# Evaluating the Relationship Between Crop Imports and Local Production in Qatar Based on the National Food Security Strategy

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## Abstract:

This paper presents a mathematical model for optimizing the distribution of agricultural products in Qatar, focusing on balancing imports and local production to meet total demand while minimizing costs. The model considers constraints such as available agricultural land, water, and energy resources, alongside factors like import diversity and resilience to disruptions. Building upon the Qatar National Food Security Strategy (QNFSS), the study extends the basic model to address additional policy objectives, including limiting imports from less reliable trade partners and ensuring import diversity. Analysis of current production and import data reveals insights into self-sufficiency rates, price differentials, and import distribution patterns. Computational experiments demonstrate that implementing QNFSS recommendations leads to significant cost reductions and a more balanced import strategy, enhancing both economic efficiency and food security. By integrating mathematical modeling with policy considerations, the study offers valuable insights for policymakers and stakeholders in optimizing resource allocation and enhancing food security in Qatar.