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Farmers’ Preferences for Sustainable Intensification Attributes in Sorghum-Based Cropping System: Evidence from Mali

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Abstract

Adoption of agricultural intensification technologies is on average low, which results in a vicious cycle of low agricultural growth, persistent rural poverty and food insecurity in many rural areas of sub-Saharan Africa, including Mali. Amongst other constraints, the limited adoption of intensification technologies could partly be because technology development does not properly consider the technological traits that farmers value most. On the other hand, there are growing concerns that promoting widespread adoption of intensification technologies may be associated with unintended adverse effects on the cropping systems and livelihoods of smallholder farmers, as experienced in the Asian Green Revolution. This gave rise to the growing interest for cropping systems to be sustainably intensified. Using a discrete choice experiment, this study assessed farmers’ preferences for technology attributes in sorghum-based cropping systems from the lens of sustainable intensification. The choice experiment was implemented among 567 smallholder sorghum-producing farmers in southern Mali. We considered six technology attributes corresponding to different domains of sustainable intensification namely: grain yield, yield instability, soil fertility, nutrition, labour requirement, and fodder yield. We used mixed logit model to analyse the data. The findings reveal that farmers have strong preferences to change their current cropping practices in favour of a more sustainable sorghum production system, indicating the importance of new R&D initiatives to respond to farmer’s needs. More specifically, farmers prefer technologies which increase the grain and fodder yields, have positive or a neutral effect on soil fertility and household nutrition. However, the farmers are not homogenous in their preferences but reveal substantial heterogeneities, including the pooled sample and sub-samples by agroecology and social networks of farmers. This suggests that development actions should be adapted to local contexts to address farmers’ preferences. More importantly, the farmers placed more value on nutrition outcome associated with uptake of sustainably intensified sorghum-based cropping systems, which calls for more R&D interventions along the nutrition domain, such as biofortification of sorghum and legume-based intercropping. Thus, development partners should strongly invest in interventions around nutrition outcomes, as they are likely to gain widespread adoption among farmers.

Keywords: Agricultural intensification, choice experiments, farmer preferences, Mali, sorghum

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