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"Management of land use systems for enhanced food security: conflicts, controversies and resolutions"

Adoption of Sustainable Intensification Practices in Northern Ghana

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Abstract

This study aims to assess the adoption of sustainable intensification practices (SIPs) and analyse its contribution to farmers' income. It is based on the data collected from 1284 households residing in 50 rural villages of northern Ghana in 2014. The data enabled us to capture variations in applying sustainable intensification practices at plot level which has also increased the number of valid observations to more than 2500. Seven sustainable intensification practices were considered in our analysis namely, inter-cropping, crop rotation, organic fertilisers (mainly manure), soil conservation practices, inorganic fertilisers, improved seeds, and pesticides (including herbicides). A multivariate probit (MVP) model was estimated using a simulated maximum likelihood method to assess the integrated adoption of multiple SIPs. Moreover, we used a multivalued semi-parametric treatment effect model (MVTE) to estimate the effects of adopting multiple SIPs on three productivity indicators i.e. gross return (GHC/ha), gross margin (GHC/ha), and returns to labour (GHC/person days) in maize production. The MVP regression result shows that multiple factors explain the adoption of SIPs including plot characteristics, resource endowments, access to information, and demographic factors, though the degree and direction of influence varies among the type of SIPs. Moreover, it shows that the adoptions of the SIPs are interdependent and that most farmers adopt agricultural practices as a package but not as a single technology. Such a mechanism of adoption has helped farmers exploit potential complementarity among the technologies which is visible from the results of the MVTE model. The MVTE estimation shows that mean maize gross income monotonically increases as one goes from no adoption of SIP category through to adoption of four or more SIPs. The results associated with gross margin and returns to labour are a bit different, however. In these cases, the results reveal that complementarity was important in reducing the loss due to bad weather in stead of enhancing gains.

Keywords: Adoption, Ghana, multivalued treatment, sustainable intensification

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