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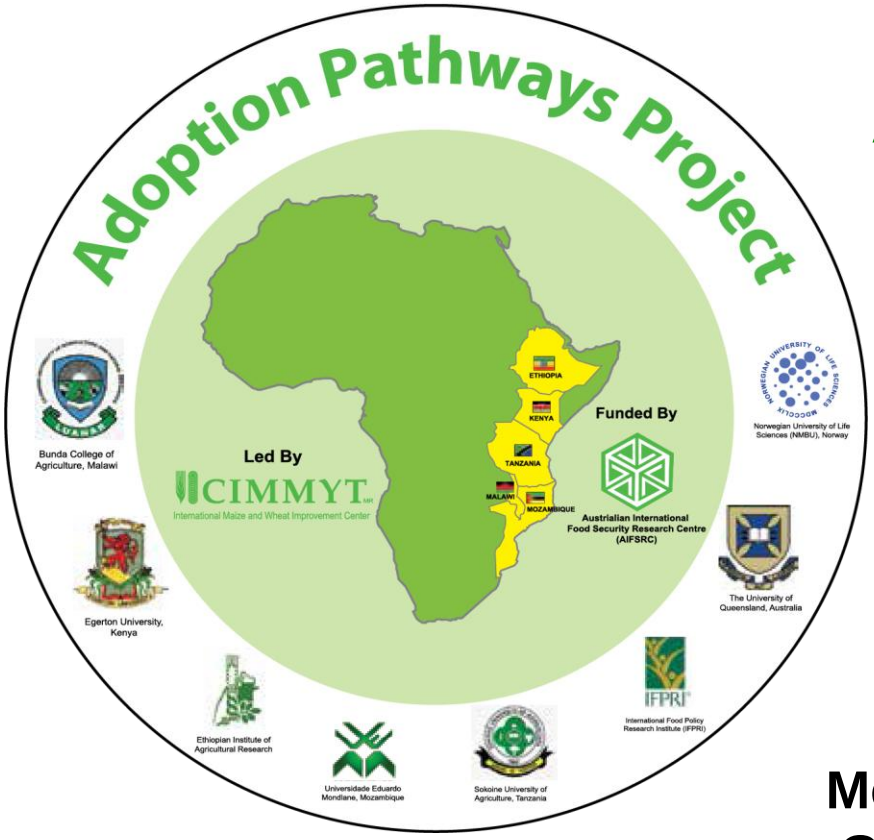


Agriculture Facts and Figures in Adoption Pathways project areas

Presentation at the Adoption Pathways 3rd Annual meeting ,

13 March 2015

Harare, Zimbabwe, The Rainbow Tower Hotel

Menale Kassie, Paswel Marenya, and Geoffrey Muricho, Stein Holden and National and International Partners

CIMMYT International Maize and Wheat Improvement Center

Egerton University Kenya

Ethiopian Institute of Agricultural Research

IFPRI International Food Policy Research Institute (IFPRI)

Lilongwe University of Agriculture and Natural Resources

Norwegian University of Life Sciences (NMBU), Norway

Sokoine University of Agriculture, Tanzania

The University of Queensland, Australia

Universidade Eduardo Mondlane, Mozambique

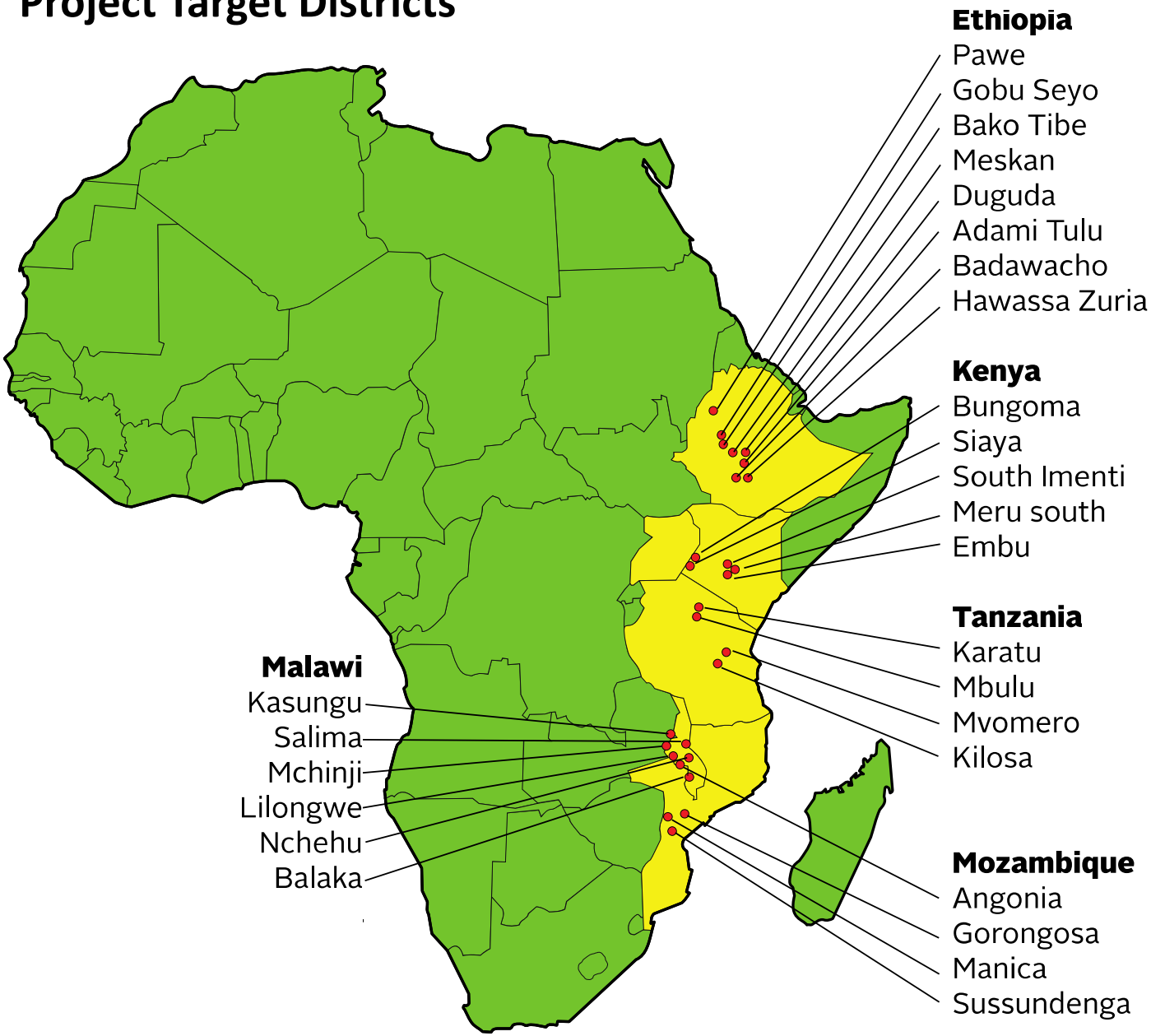
Agriculture in the Project Target Districts: Facts and Figures

- The following pages of this notebook presents facts and figures of agriculture in project districts . This information is compiled from comprehensive data sets collected by Adoption Pathways Project in maize farming systems in 2013. These data were collected and analyzed to generate information on the farming systems, production methods, farmers' livelihood strategies, farmers' means of coping with climate change and variability in the project target districts (see map below).

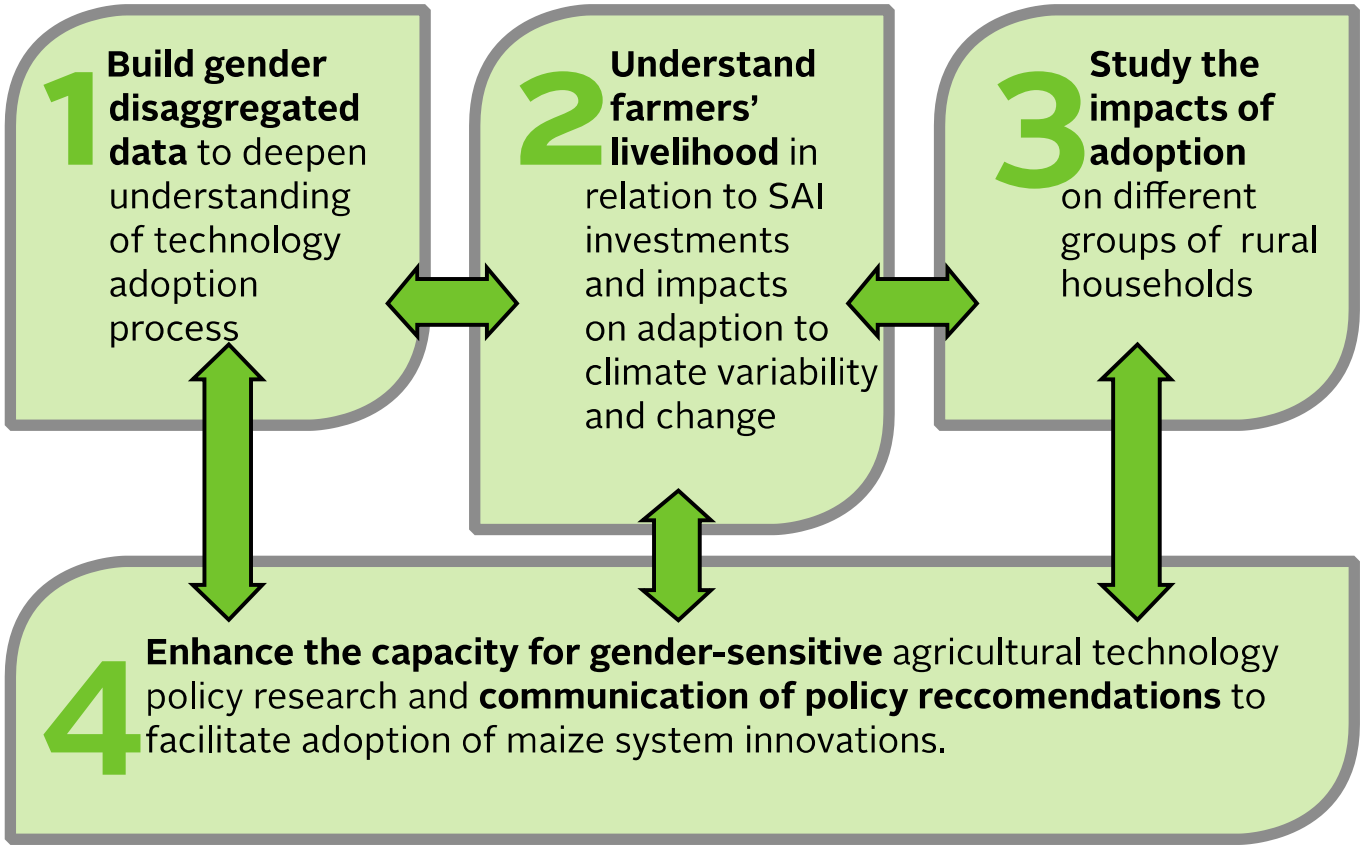
- The analysis is based on 875, 732, 550, 541, and 400 sample households from Ethiopia, Malawi, Tanzania, Kenya, and Mozambique, respectively.

- The resulting analyses are part of the broad Adoption Pathway Project objective to provide information that can guide agricultural research, investments and policy decisions. Towards this objective, several peer reviewed papers have been published from these data. For more information please visit our website http://aciar.gov.au/aifsc/projects/adoption-pathways or contact the project leader (Kassie Menale at m.kassie@cgiar .org) or any of our country coordinators or international partners whose contacts are listed at the back of this notebook.

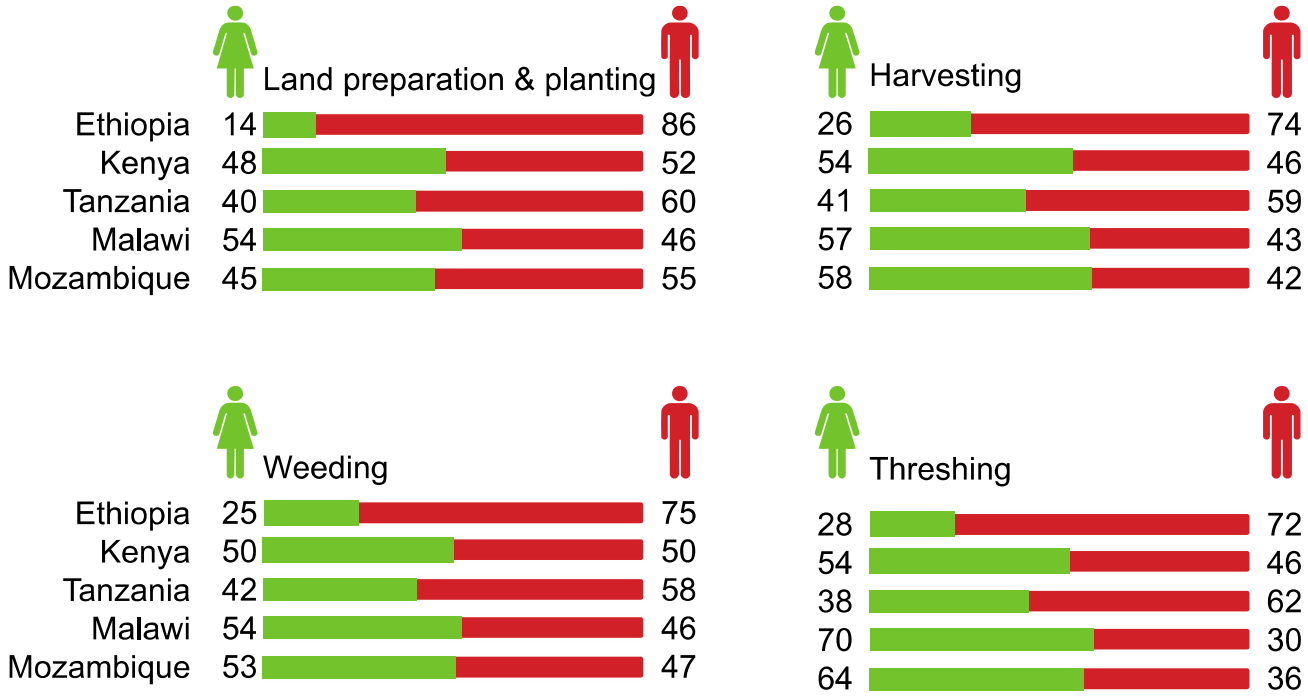
Project Target Districts



Objective of the Adoption Pathways Project



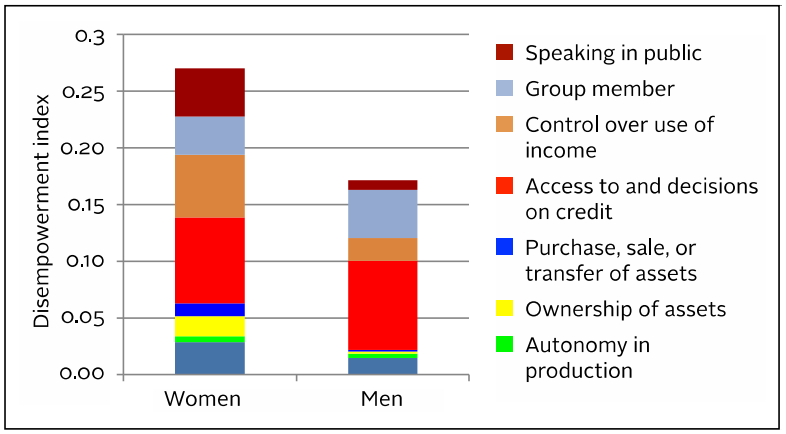
Female labor share by agricultural activity in Project Target Districts (Percentage of total man-days)



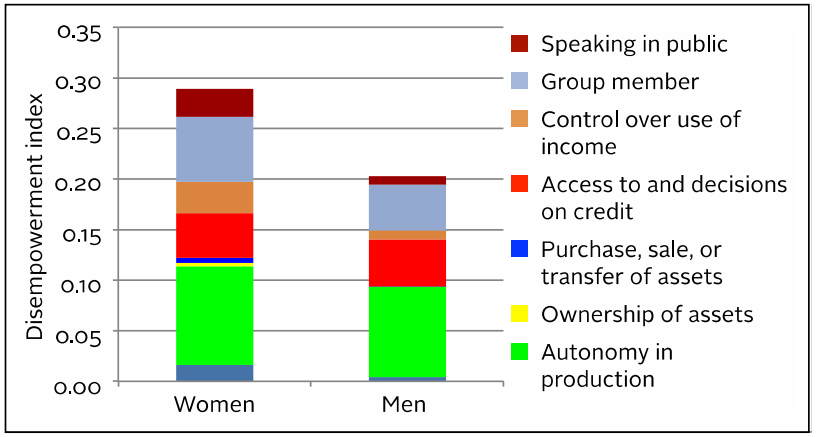
The average female agricultural labour use is 46%. Except in Ethiopia, female total agriculture labor commitment is high in the project districts given that they contribute some 50% of agricultural labor plus nearly all the labor required for family care and related household chores. What intervention(s) can ease their work load?

Source: AP 2013 survey and SIMLESA 2010 survey for Mozambique

Women's (dis) empowerment in Agricultural index in project target districts (Tanzania)

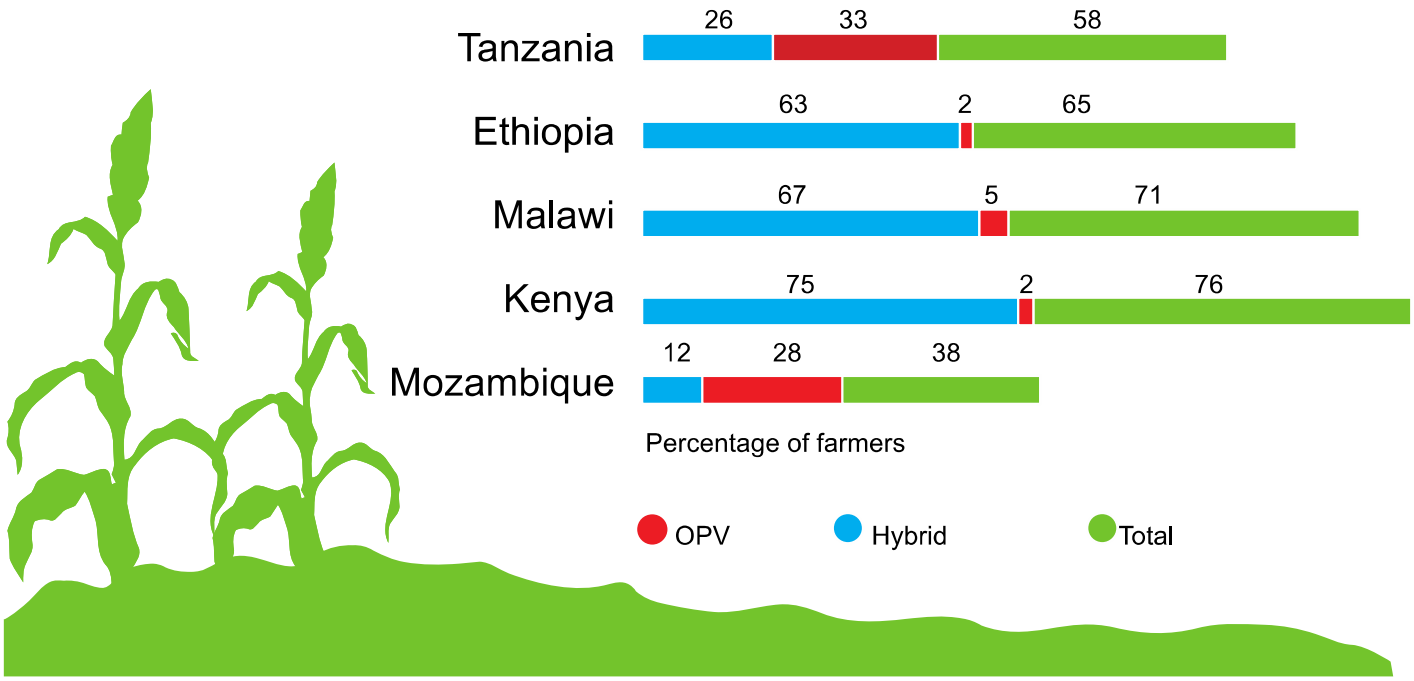


Women's (dis) empowerment in Agricultural Index in project target districts (Ethiopia)



The disempowerment measures in Tanzania and Ethiopia revealed that women's are more disempowered than men's. Ownership and control over assets, control over income, and input in productive decisions are areas in which women lagged behind men. Lack of autonomy in production is an area that makes a significant contribution to disempowerment in Ethiopia while in Tanzania access to and decision on use of credit is a major source of disempowerment. Do gender disempowerment in the same household matter for technology adoption and food security status of a household?

Proportion of farmers using fresh improved maize varieties in Project Target Districts

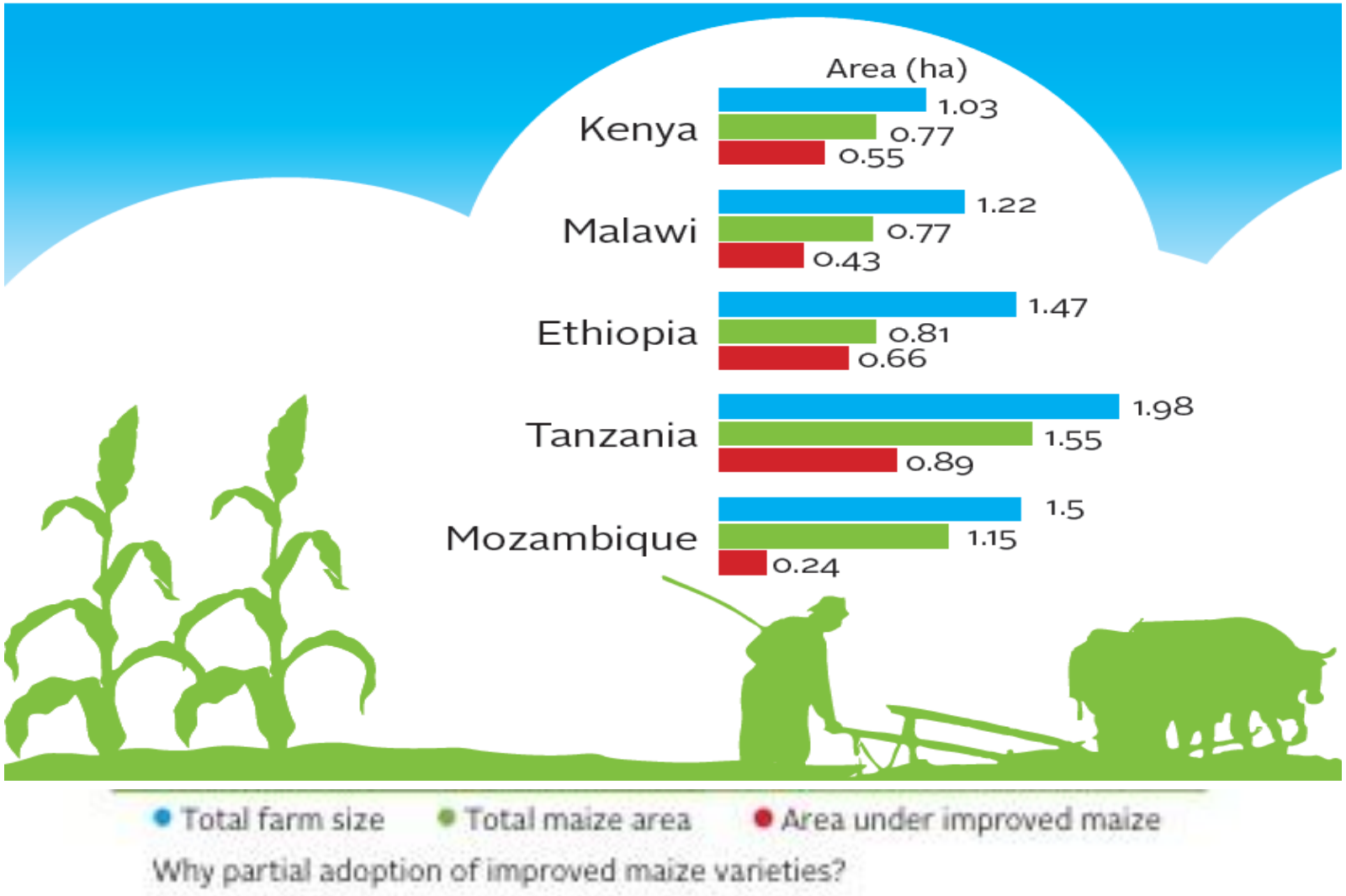


Reports show that improved maize seeds are used significantly in the target districts. Subsidy in Malawi and liberalized input markets in Kenya seem to drive high adoption in addition to other conditioning factors. In Ethiopia strong focus on extension and credit system seem to contribute to high adoption. Why does Tanzania report the lowest hybrid use?

Improved maize seed rate application in the project target districts (kg/ha)

Country	Kg/ha
Ethiopia	28
Malawi	23
Kenya	20
Tanzania	18

Area under improved maize varieties in project target districts



Why partial adoption of improved maize varieties?

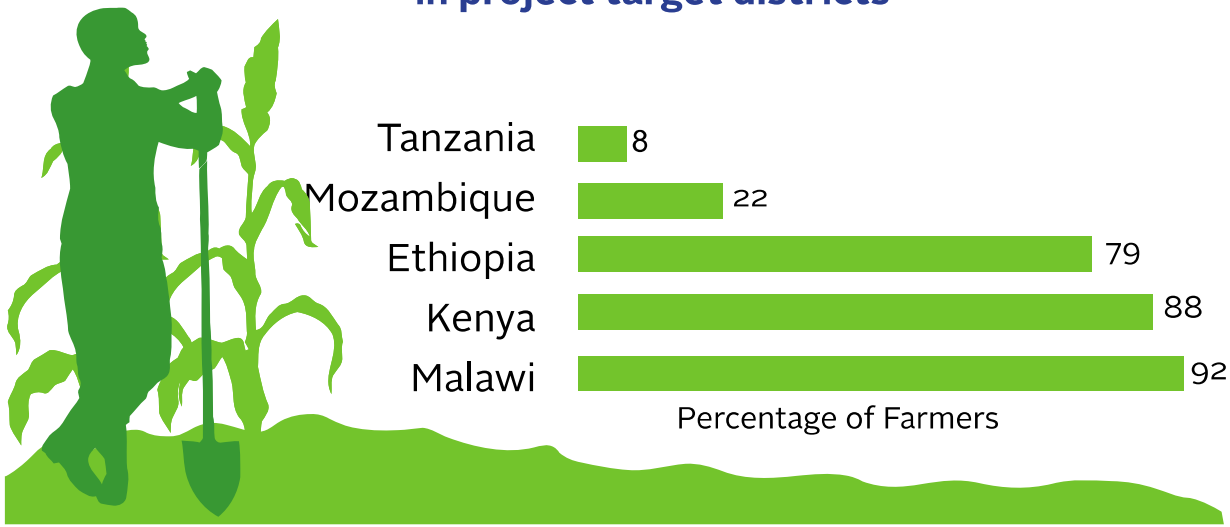
Average weeding and ploughing frequency and ploughing method for maize crop in the project target districts

country	Weeding frequency	Ploughing frequency	Common ploughing method (figure in parenthesis % plot)
Ethiopia	**2.45**	**3.57**	Animal traction (95.8%)
Kenya	**1.17**	**0.96**	Hand hoe /manual (64.8%)
Malawi	**1.26**	**1.00**	Hand hoe (94.9%)
Tanzania	1.88	1.29	Animal traction (46%) and Hand/manual (40%)
Mozambique	2.28	1.18	Manual (54%); Animal traction (44%)

Proportion of households using tractors by agricultural activity in the project target districts (%)

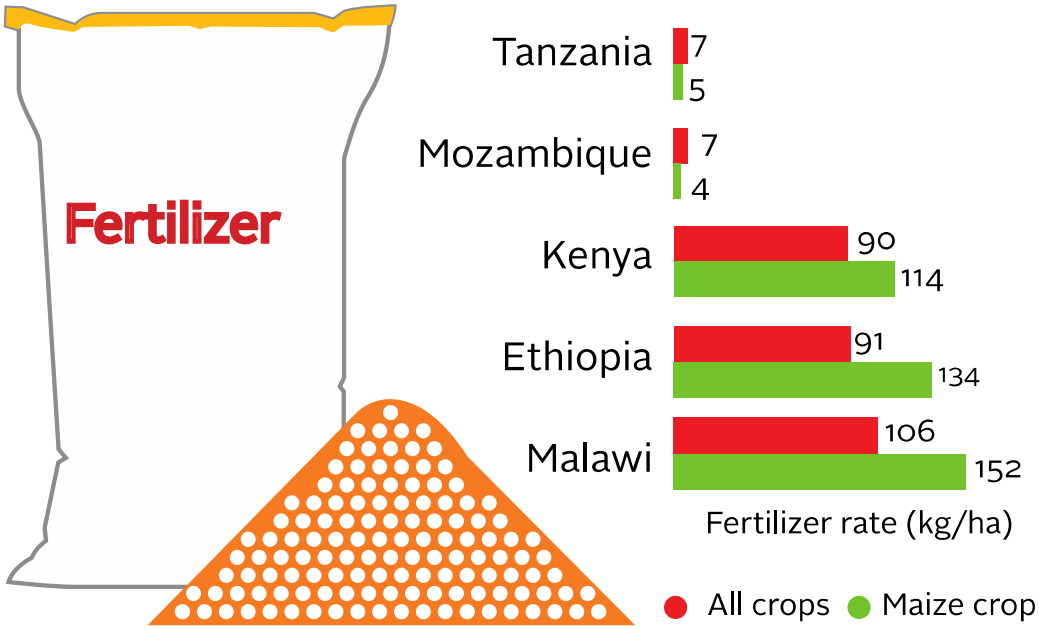
Activity	Kenya	Tanzania	Ethiopia	Malawi	Mozambique
Land preparation	**11.8**	**22.4**	1.6	0.1	1.8
Harvesting/threshing	1.9	12	3	0.8	1.0

Proportion of farmers using inorganic fertilizer in project target districts



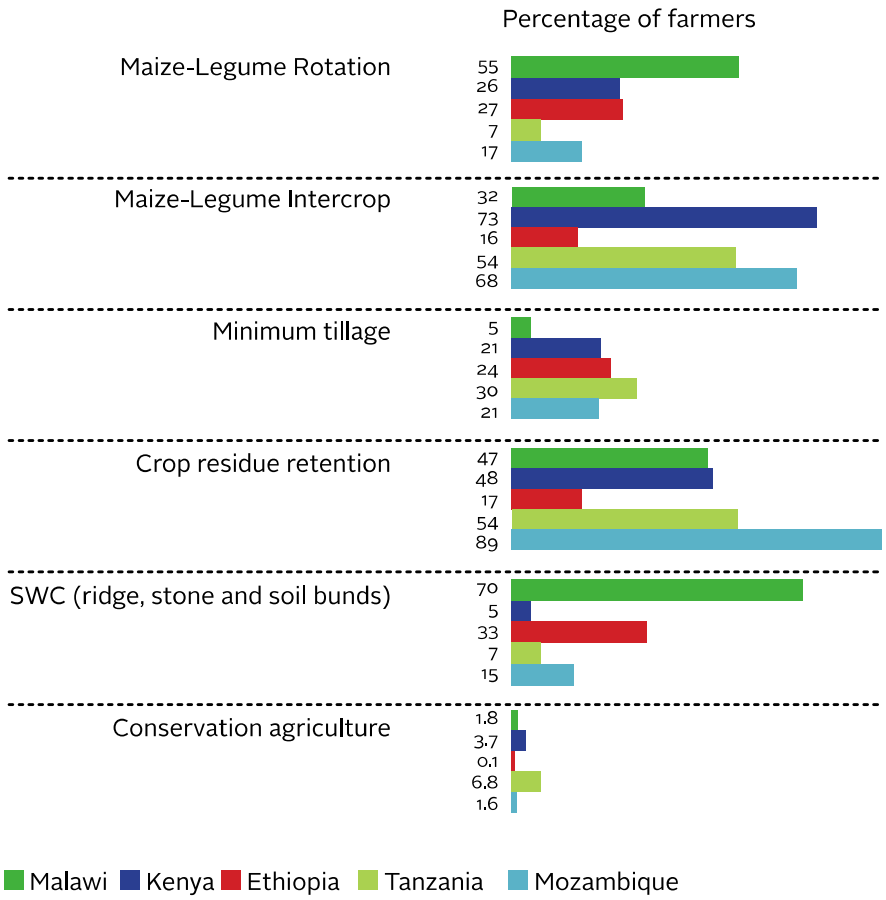
The number of farmers using fertilizer use is extremely low in Tanzania and Mozambique Districts. The high proportion of farmers in Kenya and Malawi is probably because of liberalized input markets and fertilizer subsidy respectively in addition to other conditioning factors. For Ethiopia a strong state driven fertilizer system may explain the high adoption rates.

Fertilizer intensity considering all plots (with and without fertilizer) in Project Target Districts



The project Districts in Kenya, Ethiopia and Malawi have achieved the Abidjan fertilizer declaration of 50kg/ha by 2015.

Proportion of farmers adopting improved agronomic practices in project target districts



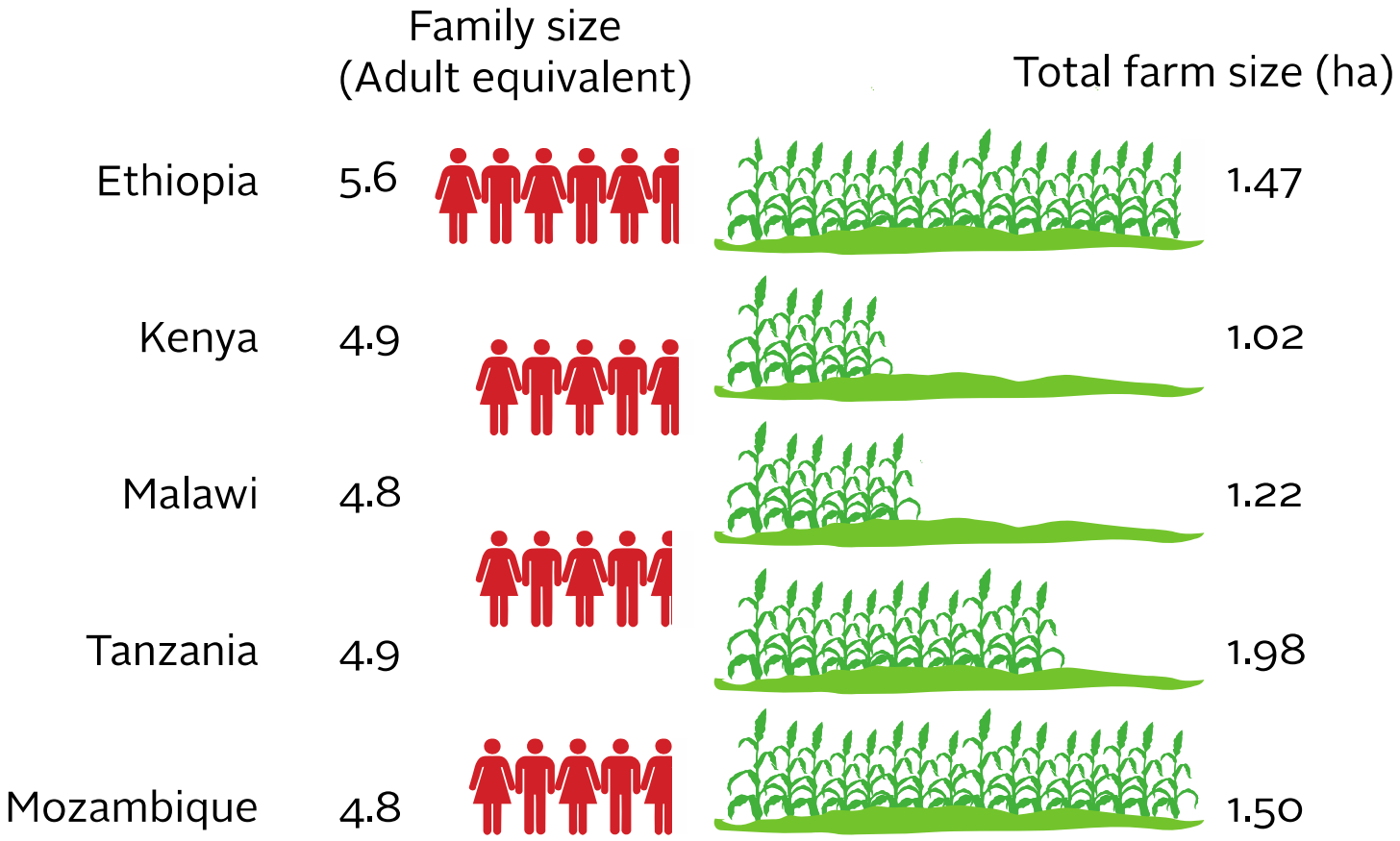
Low adoption of conservation agriculture in all countries and of intercropping and residue retention practices in Ethiopia. Why?

Crop-livestock competition and implication for CA based intensification in Project Target Districts

Country	Livestock (TLU)	Crop residue utilization (%)					
		Feed for livestock	Left in the field	Used as firewood	Burnt in the field	Sold	Used for construction
Ethiopia	4.4	62.9	8.7	16.9	6.7	1.3	3.0
Tanzania	3.5	44.0	45.0	4.3	6.2	2.0	0.1
Kenya	2.2	43.5	39.5	1.9	4.6	2.2	0.0
Malawi	0.7	4.2	65.2	10.3	13.0	0.1	0.3
Mozambique	0.6	13.0	71.4	16.9	11.1	0.0	0.0

Countries with high livestock ownership (Ethiopia, Tanzania and Kenya) use residues for livestock feed and those with low livestock ownership leave more residues on soil surface.

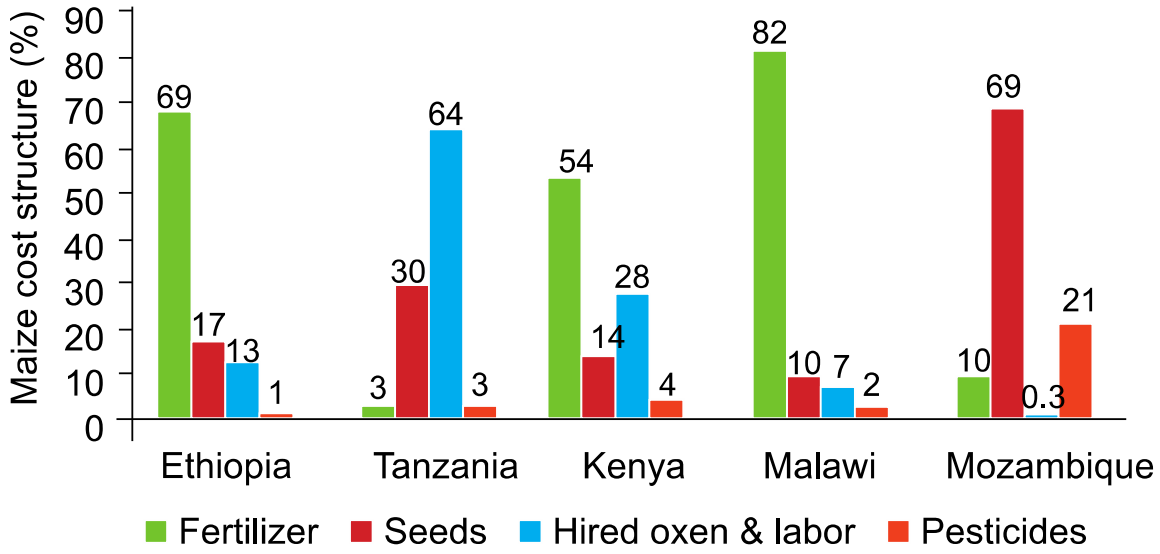
Family and farm size in Project Target Districts



Maize yields on farms using non-recycled seeds of improved varieties in Project Target Districts (-t/ha)

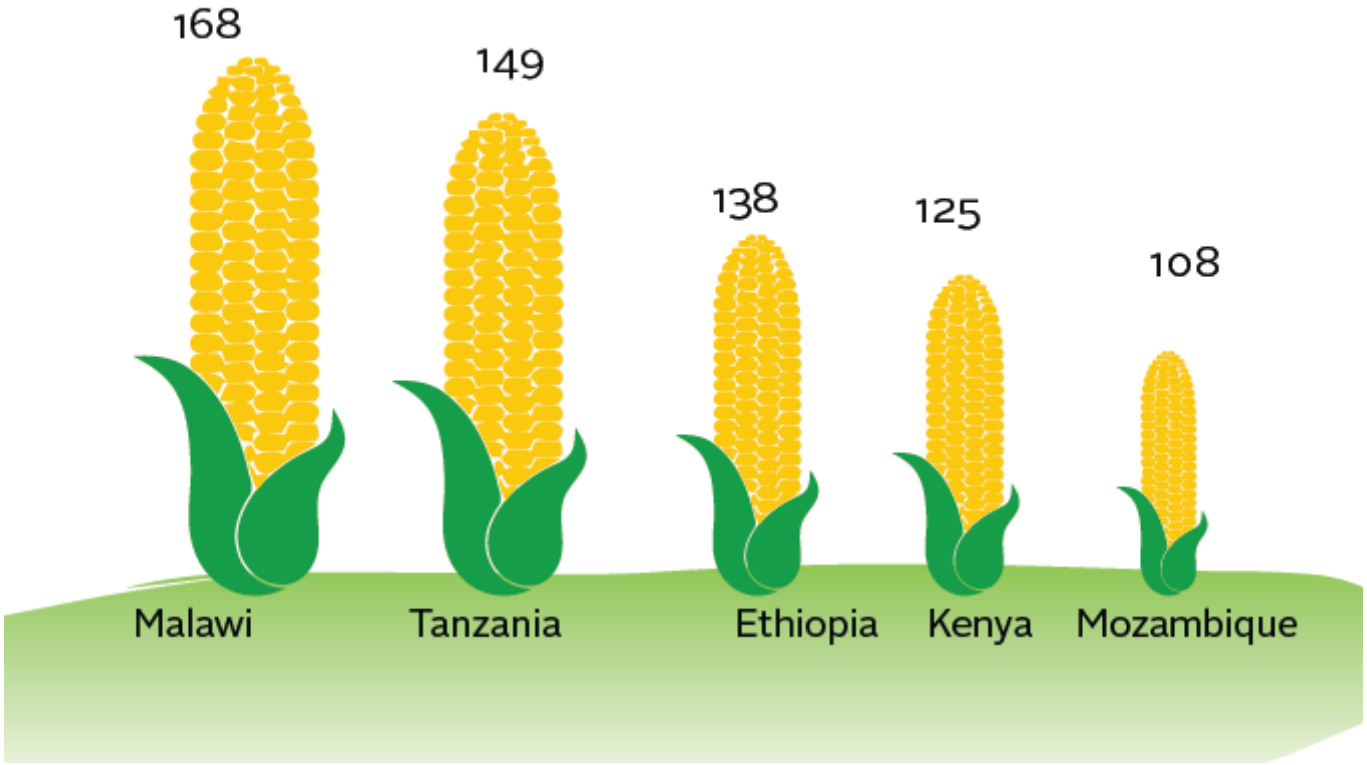
Maize yields in Ethiopia are the highest for the five countries. Is this due to superior levels of input use and management or high yielding varieties? Why are yields in Kenya only 1.7t/ha despite half a century of maize breeding in the country and arguably more developed agricultural markets? In Malawi why despite a high profile input subsidy program, are yields no better than Kenya for example?

Maize Production Cost Structure in the Project Target Districts (%)

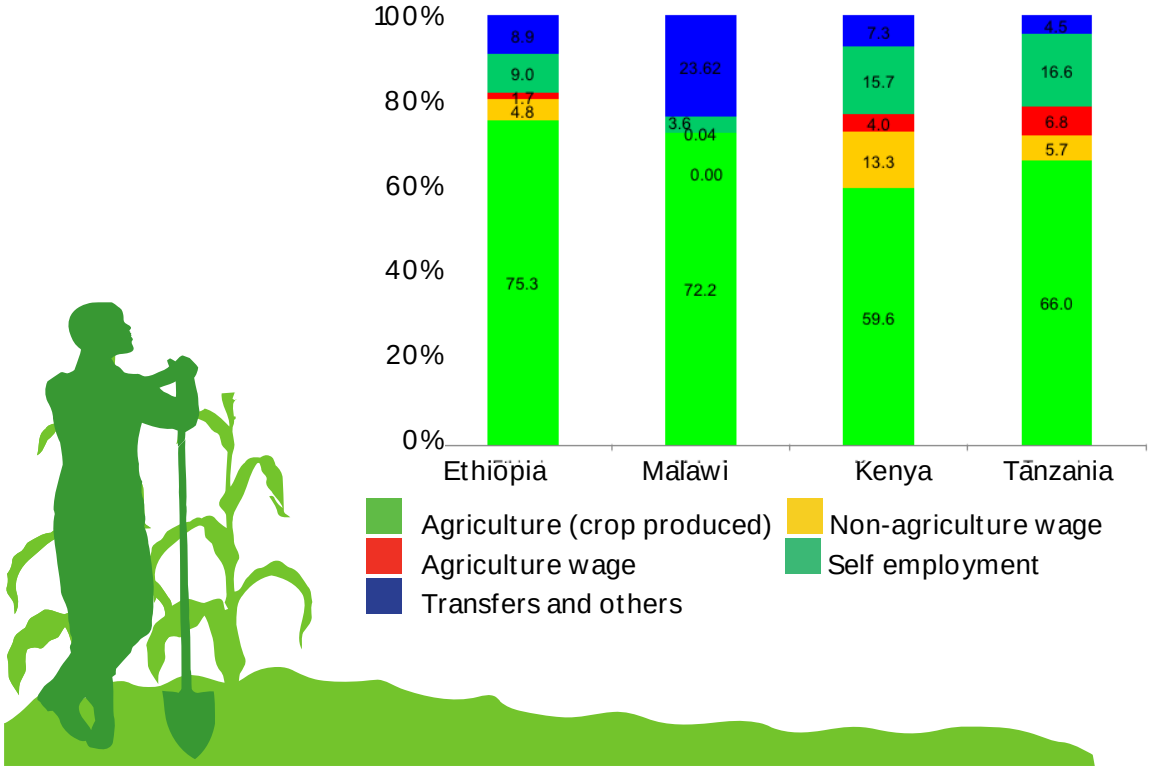


Inorganic fertilizer contributes the largest cost share. Can legume intercropping and rotations, minimum tillage and residue retention help farmers in reducing fertilizer costs?

Per capita maize consumption in the Project Target Districts (kg)



Income Diversif cation Strategies in Project Target Districts (%)



Agriculture contributes the largest share of income in all countries (no less than 60%in Kenya and 75%in Ethiopia). It follows that increasing its productivity is fundamental to improve household welfare. Non-agricultural wage employment rates are very low at a maximum of 13%in Kenya. Similarly, self-employment ranges between 4%in Malawi and 17%in Tanzania.

Household food security status in Project Target Districts (%)

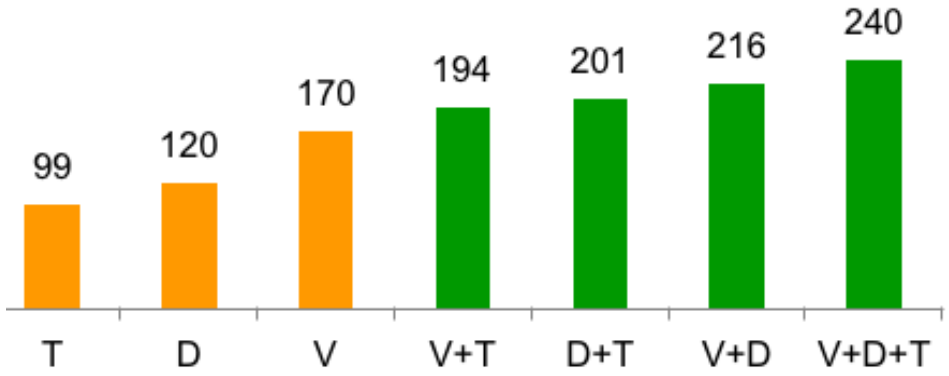
	Ethiopia	Malawi	Tanzania	Kenya	Mozambique
Chronic food insecurity	6.45	9.1	6.2	4.6	1.4
Transitory food insecurity	36.3	44	63.7	40.3	60.8
Breakeven food security	45.7	30.9	23.3	40.9	24.1
Food surplus	11.8	16	6.8	14.2	13.3

The project districts in Malawi, Tanzania and Mozambique have more number of food insecure households compared to Ethiopia and Kenya.

Top Improved Maize Varieties Grown in Project Target Districts

Ethiopia	BH540, BH660, PHB30G19 (shone), BH543
Malawi	SC403, MH18, SC627, DKC8035
Kenya	DUMA43, H513, DK8031, WS505
Mozambique	PAN67, Matuba, PAN6777, R201
Tanzania	Staha, Situka M-1, SC627, DK8031

Additional income from adoption of multiple Sustainable Intensif cation Practices (SIP) in Ethiopia (USD/ha)

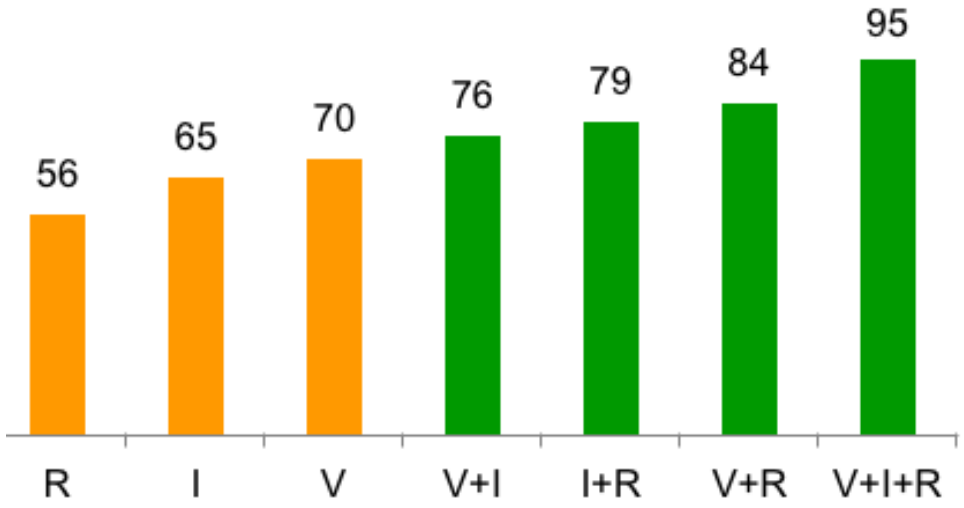


Note: V=Improved maize varieties; D=Crop diversif cation (legume-maize intercropping & rotation), T=Minimum tillage (zero/one pass).

Adoption of SIPs resulted in higher additional income but the highest additional income was obtained from joint adoption of SIPs. The contribution of improved maize varieties to additional income increases by 14-41% when they are jointly adopted with other SIPs. The study is based on nationaly representative data collected by SIMLESA Adoption Pathways Project and CRP-maize funds.

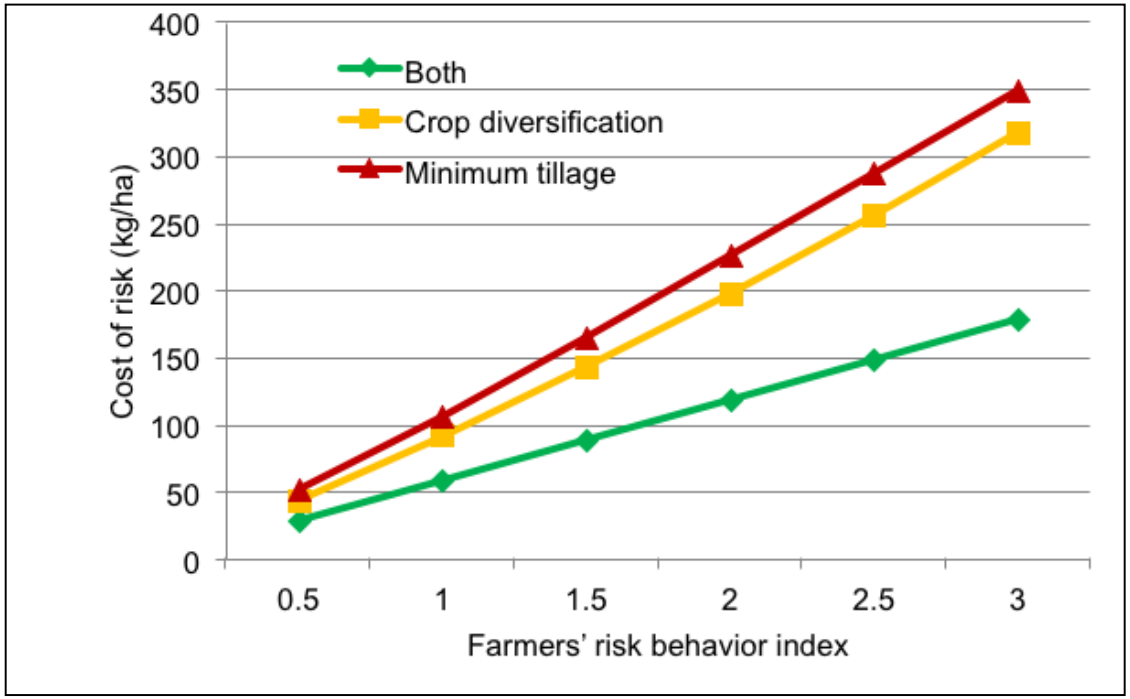
Source: SIMLESA 2010 and AP 2013 surveys

Additional income due to multiple adoption of SIPs in Malawi (in USD/ ha)



Note: V-Improved maize varieties; I-legume-maize intercropping, and R-legume-maize rotation).

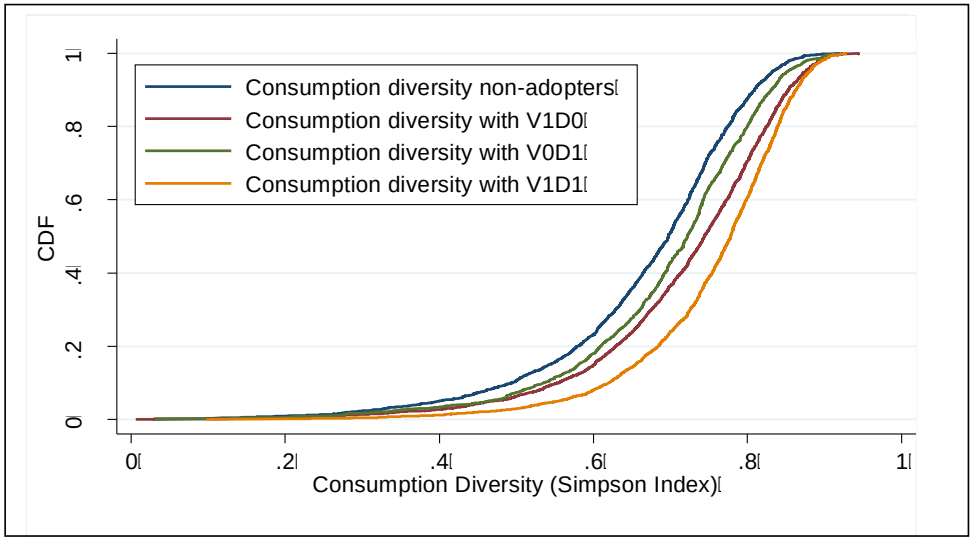
Impact of SIPs on cost of risk in Malawi



Adoption of SIPs reduces cost of risk but greater reduction was achieved with joint adoption. This analysis is based on nationaly representative data.

Source: SIMLESA 2010 survey

Technology diversif cation and nutrition security in Ethiopia

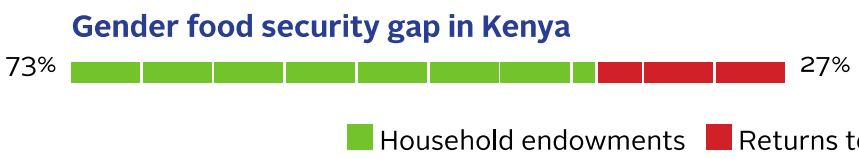


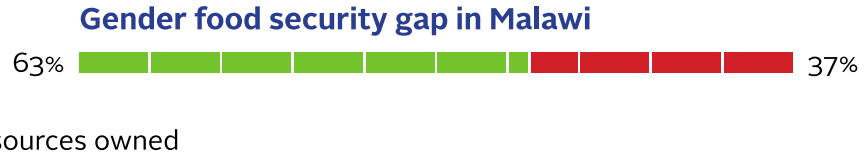
Note: V-Improved maize varieties; D-Crop diversif cation (legume-maize intercropping, and legume-maize rotation).

Adoption of technologies is not only increase crop income and reduce crop failure but can also increase food diversity. Joint adoption of improved maize varieties with good agronomic practices increased household nutrition diversity or security. This result is based on national representative panel data analysis (2010 and 2013 data).

Did You Know?

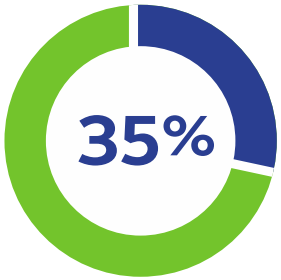
Do you know that 27% and 73% of the gender (Male and female head households) food security gap in Kenya was estimated to result from two distinct "forces"? These were due to gender differences in the amount of resources owned and secondly due to gender differences to returns to those resources respectively.





Household endowments Returns to resources owned

Do you know that 37% and 63% of the gender (Male and female head households) food security gap in Malawi was estimated to result from two distinct "forces"? These were due to gender differences in the amount of resources owned and secondly due to gender differences to returns to those resources respectively.



In Malawi about 35% of the households were unable to obtain the most preferred maize variety in the 2011/12 season. The most popular varieties were the most commonly grown Drought tolerant (DT) varieties, showing that there is room for further expansion of such varieties.

A one unit increase in farmers preference coefficient (constant relative risk aversion coefficient) is associated with a 16% increase in the adoption of DT maize

This indicates that the awareness of DT maize as a risk-reducing technology has started to make its impact on maize variety adoption in Malawi.

Farmers in Malawi with previous exposure to drought shocks are

18%

more likely to plant DT maize