AN ANALYSIS OF THE DETERMINANTS OF DIFFUSION OF SUSTAINABLE AGRICULTURAL INTENSIFICATION PRACTICES IN A MAIZE-LEGUME SYSTEM IN KENYA

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A Thesis Submitted to the Graduate School in Partial Fulfillment of the Requirements for the Master of Science Degree in Agribusiness Management of Egerton University

EGERTON UNIVERSITY

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DECLARATION AND RECOMMENDATION

Declaration
I declare that this thesis is my original work and has not been submitted in this or any other university for the award of a degree.

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DEDICATION
I dedicate this thesis to my husband Hezron Nyarindo Isaboke, my son Jasper Wren Nyarindo and my siblings for their continued support and prayers.

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May God Bless You All
ABSTRACT

The adoption and diffusion of sustainable agricultural intensification (SAI) practices remain a major concern in the development-policy agenda for Sub-Saharan Africa. This will solve the problem of land degradation, low agricultural productivity and poverty. Despite the benefits such as increase in yields and improved soil fertility that SAI offer, it is unclear why smallholder farmers report low adoption levels. Further, gender roles in decision making on farm productivity remain largely and empirically unexploited. To increase agricultural production in the agricultural sector, there is need to use appropriate combination of SAI practices. This study analyzed if SAIs uptake is linear or nonlinear and the impact of SAIs on income and labor demand among genders. Data from a sample of 535 households from five counties in Eastern and Western Kenya under Adoption Pathways project were analyzed using Multinomial Endogenous Switching Regression (MESR), Ordered Probit (OP) and a Stochastic Production function. The OP results showed that the number of technologies adopted is significantly influenced by labor use intensity, family income, plot tenure, land size and contact frequency with extension service providers significantly determined adoption. The MESR results indicated that women are more involved in majority of farm operations compared to men who mostly access extension service. Extension message is likely to have more effect if those involved in farm operations are reached, and the use of SAI practices as a package earns farmers more income than in isolation. The stochastic production function results showed that the level of fertilizer and improved variety use were positively correlated with yield across the cropping type. Further, access to credit positively affected the farmers’ choice of cropping systems, the elderly farmers practiced more intercropping, low soil fertility significantly reduced the growing of pure maize stand and limited incomes favored more intercropping. These results can help in packaging SAI practices for enhanced uptake by smallholder farmers especially in the presence of declining soil fertility and high commercial input costs. Furthermore, the results suggest that a better understanding of the determinants of cropping choices for smallholder farmers can be beneficial for better targeting of SAIs for adoption and subsequently improving crop productivity with less use of commercial inputs.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIFSC Australian International Food Security Center
APP Adoption Pathways Project
CIMMYT International Maize and Wheat Improvement Center
DH Double Hurdle
FHHs Female Headed Households
HH Household
INRM Improved Natural Resource Management
KES Kenya shillings
MESRM Multinomial Endogenous Switching Regression Model
MHHs Male Headed Households
SAI Sustainable Agricultural Intensification Practices
SIMLESA Sustainable Intensification of maize-legume in Eastern and Southern Africa
SSA Sub Sahara Africa