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Food Security Impacts of Upgrading Strategies along Agricultural Value Chain Stages to Smallholders in Tanzania

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Abstract

The use of agricultural technologies among the rural smallholder farmers is vital in improving households' welfare in developing countries. This paper examines selection decisions and evaluates the impacts of adoption of agricultural upgrading strategies on food security and income. Unlike much of reviewed literatures, that confined itself in examining adoptions of agricultural innovations and its impacts at a crop-level and/or at a given stage of the value chain, we focus on examining adoption decisions of upgrading strategies (UPS) along the local agricultural value chains and evaluating the welfare impacts of UPS adoption to the rural smallholder. We use panel data of 820 households, collected in 2013 and 2015, from four treatment and two control villages located in arid and semi-arid districts namely Chamwino and Kilosa in Tanzania respectively, of which 486 are treated while 334 are non-treated households. Using propensity score matching (PSM) and difference-in-difference (DID) approach to estimate the average treatment effects on the treated that measure impacts of adopting upgrading strategies on food security and income. Overall, we find that adopting upgrading strategies enhance food security status and incomes of rural smallholders significantly. However, after differentiation of agricultural value chain stages, adoption impacts reveal mixed results. Adopting UPS along the natural resources, crop production, processing, waste management and bioenergy show high welfare impacts in terms of both household food security and income compared to adopting UPS in the market, income generation and consumption stages, in which food security indicators reveal significant low impacts while income decrease insignificantly. Our results assert the postulated role of agricultural technology adoption in increasing rural households' welfare. This study reckons the importance of continued agricultural research to address rural development challenges and ultimately discharging the poor with better area-specific technologies to enhance welfare.

Keywords: Food security, agricultural value chain, smallholder farmers, Tanzania, upgrading strategies