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Understanding smallholder readiness for nutritious food systems in Kenya: A domain-sensitive assessment

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Abstract

Introduction: Smallholder farmers are central to supplying nutritious foods in low- and middle-income countries, yet their participation is often constrained by limited market access, inadequate post-harvest infrastructure, and fragmented institutional support. These constraints contribute to post-harvest losses, reduced income, and limited availability of nutritious foods. Despite these, most assessments approaches remain narrowly focused on production, overlooking the broader set of capacities required for effective participation.

Methodology: This study develops and applies a domain-sensitive framework to assess smallholder readiness for nutritious food systems in rural Kenya. Baseline data were collected from 172 fruit and vegetable farmers in Kilome Subcounty, Makueni County, Kenya. Readiness was assessed across six domains: production capacity, market engagement, post-harvest handling and storage, labour practices, institutional embeddedness, and strategic orientation. Composite indices were constructed using a hierarchical aggregation approach. A comprehensive measurement validation framework was applied to evaluate the reliability and robustness of the indices.

Findings: Measurement validation confirms that the indices provide a reliable basis for assessing smallholder readiness, with stronger internal consistency in market-related constructs. Readiness is uneven across domains. Production capacity is moderate, driven by strong land tenure but constrained by irrigation and input limitations. Market engagement is modest, indicating shallow integration despite participation. Post-harvest handling and storage are critically low and represent the main bottleneck. Institutional embeddedness is also weak, with limited access to finance, infrastructure, and support, despite relatively high training levels. Overall, the results reveal a fragmented readiness profile, where strengths in one domain do not translate into broader system readiness.

Conclusion: These results demonstrate that constraints to nutritious food systems extend beyond production and reflect broader structural and institutional gaps. The proposed framework offers a practical tool for diagnosing multidimensional readiness and identifying priority areas for intervention. Strengthening post-harvest systems, market linkages and institutional support will be essential for enabling smallholder participation in nutrition-responsive food systems and rural livelihoods.

Keywords: Institutional support, market engagement, multidimensional framework, nutritious food systems, post-harvest systems, readiness assessment, rural livelihoods, smallholder farmers

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