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Tree growing on farmlands in Rwanda: Farmers' preferences for adopting agroforestry in the eastern drylands

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Abstract

In Rwanda, land degradation and effects of climate change and variability drive efforts towards land restoration with aim to make vulnerable smallholder farmers more resilient through investments in soil conservation and agroforestry. Effective agroforestry implementation requires involving farmers, and understanding their choices to adopt it. Still, there is little information about farmers' preferences for tree planting in Rwanda. Thus, this study explores these preferences in the country's eastern region. We conducted a discrete choice experiment to elicit preferences for tree attributes among 248 farmers. Eight attributes (number of woody and fruit trees, root system and canopy, change in maize yield caused by tree planting, frequency of extension visits, extra labour for tree management, distance from plot to tree nursery, and tree seedling cost) were selected after qualitative methods, and evaluated using mixed logit and generalised multinomial logit models to investigate preference and scale heterogeneity, respectively; and latent class model for class-specific preferences. Results show that farmers positively value planting woody and fruit trees on their farmlands. They prefer trees with deep roots and small canopy, and trees which would increase crop yields, but dislike increase in the tree seedling cost. WTP measures indicate that deep and shallow root systems with small canopy, seasonal visits, and change in maize yield are the most valuable attributes. However, there is preference and scale heterogeneity among farmers across agro-climatic zones. Farmers are split into two latent classes with notables similarities and differences in their preferences for agroforestry practices. Our findings demonstrate that farmers are willing to participate in agroforestry practices. They prefer woody trees for their products (timber, fire woods, stakes…), and fruit trees for their multi-functionality and role in food security and nutrition. This calls for increasing the share of fruit trees in agroforestry interventions. Furthermore, preferences for increased (maize) yields suggest focusing on N-fixing tree species; while preference for trees with deep root systems and small canopy calls not only for improved fruit varieties, but also for building farmers' capacity in tree management.

Keywords: Choice experiment, farmer preferences, land restoration, Rwanda

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