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ENABLING GENDER EQUALITY IN AGRICULTURAL AND ENVIRONMENTAL INNOVATION

A resource for scientists and research teams

Embedding gender in Conservation Agriculture R4D in sub-Saharan Africa: RELEVANT RESEARCH QUESTIONS[1]

Conservation agriculture (CA) has received considerable attention as a cost-saving, soil and water-conserving set of practices in many farming systems around the world. It is built around a core set of interlocking soil and water-conserving practices which help to create a closed and interdependent farming system. The core practices are minimum tillage, soil cover – including retention of residues, and crop diversification. CA is 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. However, currently adoption rates are often low and weakly sustained beyond the lifetimes of CA projects.

An analysis of the current literature (Farnworth et al. 2015) shows that understandings of how gender relations influence CA adoption in sub-Saharan Africa is weakly researched though a few significant insights are provided by case studies, particularly in Malawi and Zambia. These indicate gender relations have a large effect upon CA adoption and adoption mechanisms. There is evidence that the position of women can be worsened, particularly when only one or two CA principles are adopted, and when no herbicides are used. Conversely, there is some tantalizing evidence that women are using their agency by adopting certain CA technologies, at least in part, to improve their own situations.

1. This resource builds on: 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. *http://dx.doi.org/10.1080/14735903.2015.1065602*

What we know so far

Basin-based CA is women-dominated. Mechanized CA is men-dominated.

Basin-based CA, whereby basins are dug with hoes, is often targeted to women and poor men. This is labor-intensive. Other manual options include manual ridging and the use of planting sticks rather than basins which may have labor-saving benefits. Men form the majority of farmers targeted for mechanized CA options (though a very few projects seek to target women). The consequence is that women and men in the same household may use different CA approaches with women engaged in manual forms of CA and men using magoye rippers and other mechanization options.

Herbicides are rarely applied because women's labor seems free.

Herbicide use can be very important in suppressing weeds but herbicide use is very low. At household level, decisions whether or not to purchase herbicides appear to focus not only on cost but also on willingness to pay. Women in wealthier male-headed households may not be able to argue successfully for the purchase of herbicides; women in female-headed households may lack the resources to do so. Women agro-dealers in Zambia, however, with ready access to herbicides use them on their own farm.

A key issue is that women's and children's labor is often perceived as 'free', including on their partner's fields, even though time spent on weeding may be diverted from childcare, household maintenance and other income generation opportunities. Conversely, where (frequently subsidized) herbicides have been used the release of women and children from weeding tasks has resulted in multiple benefits. If properly done, CA should reduce weeds over time. Regardless of the CA tillage system, women typically weed their husband's fields as well as their own when herbicides are not used.

Training through lead farmers may marginalize women

Training on CA is often delivered through lead farmers. However, lead farmer selection criteria can exclude the majority of women and poorer men in the community. An example is the need in some projects for lead farmers to demonstrate land ownership, which women can rarely do. When CA is introduced through wealthier male farmers, poorer men and women farmers may feel the technology is not relevant to them or that they are not expected to attend extension run by lead farmers. Increasingly, selection criteria target women for training but this does not necessary mean that women are able to apply the lessons they have learned. Women headed households are often 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 with maize, or cash crops may be predominantly planted. This does not mean that more food is available to the household since earnings may be spent elsewhere.

More needs to be understood as to 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.

Livestock – good or bad?

Livestock are sometimes considered a destabilizing factor in CA systems because they can compete for use of residues. However, livestock offer women many benefits, partly because land ownership is not critical in many cases to livestock keeping due to their intrinsic mobility, or because livestock often can be kept close to home. More research on integrating fodder crops with CA is required as are the gender implications of integrating livestock to facilitate weed control and nutrient cycling to avoid immobilization (etc.).

Integrating Gender Considerations into CA R&D

To develop a broad evidence-based understanding of how gender and CA technologies interact, a series of small research projects to develop detailed empirical knowledge from a number of sites across eastern and southern Africa are needed. These will build up the body of evidence required to fully understand the ways in which gender relations expressed in management of communal resources, membership of organizations, and intra-household decision-making processes, and roles and responsibilities across the farm influence CA adoption decisions. This evidence can then be used to improve extension service delivery and policy.

Comparative gender studies would be useful to help draw together commonalities in relation to smallholder systems targeted for CA interventions, 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, such as polygamous, child-headed, etc.). Attention could 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 important, because CA may have implications on their labor contributions to the farm, their health and education status, and the time parents are able to spend with them. Focusing on the opportunities and constraints offered by CA to young men and women farmers, and also to hired labor, could form further research projects. Given that the benefits of CA appear to improve with increasing investment, particularly in relation to livestock numbers, mechanization and herbicides, it is important to establish the overall capacity of smallholders to invest, by gender, economic status, and other socio-economic indicators. In some locations establishing the rights and responsibilities of pastoralists and agriculturalists to residues and other biomass may be necessary.

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 CA technologies?
- What are the gendered differentials in women's and men's ability to access CA-related services (extension services, fertiliser and herbicide, credit, etc.) and invest in various CA technologies? To what extent does acquisition of particular CA technologies impact upon women's and men's ability to deepen and expand their asset portfolios?
- What are the opportunity costs to women's, men's and children's labor at household level of specific CA technologies (for instance, schooling, off-farm and non-farm activities)?
- If CA involves increased labor requirements, how are these requirements met – through machinery, through hiring in labor, or through redeploying household labor?
- Conversely, if labor requirements decrease, what are the implications for household (including women's) and hired labor? If labor is saved, how this saved labor re-allocated?
- We also need to know land distribution dynamics – which gender has more land and what type of land, crop choices by gender, and the degree to which farm planning is individual or joint, and how resources are allocated across that farm system.

Gender Dynamics at the Community Level

- Are community resources (land, water, trees, sources of fodder, wild foods – both animal and plant) managed and utilized in gender-equitable ways?
- What are the gender implications of community management systems (including for grazing) for women's and men's ability to adopt CA?
- How do community managed land allocation systems affect the ability of women and men to invest in and implement CA?

Photo credit: Thomas Lumpkin/CIMMYT.

Minimum Tillage

Land Preparation and Seeding

- What are the gendered opportunities and constraints of different minimum tillage technologies such as basin-based CA, dibble sticks, magoye rippers and direct seeders (etc.)? A range of variables could be studied, including the opportunity costs to adult and child labor, and hired labor, of specific options. Other study variables could include gender differentials in women's and men's ability to invest financially in these technologies – particularly in mechanization; effects on time management including with respect to caring and domestic roles; effects of using particular CA technologies on other farm operations; the effects on human health including energy requirements of different technologies.
- 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? Are there other institutional arrangements, such as women-led machinery hire groups, which may encourage women farmers to hire?
- In cases where women are using magoye rippers and direct seeders, how has this situation arisen? How do the women and men involved view the opportunities and constraints of mechanization? Is it likely that women using mechanized land preparation options will be able to continue over the long term?
- What are the ergonomic effects on women and men when using different CA technologies?

Weed Control

- What factors do men and women farmers consider when evaluating the use of herbicides vis-a-vis manual weeding or mulching to control weeds?
- What are the opportunity costs for each household member of potentially increased weeding due to minimum tillage when herbicides are not used?
- What are the impacts upon hired labor of labor displacement, where it occurs?

Residue Management

- What are the trade offs, for women and men, of the use of residues for surface mulch? Is there 'competition' between women and men for the residues?
- In what ways does residue retention impact upon livestock keeping practices by women and men?
- What other sources of fodder (species, location) are used by women and men on and off-farm?
- What is the potential for building on-farm fodder banks using improved species?
- What alternatives are there for using maize stalk as fuel? Do alternative sources, such as cattle dung, compromise ability to improve soils?

Crop Rotation and Diversification

- What are the gendered opportunities, constraints, and trade offs of CA-based crop diversification/rotation?
- Which criteria do women, and men, bring to bear around decisions whether to diversify crops, and if so which crops, in CA systems?
- Do the crops selected for diversifying the system support improvements in food and nutrition security for all household members?
- Is there a conflict with meeting income generation and household nutrition objectives?
- If external actors (agronomists, development agencies, health workers) are involved in influencing crop selection in CA programs, to what degree do they (i) consider 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?
- If herbicides are used, what impact do these have upon biodiversity, and upon the presence and use of wild foods important (for example as a relish or source of protein) to the target population?
- What effect does mulching have on increasing wildlife sourced for food? In some locations it leads to an increase in rodents which comprise a food resource.

Knowledge Networks

A whole nexus of questions can be built around the degree to which information and training programmes on CA are gender-responsive. Do they map and respond to women 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 enquiry include:

- How effective are the extension services, and projects, in effectively targeting and involving 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 and men's capabilities and opportunities to understand and act on the information?
- Are vernacular languages used? This may help improve women's participation and that of less educated men.
- Do the advisory services challenge gender and social norms around membership of rural institutions, access to and participation in CA training events etc., to ensure that women, hired laborous, and other marginalized people are trained and supported in implementing CA?
- If advisory services offer gender-equitable services (as opposed to services targeted specifically at women), what are the key features which make them responsive to women and men's differential gender needs? What difference does the gender of the trainer make?
- In addition to formal sector provision, through which institutions do women in general, and poorer women and men, access and share information and training on CA practices? This include informal knowledge networks – womens' groups, informal groups, friendship and other social constructs. To what extent can working through such groups help to take CA to scale?

Suggestions for further reading

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To learn more visit:

gender.cgiar.org/collaborative-research/gennovate/

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