



LEARNING AGENDA

Climate-smart agriculture and gender

The CGIAR GENDER Impact Platform has developed a learning agenda focused on the intersection of climate-smart agriculture (CSA) and gender equality. The purpose of the learning agenda is to inform a short- to medium-term research strategy on how gender equality in agrifood systems can be advanced through CSA.

Addressing the limited evidence on the gendered dynamics of climate-smart agriculture

Detrimental effects of climate change are felt through the sudden onset and extremes of natural disasters in the short term, and through gradual environmental degradation in the long term. Intensive and more frequent climate disasters, changing weather and rainfall patterns, and recurring droughts and floods are increasingly disrupting rural communities, devastating crops, endangering nutrition and damaging livelihoods that are directly dependent on the agriculture sector, particularly women and smallholder farmers.

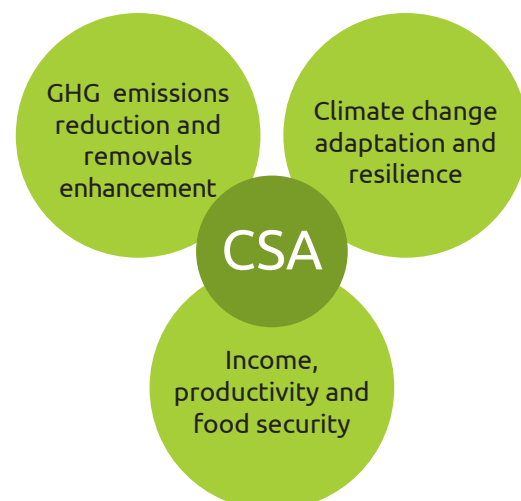
The contribution women make to agriculture is often overlooked, undervalued and under-resourced despite, in the global South. For example, women play a significant role in agriculture, constituting [up to 48 percent of the rural agricultural labor force](#), increasing to 55 percent in some countries in South Asia and Africa ([UN Women, 2020](#)).

Women in agriculture are limited by pervasive and entrenched gender inequalities and often do not own or control productive assets and resources—such as land, information, finance, technology and inputs—and are additionally burdened with household and care responsibilities. In 30 of 36 countries in Asia and Africa, less than 50 percent of women have ownership or secure tenure rights over agricultural land, whereas in another 16 countries, [less than 30 percent of women have ownership or secure rights](#). Land often acts as a collateral for access to credit and without it, women have difficulty accessing financial services. Women farmers also lack access to extension services, information and technology. The impact of these gendered differences is visible on productivity, where gaps vary between 4 and 28 percent in different contexts ([Puskur et al. 2023](#)).

As a result of these differences, women have varying abilities to cope with and adapt to climate change. In several regions, as men migrate for nonfarm work opportunities for better pay, women continue to depend on agriculture and are directly exposed to climate hazards. In 2022, the Intergovernmental Panel on Climate Change reported, with high confidence, that [gender inequalities can act as a risk multiplier](#), with women being more vulnerable than men to climate change-induced food insecurity and related risks. Regressive sociocultural norms and traditions and gendered roles and responsibilities exacerbate the effects of climate change on rural women.

Climate smart agriculture (CSA) is recognized as an approach to guide actions and activities to sustainably transform and build the climate resilience of agri-food systems. CSA has three main objectives: sustainably increase agricultural productivity and incomes; adapt and build resilience to climate change; and reduce and/or remove greenhouse gas emissions, where possible.

While available evidence highlights the potential of CSA to enhance productivity and manage the risks of smallholder farmers, very little data and evidence is available on the gender dynamics of CSA. Limited and sparse evidence reveals that CSA can enhance the productivity of women farmers in certain contexts, but it is not enough to inform sound policies, programs and investments that improve gender equality in access to, use of and benefits from CSA.



The three pillars of climate-smart agriculture

Purpose and objective of the learning agenda

The CGIAR GENDER Impact Platform puts gender equality and social inclusion at the forefront of global agriculture research for development aiming toward agri-food systems transformation. In a time of intensifying climate change and its negative impacts increasing the vulnerabilities of women and girls, the Platform has developed this learning agenda focused on the intersection of CSA and gender equality.

The learning agenda provides a brief overview of the existing research on CSA and gender, the identified gaps, learning priorities for CGIAR and its partners, and a sample of activities that could contribute to the agenda's overall goal of informing research, development and policy priorities that can make CSA gender smart. The learning agenda is a living document that establishes key learning questions that people can explore through targeted activities and refine gaps and priorities as evidence and learning emerge.

The purpose of this learning agenda is to inform a short- to medium-term research for development strategy on how gender equality in food systems can be advanced through CSA and vice-versa. The learning agenda could form the basis for research projects and programs focused on bridging priority knowledge and evidence gaps and developing actionable strategies to enhance the synergies between CSA and gender equality.

The learning agenda has been co-created through a multistakeholder engagement process that included several virtual and in-person workshops with experts in gender, agriculture and climate change. An in-depth evidence summary exploring the intersection of CSA and gender is a supporting document to this learning agenda. It is based on an [Evidence Library](#) developed for CGIAR GENDER Platform's Climate Smart Agriculture and Gender Learning Agenda, which will become a permanent resource hosted by the GENDER Platform.

The evidence summary details the gender dynamics of CSA, factors that influence adoption of CSA by women farmers, barriers and opportunities to improve CSA uptake, and how it can lead to transformative change. It also recommends how to improve the understanding and adoption of CSA among women for policymakers and researchers.

What we already know about climate impacts and gender

Climate change disproportionately affects women across the global South. These women have the greatest need for adaptation and mitigation strategies to cope with climate change-related shocks and stresses. A recent study exploring [climate change–agriculture–gender inequity hotspots](#) ranked 87 countries in the global South where smallholder women are most vulnerable to adverse effects of climate change.

The differential roles of women and men, inadequate access to resources, services and inputs, lack of control and decision-making abilities, little knowledge and information, and pervasive gender norms all contribute to worsening the impact of climate change on women farmers.

Limited adoption of CSA by women farmers

Adoption of CSA is very contextual. There is limited evidence of how CSA can lead to transformative change for women farmers and how women navigate discriminatory norms to adapt to climate change and build resilience.

Evidence indicates differential adoption of CSA practices by women and men farmers. Adoption is typically driven by social, economic and political contexts where historical marginalization of individuals, particularly women farmers, determines their ability to adopt CSA technologies and benefit from them. This results in differentiated vulnerability and resilience for different people.

Due to gendered roles, there is a difference in the kind of activities undertaken by women and men farmers in agricultural production and value chains. These differences reflect the varying knowledge and skills of women and men farmers, the different priorities and responsibilities of women and men, and the differences that persist due to the gendered engagement in these activities. This then influences the kind of CSA practices adopted. However, if those differences are not taken into account, fewer women and men take up CSA. Studies have also observed minimal uptake of CSA activities that increase labor demands and reduce free time available for women farmers.

Several studies indicate how CSA interventions have not taken gender norms, roles, requirements and perspectives into consideration and how that has impacted uptake. For example, in Nigeria, [more women than men](#) take up CSA practices. These CSA practices were more related to farming activities primarily carried out by women, and, directly improved the welfare of household members by increasing the yield of food crops. However, despite the initial higher uptake of CSA, the women did not continue using the practices over the long term due to the customary practices that determine women's roles, constrained time and access to different types of resources. This implies that while initial adoption was triggered by project interventions, due to the time- and resource-intensive nature of the CSA technologies, the women were unable to continue using them.

Understanding the underlying causes of gendered vulnerability in agricultural systems is crucial to develop successful adaptation strategies and enhance resilience by preparing for climate-related uncertainties. Evidence suggests that household food insecurity plays an important role in gendered vulnerability and is a significant determinant of the type of adaptation strategy adopted by women farmers. A study in Zimbabwe observed that to ensure food security, a significant number of women farmers adopted conservation agriculture, in some cases together with their husbands, and this resulted in improved decision-making, household food security, increased yield and enhanced knowledge.

Other studies show that it is important to take socioeconomic and sociopsychological factors into consideration in addition to cost-benefit analyses, when designing and promoting CSA technologies. For example, studies from Zambia, Mozambique, South Africa and Ghana, among others, highlight the additional labor burden for women farmers when using some CSA technologies. There is evidence that different CSA options such as direct-seeded rice, green manuring, and a system of rice intensification can potentially reduce the labor burden of women in agriculture, while helping them improve productivity and income in high climatic risk areas. Evidence from sub-Saharan Africa corroborates that CSA adoption is also influenced by past experiences of other farmers, attitudes and perceptions about the usefulness of the technology, and social capital.

In addition, demographic differences such as age, marital status, caste, class, ethnicity and disability play a significant role in determining women's access to resources and, consequently, the adoption of CSA practices. A study in Latin America (Colombia, Honduras and Guatemala) observed that [women's implementation of CSA practices is consistent with larger farm sizes](#)—a proxy for wealth. The study also found that higher education levels and extent of land under cultivation can lead to improved access to and use of climate information services.

Bundling interventions is needed to improve women's access to and benefits from CSA

Studies have shown that interventions that combine CSA practices with other interventions to improve women's access to assets, technology, knowledge and credit have been able to strengthen women's resilience and that of their households.

Land plays a major role in women farmers' livelihoods and entitlement to land allows women to manage it sustainably and also use it as collateral to obtain credit. For example, a [study from Rwanda](#) observed that providing access to land to legally married women resulted in increased investment in and maintenance of soil conservation measures. This suggests that land ownership was a means to create confidence, improve decision-making and motivation to manage the land and the income generated from it.

Formal access to land for women also resulted in reduced uncertainty of land inheritance, with substantial benefits for girls. Similarly, in Uganda women were involved in decision-making processes that sped up forest regeneration and reduced illegal harvesting of trees contributing to the climate change mitigation efforts ([Buyinza and Naguula, 2007](#)).

[Climate finance and access to credit have the potential to improve adoption of CSA practices](#) by women farmers (when acquiring inputs requires cash), facilitate diversification (financing off-farm enterprises) and enhance resilience (through savings), thereby advancing gender equality. When channelled through CSA adoption initiatives, climate finance can empower women economically and socially. For example, in Mali a [mobile phone-enabled savings platform](#) allows farmers to put aside money for agricultural inputs including seeds, fertilizers and training. An estimated [70 percent](#) of the users of this platform are women farmers and users have experienced up to a 50–100 percent increase in yields per hectare, with an average income increase of US\$150–300 per year.

Similarly, access to climate information and extension are crucial in shaping women's adoption of CSA practices. A study in Ghana observed that [climate information services enabled strategic decision-making](#) such as when to begin land preparation, when to plant, and which crop to select. Another [study](#) highlighted how learning about what type of information related to climate risks was valuable for women farmers made ICT-based advisories relevant, increased uptake among women farmers and reduced the information gap among women and men farmers.



Learning gaps, questions and activities

The learning agenda has identified eight priority learning gaps. For each learning gap, priorities, questions and key activities to address the gaps were co-developed with key stakeholders through a series of virtual and in-person workshops. The eight priority learning gaps are:

Learning Gap 1: Gendered adoption and impacts of CSA interventions.

Systematically analyzing the economic, social and environmental benefits and trade-offs of adopting CSA for women and men, as well as effective approaches for scaling gender-responsive CSA.

Learning Gap 2: Enhancing resilience and empowerment of women in agriculture through CSA.

Identifying the technologies and processes and unpacking pathways that help women and men move toward resilience to climate change.

Learning Gap 3: Potential and pathways for CSA to be transformative for women.

Developing evidence-based strategies to enhance the transformative potential of CSA, including bridging gender gaps, encouraging collective action, strengthening women's voices in policy processes, developing capacity and infusing diverse gender-transformative approaches.

Learning Gap 4: Research to accelerate women's empowerment and adoption of CSA.

Conducting biophysical, economic, social, institutional and policy research that can maximize change and movement toward gender equality in and through CSA.

Learning Gap 5: Catalyzing multidimensional policies and multisectoral coordination and action to promote gender-responsive CSA.

Understanding information needs of policy makers and effective ways of policy engagement and multisectoral stakeholder processes.

Learning Gap 6: Private sector engagement to promote gender-equitable CSA.

Developing the business case for private sector investments and designing effective models.

Learning Gap 7: Climate financing models for gender-responsive CSA.

Developing and adapting models for inclusive financing for CSA that can advance women's empowerment and gender equality.

Learning Gap 8: Mitigation.

Understanding the social, economic and environmental costs of mitigation options for women and men, and ensuring women are not left out of mitigation strategies.

The key learning questions and proposed activities under the eight themes are described in the following tables.

Learning Gap 1: Gendered adoption and impact of CSA Interventions	
Key question: What influences uptake of diverse CSA practices by different socioeconomic groups of women and men and what impacts do they lead to?	Key learning activities
Subquestions	
How are CSA interventions integrating gender considerations currently?	Case studies
Which formal and informal institutions and gender and social norms influence uptake of CSA by women and other vulnerable socioeconomic groups?	Institutional analysis, diagnostic studies
How is access to and adoption of CSA influenced by various intersectional factors in addition to gender?	Adoption studies using intersectional analyses, case studies
What are the incentives and complementary support needed for women to adopt CSA practices (e.g., women's land tenure rights, access to markets, agro-biodiversity)?	Adoption studies, case studies
How do gender gaps in knowledge, awareness and information on CSA influence decision-making by women and men? What are the good and scalable practices for bridging these gaps?	Adoption and decision-making studies, Scaling studies, evidence synthesis, case studies
What are the social, economic, financial and environmental benefits of gender-responsive CSA?	Impact analysis (livelihood outcomes/ well-being outcomes), case studies
What gender data is available and collected regularly on CSA adoption and impacts? What are the gaps and where are mechanisms and investments needed to generate relevant data on a continuous basis?	Scoping reviews, evidence/data gap maps
What approaches are effective in scaling gender-responsive CSA?	Scaling studies, action research

Learning Gap 2: Enhancing resilience and empowerment of women in agriculture through CSA	
Key question: Does climate-smart agriculture affect resilience and empowerment of women?	Key learning activities
Subquestions	
Which packages or combinations of technologies and social and institutional innovations can enhance women's resilience to climate change in the food systems in different contexts?	Impact analyses, action research
Does women's uptake of CSA technologies and processes impact their work burden and time poverty?	Impact analyses
What are the different pathways and trajectories of resilience building of women and men across food systems in different contexts?	Qualitative research – life histories to understand pathways

Learning Gap 3: Potential and pathways for CSA to be transformative for women	
Key question: Can the transformation of climate-smart food systems and gender equality be mutually reinforcing? Are there trade-offs and synergies?	Key learning activities
Subquestions	
Can CSA be gender transformative? Can integration of gender-transformative approaches (GTAs) facilitate more equitable CSA? What are the opportunities and/or constraints for integrating GTAs, including engaging men and boys, in CSA approaches?	Stakeholder dialogues, action research
What capacities and skills (technical and soft) do various actors need to integrate gender-transformative approaches in CSA? Do such capacities exist widely? What capacity development strategies would be effective in bridging the gaps?	Capacity needs assessment, capacity strengthening, strategy development and piloting
What are the dimensions of women's empowerment that are critical and will lead to positive CSA outcomes?	Impact analyses
Are group-based approaches/collective action more effective than individual approaches in promoting access to and benefits from CSA while promoting transformative change? What barriers do group-based approaches break down that enable this?	Impact analyses
What are the limitations to group-based approaches? How might these limitations be overcome with technical/capacity/policy support?	Scoping reviews, short-term mixed methods research projects
What have been the patterns in the use of indigenous knowledge by women and men farmers in the context of response to climate change?	Diagnostic studies

Learning Gap 4: Research to accelerate women's empowerment and adoption of CSA	
Key question: What biophysical, social, economic, institutional and policy research areas should CGIAR and its partners focus on to maximize impact?	Key learning activities
Subquestions	
What are the key knowledge and technology gaps that need to be bridged in CSA in crops, livestock and fisheries/aquaculture in the context of ongoing rural and food systems transformations?	Systematic study, rapid review
How can existing evidence, tools and methods be incorporated into research for development programs?	Stakeholder engagement or socialization of existing data sets and evidence

Learning Gap 5: Catalyzing multidimensional policies and multisectoral coordination and action to promote gender-responsive CSA	
Key question: Gender-transformative CSA needs multidimensional policies and multisectoral coordination and action. What are the best ways to catalyze this?	Key learning activities
Subquestions	
What are the information or evidence needs of policymakers regarding CSA and gender? What evidence is needed to influence policy processes? What communication products and channels do policymakers prefer and best respond to? What form of research evidence packaging is accessible to policy makers and implementers?	Stakeholder engagement, key informant interviews
What knowledge or capacity gaps need to be bridged for policymakers and program implementers?	Capacity and knowledge needs assessments
What key constraints to gender equality in CSA need to be addressed through policy changes? What are the policies and processes (and at what levels) that are important to influence?	Scoping reviews and stakeholder dialogues
What are effective strategies to influence informal institutions and norms to advance gender equality through CSA?	Action research
Which government ministries and local and regional institutions need to be engaged in addition to agriculture to make the policies and strategies effective?	Scoping reviews and stakeholder mapping and dialogues

Learning Gap 6: Private sector engagement to promote gender-equitable CSA	
Key question: How do researchers engage effectively with the private sector to promote CSA for gender equality?	Key learning activities
Subquestions	
Are the current private-sector investments in food systems climate smart and gender equitable (highlight cases if available)? What kind of investments does the private sector need to make to promote gender equality and climate resilience?	Scoping reviews, case studies, success stories, round table convenings/ fairs for learning sharing
What incentives can stimulate private sector investment to become climate smart and gender responsive?	Case studies and stakeholder engagement
What capacities, skills and tools are needed by the private sector actors to improve climate smartness and gender responsiveness of their programs and investments?	Capacity needs assessment

Learning Gap 7: Climate financing models for gender-responsive CSA	
Key question: How might climate financing need to be adapted to make it gender-responsive and support adaptation and mitigation technology uptake by women and other vulnerable socioeconomic groups?	Key learning activities
Subquestions	
What are the patterns in women-targeted climate financing?	Scoping reviews, data analysis, case stories
What climate financing interventions have the potential to be gender transformative? What works and what does not and for whom?	Scoping or systematic reviews
What precludes financial organizations from supporting women with CSA? What incentives would trigger gender-transformative climate financing? What is the business case for investing in gender-responsive climate financing?	Scoping reviews followed by in-depth case studies, stakeholder engagement

Learning Gap 8: Mitigation	
Key question: How gender-responsive are the mitigation strategies and technologies currently being promoted and how can they be made more relevant and responsive?	Key learning activities
Subquestions	
What mitigation strategies/technologies in agriculture (particularly in emissions reduction) have been used by women? What are their needs and preferences?	Scoping reviews
What are the threats and opportunities for gender equality in current mitigation policies and programs and how can CSA address them?	Scoping reviews
What are the social, economic and environmental benefits and costs of adopting mitigation strategies for women and men? Have these strategies empowered women in different contexts?	Systematic and scoping reviews, impact analyses
How do we strengthen women's capacity to adopt mitigation interventions (e.g., reducing emissions from deforestation and forest degradation in developing countries (REDD) and REDD+)?	Capacity and skills needs assessment

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COVER PHOTO: Couple Yadav and Bujji Bhavanth grow tomatoes in their greenhouse located on the family farm near Laxmapur village in Telangana state, India. These greenhouses require 90 percent less water than traditional farming, and the Bhavanths have seen promising outputs in a region known for extreme water patterns. Credit: Sara Hylton/Climate Visuals Countdown.

PAGE 5 PHOTO: Farmers weeding a paddy field in Belanpur village, Banke district, Nepal. The paddy field is irrigated from the irrigation channel of the Sikta Irrigation Project. Credit: Nabin Baral/IWMI.



Generating Evidence and New Directions for Equitable Results (GENDER) is CGIAR's impact platform designed to put equality and inclusion at the forefront of global agricultural research for development. The Platform is transforming the way gender research is done, both within and beyond CGIAR, to kick-start a process of genuine change toward greater gender equality and better lives for smallholder farmers everywhere.

gender.cgiar.org



CGIAR is a global research partnership for a food-secure future dedicated to reducing poverty, enhancing food and nutrition security, and improving natural resources.

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