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Balancing trade-offs and achieving synergies: The case for joint adoption of conventional and agroecological farming in Tanzania

HAJI ATHUMANI MSANGI¹, MARTHA SWAMILA², NTENGUA SELEMANI MDOE¹, ANTHONY KIMARO², KATHARINA LÖHR³, STEFAN SIEBER³, BETTY WAIZED¹, DANIEL NDYETABULA¹

¹*Sokoine University of Agriculture, Agricultural Economics and Agribusiness, Tanzania*

²*World Agroforestry (ICRAF), Tanzania Country Programme, Tanzania*

³*Leibniz Centre for Agric. Landscape Res. (ZALF), Sustainable Land Use in Developing Countries (Sus-LAND), Germany*

Abstract

Climate change is one of the greatest global challenges of the 21st century. Its adverse effects on global agricultural production and food systems pose significant threats in Sub-Saharan Africa, where poverty, rapid population growth, and food insecurity are already prevalent. To address this issue, agroecological farming approach have been considered a viable solution. It ensures sustainability in agri-food systems while mitigating the impacts of climate change. However, concerns arise regarding the ability of agroecological farming to replace conventional external input farming to meet productivity and food security objectives, especially in Sub-Saharan African nations where agricultural productivity remains low, and food systems are unstable. This study is conducted in Tanzania to investigate the synergies between conventional and agroecological farming practices using the Tanzania's national panel survey (NPS) for the 2020/2021 wave. The study employed Multinomial Endogenous Treatment Effect (METE) regression to determine how the joint adoption of both approaches could improve farm productivity and food security in a sustainable manner compared to their separate implementation. The study reveals that combining conventional farming practices (inorganic fertiliser and agrochemicals) with agroecological farming practices (organic manure and agroforestry) can significantly enhance farm productivity and food security, indicating that the two approaches have a strong synergy. Interestingly, exclusive adoption of conventional farming can improve farm productivity and food security, but the magnitude of this effect is almost the same as that of the joint adoption of both approaches. In contrast, exclusive adoption of agroecological farming has a positive but insignificant effect on farm productivity and food security. These findings suggest the potential benefits of balancing the trade-offs of conventional high external input farming by adopting agroecological farming. Combining the two approaches can help achieve productivity and food security objectives while protecting the natural agroecology. Therefore, the study emphasises the need for promoting policies and initiatives that encourage the joint adoption of conventional and agroecological farming practices to achieve sustainable and resilient agricultural production and food systems in Tanzania. However, such policies and initiatives must be complemented by other measures like credit access, extension, and social protection to enhance their adoption and impacts.

Keywords: Agro-ecological farming, Climate change, conventional farming, farm productivity, food security, METE, Synergies, Tanzania