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“Bridging the gap between increasing knowledge and decreasing resources”

Influence of Biophysical and Socio-Economic Factors on Fruit Tree Diversity in Machakos County, Eastern Kenya

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Abstract

Growing fruit trees on smallholder farms can contribute a lot to income generation and nutrition security for the farming households. Fruit tree species richness and diversity, however, are influenced by many biophysical and socio-economic factors. Programs aiming at promoting cultivation and consumption of fruits need to understand and consider these factors. To identify influencing factors and their complex interactions, a baseline survey of 300 randomly selected households was performed in four agro-ecological zones in Machakos County, eastern Kenya. Households were selected from three strata/groups; one group exposed to a programme promoting fruit cultivation ('FRUIT'), one group exposed to a hygiene programme ('WASH') and one other group not exposed to any programme ('Control'). Interviews were performed to gather basic socio-economic data and information on the fruit species and tree individual numbers per farm. Statistical analyses included U- and H-tests, correlation and regression analyses.

A total of 56 different fruit tree species were mentioned in the surveyed farms, including 30 indigenous fruit species (54%). Out of the total of 20,457 fruit tree individuals mentioned, only 10% were of indigenous species. The most frequently mentioned fruit tree species were *Mangifera indica*, *Carica papaya* and *Persea americana*, occurring on 96, 65 and 54% of the farms, respectively. Median number of fruit species and individuals per farm were six and 32, respectively. Respondents in the two surveyed lower midland agro-ecological zones mentioned significantly more indigenous fruit tree species and individuals on their farms (1 species and 2 individuals per farm, respectively) than those in the two upper midland zones (0 and 0; $p < 0.000$). Respondents being members of the 'FRUIT' or the 'WASH' groups mentioned less fruit tree species (medians 5 and 5 per farm, respectively) and individuals (medians 23 and 35 per farm, respectively) than the 'CONTROL' group respondents (7 and 43; $p < 0.000$ and $p = 0.002$, respectively). Household poverty index, farm size, age of household head and distance to the nearest market were among the factors influencing fruit tree species richness and abundance variables. This study will contribute to develop better programs that enhance wealth and health of smallholder farmer families by improving fruit production and consumption, particularly of the largely underutilised indigenous fruit tree species.

Keywords: Food and nutrition security, indigenous fruit trees, regression