



## Climate-smart agriculture technologies bridge the gender productivity gap and improve food security in Tanzania

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### Key messages

- **Low agricultural productivity and the limited diversification of rural households' diet in Tanzania can be addressed by ensuring the sustainable adoption of agricultural climate-smart technologies.**
- **Supporting women to access agricultural climate-smart technologies can increase their productivity and bridge the gender gap in agricultural productivity between male and female smallholder farmers.**

### Climate change poses a threat to agricultural productivity and women's welfare in Tanzania

About 55% of rural people in Tanzania are directly employed directly in agriculture, with women accounting for about 57% of the total employment (Palacios-Lopez et al., 2017).

Over recent decades, agricultural productivity in Tanzania has varied considerably because of climate change. Many areas that could once count on rainfall twice a year (bimodal) are now experiencing a shift in rainfall patterns toward unimodal rainfalls (URT, 2008). The average production loss for the major food crops (maize, rice, cassava, and beans) from drought-related shocks in Tanzania over the last two decades amounts to US\$ 164 million, contributing to chronic food insecurity in most parts of the country.

The impact of these changes on agriculture has affected women significantly and disproportionately. As a result of gender inequality in access to and control over resources, women have only limited adaptation capacity. The latest findings indicate that women in Tanzania are 21% to 30% less productive than men (Slavchevska, 2015), and this exacerbates their vulnerability to climate change.

To improve adaptation to climate change, the Government of Tanzania developed the **National Climate Smart Agriculture programme (NCAP) (2015-2025), which emphasizes the adoption of climate-smart agriculture (CSA) technologies.**

Recognizing the structural and institutional gender barriers that deny women access to these technologies (see figure 1), the Government also prepared a Climate-Smart Agriculture Guideline (2017) with a clear focus on gender and guidelines to implement the programme for the benefit of vulnerable women. The extent to which such an approach could boost women's productivity and narrow the gender productivity gap is based on anecdotal evidence that reducing gender inequality in resource access would increase women's productivity by 20% to 30% (FAO, 2011).

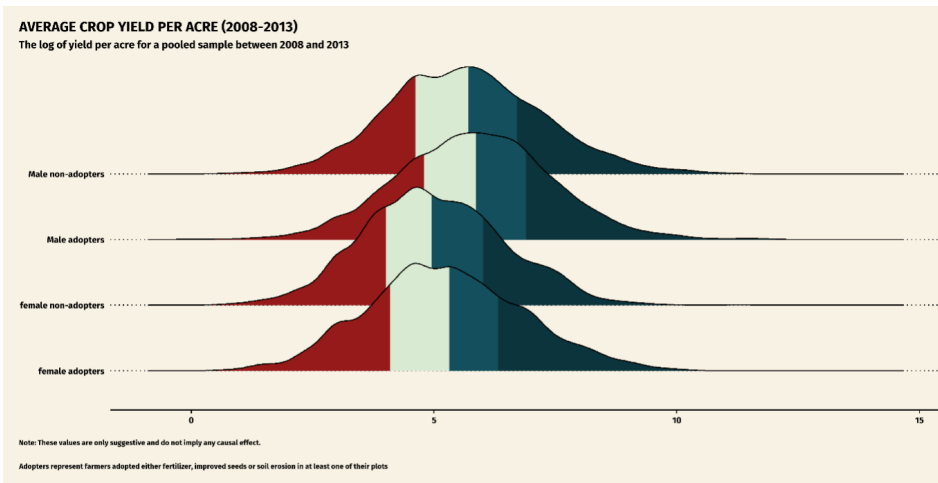
We investigated the impact of adopting climate-smart agriculture technologies on productivity and assessed whether the effects are heterogeneous for male and female farm managers. The research findings confirm the need to invest in women to narrow the gender gap in agriculture technology adoption and to improve productivity and welfare.

### Methodology

We used data from the Living Standard Measurement Survey Integrated Surveys on Agriculture (LSMS-ISA) (2008-2013) for Tanzania, and NASA's Modern-Era Retrospective analysis for Research and Applications, Version 2 (MERRA-2) database. In the estimation, the study employed an endogenous switching regression model.



**Figure 1. A comparison of the impact on crop yields by male and female adopters and non-adopters**



## Key findings

- There is a large and significant gender gap in productivity (24%) in favour of males when neither males nor females adopt climate-smart technologies or when only men adopt.
- The gender gap in agricultural productivity translates to the gap in diet diversity between female- and male-headed households.
- The adoption of climate-smart technologies by male and female farmers bridges the gender agriculture productivity gap. Though the resulting gap is not significant, women are 0.1% more productive than men when both access and adopt climate-smart agriculture technologies on their farms.
- Female adopters are 36% more productive than female non-adopters, while male adopters are 16% more productive than male non-adopters.

The authors' evaluation of the policy options in Table 1 shows that **gender-responsive CSA (Option 1) is more likely to have a larger impact on women by increasing their adoption rate and productivity.**

The policy has a high likelihood of addressing multiple constraints faced by women farmers, by:

- Eliminating the structural barriers that hinder women from adopting CSA, reducing the gender adoption gap, and
- Taking into account the special needs of women, with their preferences for CSA technologies (i.e. seeds) differing to those of men.

**Table 1: Evaluation of policy options:**

POLICIES CRITERIA	Option 1 Gender-responsive CSA	Option 2 Extension services targeting women	Option 3 Integration of CSA in social protection programmes
Efficiency	High	High	High
Effectiveness	High	Medium	Medium
Equity	High	High	Low Unless the programme is re-designed with a gender focus in its implementation
Political feasibility	High	High	High
Administrative feasibility	Medium	Medium	Low
Relevance	High	High	High

However, the administrative feasibility of Option 1 is somewhat complex, particularly in changing deep-rooted gender norms, which requires changes in communities' behaviour and perceptions towards women.

Despite the relatively larger impact Option 2 would have on women compared to Option 3, it is narrowly focused on information access and technical knowledge. A holistic approach is required to address gender inequality and women's low adaptation capability and their multidimensional aspects – institutional and structural.



Photo: IITA/Gloriana Ndibalema

## Policy roadmap

### 1. Prioritize gender-sensitive agriculture policies

- To reduce rural women's vulnerability to climate change, the Government of Tanzania should create enabling institutional environments by land formalization, improved access to extension services and the removal of liquidity constraints so that women can increase investment in their land through the use of fertilizer, improved seed use and soil erosion control.
- Increasing the availability of agricultural inputs that cater for the needs of women and farm management skills through training may boost women's productivity and welfare.
- Building on Tanzania's ongoing programmes, the Government should also increase the share of women who are recruited to participate in the farmers' field school and champion farmers' training programmes to increase women's managerial skills and decision-making in agriculture.

### 2. Reviving and revising the national voucher inputs scheme (NVIS)

- In addition to ensuring that the intended beneficiaries actually benefit from the inputs subsidy, the Government must guarantee that the programme is implemented with an explicit gender focus by targeting women farmers in households. A gender-targeting voucher scheme is likely to reduce the social norms that prevent women from accessing fertilizer and improved seeds.

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