

# Info Note

## Gender considerations in the promotion of climate-smart agriculture practices: Evidence from rural Tanzania

*Haki Pamuk (WUR), Miriam van Muijlwijk (CARE Nederland), Cor Wattel (WUR), Karl Deering (CARE USA), Marcel van Asseldonk (WUR)*

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### Key findings

- Women's empowerment is positively associated with the adoption of CSA practices in Iringa Region, Tanzania.
- VSLA membership also increases farmers' likelihood of adoption of CSA practices and contributes to the leadership dimension of women's empowerment.
- When women are involved in decision-making on couples' investments, the labour efficiency of those investments increases, while the level of risk taken reduces.
- Scaling out VSLAs in small-scale farmer communities is a promising way to increase CSA adoption and women's empowerment.

### The objective of this Note

This is the second of two Info Notes that summarize insights from five studies conducted between 2018 and 2021 on upscaling climate-smart agriculture (CSA) practices among small-scale farmers in rural Tanzania. The first Info Note - *Upscaling climate-smart agriculture practices: working with Farmers' Field and Business Schools and Village Savings and Loan Associations in rural Tanzania* - summarizes key findings and policy recommendations on upscaling CSA practices.

This second Info Note focuses on findings concerning the gender dynamics in promoting the adoption of CSA practices, and provides recommendations for policy makers and practitioners. The Note begins with the study background, main concepts, and methodology before

presenting and discussing results and making recommendations.

### CSA-SuPER research project

Climate change has reduced global agricultural production, primarily in the global south, as extreme weather events, higher temperatures, shifting seasons, and erratic rainfall pose significant challenges for farmers. However, agriculture, primarily in the global north, also contributes to climate change through greenhouse gas (GHG) emissions. Climate-smart agriculture (CSA) is among several paradigms attempting to address these complex challenges. CSA includes practices, technologies, and institutions to reach three objectives: 1) sustainably increase agricultural productivity and incomes; 2) adapt and build resilience to climate change, and 3) reduce or remove GHG emissions when and where appropriate. Scaling the adoption of CSA practices among small-scale farmers has been challenging for many reasons, including knowledge and innovation skills gaps, lack of access to finance, harmful and discriminatory social norms, poor policy architecture and extension services and other barriers. It is increasingly clear that the failure to embed equity and social justice in the CSA paradigm is a major reason for lack of adoption – given that so many women are engaged in agriculture.

CARE, The Alliance of Bioversity International and CIAT, Sokoine University of Agriculture, and Wageningen University and Research conducted research (CSA-SuPER) to examine whether the presence of community learning platforms and collectives that provide agricultural and agri-business knowledge and access to microfinance can fill knowledge gaps and address financial barriers for small-scale farmers – and whether this can drive the uptake of climate-resilient practices. Increasing attention to

gender equality can help scale the adoption of sustainable practices - an issue which this project also aimed to explore and address. To do this, the project overlaid CARE's SuPER (Sustainable, Productive, Equitable and Resilient) principles on the CSA objectives. The outcomes sought from SuPER are food and nutrition security and greater resilience to climate change (see Box 1).

#### *Box 1: SuPER Principles*

SuPER is a set of principles that guides CARE's work in small-scale agriculture in a changing climate. In broad terms, sustainable implies agriculture that is protecting and enhancing the natural resource base and at the same time is driven by inclusive and accountable institutions and policies and by accessible financing. The productive principle implies increased yields and incomes for small-scale farmers and meeting the needs of women producers by reducing labour burdens and improving household nutrition. The equitable principle implies enabling equal access to opportunities, resources, services and rewards for women farmers as well as men and promoting access to affordable nutritious food for all. Finally, the resilience principle implies that communities are able to withstand and recover from climate-related and other shocks by supporting community-based adaptation, connecting institutions and collectives (such as VSLAs) for better governance, and using information and learning (such as through FFBSs) to support farmer-led knowledge transfer, planning and risk management.

Our research was based on a case study of the Kukua ni Kujifunza (KnK) project implemented by CARE in 15 villages in Iringa District Councils in Tanzania. The project introduced the soybean value chain and CSA practices to mainly small-scale woman farmers through Farmers' Field and Business Schools (FFBS) and Village Savings and Loan Associations (VSLA) (see Box 2). The KnK project focuses on practices of soybean cultivation, mulching, crop rotation and intercropping, using organic fertilizer (composting) and rhizobium inoculation.<sup>1</sup> To scale the adoption of these practices, FFBS offered four clusters of trainings.

- Agronomy training on CSA practices provided by extension officers through FFBS demonstration plots established in each village.
- Business and enterprise training on collective marketing, saving, lending and investing.
- Gender training where awareness was raised among women and men on how exclusion disproportionately affects women, and how gender equality in land management, input access, decision-making, unpaid care, and control over income benefit both women and men.

<sup>1</sup> We note that these are practices applied long before 'CSA' under conservation agriculture and are also considered as CSA practices.

- Nutrition training on food groups and healthy and diverse diets. This training also included cooking demonstrations (e.g. cooking soybean and nutritional benefits of soybean).

The KnK project supported FFBS training with the VSLA approach, where trained farmers were encouraged to participate in existing VSLAs and use savings and loans to invest in CSA practices.

#### *Box 2: Farmers' Field and Business Schools (FFBS) and Village Savings and Loan Associations (VSLA)*

FFBS is a participatory, women-focused extension model that helps farmers build skills necessary to increase production, access markets and sell at competitive prices, collaborate, and improve decision-making. It also transforms the status and recognition of women. Evidence shows that participation in FFBS builds women's self-confidence and expands their autonomy, reduces gender-based violence, and engenders respect from their families and communities towards them (CARE, 2017a).

A VSLA is a self-managed group of 20-30 individuals, usually women, who meet regularly to provide members a safe place to save their money, access loans, and obtain emergency insurance (CARE, 2017b). VSLAs are proven to increase social capital, food security and nutrition, access to services and resources, collective activism – and more. For detailed discussion and research on savings and credit groups and VSLAs, please see [Pamuk et al. \(2021a\)](#).

## Methods

This Note uses insights from five research studies that CSA-SuPER conducted between 2018 and 2021:

1. An [Iringa district climate risk profile](#) (CIAT, CARE Tanzania, 2019) examines the effect of climate change on agricultural value chains in the Iringa District, using secondary data sources, focus group discussions, and in-depth interviews.
2. A [baseline study](#) (Fuchs, 2021) uses baseline survey data collected in 2018 from farming households at 15 KnK project villages and 18 comparison villages (20 farmers from each village) and tests the relationship between gender roles and the uptake of CSA practices, including crop management, improved varieties, crop diversification, and irrigation.
3. A [modelling study](#) (Keenan et al., 2021a) theoretically examines the links between production diversity, household nutrition and market access of small-scale farmers.
4. A [lab in the field experiment](#) (Keenan et al., 2021b) involves a risky real effort task (bean sorting),

analysing the effects of decision-making (by men, by women, or jointly) on agricultural investments carrying labour costs and market risks.

5. [A quasi-experimental evaluation study](#) (Pamuk et al., 2021) investigates the effect of the FFBS and VSLA models on the adoption of CSA practices among small-scale farmers in Iringa District, using baseline (2018) and endline (2021) survey data from KnK project villages and control villages. Specifically, the study first examines the direct effect of FFBS trainings and VSLA credit on CSA adoption. Second, it studies the effect of the FFBS and VSLA models on women's empowerment domains and the indirect effect of women's empowerment on CSA adoption.

In this Note we first use findings from the climate risk profile and baseline to explain the background of gender dimensions in adopting CSA practices in Iringa Region. The quasi-experimental evaluation study provides field evidence on the relationship of FFBS and VSLA models with women's empowerment and adoption of CSA practices among women. The lab in the field experiment shows the potential implications of agricultural investment in CSA practices when programmes engage women and support their agency as the KnK project has done. Finally, the modelling study demonstrates the link between household nutrition and our conclusions on women's engagement in CSA.

## Research results

### Women's role in agriculture and CSA practices in Iringa Region

Women play an important role in agriculture in Iringa Region but are more vulnerable to the impacts of shocks and stresses due to inherent institutional and structural biases and harmful social norms. The literature review for the climate profile shows that 7 out of 10 women work in agriculture in the Iringa Region. The profile also shows that compared to men, women farmers are more vulnerable to climate shocks that negatively affect agricultural value chain activities. The report describes several reasons for the high vulnerability of women. Although women supply an important share of agricultural labour, they cannot economically benefit from those activities as much as men due to harmful social norms and cultural practices. Moreover, they are usually left out of decision-making processes regarding agriculture and lack access to water and land. They also have less control over household assets and income than men.

The baseline study shows that programmes and projects should consider intra-household dynamics and the role of women in the household to scale the adoption of CSA practices in Iringa Region. Table 1 summarizes the findings of the baseline study, which showed that equal division of decision-making power and income is positively associated with adopting improved varieties, crop diversification and irrigation. In turn, adoption of crop diversification practices is positively associated with participation of women in socioeconomic collectives or groups. The equal division of domestic tasks is positively associated with adoption of multiple CSA practices. Furthermore, the use of crop management practices is associated with above average women's ownership of and control over household resources.

**Table 1: Summary of findings on women empowerment and CSA practices relationship in Iringa Region.**

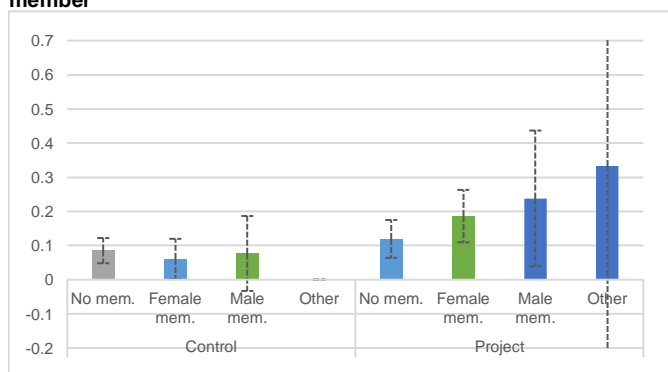
Empowerment domain*	Sub-domain	Description	CSA practices positively associated with the empowerment domain
Resources	Ownership of assets	Female sole or joint ownership of major household assets	Crop management (e.g., plant spacing, row planting, chemical fertilizer, inorganic pesticide)
	Purchase, sale or transfer of assets	Female participation in the decision to buy, sell or transfer own assets	
Decision on production and income	Input in productive decisions	Female sole or joint decision-making over food and cash-crop farming	Improved varieties (soybean varieties and others),
	Autonomy in production	Female sole or joint decision-making about household life (inputs to buy, types of crops to grow and to sell and whether to engage in livestock raising)	Crop diversification (intercropping and crop rotation)
	Control over the use of income	Female sole or joint control over income and expenditures	Irrigation
Time	Workload	Equal allocation of time to productive activities	Crop diversification (intercropping and crop rotation)
Leadership	Group member	Female membership to socioeconomic or social groups	Crop diversification (intercropping and crop rotation)

Source: Adapted from Fuchs (2021). \*The women's empowerment domains and sub-domains are adapted from the [women's empowerment in agriculture index](#).

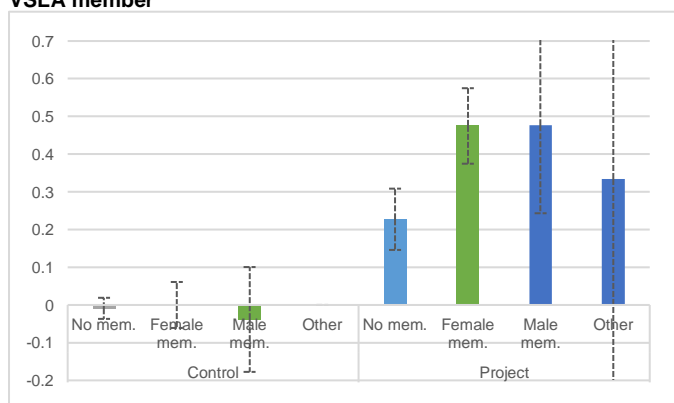
## The effect of VSLA membership on adopting CSA practices and women's empowerment

The quasi-experimental study shows that the KnK project has increased the fraction of households with female VSLA members by 8 percentage points while it increased the fraction of households with male VSLA members by 2 percentage points. The increase in membership of women in socioeconomic groups, especially VSLAs, contributed to the increase in CSA adoption rates in project villages. In project villages, the households with female VSLA members increased the adoption rate of rhizobium inoculation and soybean cultivation more than in control villages (Figures 2 and 3). For other CSA practices, the study did not detect a differential effect of women's VSLA membership. It is important to note that while households with female VSLA members were associated with increased adoption rates, the same is true for households with male VSLA members. This shows that in terms of CSA adoption rates, women and men benefit from VSLA membership to a similar extent.

**Figure 2: Average change in the fraction of farmers using inoculation from 2017/2018 season to 2020/2021 season by gender of VSLA member**



**Figure 3: Average change in the fraction of farmers cultivating soybean from 2017/2018 season to 2020/2021 season by gender of VSLA member**



Note: The bars indicate the average change in the fraction of farming households that used inoculation or produced soybean. The dashed lines indicate the 95% confidence intervals, showing the statistical uncertainty in the average changes.

We find that when comparing project to control villages, the FFBS+VSLA approach had a positive effect in terms of the numbers of women joining VSLAs. However, the study does not detect any project effect on other domains of women's empowerment, such as equal control over

resources, agricultural production, and income sources. One explanation for this limited effect could be that aspects such as control over income and resources within the household are deeply engrained in social norms, which take more time and specific interventions to change.

## Gender dynamics and risk taking in agricultural investment decisions

Practitioners' experiences from neighbouring countries show that CSA practices are sometimes abandoned after some time, as some are very labour intensive (e.g. mulching in Malawi) (CARE and WUR, 2021). The lab in the field experiment provides insights into the dynamics behind household labour allocation by investigating how investment and labour efficiency change depending on who makes the decisions on labour-intensive and risky agricultural activities in the household.

In the experiment, couples were given the choice of investing in risky inputs with a high but volatile return, and/or in safe inputs with a low but stable return. They were then asked to work on a real, tedious, labour-intensive task to earn money using the inputs. (Please see box 3 for the experimental set-up.)

### Box 3: Experimental set-up

At the beginning of the experiment, every couple received an endowment of 30,000 Tanzania Shillings (Tsh), equivalent to approximately 13 USD, and was randomly assigned to a treatment group regarding who will make the decisions and who will do the labour of sorting yellow and red beans (only the man, only the woman, or jointly). The couple could then decide (either jointly or solely by the man or woman) how many cups of mixed beans to buy. Each cup cost 300 Tsh to purchase, and by the end of the task couples could earn 500 Tsh for each safe cup sorted, and either 300 or 900 Tsh for each risky cup sorted (see pictures of a safe and a risky cup below).

**Safe cup**



**Risky cup**





The experiment shows that generally, when women were involved in investment decisions, they increased labour efficiency but reduced the risk taken by the couples. When women were the sole decision-makers, they invested less in risky inputs than men, even though they were more productive than men in performing the tedious tasks to earn money with the inputs. When couples decide jointly, women negotiate with men to reduce the investment risk, so the input investment better matches the amount of labour the couple can exert. However, when women influence the decision towards safer investments, this also tends to result in lower average returns than when women are not involved in the decision.

The experimental study also analysed how gender training and VSLA membership affected couples' investment decisions and results. The experiment shows that women who attended a gender training in the twelve months prior to the experiment were more likely to choose larger and riskier investments. Moreover, the analysis indicates that they were more effective in negotiating with their husband about the investment levels. We also find that in couples where the woman is a VSLA member, husbands chose less risky investments than in couples with no VSLA members. Meanwhile, in couples where the man himself is a VSLA member, husbands chose even riskier investments than in other couples. This indicates a relationship between VSLA membership and bargaining power between spouses. Further research is needed to explore the dynamics behind these relationships.

## Conclusions and policy recommendations

The CSA-SuPER studies underline the importance of gender equity, women's empowerment and women's and men's structural engagement in training, extension and decision-making when promoting CSA adoption.

This is because, first, women farmers are more vulnerable to the effects of climate change due to social norms, often underpinned by men or male-dominated institutions, that exclude them from important agricultural decisions and resources. Second, it is because in households where women are more empowered, farmers are more likely to adopt one or more CSA practices. Finally, it is because when women have more equal roles in (agricultural) investment decisions, they increase the efficiency of those investments and limit investment failures. Particularly when CSA practices are labour intensive, the uptake and investments are likely more effective when women can influence the decisions.

Tackling gender inequality by engaging women and men is imperative for increasing resilience and dietary diversity. Increasing cultivation and consumption of soybean through gender equitable strategies, for example, improves both resilience and dietary diversity. The modelling study shows

that farmers allocate more resources to crop diversification with crops that they can either consume at home or sell in the market. Increasing household consumption of soybean could be an important argument for farmers to allocate more resources to the cultivation of this crop, especially since findings from the quasi-experimental study show that they currently have limited options to sell soybean on the market. Since women not only engage in crop production, but also are the main decision-makers regarding food consumption and diets, it is key to engage women effectively in the promotion and socialization of soybean as a new crop in Iringa Region.

Moreover, the findings stress the value of gender-responsive interventions regarding risk preferences. As women tend to be more risk averse than men, they may underinvest in promising (new) CSA practices they perceive as risky or uncertain. Not changing practices may be perceived as a safe, predictable choice, but it results in lower potential yields, and may inhibit women from responding to changed circumstances (e.g., due to climate change). In the face of less predictable rainfall and weather patterns, the 'risky' decision to adopt a new CSA practice may actually reduce the risk of failed harvests. Therefore, it is necessary to design interventions that encourage risk taking and in particular risk assessment among women, and that respond to the factors determining women's perceptions of risk. This may be achieved for example through analysing why women perceive certain practices as risky, providing specific information to build confidence, manage hesitations and help to re-assess risks. Increasing farmer awareness of and knowledge about the risk-reducing benefits of CSA can also stimulate the adoption of good practices, particularly among women farmers. Participatory Scenario Planning can be used as a tool to support farmers in assessing risks and taking informed decisions about CSA practices to mitigate risks, for example.

The findings from the experimental study show a positive relationship between participation in gender training and women's risk taking in investments. Therefore, it is essential to structurally integrate trainings on gender roles, intra-household decision-making, and effective risk management in FFBS and other agricultural extension interventions, in which both women's and men's active engagement is required.

Furthermore, it is recommended to address the underlying factors of harmful gender norms and social exclusion with gender-transformative activities, such as participatory analysis of social norms and gender roles, couples' dialogues and engagement of men to promote positive masculinities. Further research is needed on the benefits that Participatory Scenario Planning and climate information can bring to transforming gender and power relations in FFBS work.

Overall, VSLAs are identified as a promising intervention to scale up, because:

- In households with VSLA members (women or men), farmers are more likely to adopt CSA practices.
- In villages with VSLAs, women are more empowered through increased membership of socioeconomic groups.
- VSLA membership increases bargaining power in intra-household decision-making.

The positive effect of VSLAs on CSA adoption is stronger when VSLAs are complemented with the FFBS approach as a platform for agricultural, business and gender trainings. For more information on how the outcomes of VSLA and FFBS reinforce each other, please refer to the first Info Note.

## Further readings

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**Dr. Haki Pamuk** ([haki.pamuk@wur.nl](mailto:haki.pamuk@wur.nl)) is a senior researcher at Wageningen Economic Research of WUR and coordinated the CSA-SuPER project.

**Miriam van Muijlwijk**

([vanmuijlwijk@careneland.org](mailto:vanmuijlwijk@careneland.org)) is Women's Economic Empowerment project manager at CARE Nederland and advises on monitoring, evaluation and learning.

**Cor Wattel** ([cor.wattel@wur.nl](mailto:cor.wattel@wur.nl)) is a researcher at Wageningen Economic Research of WUR and participates in the CCAFS project "Incentives and innovative finance for scaling CSA".

**Karl Deering** ([karl.deering@care.org](mailto:karl.deering@care.org)) is Strategic Partnerships Lead in the Food and Water Systems team at CARE USA.

**Dr. Marcel van Asseldonk**

([marcel.vanasseldonk@wur.nl](mailto:marcel.vanasseldonk@wur.nl)) is a senior scientist at Wageningen Economic Research of WUR and leads the CCAFS project "Incentives and innovative finance for scaling CSA."

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