CIMMYT MR
International Maize and Wheat Improvement Center

SIMLESA
SUSTAINABLE INTENSIFICATION OF MAIZE-LEGUME CROPPING SYSTEMS FOR FOOD SECURITY IN EASTERN AND SOUTHERN AFRICA

Australian Government
Australian Centre for International Agricultural Research

Input subsidies or extension: which policy should take precedence when supporting farmers?

Research Background

The Sustainable intensification of maize legume systems in eastern and southern Africa (SIMLESA) R4D project in conjunction with the adjunct Adoption Pathways project were designed to test the agronomic, economic and institutional requirements for CA-based sustainable agricultural intensification practices (CA-SAIPs) in five countries in Eastern and Southern Africa. One of the research efforts towards understanding some of the micro-level and policy enablers of CA-SAIPs looked at key household and farm-specific and macro (country specific) factors as predictors of adoption of two critical components of CA-SAIPs: minimum tillage and mulching. The study was done in four SIMLESA and Adoption Pathways project countries (Ethiopia, Kenya, Tanzania, and Malawi. Many studies in the agricultural development literature that look at the adoption of agricultural technologies often study factors observed at the farm level and policy variables are often discussed as part of the broad interpretation of these results. In this brief we report on results from a study that is based both on adoption and policy simulations models.

What drives adoption of mulching and minimum tillage? Results from micro level adoption models

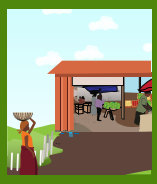
At the micro-level the results indicated that adoption of mulching and minimum tillage was higher in areas where there was relatively better access to infrastructure, markets and agricultural extension: If the key decision maker in the household reported that they were credit constrained, then there was a corresponding reduction in the probability to adopt minimum tillage and mulching. In areas where the reported amount of time it took to reach the market was higher, the less likely was the adoption of the two practices. This suggested that markets can change the terms of trade and opportunity costs of labor and other inputs needed for minimum tillage and mulching. Where famers reported that they were confident in the skills and advice given by their extension staff, there was more likelihood that they had adopted minimum tillage and mulching.

Adoption of mulching and minimum tillage was higher in areas where there was relatively better access to:

Infrastructure

Agricultural extension

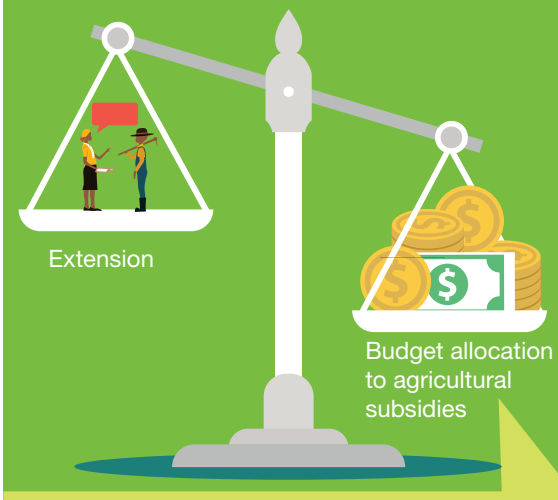
Markets



What else can we learn from policy simulation about adoption of mulching and minimum tillage?

In policy simulations, we analysed an “all-else-equal” scenarios involving national budget allocations to agricultural input subsidy policies, agricultural extension personnel to farmer ratios (reflecting the degree of investments in agricultural extension and access to credit in predicting the adoption of minimum tillage and mulching. These simulations were done by varying the levels of extension to farmer ratios, credit availability and national budget allocations to input subsidies. Generally; the results showed that both increases in investments or expenditures on input subsidies or extension can influence the probability of adoption of minimum tillage and mulching. When the extension-staff-to-farmer was raised and was compared to scenarios where budget allocations to agricultural expenditures on subsidies was raised (all else equal), the effect of the budget allocation to agricultural subsidies appeared to have the stronger effect on adoption of minimum tillage and mulching. In a related scenario, when extension staff-to-farmer ratio was increased and the budget allocation on subsidies reduced, the probability of adoption of minimum tillage nevertheless was still reduced. While noting that these results may be context specific to this particular study and data, these results suggest that the adoption of mulching and minimum tillage will be enabled (or hindered) by similar or the same set of factors as those typically observed for other agricultural technologies in general. These include resource availability, market access and social capital.

Subsidy and extension can influence the probability of adoption of minimum tillage and mulching



In recent years, agricultural subsidies have taken a lion’s share of agricultural recurrent budgets in some countries

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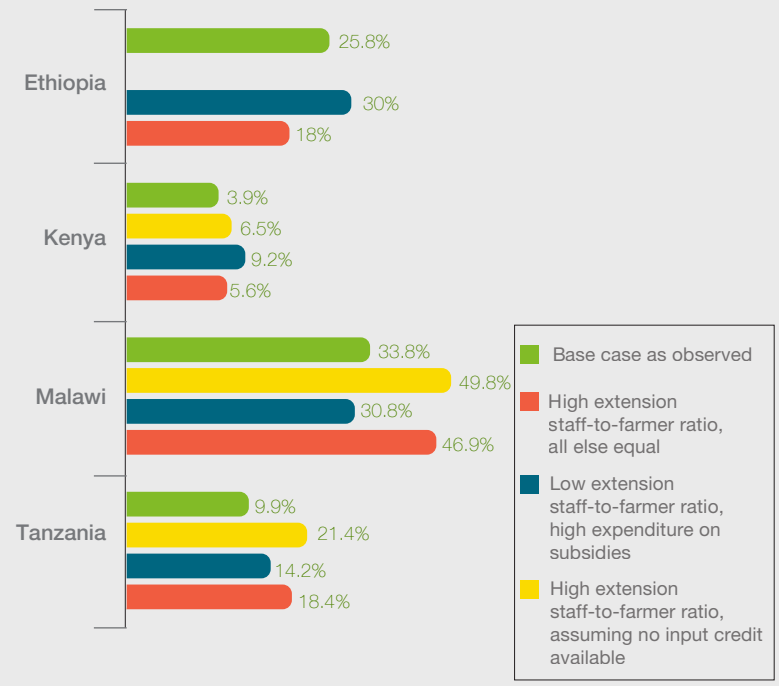
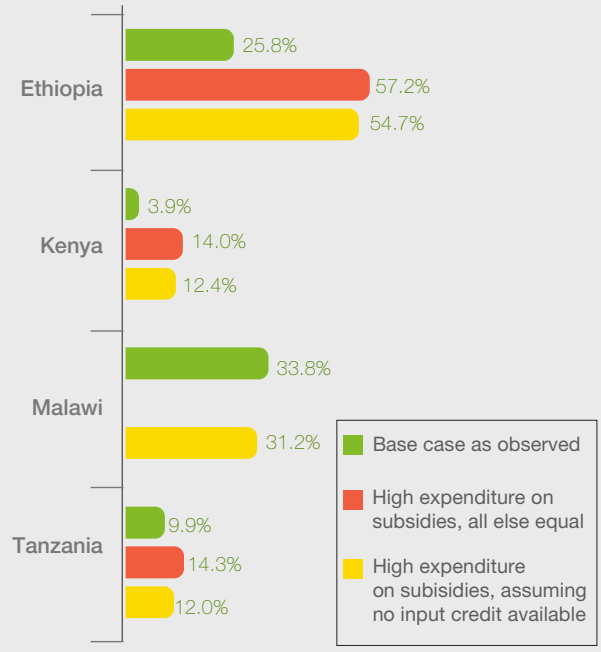
Simulating the effects of extension staff-to-farmer ratio on adoption outcomes for CA-based SAIPs



Simulating the effects of government expenditure on input subsidies on adoption outcomes for CA-based SAIPs



How can these results inform agricultural development policy?

The results summarized here have two major implications. The first lesson is that the positive effect of input subsidies in increasing the probability of adoption of minimum tillage and mulching comes from lowering the costs of these complementary inputs a fact that can help encourage farmers to try out new methods of production such as CA-SAIPs. In broad terms, subsidies specifically targeted at encouraging adoption of CA-SAIPs (especially to help defray the learning costs of knowledge intensive methods such as reduced or minimum tillage) could also be considered. It should not be assumed that adoption of CA-SAIPs will inevitably benefit from input subsidies on fertilizers or seeds. As an example, farmers willing to comply with some CA-SAIPs or other environmentally-beneficial farming practices can be enrolled in programs that pay for environmental services out of recognition of the positive environmental benefits that accrue to society from widespread adoption of these practices.

The second major lesson was related to investments in extension systems. The focus of policies meant for CA-SAIPs need to remain focused on strong delivery systems of information through strong public and private agricultural extension partnerships, on better access to markets to reduce the costs of inputs and ensuring more inclusive financial services for farmers to access the finance needed for to support adoption of CA-SAIPs.

When extension staff to farmer ratio is increased from base levels to **16** per 10,000 farmers the predicted probability of adoption increased from base levels i.e from:	When extension staff to farmer ratio was increased to about **16** per 10,000 farmers and **credit assumed unavailable** then the predicted probability of adoption increased from base levels by:
3.9% to **6.5%** in Kenya	**2%** in Kenya
3.4% to **5%** in Malawi	**13%** in Malawi,
10% to **21.4%** in Tanzania.	**9%** in Tanzania.

ETHIOPIA KENYA MALAWI MOZAMBIQUE TANZANIA AUSTRALIA