# LAND UTILIZATION OPTIMIZATION IN ADDRESSING LAND CONVERSION FOR FAMILY RESILIENCE IN THE BEKASI-JAKARTA BORDER DISTRICT, BOGOR REGENCY

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**Background:** This pressure for land conversion has resulted in a decline in rice paddy area and rice production. This phenomenon indicates a significant shift in land use from the agricultural to non-agricultural sectors. In the context of family resilience, this situation has the potential to reduce households' ability to meet food needs independently and sustainably. Family resilience, as explained by the FAO (2021), is an integral part of national food security, as the family is the smallest unit in the food production, distribution, and consumption system. Optimizing land use is a crucial strategy in addressing this challenge. Through agricultural intensification, crop diversification, and the utilization of home gardens, communities can increase household food self-sufficiency despite limited land area. Furthermore, policies for protecting sustainable agricultural land (LP2B) and implementing environmentally friendly agricultural technologies are also key to maintaining the productivity and sustainability of food sourc

**Purpose:** • To identify the impact of land conversion on family resilience in the border area of Bekasi and Jakarta. • To develop effective land use optimization strategies to strengthen family resilience based on local resources

**Methodology:** This research uses a quantitative descriptive approach to analyze the existing conditions of agricultural land use and develop a land use optimization model to improve family resilience. The research location was purposively determined based on agricultural potential and land conversion pressures, namely Tenjo District, Bogor Regency. The stages of this method include primary and secondary data collection, land suitability analysis, and optimization modeling. Data analysis was conducted by integrating land characteristics and the potential for suitable food commodities, and aimed to generate data-driven strategies based on local context that can sustainably strengthen food security in Tenjo District. The optimization model was designed using linear programming (LP) or multi-objective programming methods, with the objective function of maximizing food production (in tons or kcal).

**Finding:** The results show that during the 2020–2024 period, the total rice field area decreased by 6.62%, from 5,175.57 ha to 4,832.74 ha, and the harvested area decreased by 10.3%. The 9.9% decline in rice production was primarily due to the reduction in active land due to conversion to residential and industrial areas. A sustainable optimization scenario through agricultural technology intensification (balanced fertilization and jajar legowo) and the integration of the family food yard (P2L) program could increase production efficiency by up to 15% without requiring new land expansion. Implementation of the sustainable optimization scenario could increase production by up to 54,392 tons, adding economic value of IDR 28.3 billion per year. Optimizing sustainable land use has the potential to strengthen family resilience in urban border areas, reduce food insecurity, and support the Sustainable Food Agricultural Land (LP2B) policy in Bogor Regency. Jonggol plays a strategic role as a center for agricultural economic

optimization, making the largest contribution to increasing farmer incomes and regional food security.

**Limitation:** The optimization model used (based on linear programming) relies on price, productivity, and input cost parameters, which are assumed to be constant throughout the analysis period. In reality, these three factors are highly dynamic and influenced by climatic conditions, market fluctuations, and government policies.

**Originality:** The study area, which faces high urbanization pressure and borders Greater Jakarta (Jabodetabek), where agricultural land conversion is occurring rapidly, provides a novel contribution to understanding how land optimization strategies can maintain local food security in areas with high land conversion pressure.

**Keywords:** land optimization, land conversion, family resilience, sustainable intensification