

Cereal Systems and Food Security in Senegal: An Economy-Wide and Distributional Analysis

Topic: SAM and CGE Modelling for Food System Transformation and Policy Evaluation (II)

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Cereals constitute the backbone of food consumption and agricultural livelihoods in Senegal. While rice has become the dominant staple—accounting for a large and growing share of caloric intake—the country remains significantly dependent on imports to meet domestic demand. At the same time, traditional cereals such as millet, sorghum, and maize continue to play a crucial role in rural diets, climate resilience, and local production systems. Despite this, policy discussions have largely focused on rice self-sufficiency, with limited attention to the broader cereal system and the interactions among staple crops in shaping food security outcomes.

This paper analyses the role of Senegal’s cereal system in ensuring food security, with particular attention to substitution dynamics, import dependency, and diversification pathways. We employ a recursive dynamic computable general equilibrium (CGE) model, DEMETRA (Dynamic Equilibrium Model for Economic Development, Resources, and Agriculture), calibrated to a highly disaggregated Social Accounting Matrix covering 61 activities, 70 commodities, and 14 regions, distinguishing rural and urban households. A top-down microsimulation approach based on the Harmonized Survey on Households Living Standards (EHCVM 2018/19) is used to assess poverty and distributional impacts.

The study evaluates policy scenarios including cereal productivity improvements, relative price shocks between rice and domestic cereals, trade policy adjustments, and diversification strategies. Results indicate that while rice productivity growth enhances aggregate output and reduces import dependency, diversification toward domestic cereals such as millet strengthens resilience to external price shocks and generates stronger poverty reduction effects in rural regions. Relative price shifts between rice and millet reveal asymmetric substitution patterns across income groups, with poorer households benefiting more from diversified cereal systems.

Overall, the findings suggest that a cereal system perspective—rather than a narrow focus on rice self-sufficiency—offers a more robust pathway toward food security in Senegal. Policies that combine productivity improvements, value-chain efficiency, and crop diversification can reduce vulnerability to global market shocks while promoting inclusive rural development.