

# **FR1.3: Gendered differences in accessing and using climate-smart agricultural technologies in Tanzania**

Presenter

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# Background

- ❑ Agriculture is critical to the economic growth of sub-Saharan African countries but is negatively affected by climate change.
- ❑ Some of the rampant effects of climate change in SSA include
  - Prolonged drought
  - Flooding
  - Erratic rainfall
  - Increased pest and diseases, and
  - Rising temperatures

# Background

- ❑ Smallholder farmers are the most affected because of their reliance on rain-fed agriculture.
- ❑ As a result, climate change results in increased cases of food insecurity and poverty, affecting local markets, and slowing down economic growth.
- ❑ The vulnerability of smallholder farmers to climate change is worsened by pre-existing conditions, including:
  - Low access to markets,
  - Weak institutional support and policy,
  - Low technology adoption, and poverty

# Background

- ❑ The impacts of climatic shocks are skewed with women being the most vulnerable group in Tanzania.
- ❑ Smallholder farmers, especially women cultivate relatively small pieces of land which often lack access to reliable irrigation.
- ❑ Their participation in output markets is low largely because of poor harvests.
- ❑ As a result, climate change has undermined the ability of Tanzania to achieve the Sustainable Development Goals.

# Background

- ❑ Few studies have focused on how access and use of these technologies vary by gender in Tanzania
- ❑ The potential role of individuals and households in gendered differences in the use of climate-smart agriculture has not been explored comprehensively in Mbeya and Mbozi districts.
- ❑ This study investigated the role of gender in the uptake of climate-smart agricultural practices in Tanzania.

## Conceptual Framework

Financial Capital (credit, cashable properties and regular cash flows)

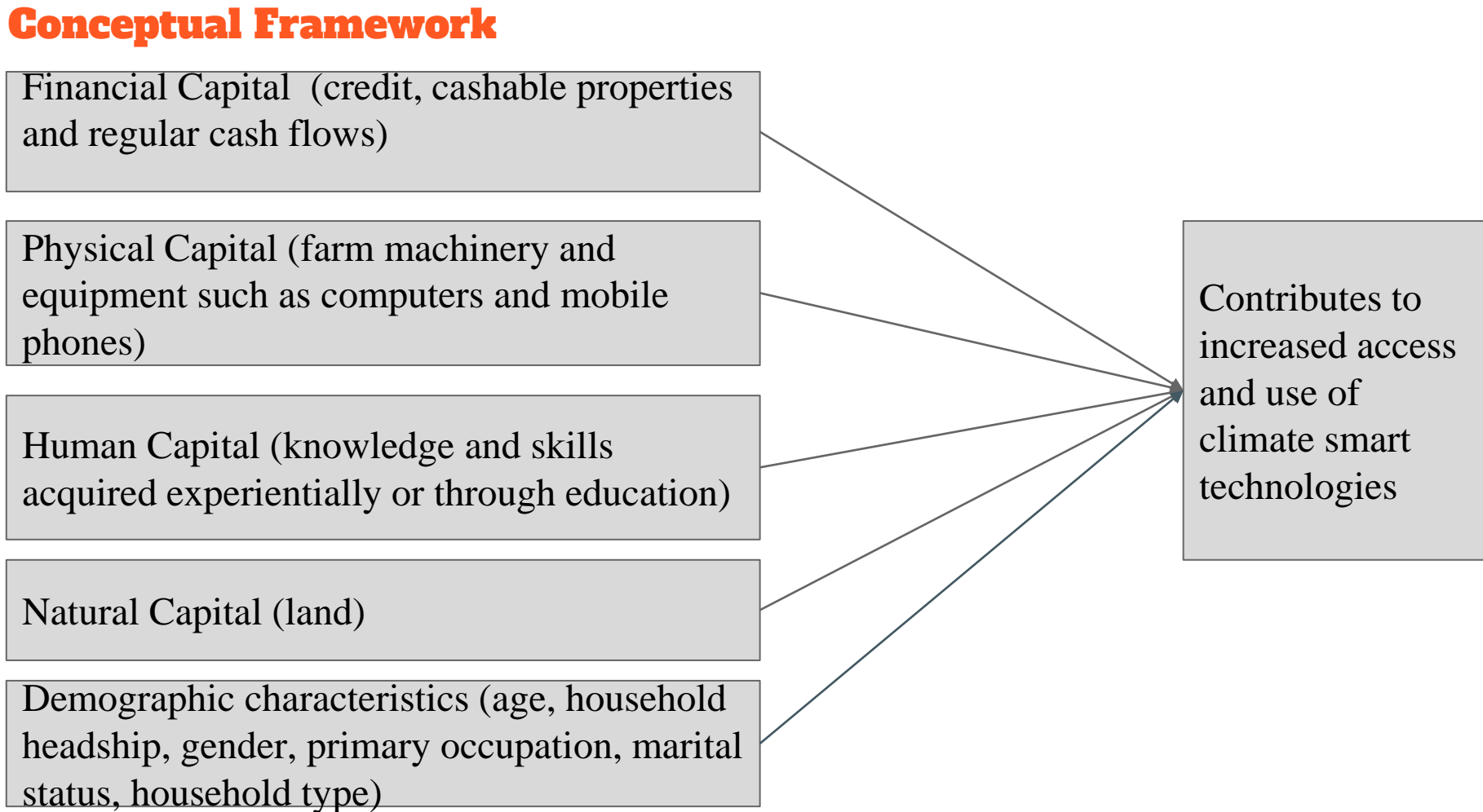
Physical Capital (farm machinery and equipment such as computers and mobile phones)

Human Capital (knowledge and skills acquired experientially or through education)

Natural Capital (land)

Demographic characteristics (age, household headship, gender, primary occupation, marital status, household type)

Contributes to increased access and use of climate smart technologies

A conceptual framework diagram showing five input boxes on the left pointing to one output box on the right. The input boxes are: Financial Capital (credit, cashable properties and regular cash flows), Physical Capital (farm machinery and equipment such as computers and mobile phones), Human Capital (knowledge and skills acquired experientially or through education), Natural Capital (land), and Demographic characteristics (age, household headship, gender, primary occupation, marital status, household type). The output box is: Contributes to increased access and use of climate smart technologies.

# Methodology

## Study Area

- ❑ The study was conducted in
  - Mbeya rural
  - Mbozi districts.
- ❑ Main occupation
  - Farming
- ❑ Seasons
  - Long rains October to May
  - Short rain June to September

## Sampling Design

- ❑ Two districts were selected for the study
  - Mbeya
  - Mbozi
- ❑ Six villages were randomly selected from the two districts
- ❑ Participants were then selected randomly from lists of farmers that were provided by local extension offices in the different wards.
- ❑ Farmers randomly selected using the RAND function resulting in 357 respondents



## **Sampling Design**

- ❑ The two districts were selected for the study because they are among the main bean production hubs in the Southern Highlands of Tanzania.
- ❑ They also receive diverse bean value chain interventions.

## Data Collection

- ❑ Data was collected using semi-structured questionnaire.
- ❑ The tool was co-developed by all stakeholders
- ❑ The information collected comprised
  - Demographic characteristics
  - Land ownership, access, and allocation to bean production
  - Types of seed and bean varieties planted by farmers
  - Bean production practices
  - Production constraints
  - Farmers access to information on bean production, technologies, and marketing

## Data Analysis

- ❖ Measures of Central Tendency (Mean and standard deviation)
- ❖ Analysis of proportions (Frequencies and percentaged)
- ❖ Inferential statistics
- ❖ Analysis of test of significance (ANOVA and chi-square).

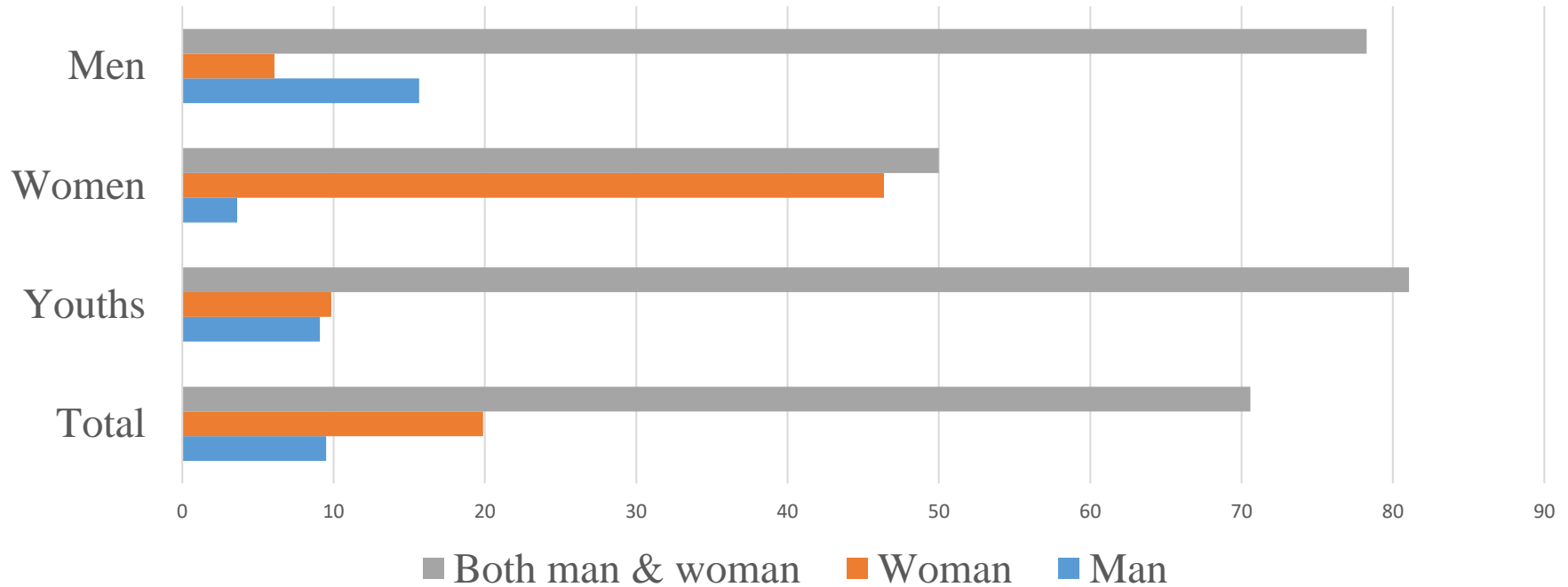
# Results

## Sociodemographic characteristics of respondents by gender

- ❖ Most households were men headed.
- ❖ Women had lower education qualification compared to men and the youth.
- ❖ 31% of the women were either widowed, separated or divorced.

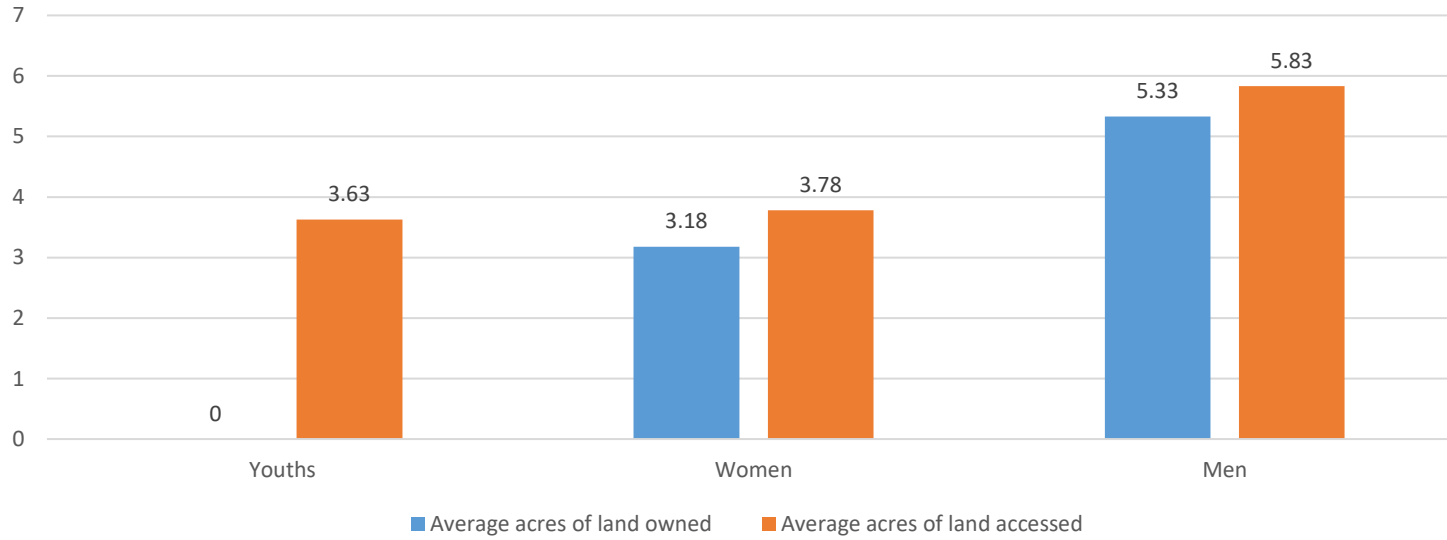
Variable	Total (N=357)	Youths (n=132)	Women (n=110)	Men (n=115)	p-value
Gender of respondent (%)		36.97	30.81	32.21	
Age of respondent (years)	41.41 (11.69)	29.34 (3.63)	47.82 (8.48)	49.15 (8.60)	0.000
Relation of respondent to HHH (%)	63.59	52.27	39.09	100.00	0.000
Education level respondent (%)					
No formal education	10.36	9.85	19.09	2.61	0.000
Primary	73.11	59.09	74.55	87.83	
Secondary or higher	16.53	31.06	6.36	9.57	
Farming as the main occupation (%)	83.19	81.06	84.55	84.35	0.711
Marital status - Married (%)	86.83	92.42	69.09	97.39	0.000
Household type (%)					
Dual type	87.96	93.18	71.82	97.39	0.000
Woman only	9.52	4.55	25.45	0.00	
Man only	1.68	1.52	0.91	2.61	
Woman with absentee husband	0.84	0.76	1.82	0	

## Farm and bean farming characteristics



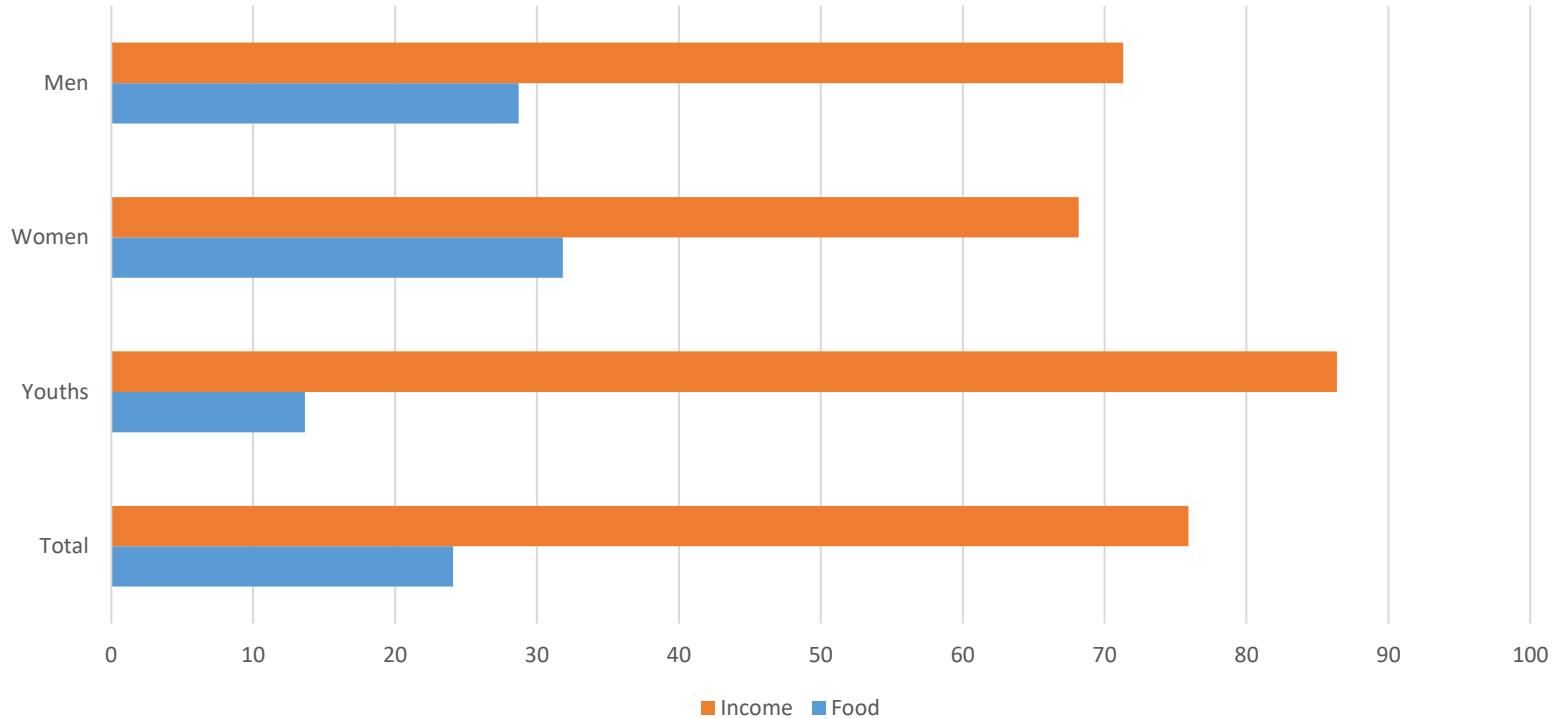
Decision-making on the purpose of growing beans was made jointly between man and woman in a household but secondly, by women, even though men said otherwise

# Farm and bean farming characteristics



- ❖ Men owned more land (5 acres) than women (3 acres) and youth (0 acres).
- ❖ Men also accessed more land (6 acres) than women (4 acres) and youth (4 acres)

# Farm and bean farming characteristics



❖ Beans were mainly grown for income (76%), while only 24% grew for food. It is important to note that beans are now more commercialized and this might have implications for women in relation to income from sale of beans

## Bean Production Constraints

- ❖ Pest and diseases was a common production constraint affecting majority of the responds, especially the youth (65%).
- ❖ More women (5%) than men (3%) and youth (2%) were affected by lack of access to fertilizer.
- ❖ This result indicates that vulnerability to adverse effects of climate change varies by gender possibly due to disparities in resource endowment, awareness, knowledge, and access to agricultural support services

Constraint	Total	Youth	Women	Men
Production constraint (%)				
Pests and diseases	56.0	65.15	51.82	49.5
Access to production finance	11.4	12.88	9.09	12.1
Drought	7.00	7.58	8.18	5.22
Floods	8.68	6.82	8.18	11.3
Access to fertilizers	3.36	1.52	5.45	3.48
Access to quality seed	2.52	0.76	1.82	5.22
Other	1.12	0.76	0	2.61
Poor soils	1.4	0.00	0.91	3.48
Access to knowledge & information	0.56	0.00	0.91	0.87
Labour constraints	0.28	0.00	0	0.87
Increase the input prices	2.24	0.00	5.45	1.74
None	5.32	4.55	8.18	3.48



## Post-harvest constraints

- ❖ More women (21%) mentioned excessive rains during harvesting to be a major post harvest constraint.
- ❖ Lack of knowledge on post harvest handling was mentioned by more women (4%) than men (3%) and the youth (2%).
- ❖ By contrast more men (3%), and youth (3%) mentioned storage pests as a post harvest constraint

Constraint	Total	Youth	Women	Men	p
<b>Post-harvest constraints (%)</b>					<b>0.697</b>
Excessive rain during postharvest	19.89	18.94	20.91	20	
Lack of knowledge on post-harvest handling	3.08	2.27	3.64	3.48	
Storage pests	2.52	3.03	0.91	3.48	
Lack/access to PHH facilities/equipment	1.68	1.52	1.82	1.74	
Labour constraints	1.12	0.76	0.91	1.74	
storage space	0.56	0	0.91	0.87	
Other	0.84	0	0	2.61	
None	70.31	73.48	70.91	66.09	

## Marketing constraints

- ❖ More women (10%) reported that distance to market was a marketing constraint.
- ❖ Additionally, more women (4%) than men (3%) and youth (2%) mentioned poor means of transport as a constraint.
- ❖ By contrast more men (42%), and youth (33%) mentioned price fluctuations as a marketing constraint

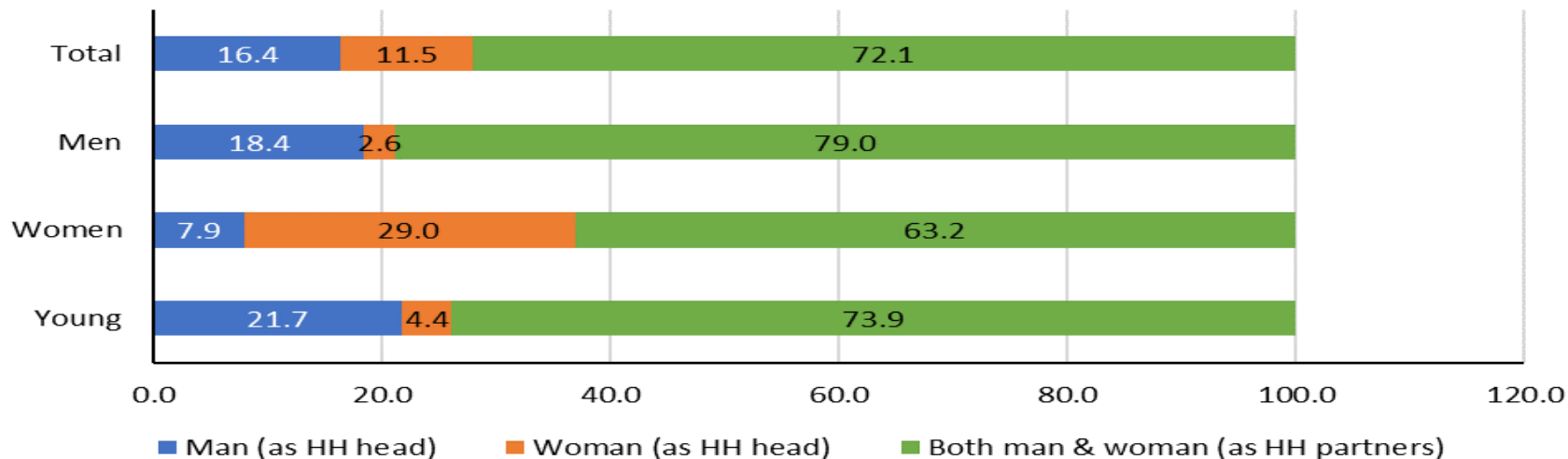
Constraint	Total	Youths	Women	Men	p
<b>Marketing constraints</b>					<b>0.160</b>
Price fluctuation	34.17	32.58	27.27	42.61	
Distant market	7.56	4.55	10	8.7	
Poor means of transport	2.8	2.27	3.64	2.61	
Unstandardized weighing scale	1.4	2.27	0	1.74	
Bad roads	0.56	1.52	0	0	
Other	0.56	0.76	0	0.87	
None	52.94	56.06	59.09	43.48	

## Changes made in response to production constraints by gender

Change made	Total	Youths	Women	Men
Pesticide	49.39	50.00	52.73	49.09
Use fertilizer	21.34	25.00	16.36	18.18
Change variety/improved	16.46	13.89	14.55	18.18
Early/timely planting	6.1	5.56	7.27	7.27
Conservation agriculture	3.66	4.17	5.45	3.64
Sell assets	0.61		1.82	
Timely harvesting	0.61		1.82	
None	1.83	1.39		3.64

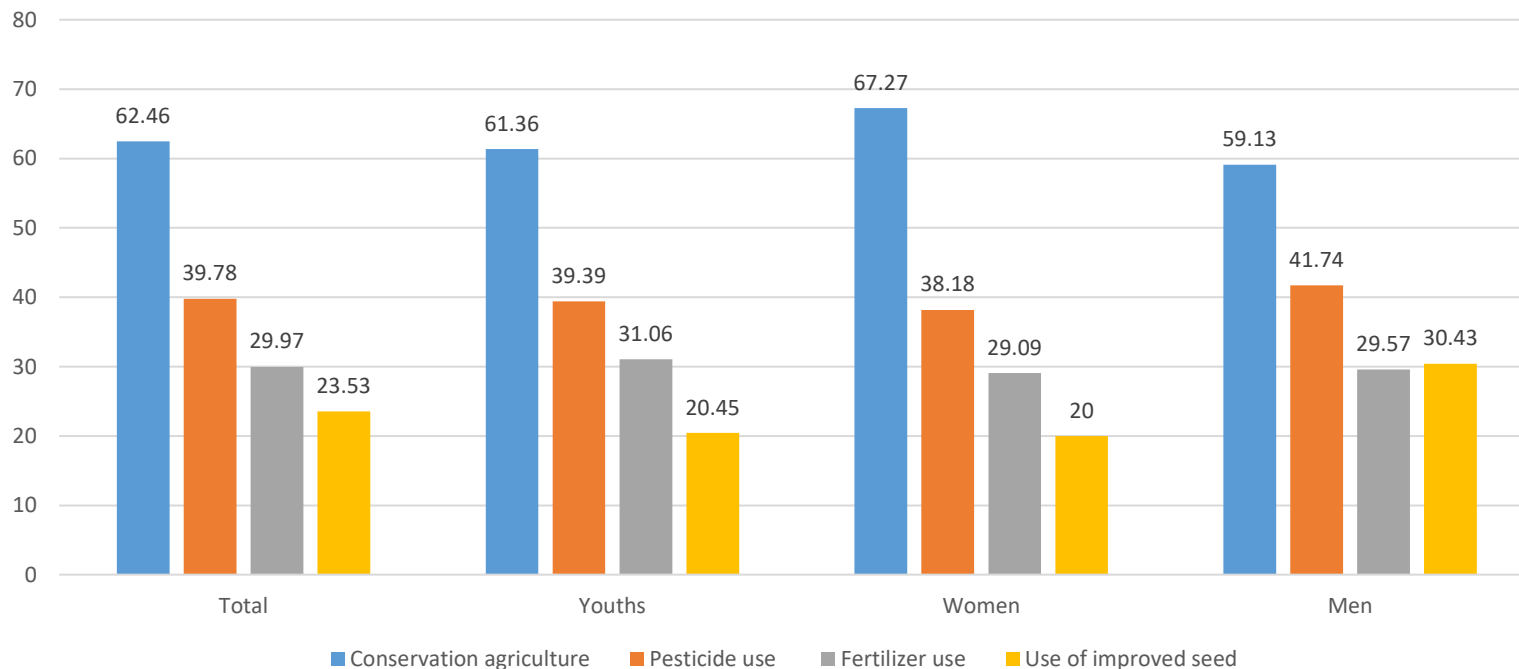
- ❖ Majority of the women (53%) used pesticides. Majority of the youth (25%) used fertilizer, while majority of the men (18%) preferred improved varieties.
- ❖ Timely planting was preferred equally by men and women (7%) than by the youth (6%).

## Decision maker about changes to protect bean production against production constraints by gender



More men farmers (79%) than women (74%) and youths (73%) said that both man and woman in the household made the decision to make changes in response to the production constraints.

## Use of climate-smart agricultural technologies/practices by gender



Conservation agriculture (62%) and pesticide use (40%) were the most frequently used climate-smart agricultural practices, followed by the use of fertilizer (30%) and improved seed (24%).

## Farmers access to institutional, technical, and social support services

Variable	Total	Youths	Women	Men	p-value
Average distance to agro-dealer (km)	17.52	18.33	17.65	16.47	0.541
Percent owning mobile phone	90.76	91.67	84.55	95.65	0.014
Percent receiving information on mobile phone	39.78	34.85	37.27	47.83	0.094
Presence on agriculture social media platform (%)	3.36	6.06	0.91	2.61	0.074
Percent received bean production information	28.01	23.48	27.27	33.91	0.187
Percent received agricultural training	26.61	21.21	26.36	33.04	0.110
Membership to local groups/associations (%)	42.86	40.15	40.00	48.70	0.307

- ❖ Access to production information and agricultural training was low with only 28% and 26% of the respondents reporting that they received the support, respectively.
- ❖ Women had marginally lower access to information via social media and mobile phones than men and youths.
- ❖ Low access to information via mobile phones was reported despite 91% of the respondents indicating that they owned mobile phones.

# Determinants of use of climate-smart technologies and practices

	Seed	Pesticides	Fertilizer	CA
Variable	Coeff.	Coeff.	Coeff.	Coeff.
Youths	0.557**	-0.096	0.592**	-0.114
Age	0.026***	-0.007	0.016	-0.001
Marital status (married)	-0.546*	-0.152	-0.623**	-0.580***
Relation to HH head (=head)	-0.125	-0.133	-0.536**	-0.205
Education level	0.393**	0.417***	0.459***	0.111
Occupation of HH head (=Farming)	1.013***	0.666***	0.727***	1.709***
land size accessed	0.031	0.031*	0.048***	0.024
Manager of bean plot	0.216	-0.024	0.067	0.605***
Distance to agro-dealer	-0.017***	-0.019***	-0.022***	-0.024***
Cell phone ownership	1.222***	0.443*	0.569**	-0.244
Group membership	0.766***	0.345**	0.488***	0.261
Region (Songwe)	0.008	0.002	0.022	-0.488***
Constant	-4.402	-1.069	-2.304***	0.413

- ❖ Younger farmers were more likely to use improved bean seed and fertilizer than women farmers
- ❖ Education had a significant positive influence on the use of improved seeds, fertilizer-, pesticides, and conservation agriculture.
- ❖ Married farmers were less likely to use improves seed, fertilizer, and conservation agriculture.

# Conclusion

- ❖ Gender and intersectional categories influence adaptation to changing climate conditions
- ❖ There were gender differences in ownership and access to land, with men owning and having higher access to land than women and youths
- ❖ Joint decision-making dominated bean farming decisions.
- ❖ There were also gender disparities in bean production constraints with women and young farmers being more vulnerable than men



# Conclusion

- ❖ There was also low institutional, technical, and social support to enable farmers to adopt climate-smart technologies and practices
- ❖ There were systematic differences in terms of factors that conditioned the use of agricultural technologies and practices
- ❖ Addressing gender disparities in land access, access to digital technology, encouraging women's literacy through higher education, and collective action are likely to enhance the resilience dimension in farming

# Acknowledgement



Alliance



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