Evaluation of Land Feasibility for Food Crop Selection with Fuzzy Multi-Criteria Decision Making Method

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ABSTRACT

The global food crisis due to climate change, conflict, and economic shocks has affected food security in various countries, including Indonesia. One strategic solution is to plant food crops that are in accordance with land characteristics. This study aims to develop a web-based Decision Support System (DSS) using the Fuzzy Multi-Criteria Decision Making (FMCDM) method to recommend food crops (rice, corn, soybeans) based on land parameters such as temperature, soil pH, air humidity, soil texture, NPK content, and altitude. The calculation process in the system is carried out through the stages of data conversion to triangular fuzzy numbers (TFN), weight multiplication, aggregation, and integral value calculation. The test results show that the accuracy of the system's calculations reaches 100% compared to manual calculations, and the level of conformity between the recommendation results and actual BPS production data is 66.67%. In addition, usability testing by experts shows that the system is easy to use, and the results of blackbox testing ensure that all system features run according to their functions. This system is considered effective in providing recommendations for food crops that are in accordance with land characteristic data, and has the potential to support food security through data-based decision making.

Keywords **:** *Decision Support System, Fuzzy Multi-Criteria Decision Making, FMCDM, Land Feasibility, Food Crops.*