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Exploring the impacts and drivers of agro-ecological interventions on managing resources: A case of vegetable production system in Ethiopia

YIDNEKACHEW ZEWDE, RALPH ROTHHAERT, WUBETU LEGESSE

World Vegetable Center, Ethiopia

Abstract

The misuse and abuse of chemical inputs such as fertilisers and pesticides are mostly pronounced in the vegetable sector. To this end, various studies advocate for a sustainable production system that promotes the adoption of agro-ecological practices (AEPs) to enhance the health of people and environment. This paper examines the impacts and drivers of adopting a wide range of AEPs in three districts of Ethiopia. The findings from the study show that capacity development and awareness creation efforts significantly enhanced the perception and uptake of AEPs. The most widely adopted AEPs are soil health interventions, bio-fertilisation, integrated pest management and use of improved seed varieties. The main constraints of adopting AEPs include cost of adoption, ease of access, agronomic requirements, effectiveness of AEPs relative to conventional inputs, scale of production, skills needed for adoption, enabling environment and incentive mechanisms. A comparative cost-benefit-analysis shows that the adoption of AEPs helped farmers to reduce the use of conventional inputs (chemical fertiliser and pesticide) by more than 15%. Therefore, AEPs have huge resource-conserving and cost-reducing implications for small-holder farmers. Moreover, a Poisson regression analysis on the determinants of adoption indicates that factors such as age, gender, level of education, farming experience, availability of agrological inputs, farm size, access to training, and proximity to market are important determinants AEPs adoption. However, the market fails to differentiate and value vegetables produced in conventional and regenerative ways. This in fact acts as a huge disincentive for farmers to adopt AEPs and requires institutional and market level interventions. In nutshell, efforts to promote the adoption of AEPs should focus on maximising their impacts coupled with efforts to enhance the enabling environment and policy landscape.

Keywords: Agro-ecology, conventional production, cost-reducing, enabling environment, impacts, resource-conserving, sustainable production system