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## Enhanced Food Security via Adoption of Improved Cooking Stoves and Local Wood Plantations in Tanzania

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### Abstract

Firewood supply is a severe challenge in degraded and deforested areas of Tanzania which negatively affects the livelihoods of rural dwellers. The majority of rural households cook with energy-inefficient traditional three-stone-fire-stoves. Especially women and children who are mainly responsible for firewood collection spend substantial time to collect firewood which increasingly compromises their available time for agricultural activities. Our analysis showed that Improved Cooking Stoves as well as enhanced planting of on-farm trees realise time savings and can improve agricultural landuse management schemes in semi-arid areas of Tanzania.

Improved Cooking Stoves were implemented in a participative way within the case study villages. The quantitative and qualitative field-based stove performance test “Kitchen Performance Test,” demonstrated that the implemented Improved Cooking Stoves reduce the demand of firewood by almost 30% and decreased cooking time by around 20% compared to the traditional three-stone-fire-stoves. Farmer’s local knowledge - here on loam construction - supported the sustained adoption and dissemination process of locally manufactured two-pot Improved Cooking Stoves which provided additional available time for agricultural activities.

In addition, on-farm wood plantations (either as bordering or intercropped plantations) close to homesteads reduce the number of walks to collect firewood and therefore save time. Nevertheless, tree husbandry faces several challenges caused by environmental as well as anthropogenic factors. In a next step, trial plots will be established to quantify yield enhancements induced by tree / crop integration. By providing evidence-based results on the positive effects of tree plantations on agricultural landuse management practices as well as on food-security in semi-arid areas of Tanzania, rural dwellers are further incentivized to engage in tree planting.

Capacity building and creation of local know-how on constructing and using Improved Cooking Stoves as well as tree husbandry are central for the realisation of socio-economic

benefits. It is important to monitor the implementation of Improved Cooking Stoves and the adoption process of planted trees regarding slow-down of dissemination rates or incomplete usage practices. The identification of bottlenecks for sustained adoption is central for endurance and enhanced dissemination of the two innovation strategies which provide substantial “free” time for agricultural activities.

**Keywords:** Agricultural yields, improved Cooking Stoves, intercropping, on-farm tree plantation, Tanzania