



A resource for scientists and research teams

Integration of gender considerations in Climate-Smart Agriculture R4D in South Asia: USEFUL RESEARCH QUESTIONS¹

Agriculture takes place in a social context. South Asia is a large and heterogeneous region of mixed farming systems and different cultures and social systems, which can enable or constrain opportunities and outcomes differently, for different social groups. Gender and other social relational factors have direct implications for who is able to learn about, try out, take up, and benefit from agricultural research for development (AR4D). Aimed at researchers working with climate-smart agriculture (CSA) in South Asia, this resource suggests a set of issues to consider in relation to the integration of gender in climate-smart agricultural research for development.

CSA practices address production challenges through a variety of short- and long-term strategies that aim to increase resilience to extreme weather and decrease agriculture's contribution to climate change, while meeting people's food security needs. Conservation agriculture (CA) has received considerable attention as a cost-saving set of practices that can promote conservation of soil, energy, and

labor in farming systems around the world. CA is also widely considered as having an important role to play in strategies contributing to global food security as well as improving resilience and adaptation to climate change. Built around a core set of interlocking soil and water conservation practices that help to create a closed and interdependent farming system, CA's core practices include minimum tillage, soil cover (e.g., retention of residues), and crop diversification. However, current adoption rates in South Asia are often low and weakly sustained beyond the lifetimes of CA projects.

Climate change often exacerbates the problems and inequities that poor rural women face. Their roles and livelihoods are highly dependent on the natural resources most threatened by climate change. The feminization of agriculture underscores the need to ensure that both men and women are able to learn about, try out, take up, and benefit from improved agricultural technologies, including climate-smart practices.

¹ This resource was adapted to South Asia from Farnworth, C.R.; Badstue, L. (2017). Embedding gender in conservation agriculture R4D in Sub-Saharan Africa: Relevant research questions. GENNOVATE resources for scientists and research teams. CDMX, Mexico: CIMMYT.

What we know so far

Mechanized CA is men dominated

Men form the majority of farmers targeted for mechanized land preparation options (though a few projects seek to target women). As a consequence, women and men in the same households may employ different farming approaches, with women engaging in traditional farming practices and men using mechanization options.

Women's labor opportunity cost not calculated

Women's and children's labor are often perceived as "free," even though time spent on farming may be diverted from childcare, household maintenance, and other income-generation opportunities. At the household level, decisions about whether or not to

purchase herbicides appear to focus not only on cost but also on willingness to pay.

Training through lead farmers may marginalize women

Agricultural demonstration events and training, including on CA/CSA, are sometimes hosted by or delivered through lead farmers. However, lead farmer selection criteria often exclude the majority of women and poorer men in the community from acting as lead farmers or demonstration hosts. An example is the need in some projects for lead/host farmers to demonstrate land ownership, which women can rarely do. When CA/CSA is introduced through the example of wealthier male farmers, poorer farmers – whether women or men – may feel that the technology is not relevant to them.

Increasingly, selection criteria target women for training, but this does not necessarily mean that women are able to apply the lessons they have learned. Women-headed households often have potential to be early adopters, yet are rarely specifically targeted.

Evidence on whether CA supports food and nutrition security is limited.

There is limited evidence on the degree to which CA supports health and food and nutrition security objectives. Legumes are sometimes planted as an intercrop, or as a sequential crop. More needs to be understood about whether crop choice within a specific CA system supports household food objectives, by whom and with what logic such choices are made, and what happens when there is a conflict of interest.



Integrating gender considerations into R&D on Climate-Smart Agriculture

To develop a broad evidence-based understanding of how gender CSA technologies interact, studies are needed to provide detailed empirical knowledge from a number of sites across South Asia. These will build up the body of evidence required to fully understand how gender relations influence adoption decisions. This evidence can then be used to improve extension service delivery and policy.

Comparative gender studies would help draw together commonalities in relation to smallholder systems targeted for CSA interventions, including CA, as well as to develop understandings of critical gender variations. In all cases, it is necessary to distinguish – within the diversity of households in any location – between women-headed households and women in male-headed households (and other household typologies as relevant). Attention can focus on differences in access to and control over resources, and intra-household decision-making between different household arrangements. Considering the costs and benefits to children in households is also important because changes in practices may affect their labor

contributions to the farm, as well as their health status and the time parents are able to spend with them. Focusing on the opportunities and constraints offered by CSA/CA to young men and women farmers, and also to hired labor, could form further research projects. Finally, given that the benefits of CA appear to improve with increasing investment, particularly towards mechanization and herbicides, it is important to establish the overall capacity of smallholders to invest, and specifically by gender.

Evidence-based comparative gender studies will help track short- to medium-term outcomes of innovation technologies, policies, and organizational interventions in agriculture. This will contribute to establishing gender-sensitive business model frameworks implemented through service providers and which women are able to access. Such models should identify gender-responsive interventions that assist in taking CSAs to scale. This would be achieved within the framework of integrating CSA into village development plans, using local knowledge and expertise and receiving support from local institutions.



Potential research questions

Gender Dynamics

Gender Dynamics at the Household Level

- What criteria do smallholders apply in intra-household decision-making processes regarding selecting and implementing CSA/CA technologies?
- What roles do men and women play in meeting household nutrition requirements via livestock, poultry, kitchen gardens, and foods purchased through crop sales; and how can improvements be made in securing a nutritious food basket?
- What are the gendered differences in women's and men's ability to access services and inputs (extension services, fertilizer and herbicide, credit, etc.) and invest in various CSA/CA technologies? To what extent does the acquisition of particular technologies impact women's and men's ability to deepen and expand their asset portfolios?
- What are the opportunity costs of specific technologies to women's, men's, and children's labor at the household level?
- How can improved farm accounting skills strengthen capacity of women to participate in intra-household decision-making in male-headed as well as female-headed households?

Gender dynamics at community level

- To what degree are community resources (land, water, trees, and sources of fodder, and wild foods – both animal and plant) managed in gender-equitable ways? What can be done to make management processes more equitable?
- How do share-cropping, land-renting, or community-managed land allocation systems affect the ability of women and men to invest in and implement CSA-related technologies?
- How is adoption of CSA by women perceived in the wider community, and how can negative community attitudes be influenced to become more positive?
- Research on specific practices: mapping involvement, knowledge, access to and impact of technologies, for example precision land levelling, mulching, Alternate Wetting and Drying (AWD), bundling, micro-irrigation, and their related gendered differences.



Photo credit: Jhabar Mai Sutaliya/CIMMYT.

Minimum tillage

Land preparation and seeding

- Gender differences in women's and men's ability to invest financially in CA technologies, particularly in mechanization with contribution to other livelihood opportunities; effects of using particular CA technologies on other farm operations.
- Do contracting services for hire of specific machinery provide opportunities to overcome gender-based constraints to mechanization in CA, both for women heads of household, and for women within male-headed households? Do institutional arrangements, such as women-led machinery rental groups, encourage women to rent machines?
- How do women and men perceive the opportunities and constraints of mechanization? What sustainability measures are women practicing?
- What are the ergonomic effects on women when using particular options?
- Many women and men appreciate that mechanization reduces their workload. But others can lose their livelihood when mechanization displaces wage labor. Are there mitigation measures to lessen the negative impacts of labor displacement in CA?

Residue management

- Awareness mapping of men and women on how residue retention and reducing burning improves soil health, thus strengthening productivity and combating human health hazards.
- What are the trade-offs, for women and men, of using residues for surface mulch?
- In what ways does residue retention affect livestock keeping practices and related income by women and men?
- What is the potential for building on-farm fodder banks using improved species? And what, if any, would be the trade-offs of this for women? And for men?

Crop diversification

- What are the gendered opportunities, constraints, and trade-offs of CA-based crop diversification/rotation?
- What sources of knowledge do women and men access regarding crop varieties? What factors explain gendered differences in selection and adoption?

- Which criteria do women and men bring to bear around decisions of whether to diversify crops, and if so, which crops in CA systems?
- Do the crops selected for system diversification support improvements in food and nutrition security for all household members?
- If external actors (agronomists, development agencies, health workers) are involved in influencing crop selection in CA programs, to what degree do they consider (i) intra-household food and nutrition security requirements, (ii) development and promotion of value chains in targeted crops, and how to support women's participation in these, and (iii) intra-household decision-making processes around expenditures?
- How and to what extent are women able to access and control the additional income earned from crop diversification?
- How does diversification affect the availability of nutritious food for different household members?

Knowledge networks

A whole nexus of questions can be built around the extent to which information and training programs on CSA/CA are gender responsive. Do they map and respond to women's and men's potentially different information and investment requirements (based on their existing roles and knowledge in the farming system)? In what ways do they work with, support, and extend women's and men's often different learning and knowledge exchange networks? Areas of inquiry include:



Photo credit: Peter Lowe/CIMMYT



Photo credit: M. DeFreese/CIMMYT.

- How effective are extension services in targeting women as well as men farmers? Attention should focus on the targeting of women within male-headed households as well as women heads of household.
- Do the means of learning and dissemination recognize and work with potential differences in women's and men's capabilities and opportunities to understand and act on the information?
- Do the advisory services challenge gender and social norms around membership of rural institutions, access to and participation in CSA/CA training events, etc. to ensure that women, hired laborers, and other marginalized groups are trained and supported in implementing CSA/CA?
- In addition to formal sector provision, through which institutions do women in general, and poorer women and men in particular, access and share information and training on CSA/CA practices?
- How does the use of ICT-based tools for accessing information (e.g., videos on fertilizer application or pest management) differ by gender? Are the agencies providing these tools aware of these differences?
- How are women's and men's perceptions of climate risks different? Or similar?

Suggestions for further reading

1. Beuchelt, T. D. & Badstue, L. (2013). Gender, nutrition- and climate-smart food production: Opportunities and trade-offs. *Food Security*, 5(5), 709–721. doi:10.1007/s12571-013-0290-8.
2. FAO (2012). What is conservation agriculture? Available at: <http://www.fao.org/ag/ca/1a.html>.
3. Farnworth, C.R., Baudron, F., Andersson, J.A., Misiko, M., Badstue, L. & Stirling, C.M. (2015). Gender and conservation agriculture in East and Southern Africa: Towards a research agenda. *International Journal of Agricultural Sustainability*, 1 (2), <http://dx.doi.org/10.1080/14735903.2015.1065602>.
4. Giller, K. E., Witter, E., Corbeels, M. & Titoneel, P. (2009). Conservation agriculture and smallholder farming in Africa: The heretics view. *Journal of Field Crops Research*, 114(1), 23–34.
5. Harman Parks, M., Christie, M.E. & Bagares, I. (2015). Gender and conservation agriculture: constraints and opportunities in the Philippines. *GeoJournal* 80(61), 61–77, doi: 10.1007/s10708-014-9523-4.
6. Jat, M.L., Dagar, J.C., Sapkota, T.B., Singh, Y., Govaerts, B., Ridaura, S.L., Saharawat, Y.S., Sharma, R.K., Tatarwal, J.P., Jat, R.K., Hobbs, H. & Stirling, C. (2016). Climate change and agriculture: Adaptation strategies and mitigation opportunities for food security in South Asia and Latin America. *Advances in Agronomy*, 137, 127–236.
7. Nyanga, P. H., Johnsen, F. H. & Kalinda, T. H. (2012). Gendered impacts of conservation agriculture and paradox of herbicide use among smallholder farmers. *International Journal of Technology and Development Studies*, 3(1), 1–24.
8. Parry, M.L., Rosenzweig, C., Iglesias, A., Fischer, G. & Livermore, M. (1999). Climate change and world food security: A new assessment. *Global Environmental Change*, 9, S51-S67.
9. Nyasimi, M., & Huyer, S. (2017). Closing the gender gap in agriculture under climate change. *Agriculture for Development*, 30, 37 – 40.

This publication was made possible by the support of the Bill & Melinda Gates Foundation and was developed under the CGIAR Research Programs on MAIZE and WHEAT. The authors thank CIMMYT colleagues R. Adam, F. Baudron, B. Govaerts, T. Krupnik, M. Misiko, C. Thierfelder, and R. Gopal Singh for their valuable comments.

To learn more visit:
gender.cgiar.org/collaborative-research/gennovate/

Contact:
Lone Badstue
International Maize and Wheat Improvement Center (CIMMYT)

email: l.badstue@cgiar.org

Correct citation: Farnworth, C.R., Badstue, L., Jat, M.L., Rai, M. & Agarwal, T. (2017). Integration of gender considerations in Climate-Smart Agriculture R4D in South Asia: Useful research questions. GENNOVATE resources for scientists and research teams. CIMMYT, CDMX, Mexico.