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## Assessing the agroecological performance of smallholder households in kiambu and makueni counties in kenya

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### Abstract

Agroecological innovations have garnered increasing attention in recent years, yet there remains limited assessment of their adoption and effectiveness within smallholder farming systems. This study evaluates the extent to which the 13 agroecological principles are integrated into smallholder farms in Kenya, focusing on two agriculturally distinct landscapes with differing contextual characteristics.

Using the Holistic Localized Performance Assessment (HOLPA) tool, we assessed 237 households in Kiambu County and 242 in Makueni County. Each household was scored on a scale of 1 to 5 for each of the 13 agroecological principles, where 1 indicated low adherence and 5 indicated high adherence. We also evaluated agroecological performance across a diverse set of agricultural, environmental, economic, and social indicators.

Results showed that, in both counties, farms scored highest on principles related to animal health and social values and diets. In Kiambu, adherence was weakest for the principles of synergy and governance, while in Makueni, low adherence was observed for knowledge sharing and soil health. Overall, 65 % of farmers in Kiambu and 57 % in Makueni demonstrated moderate adherence across all principles. Households with stronger connections to local institutions promoting agroecological practices scored higher on principles such as recycling and input reduction.

Agroecological performance varied significantly between the two counties. Farms with low adherence to agroecological principles generally exhibited weaker outcomes across key sustainability indicators, including income stability, dietary diversity, landscape complexity, and crop richness. In contrast, farms with high adherence consistently demonstrated stronger performance across most agricultural, environmental, social, and economic indicators.

These findings underscore the importance of context-specific, comprehensive evaluations of agroecological practices. Such assessments are critical for informing targeted strategies to support the adoption of sustainable farming practices across Kenya’s diverse smallholder systems.

**Keywords:** Agroecology, hOLPA, Kenya