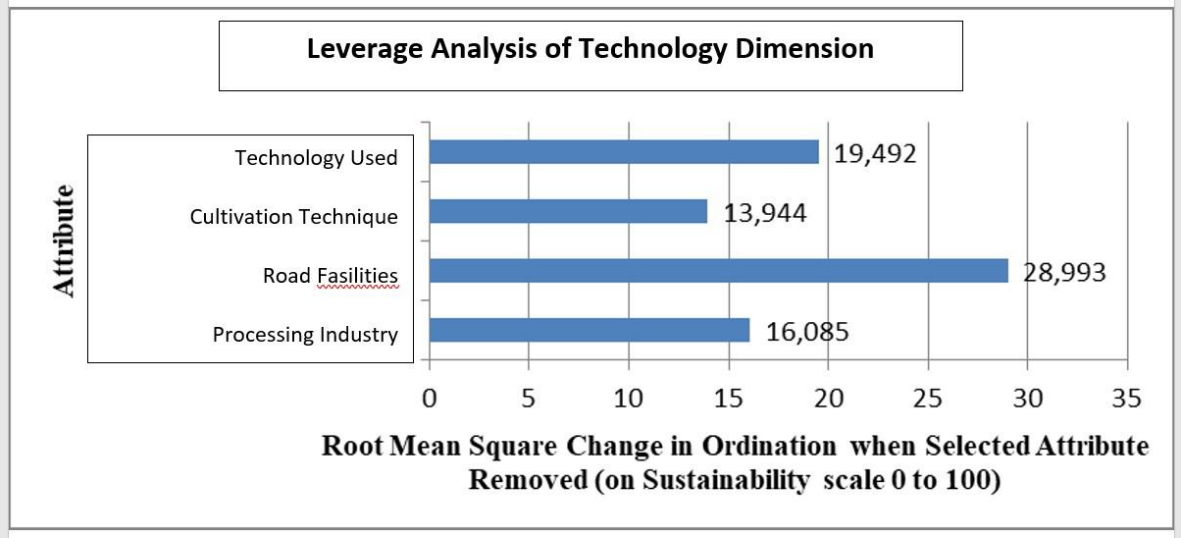

Figure 4. Leveragw Analysis of Technology Dimension

Institutional Dimension

The value of the sustainability index and sustainability status on the institutional dimension is 63.49 in the sense that the index value on this economic dimension is included in the "fairly sustainable" category. Attributes that are sensitive affect the sustainability of oil palm on this institutional dimension, namely, 1) sources of capital, 2) farmer groups, 3) extension centers and 4) extension activities. The index value and sustainability status are influenced by the above attributes with different effects for each attribute. The results of leverage analysis on each attribute are:

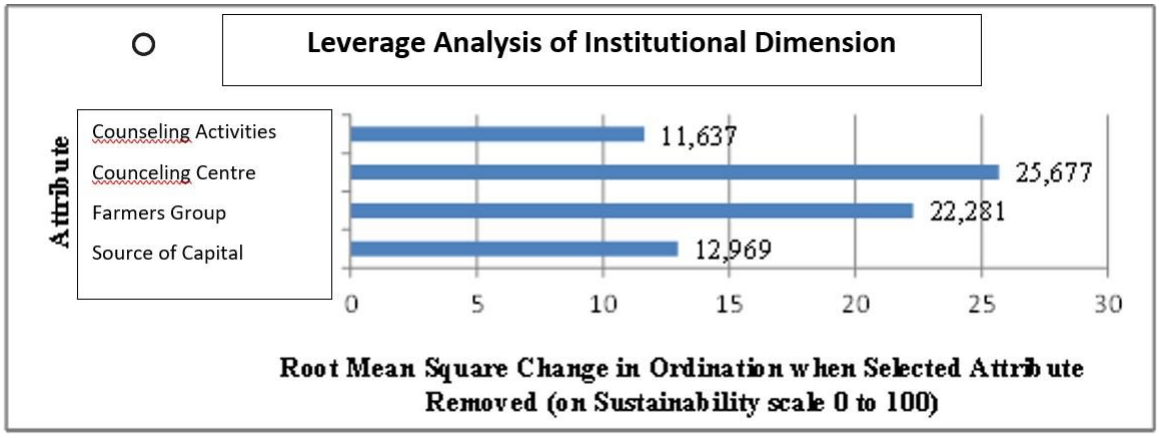

Figure 5. Leverage Analysis of Institutional Dimension

D. Conclusion

The index value of the sustainability of oil palm farming in Sebatik District, Nunukan Regency in multidimensional terms is 51.01 with the status of "Sufficiently sustainable". The value of the sustainability index of each dimension ranges from 24.03 to 76.57 which is included in the category of not-very sustainable. The social dimension has the lowest sustainability value in the unsustainable category. The dimension with the highest sustainability value is the ecological dimension. Sensitive attributes affect sustainability there are 11 out of 24 attributes.

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