

Dynamic System Simulation Model for the Fulfillment of Soybean Logistics to Maintain Soybean Price Stability

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Abstract

One of the industrial commodities made from agricultural raw materials that has the ability to compete is soybeans. The fluctuation of soybean commodity prices is a crucial issue in Indonesia every year. The current problem is that the demand for soybeans continues to increase, but it cannot be matched by domestic production, local soybean production is still low and cannot meet demand. To fulfill it, imports were carried out which continued to increase every year. The dependence of soybeans on imported products has consequences on local soybean prices that are not able to compete, resulting in price instability. Central Java is one of the provinces that produces the second largest soybean in Indonesia after East Java. The problems involved in the logistics of the Central Java soybean supply chain appear to be interrelated, namely the price of imported soybeans is still low, the flow of imports is still high, so the price of soybean farmers is still priced cheaply, so farmers are not enthusiastic about planting soybeans. Due to the low planting interest of farmers, the soybean production capacity will also decrease, the local soybean supply will decrease so that it is increasingly dependent on imports, import volumes will increase, local prices are increasingly unable to compete, farmer welfare decreases (demotivation), supply is increasingly reduced and the volatility of prices was getting out of control. This study will develop a dynamic system model for the fulfillment of soybean logistics which aims to maintain soybean price stability. Researchers focus on examining the relationship between variables in the fulfillment of soybean logistics in Central Java, namely regarding the need for food (demand), the total availability of soybeans (supply) and the price of soybeans (distribution) using a dynamic system framework. This research is also expected to identify the determining factors in increasing the competitiveness of local soybeans to meet the needs and desires of consumers in the soy-based industry through policy simulations in an effort to increase the competitiveness of local soybeans on the national market and stabilize soybean commodity prices that can benefit two parties, namely producers and consumers. This study adds and considers post-harvest factors, competitor commodity price factors and output in the form of a decision support system (DSS) application using Powersim Studio 10 software to support government and stakeholder decision making. The results of the model scenario can be used as supporting material for government decisions and stakeholders in strategy development and can use the results of these simulations to make strategic decisions.

Keywords

Soybean, Price Stability, System Dynamic, Simulation Model, Soybean Supply Chain, Decision Support System (DSS).

Biographies

Isna Nugraha is a student at Master Program of Industrial Engineering, Faculty of Engineering, Universitas Sebelas Maret, Surakarta, Indonesia. She earned B.S. in Industrial Engineering from Universitas Islam Indonesia, Yogyakarta, Indonesia. She has published journal and conference papers. Her research interests include supply chain management, modeling and simulation.

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