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## Risk management of agroindustry biodiesel raw materials based on Elaeisguineensisjacq. : Model Simulation Technique

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Abstract

Biodiesel is a kind of plant oil which has it's characteristic like diesel fuel. One of the plant oil that can be used to produce biodiesel is crude palm oil. Some of the main aspects in biodiesel agroindustry development system based on crude palm oil will consist of risk potential that should be concerned and needed to be well maintained, especially the supplying of the raw materials. This research is generally, aimed to create a system of supporting the risk management policy for the development of biodiesel agroindustry based on crude palm oil.The method which is used in this research is AHP method to choose the alternative risk that needs to be concerned in biodiesel agroindustry based on crude palm oil, the model of risk analysis uses the fuzzy non-numeric multiple criteria multi-person decision-making method. The result of this research is achieved through the aggregation of the possibility of the risk occurrence from certain factors of the raw material supplying the amount aspect of the raw material is highly risked. The main priority from this alternative is supplying the raw material which is combined with self-manufacturing and purchasing by the contract system as well.

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# Risk Management of Agroindustry Biodiesel Raw Materials Based on Elaeis guineensis Jacq.

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**Abstract**---Biodiesel is a kind of plant oil which has it's characteristic like diesel fuel. One of the plant oil that can be used to produce biodiesel is crude palm oil. Some of the main aspects in biodiesel agroindustry development system based on crude palm oil will consist of risk potential that should be concerned and needed to be well maintained, especially the supplying of the raw materials. This research is generally, aimed to create a system of supporting the risk management policy for the development of biodiesel agroindustry based on crude palm oil. The method which is used in this research is AHP method to choose the alternative risk that needs to be concerned in biodiesel agroindustry based on crude palm oil, the model of risk analysis uses the fuzzy non-numeric multiple criteria multi-person decision-making method. The result of this research is achieved through the aggregation of the possibility of the risk occurrence from certain factors of the raw material supplying the amount aspect of the raw material is highly risked. The main priority from this alternative is supplying the raw material which is combined with self-manufacturing and purchasing by the contract system as well.
**Keywords**---biodiesel agroindustry based on crude palm oil, management risk, raw material.

## I. Introduction

Indonesia is currently experiencing an energy crisis. The energy availability derived from petroleum is increasingly limited. This condition triggers an increase in the selling price of petroleum fuels. This is due to domestic petroleum production cannot meet rapidly increasing market demand due to population and industrial growth. Indonesia is a net exporter in the field of fuel oil (BBM) but has now become a net importer of fuel since 2000. This is very ironic because it occurs when world oil prices are unstable and tend to increase. In the period of January-July 2006, Indonesia's fuel production only reached 1.029 million barrels per day, while fuel consumption reached around 1.3 million barrels per day. Therefore, there was a fuel deficit of 0.27 million barrels which must be met through imports. With world oil prices reaching US $ 70 /barrel, Indonesia must provide a daily budget of around the $ 18,900,000 to meet the deficit of 0.27 million barrels per day (around IDR. 170.1 billion/day) (Alam Syah, 2006).

Indonesia's dependence on fossil fuels is very large. Based on ESDM data (2004), petroleum dominates 52.5 percent of energy use in Indonesia. While the use of natural gas is 19.04 percent, coal is 21.5 %, water is 3.73 %, geothermal is 3.01 %, and renewable energy is only about 0.2 % of total energy use. The dependence on oil has caused Indonesia to be easily swayed by world oil prices which soared to penetrate above the $ 75 /barrel. In addition, the scarcity of oil will immediately cause a crisis in various fields.

ESDM data (2006) also stated that oil reserves in Indonesia are only around 9 billion barrels. Meanwhile, every year Indonesia produces 500 million barrels. This means that if it continues to be consumed and no new oil reserves are found, it is estimated that Indonesia's oil reserves will run out in the next eighteen years. In order to overcome this problem, it is time for Indonesia to reduce its dependence on fossil fuels by developing renewable alternative energy sources from vegetable natural resources (Barrón & Rello, 2000; Vijayarathna & Sasidharan, 2012). It has been realized the Indonesian government, as evidenced by the issuance of Presidential Regulation No. 5/2006 concerning national energy policy and Presidential Instruction No. 1/2006 concerning the supply and utilization of biofuels as alternative fuels.

To overcome this problem, it is time for Indonesia to reduce its dependence on fossil fuels by developing alternative renewable energy sources. Bioenergy development is an alternative that can be offered. Bioenergy

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and cost. High *free fatty acids (FFA)* cause the oil to easily freeze at room temperature so that it affects the biodiesel products and will also complicate the process of oil transportation.

## V. Conclusion

Decision support system engineering for palm oil-based biodiesel agroindustry risk management can increase the effectiveness of risk management. In the development of palm oil-based biodiesel agroindustry models, the results of risk analysis have a risk analysis model for the procurement of raw materials. The risk analysis model uses the fuzzy non-numeric multi-person decision-making method. The aggregation results show the aspect of raw material procurement in the development of palm oil-based biodiesel agroindustry in the factor of the amount of raw material having a very high risk, then the availability time, quality of raw materials, and procurement costs of each raw material are at high risk.

The main constraints that are often faced in palm oil-based biodiesel agroindustry are limited funds and business capital. This capital aspect is one of the key sub-elements. Further research is needed to develop this biodiesel agro-industry risk management model by adding risk management to institutional aspects, processing, and financial risk

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