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Fruit Tree Diversity and its Contribution to Food Security of Smallholder Farm Households in Western Kenya

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Abstract

Cultivation of fruit trees on farms can contribute to household food security especially during non-cropping seasons and at times when crops have failed. Fruit tree cultivation also diversifies the income generation options of smallholder farmers and provides micronutrient-rich foods for increased dietary diversity. However, there is insufficient data on diversity of fruit trees on farms and their contribution to food security in Kenya. Understanding these relationships was the aim of the present study.

In a stratified random sampling design, a total of 296 farming households were selected, covering four agro-ecological zones (AEZs) in western Kenya and three groups of respondents; one group exposed to a programme promoting fruit cultivation ('FRUIT'), one group exposed to a hygiene programme ('WASH') and one group not exposed to any programme ('CONTROL'). Socio-economic and farm and fruit tree diversity data was collected through interviews.

Of the 32 fruit tree species and 8,376 tree individuals mentioned by respondents, only 9 and 180 were of indigenous origin, respectively. Most frequently mentioned species were the exotics *Mangifera indica*, *Persea americana* and *Psidium guajava*, occurring on 80, 77 and 62% of the farms, respectively. Median number of fruit species per farm was 4.0 (range 0–10) and median tree abundance 13 individuals (range 0–1,091). All the fruit tree diversity and richness variables showed significant differences across the selected AEZs ($p < 0.001$). The 'CONTROL' groups had significantly lower number of indigenous tree individuals ($p = 0.039$). Male headed households had more exotic individuals than female headed households ($p = 0.030$). About 90% of households had experienced food scarcity with peaks in April and May. Mean household hunger scale was 5.1 (range 0–15) and mean number of food insecure months 3.6 (range 1–12). Multivariate regression analysis showed that household hunger scale was mainly influenced by the household's poverty index, ethnicity and farm size, but not by on-farm fruit tree richness or abundance.

Interventions should be designed and implemented in the study region to address the currently relatively low level of fruit tree cultivation on farms and to provide fruit tree species, particularly indigenous ones, ready for harvest during the most food-insecure months to vulnerable households.

Keywords: Food scarcity, fruit tree cultivation, household hunger scale, indigenous fruit trees