



Gender and Innovation Processes in Maize-Based Systems

**GENNOVATE Report
to the CGIAR Research
Program on Maize**



GENNOVATE

ENABLING GENDER EQUALITY
IN AGRICULTURAL AND
ENVIRONMENTAL INNOVATION



RESEARCH
PROGRAM ON
Maize



The [CGIAR Research Program on Maize](#) (MAIZE) is an international collaboration between more than 300 partners that seeks to mobilize global resources in maize research and development to achieve a greater strategic impact on maize-based farming systems in Africa, South Asia, and Latin America.

Led by the [International Maize and Wheat Improvement Center](#) (CIMMYT), with the [International Institute of Tropical Agriculture](#) (IITA) as its main CGIAR partner, MAIZE focuses on increasing maize production for the 900 million poor consumers for whom maize is a staple food in Africa, South Asia, and Latin America. MAIZE's overarching goal is to double maize productivity and increase incomes and livelihood opportunities from sustainable maize-based farming systems.

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Correct citation: Petesch, P., Badstue, L., Williams, G., Farnworth, C., & Umantseva, A. (2017). Gender and innovation processes in maize-based systems. GENNOVATE Report to the CGIAR Research Program on Maize. GENNOVATE Research Paper. Mexico, D. F.: CIMMYT.

ISBN: In process

AGROVOC descriptors: Agriculture; Gender; Maize; Innovation

AGRIS category codes: A50 Agricultural Research; E10 Agricultural Economics and Policies

Dewey decimal classification: 338. 1082 PET

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Acknowledgements

GENNOVATE builds on multi-level research collaboration by a large number of people across the world, and we thank everyone who helped to make this initiative come through.

This report was prepared by Patti Petesch, Lone Badstue, George Williams, Cathy Farnworth, and Anya Umantseva with important inputs from Daniela Moctezuma. We wish to extend our thanks to Ibrahim Gaya, Adalbertus Kamanzi, Vongai Kandiwa, and Alejandro Ramirez for their inputs to the report, and to Mahlet Hailemariam and Amare Tegbaru for the leadership to their field teams. We are also grateful to Diana Lopez for her excellent management of the data and coding team for the 27 MAIZE community case studies upon which this report is based. We send deepest appreciation as well to the local field team members (details in annex 5) for high quality work, and to the MAIZE case studies coding team: Andrea Bruni, Edgar Dominguez, David Lara, Daniela Moctezuma, Anaid Ortiz, Nora Soto, and George Williams.

Shelley Feldman has provided invaluable guidance and feedback throughout preparations of this report and to the wider team of GENNOVATE researchers. Jonathan Hellin and David Watson also provided very valuable feedback on earlier drafts. The report benefited greatly as well from feedback and reflections of the wider GENNOVATE team during their October 2016 research workshop.

Support for GENNOVATE's methodology design, training of PIs and field teams, data collection, and data coding and analysis were provided by the 11 CGIAR Research Programs engaged in the study, World Bank, CGIAR Gender and Agriculture Research Network, Government of Mexico, and the Federal Ministry for Economic Cooperation and Development (BMZ, Germany). We would also like to express our gratitude to the Bill & Melinda Gates Foundation for the two-year grant that has made it possible for the GENNOVATE initiative to jointly move into the analysis phase. We also wish to thank CRP MAIZE and CIMMYT managers and staff who have provided valuable guidance and support to the wider GENNOVATE initiative.

The report would not have been possible without the generosity of the women and men across the 27 villages from seven countries who shared their perspectives and experiences and their time.

Finally, Paula Kantor contributed significantly to GENNOVATE's design, scope, and collaboration. While setting up fieldwork in Afghanistan in May of 2015, Paula lost her life in a terrorist attack. We dearly miss her leadership and spirit. It is to Paula, and her passion and keen intellect, that we dedicate GENNOVATE's efforts to shine a light on the rural women and men who are challenging and changing the social rules that no longer make sense and disadvantage them.

Preface

Today, maize is the most important food crop in Sub-Saharan Africa and Latin America, and is a key Asian crop. In Sub-Saharan Africa, maize is consumed by 50 percent of the population and is the preferred food for one third of all malnourished children and 900 million poor people worldwide. As the world's population increases and more people begin to include higher amounts of meat, poultry and dairy into their diets, demand for maize is expected to rise. By 2025, maize will be the developing world's largest crop and between now and 2050 the demand for maize in the developing world is expected to double. This puts pressure on agricultural research and development to further enhance productivity of maize-based systems, and significantly expand the uptake of improved maize technologies. A key challenge in this concerns the need to harness the ability of many more rural men as well as women to innovate in their local livelihoods. To address this, an understanding of the linkages between gender norms, agency, and innovation is required.

This report offers a panorama of the gender dimensions of local agricultural innovation processes in the context of maize-based farming systems and livelihoods. Drawn from GENNOVATE's larger sample, the analysis is based on 27 village case studies from seven countries set in diverse maize regions of the Global South, and which were commissioned by the MAIZE CRP. The findings are primarily targeted to MAIZE research managers, scientists and research teams, although we hope others may find the report useful.

GENNOVATE, or *Enabling Gender Equality in Agricultural and Environmental Innovation*, is a qualitative comparative research initiative of 11 CGIAR Research Programs (CRPs). Together the GENNOVATE research team is advancing a two-track strategy of contributing authoritative qualitative research and catalyzing gender-transformative change in international agricultural research for development (AR4D).

Across the GENNOVATE initiative researchers are working, both independently and together, on additional in-depth analyses. Please be on the lookout for this work to follow in journal papers, books, briefing notes, and other outreach.

We hope you enjoy the report,

Lone Badstue

Chair, GENNOVATE Executive Committee

CIMMYT Strategic Leader for Gender Research

Executive Summary

For several decades maize research for development has delivered valuable improved technologies to poor farmers. Some of these innovations significantly enhanced productivity, food security, and incomes, while others have had more limited impacts.

Most of the innovations developed by the CGIAR and partners have been, and continue to be, driven by a focus on resolving important technical problems, such as low-yielding and susceptible varieties; widespread crop pests and diseases; debilitating abiotic stresses; and the productivity problems of poor quality seed. Evidence is growing that without appropriate incorporation of gender and other social considerations in agricultural research and development, otherwise technically superior innovations can be limited in their impact and in some cases may even lead to exacerbation of social inequalities (Cornwall & Edwards, 2010; Okali 2011, 2012; Kumar & Quisumbing, 2010).

Deep-seated gender norms—or societal expectations governing women’s and men’s daily behaviors—contribute to important differences in the ability of women, men, and youth to learn about, try out, adapt, and benefit from new agricultural and natural resource management (NRM) technologies and practices. Such norms often limit women’s access to and control over productive resources (e.g., Quisumbing & Pandolfelli, 2010), which in turn further constrain their capacities to access new technologies and practices (e.g., Ragasa, 2012). Yet, how and why women in some contexts can effectively access and benefit from new technologies but not in others, remains poorly understood. This lack of understanding of the relationship between local contextual characteristics, including the normative environment for gender and wider social inclusion, and the uptake of agricultural technologies, restrains the capacity of agricultural research for development (AR4D) to design and scale out innovations that enable women and men in poor communities to engage and benefit.

This report examines the gender dimensions of agricultural innovation and wider social change. The findings are based on the perspectives and experiences of approximately 1,600 women and men who reside in 27 villages of Ethiopia, Malawi, Mexico, Nigeria, Nepal, Tanzania, and Zimbabwe where maize is a key crop.

This study is part of the wider GENNOVATE (*Enabling Gender Equality in Agricultural and Environmental Innovation*) research initiative conducted in 26 countries. The research methodology was designed to illuminate how gender norms and agency work together to shape access to, adoption of, and benefits from agricultural innovation. Gender norms underpin gender power relations and continue to privilege men’s agency, authority, and resource control. Yet, these norms are in flux around the world, and, in the set of research villages where the normative environment encourages both women’s and men’s agency and participation in agricultural innovation, the evidence points to more rapid and inclusive rural development on the ground.

Study approach

Agricultural innovation in this study is conceived broadly as a social process, and the report explores experiences with improved maize varieties, Conservation Agriculture, and other innovations identified by study participants as the most important for the women and men of their villages. The analysis of their testimonies is framed by an exploration of how gender norms and agency interact to shape local innovation processes:

- **Gender norms** encompass the many societal rules governing men’s and women’s daily behaviors and roles in their households and communities.
- **Agency** refers to the capacity to act and pursue goals individually or together with others; and empowerment is defined as study participants observing a growing sense of agency.

The GENNOVATE methodology features advances in multi-site qualitative comparative research designs. Between mid-2014 and mid-2016, field teams received in-depth training and collected data for each community-level case study with a standardized package of six sex-specific focus groups, eight semi-structured interviews, and a detailed community profile. The fieldwork engaged equal numbers of women and men from different socio-economic and age groups. The data generated then allowed for contextually grounded analysis, comparison, and identification of patterns across the varied contexts and population groups studied.

Findings

Changes in the macroeconomic and political environments are interacting with demographic shifts as well as technological advances to open up opportunities for women and men farmers to adapt and change their livelihood strategies. This happens, for example, through adoption of new maize technologies, off-farm income generation in the local economy, and outmigration of household members to better jobs than available locally. While current levels of poverty are perceived to be very high by study participants’ estimates—ranging between a median of 50 to 60 percent across cases—large majorities nevertheless report falling poverty, greater empowerment, and better livelihood opportunities for the men and women of their communities when compared to a decade ago. Study participants testify to diverse new agricultural technologies and practices in their villages.

1. Agricultural innovations, especially adoption of improved maize-related technologies, take place and bring benefits, but these benefits differ importantly by gender.

- ***A majority of focus groups rank improved maize seeds as among the two most important agricultural innovations to have come into their communities.*** While focus groups identify the introduction of numerous innovations into local farming practices, improved maize receives a top two rating on average by 62 percent of men’s focus groups and 57 percent of women’s. These findings attest to the strong relevance of improved maize for both women and men farmers. Men and women alike speak favorably of the greater yields and profits for technology adopters. Women consider improved maize central to maintaining household food security.
- ***Men are widely framed as key knowledge holders about farming and innovation processes.*** Men find it much easier than women to participate actively in agricultural training activities and implement what they learn. Men also strongly associate themselves with effective use of modern agricultural inputs. These include improved seed varieties, fertilizers, pesticides, and herbicides.
- ***Women are increasingly important in agricultural processes.*** The feminization of agriculture continues. In 80 percent of the research villages, men’s temporary migration is on the rise, and women manage farms in ever higher numbers. In many cases, married women run diverse farming and livestock activities independently and over long periods of time. A significant number of farms are headed by women on their own. Large majorities of focus group members testify to women’s access to extension services in their villages. More women are also working in agricultural wage jobs and agri-related petty trades. Yet, even as women increasingly manage

farms and access information, our evidence indicates that their use of improved technologies and ownership of farmland, machinery, and tools remain low.

- ***Both men’s and women’s innovation adoption is constrained by costs and seed market limitations.*** Study participants across diverse contexts report hardships with ensuring reliable yields. These concerns are often related to the affordability of new seed technologies, and the inputs they require, and inconsistent supply of good quality seeds in their local markets. Women often rely on local seed varieties for their own crops.

2. The various ways that norms and agency influence innovation processes make for opportunity as well as risks.

Study participants observe strong empowerment and poverty reduction. Overall, 83 percent of focus groups report rising power and freedom for the women and men of their communities. Moreover, focus groups of men find that over the previous decade a median of 27 percent of the once-poor households in their villages moved above the community poverty line agreed by their focus group. Women’s focus groups observe local poverty reduction at 17 percent overall.

Underneath these encouraging trends, however, is substantial variance. A set of **five positive outliers—or tipping point communities**—are identified where we observe evidence of normative shifts towards more equitable gender relations and economic roles, which contribute to fostering an enabling environment for more inclusive agricultural innovation. Compared to the other 22 research communities, **both men and women from these five communities report significantly higher empowerment and poverty reduction levels.**

The report offers three typologies which emerge from the data for understanding innovation processes in communities with different normative environments for women’s and men’s economic agency:

- ***Tipping point cases: some gender norms have changed sufficiently to encourage many women’s as well as men’s participation in agricultural innovation.*** Again, this is fueling local social change where both genders report significant empowerment, rapid poverty reduction, and wider institutional change. Women may not be employing the latest agricultural technologies, but their agri-related livelihoods are widely recognized as beneficial to the wellbeing of their households. These cases also feature higher levels of men’s labor migration and of women headed households relative to the rest of the sample, which may have provided local women with greater scope to negotiate and over time change the norms that constrained their economic agency.
- ***Climbing cases: local norms governing women’s agency are in flux and constraining access to and benefits from innovation.*** In these more typical research contexts, women are actively innovating with their rural livelihoods, but different gender norms still limit many women’s decision making, physical mobility, economic participation, resource control, and access to information, networks, extension services, and other opportunities.

- ***Churning cases: the local institutional climate is discouraging of either men’s or women’s agency and innovation.*** In these contexts, local innovation or wider development processes may be excluding or disadvantaging particular social groups. Contested views of gender norms often emerge in the testimonies. In selected churning cases, the tradeoffs associated with innovation processes emerge forcefully, as do important differences in men’s and women’s capacities to manage these tradeoffs. For example, men may be discouraged and withdrawing their agricultural labor and household support, and women are pressed to fill these gaps.

The typologies are offered as broad reference points for conceptualizing differences in local normative environments, and how these differences shape the distribution of the benefits and tradeoffs that arise from innovation processes.

3. Normative framing continues to discourage women from farming and innovating. But there is change.

When explaining their rising sense of power and freedom in their lives, study participants speak often of more consultative intra-household decision-making and greater acceptability of women’s income earning; and they mainly testify to how these changes are contributing to improved wellbeing in their households and communities.

In addition to normative change, however, men and women also relate their sense of empowerment to many longstanding gender norms. In addition to their roles as income earners, women in our sample speak of gaining power and freedom in relation to their roles as wives, mothers and household heads (when that is the case). Men in our study stress their gender-ascribed role as economic providers above their other roles when explaining their empowerment.

The normative climate is shifting and uncertain in most communities, and more restrictive norms continue to constrain women’s and men’s freedom of action. Many gender norms are out of sync with realities of farming communities. Although exceptions can of course be found, with great regularity we find in the data that women often are:

- ***Poorly recognized as farmers or farm managers in their own right.*** Rather, women farmers are widely described as “supporting men” in their farming. With limited exception, men manage and control the major agricultural production and transactions for their household.
- ***Small-scale producers and traders.*** Women are widely involved in petty trades, particularly of goods they have processed themselves from primary products grown on the farm, but also from small amounts of produce and livestock (especially eggs, poultry).
- ***Lacking control over land and other productive assets of their households.*** Women mainly defer to men on seed purchases, technology and large machine use, hiring labor, and implementing new land management practices.
- ***Restricted in their physical mobility.*** In virtually every community, reputational risks limit women’s movement beyond their homesteads and villages. Other constraints to mobility may include housework and time burdens, seclusion practices, religion, and limited public safety.

- ***Discouraged from taking risks.*** Risk-taking by women is widely viewed negatively, and women express concern for how taking risks with their crops may jeopardize household food security and invite scorn, ostracism, or violence.
- ***Struggling to apply new agricultural knowledge.*** While women are accessing extension services in ever larger numbers, their capacities to apply what they learn remain constrained.
- ***Responsible for housework and care needs.*** Women’s heavy household workload constrains the time and resources they can invest in other activities. Conceptions of women’s farming roles, but not men’s, often include these responsibilities.

4. Within communities, the data displays significant patterning in how different social groups engage with local innovation processes.

At risk of oversimplifying the creative ways that men and women draw on different roles and norms to pursue goals, important regularities emerge in individual capacities to access and benefit from agricultural innovation.

Across this sample of communities, we find numerous women who are running their own households and actively engaged in agricultural innovation, but often not the entire package of recommended changes. The participation of women-headed households in local innovation processes is supported by more fluid norms: In a large majority of communities, it is more acceptable for “unattached” women than for married women to move about their communities unaccompanied, interact with the opposite sex, access information, participate in networks and learning opportunities, and assume leadership positions.

Women farmers who are married and with older children often farm under the guidance of husbands, contribute financially towards household farming activities, and inform decisions on food security and technology adoption. Focus groups of both genders observe a shift toward greater joint decision-making among couples, for example, on the sale of women’s farm produce. Women speak much more often than men of entrepreneurial activities, and frequently relate how they cross-subsidize their farming and business initiatives. Nevertheless, decisions regarding major resources—such as land or a women’s inheritance—remain strongly with men.

Young women and men perceive the most limited agency and the most restrictive norms among the sample groups who participated in the study. Young people often observe their farming and other opportunities as highly dependent on their parents’ support, and they describe farming roles as more gender differentiated than the adults, especially young men. Newly married young women’s freedom of action is especially circumscribed. Youth also had the least to say about agricultural innovations, and express strong aspirations for non-farm livelihoods. In roughly 40 percent of the research villages, nevertheless, young men and women alike report access to formal and informal opportunities for them to gain agricultural knowledge, and extension services have clearly contributed to this.

Capacities to access and apply local agricultural learning opportunities remain uneven for nonpoor women, as well as for poor men and women without land. Large majorities of women and men from the nonpoor focus groups report access to extension opportunities; however, their testimonies

of women's participation are frequently qualified by explanations that farming activities differ by gender, that women's access is limited by household demands and constraints on their physical mobility, that one-on-one interactions with male extension agents (rather than in groups) could risk social disapproval for women, or that only women who head their households engage with extension services. Many focus groups with poor women and men indicate that the poorest community members without land rarely interact with extension services, including because they would face strong social disapproval or cannot meet requirements for landownership or payment of fees. Study participants identify better-off men with landholdings as the most common targets of extension services when new technologies are introduced. This allows others to watch safely from the sidelines, but gives early adopters a valuable head start.

Opportunities for maize research for development

Poor and better-off rural women in the MAIZE sample are deeply engaged in agricultural innovation and reaching for better lives, and, together with men, slowly transforming the social relations and institutions of their villages to become more inclusive. Here we highlight opportunities for AR4D to identify and support these processes on the ground as a strategic complement to wider initiatives to scale-up adoption of improved maize varieties and other innovations.

Technology development and diffusion that explicitly accounts for strong normative influences on innovation processes, and contributes to gender-transformative change, has a larger probability of success. The different typologies for how agency and norms interact to shape innovation processes provide a broad framework for further research and experimentation:

- ***Tipping point contexts:*** In these rarer contexts, existing AR4D models with gender objectives have a good probability of success. Varieties and land management practices that save labor and inputs, improve production, offer resilience to weather shocks, and meet household and market preferences are helpful for women and men alike. Also strategic are investments in both women and men extension agents and AR4D services that can assess and be responsive to the different and changing opportunities and barriers facing men and women farmers from both poorer and better off households in these dynamic communities.
- ***Climbing contexts.*** In these more typical villages, experimentation is needed to support a normative climate that better recognizes and nurtures women's agricultural innovation in addition to men's. Household Methodologies, a suite of participatory tools, offer promise because they tap into community leadership and nurture more equitable intra-household decision-making and resource access (IFAD, 2014). Activities to engage men as well as women in strategies to secure and manage household food security and nutrition are important (Otieno, Farnworth, & Banda, 2016), as are initiatives to deepen learning, build networks, and promote and mentor women innovators as much as men innovators.
- ***Churning contexts.*** These case studies reveal challenges with current development processes for selected population groups. Rather than avoid or withdraw from these villages, experimentation is needed in research partnerships warning systems and mitigation strategies that better identify and support specific groups of poor and vulnerable women and

men to reduce risks (including backlash and violence against women) and connect with better opportunities.

Evidence is growing for multi-faceted intervention models that support both women and men to access opportunities. A recent evidence review of gender interventions finds strong benefits from locally tailored projects which combined farmer groups, financial services, processing and storage technologies, and training; and while these programs targeted women, they also “involved male partners and community leaders” (Buvinic, Furst-Nichols, & Courey Prior, 2016, p. 40). Indeed, many economic empowerment interventions which solely target women or provide limited services have struggled with effectiveness (Kabeer et al., 2013).

Invest in institutional innovation in maize agri-food systems. In many rural communities, women’s meaningful inclusion in agricultural innovation processes requires normative change, especially coordinated shifts among community members in support of women’s economic independence, voice and leadership. To support this transition, the tipping point cases signal the strategic benefit of intervention models that can **effectively strengthen both women’s and men’s initiatives to expand and diversify their livelihood activities in the same communities and at the same time**. Promising avenues for institutional innovation include initiatives that:

- **Learn from men and women innovators:** Further analysis on the trajectories and experiences of local men and women innovators could strengthen understanding of and support for more inclusive agricultural innovation processes by contributing to the evidence base on factors and processes that help (and hinder) innovation capacities, including for early adopters (and dis-adopters).
- **Proactively cultivate positive role models of both genders for inclusive change:** Investments in women and supportive men role models as part of specific downstream AR4D interventions can create openings for more inclusive innovation processes.
- **Support female-household heads to open space for other women:** Women-headed households who are actively innovating in their agricultural livelihoods emerge across the three typologies and serve as role models for normative change; however, further learning is needed to ensure that interventions targeting this group do not increase stigma, work burdens and other risks.
- **Work with and build capacity of progressive opinion leaders:** Strong local rural leaders for inclusive agricultural change can complement and enhance the development of mechanisms for institutional innovation in maize agri-food systems.
- **Develop and test agricultural extension services that cater to women as well as men:** A key challenge remains to open space for agricultural learning and information diffusion services which effectively support women farmers as well as men farmers. This can be done as part of research on scaling out, as stand-alone, or as part of larger maize research projects.

- **Experiment with informal education and community learning models—especially in contexts where normative environments highly discourage women’s agency:** Growing evidence finds community-based learning initiatives to be effective that work with local leaders and community members of both genders to improve rural livelihoods, build awareness of human rights, and support social norm change (Cislaghi, Gillespie, & Mackie, 2016; Edström & Shahrokh, 2015; Najjar, Spaling, & Sinclair 2013; Friis-Hansen, Duveskog, & Taylor, 2012; Humphries et al., 2012).
- **Strengthen the capacities of seed companies and retailers to account for gender as a customer attribute and to develop and test innovative mechanism for timely delivery of quality seed and varietal information.**
- **Enable young people to participate in local innovation processes:** The youth who participated in the study express strong aspirations and are better educated than previous generations, but remain deeply embedded in family and community networks. Young women especially struggle to engage with opportunities in the public sphere and will often require special measures to ensure their inclusion. Schools also offer promising opportunities for engaging children and young people in agricultural innovation through training and education on agriculture.
- **Strengthen initiatives working for equitable asset ownership:** Strong normative barriers to more equitable asset ownership and control, especially land, hamper women’s efforts to apply and benefit from new learning. While addressing these issues is typically not directly within the remit of AR4D, international and national AR4D entities have strong interest in and are well positioned to support efforts that advance national and international decision makers and fora to address issues of inequitable asset ownership and control.
- **Collaborate with partners with strong track records of serving poor rural women and men:** Many interventions with gender objectives struggle because they challenge social conventions, and thus require specialist staffing, flexible designs, and close monitoring to stay on course.

The GENNOVATE study approach provides a means for large-scale research and intervention programs like the MAIZE CRP to better understand and contribute to social processes where *both* women and men effectively access and benefit from agricultural innovation. In the period ahead, community revisits provide ripe opportunities for further learning as GENNOVATE’s multidimensional baseline information can be used to enrich understanding of these dynamics over time.

The transition to more inclusive and diverse livelihood opportunities and faster poverty reduction requires *both* women and men to be actively engaged, simultaneously, in driving these processes in their everyday lives and enlarging their power and freedom along the way. As AR4D moves toward an agri-food systems approach, **research capacities are required for examining and learning from the interdependent elements and evolution of local institutions, and the central role of local actors** in processes of social change and development (Cunningham & Jenal, 2016).

INTRODUCTION

A 48-year-old father of seven, Bakari¹ lives in Kilosha, Tanzania, a village in the country's relatively prosperous Morogoro region. In the rainy seasons, Bakari cultivates his five acres with Stuka, an improved maize variety, along with rice and pigeon peas. He and his wife then plant tomatoes and other vegetables in the dry season, which they irrigate with a water pump. When asked if he likes to try out new things, Bakari replies, "For sure I do live like a researcher. . . . One must question every difference noticed on the farm and try to find out solutions." Bakari says he struggles with pests, diseases, heavy rains, and poor market prices for his produce; but the agricultural trainings he received have helped him greatly to gain new skills and innovate. Bakari also relates that he has been greatly empowered over the past 10 years by his initiatives with his family, farming and community: "Today, I do plan and discuss with my wife and other family members." Also, tractors, new seed varieties, and other improved farming practices have enabled Bakari to provide food for his family, educate the children, and roof his home with iron sheets. Bakari is also active in local committees overseeing river protection, land management, and irrigation, "And I am like an exemplary person who spreads agricultural knowledge around the village."

Zaira, a 36-year-old mother of two schoolchildren, also resides in Kilosha. Recently separated from her husband, she provides for her household by cultivating maize, rice, and vegetables on two acres of leased land. She has diversified because, "I am the household head and have to satisfy everyone's needs. I cannot be selective because I don't know what will lead me to success." Like Bakari, she credits her interaction with extension workers and other farmers as key to her farming achievements: "They do assist me and I do assist them, too. I have improved the way I do things, not as in the past when I was still doing everything on my own." She learned, for instance, to plant in ridges and use pesticides correctly. While Zaira applies some of the new practices, unlike Bakari, she has abandoned planting new maize varieties. Her first crop using new varieties was excellent, but the next season failed. She attributes failure to many reasons: pests and disease, inability to apply all the new methods and inputs, and drought. Presently she plants local maize using seeds she has saved. Zaira also runs a small business, which helps to finance the pesticides for her tomatoes. While she regrets that her farming and business activities require so much time away from her children, Zaira says she feels more respected in the community and in greater control of her life. In the past, though she worked very hard, "My husband used to decide how to spend the money. After the harvest he was the one to sell the produce and at the end of the day I did not benefit from the income we made. Now, I take my own decisions."

How and why women as well as men are able to access and benefit from agricultural innovations in some circumstances, but not in others, continues to be poorly understood. This constrains the ability of Agricultural Research for Development (AR4D) to design and scale out innovations that deliver benefits efficiently and fairly to poor women and men.

Bakari's and Zaira's village of Kilosha is one of the 27 case studies conducted by the MAIZE CRP for GENNOVATE (*Enabling Gender Equality in Agricultural and Environmental Innovation*). Like most other research contexts in this sample, study participants from Kilosha consistently report that improved maize has enhanced the wellbeing and food security of their village; however, the ability of

¹ Study participants' names and villages are pseudonyms.

the local women and men to engage fully with the new seed technology and draw benefits from it varies significantly. This study provides a framework for AR4D to conceptualize and work more strategically with this heterogeneity on the ground.

GENNOVATE is a qualitative comparative research initiative engaging 11 CGIAR Research Programs (annex 1). The data, collected from mid-2014 to mid-2016, allow for contextually grounded analysis, comparison, and identification of patterns across the research contexts and sample groups reached. The starting point of the analytic approach is the understanding that, for an agricultural innovation to be effective, the primary stakeholders—women and men on the ground—must exercise agency and be active participants in learning about, developing, testing, and adapting a new technology or practice to their needs and local conditions.

Yet, gender norms—the societal rules governing roles and behaviors expected of each gender—differentially shape men’s and women’s capacities to innovate in their livelihoods. Across most rural contexts worldwide, it remains more common and acceptable for a man than a woman to display agentic beliefs and behaviors, including taking the initiative to become knowledgeable about and test a new variety or soil management practice, and then be rewarded with a great leap in productivity. This remains the case even as men’s labor migration grows and agriculture becomes increasingly feminized. Across the case studies, women manage farms and run small trades to support their households, yet normative influences continue to limit the recognition and resources which they derive from their farming activities.

Overall, the case studies demonstrate high regard for and strong benefits from improved maize technologies. Nevertheless, additional returns could be achieved from AR4D approaches that are informed by significant patterns in how gender norms and agency work together to shape local innovation processes.

Importantly, in a small set of research contexts where gender norms are more fluid, and women more easily access opportunities along with men to experiment with and benefit openly from their agricultural livelihoods, study participants observe much higher rates of poverty reduction compared to communities where norms are more discouraging of women’s agency and innovation. More often, as the report finds, women are excluded from engaging with the most promising agricultural innovations and other opportunities of their villages, or even disadvantaged by them. These latter findings are consistent with a wider literature of innovations and interventions that led to a worsening of the wellbeing and workload of poor women (e.g., Okali, 2011, 2012; Cornwall & Edwards, 2010; Kumar & Quisumbing, 2010).

The GENNOVATE methodology, presented next in Section I, provides an opportunity to systematically assess and learn from the variability of men’s and women’s experiences with their local innovation processes. Section II then opens with findings on empowerment and poverty reduction in the research communities. This sets the stage for identification and exploration of three community typologies, including the tipping point cases. Sections III and IV continue to draw on the typologies to compare men’s and women’s experiences with improved maize varieties and other innovations, and with their local agricultural learning opportunities. These sections also examine how various gender norms shape the capacities of women, men and youth to access and benefit from agricultural

innovations and to manage their risks. The report closes with reflections on opportunities from the study findings for maize research and development.

SECTION I. RESEARCH METHODOLOGY

GENNOVATE explores the gender dimensions of agricultural innovation processes. The research design was guided by the following study questions:

- How do gender norms and agency advance or impede innovation capacity and technology adoption in agriculture and natural resource management across different contexts and social structures?
- How do new agricultural technologies affect gender norms and agency across different contexts? Under what conditions can technologies do harm?
- How are gender norms and women’s and men’s agency changing, and under what conditions do these changes catalyze innovation and adoption, and lead to desired development outcomes? What contextual factors influence this relationship?

The comparative analysis in this report employs the concepts of agency and gender norms, and important regularities in their interactions, to enhance understanding of innovation processes on the ground. Box 1 defines the key study concepts, and annex 1 elaborates in greater detail the research objectives and protocols.

Box 1. Key study concepts: Gender norms, agency, and innovation

Gender norms refer to gender dimensions of social norms, or the societal expectations of how men and women ought to behave in their everyday affairs. Social norms also “structure social interactions in ways that allow social actors to gain the benefits of joint activity. And they determine in significant ways the distribution of the benefits of social life” (Knight & Ensminger, 1998, p. 105).

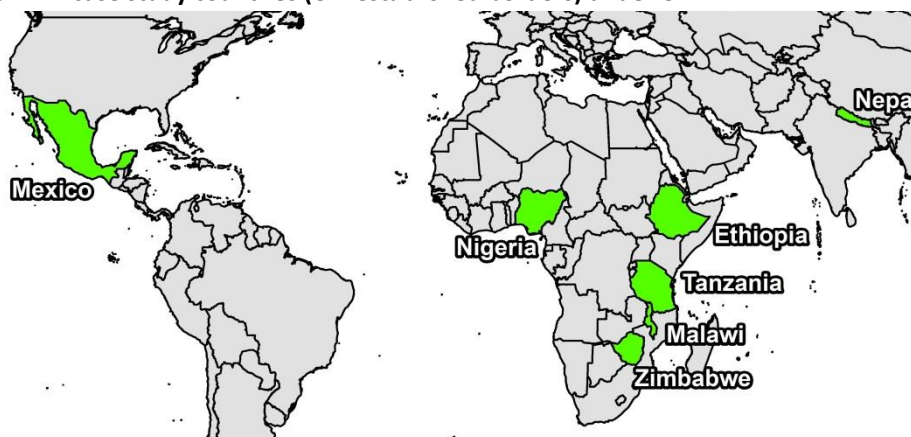
As Ridgeway (2009, p. 145) further explains, “Gender is a primary cultural frame for coordinating behavior and organizing social relations.” Despite technological and institutional change in a society, gender-framing persists in shaping social life. For instance, stereotypical beliefs about men’s greater authority and competence compared to women are often “reinscribed into new organizational procedures and rules that actors develop through their social relations in that setting” (p. 152).

Agency is “the ability to define one’s goals and act upon them” (Kabeer, 1999, p. 438), either independently or jointly with others. GENNOVATE’s conceptual framing positions the process of exercising agency as mainly embedded in, and conditioned by, local formal and informal institutions. It recognizes that increased agency, or empowerment, of disadvantaged groups can transform constraining institutions and their rules.

Innovation in this study is defined expansively to encompass agricultural technologies, natural resource management practices, learning opportunities, relationships, and institutions which are new for the study communities sampled. These innovations may be locally devised or externally introduced. Our understanding of innovations and innovation systems is informed by Berdegue’s (2005, p. 3) definition of innovation as “social constructs, and as such, they reflect and result from the interplay of different actors, often with conflicting interests and objectives, and certainly with different degrees of economic, social, and political power.”

GENNOVATE brings together a collaboration of 11 CGIAR Research Programs (CRPs). Field teams travelled from mid-2014 to mid-2016 to 137 agricultural and forest communities spread across 26 countries of Asia, Africa, and Latin America. This report draws on the subset of 27 village-level case studies from seven countries which were sponsored by the MAIZE CRP and illustrated in map 1 below.

Map 1. GENNOVATE case study countries (UN-established borders) under CRP MAIZE



The individual case studies were purposively selected to enable exploration of innovation processes across diverse regions. Maximum diversity sampling procedures introduce strong differences in the sample to increase generalizability (Miles, Huberman, & Saldaña, 2014) on the basis that “[a]ny common patterns that emerge from great variation are of particular interest and value in capturing the core experiences and central, shared aspects or impacts of a program” (Patton, 1990, p. 172). As discussed in annex 1, the GENNOVATE sampling procedures call for cases that differ significantly in economic dynamism and gender gaps in assets and capacities within the study countries; and annex 2 highlights this diversity in the MAIZE CRP sample.

Annex 2 also reviews the macro context for the MAIZE CRP case studies. In general, national indicators for the seven countries point to a constrained macro environment for development and gender equality. Data from the study communities mainly indicate favorable experiences with agricultural innovation, however.

The testimonies particularly display extensive high regard for improved yields and other benefits derived from adoption of improved maize varieties and practices related to Conservation Agriculture (CA²). The study participants’ generally favorable assessments are likely influenced by programs associated with the MAIZE CRP in many research sites. The programs vary, and feature capacity building or policy initiatives at the national and subnational levels which engage public, private, and civic sector partners. In addition to receiving national agricultural extension services, many research

² Conservation Agriculture commonly refers to the combination of three core principles which interact to enhance agricultural productivity and reduce soil degradation: i) zero tillage (or minimum or no mechanical soil disturbance), ii) crop residue management (or soil cover from a growing crop or a dead mulch of crop residues), and iii) diversified crop rotations (Giller et al., 2009). However, in this report, when CA or CA-related technologies are mentioned *it does not necessarily refer to the combination of all three aforementioned principles, but may merely refer to one (or several) technologies/practices that may be related to any one of the three principles.*

villages participate in ongoing community-level agricultural research programs, such as trials or demonstration plots with new maize seeds and soil management practices for small groups of farmers. The community-based programs may be led by MAIZE CRP staff or partners.

Nevertheless, this study is not an evaluation, but rather a broader examination of the gender dimensions of innovation processes. The majority of the data collection elicits local people's views of and experiences with the range of new technologies and practices to have come into their communities or which have been devised locally. While hybrid maize technologies and CA-related practices feature prominently in the testimonies from this sample with no prompting from the field teams, what becomes evident is the great variability both within and across the 27 case studies in the benefits and risks that men and women associate with these and other innovations. As the report reveals, this variability provides a rich basis for examining the study questions on interactions between gender norms, agency and innovation.

GENNOVATE's qualitative methodology prioritizes learning systematically from people's own perceptions and lived experiences with agriculture and the management of natural resources. In gender-specific focus groups and semi-structured individual interviews, the study engages equal numbers of women and men in reflecting on questions such as:

- What are the most important new agricultural practices and technologies for the men of the village? And for the women?
- What qualities make a woman a good farmer? And a man a good farmer?
- Do young people in this village follow local customs of women doing certain agricultural activities and men others? Why or why not?
- Are there differences in the characteristics of a woman who is innovative compared to a man who is innovative?

Field teams carried out 159 focus groups, 216 individual interviews, and 27 community profiles with a standardized package of six different data collection instruments applied in each research community. Table 1 presents an overview of the population groups reached and data collected in the study countries³; and the principal investigators and teams are identified in annex 4. The instruments feature semi-structured questions as well as selected pre-coded questions. Some topics and questions, such as those related to new farming practices, are repeated in different instruments, while others appear only once, such as those for youth about education.

The data were gathered in standardized formats, cleaned, and systematically coded. The data analysis approach integrates two procedures: in-depth analysis of the key study questions in individual case studies; and variable-oriented comparative analysis on particular topics across the different cases and population groups sampled. Together, the two analytic strategies allow broad patterns to be detected without losing their grounding in local contexts and realities.

³ In two case studies in Mexico, field teams encountered difficulties recruiting young people for focus groups due to high rates of migration among young workers, busy schedules, and lack of interest in contributing to an agricultural study. As a result, one young women's focus groups and two with young men had to be cancelled.

Table 1. Overview of data collection

Study country	# cases	Comm. Profile	# Focus groups						# Semi-structured individual interviews			
<i>Sample group / method</i>		<i>1. Key informants</i>	<i>2. Poor</i>		<i>3. Nonpoor</i>		<i>4. Youth</i>		<i>5. Innovation pathways</i>		<i>6. Life stories</i>	
		Both	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
Ethiopia	4	4	4	4	4	4	4	4	8	8	8	8
Malawi	2	2	2	2	2	2	2	2	4	4	4	4
Mexico	6	6	6	6	6	6	5	4	12	12	12	12
Nepal	3	3	3	3	3	3	3	3	6	6	6	6
Nigeria	4	4	4	4	4	4	4	4	8	8	8	8
Tanzania	4	4	4	4	4	4	4	4	8	8	8	8
Zimbabwe	4	4	4	4	4	4	4	4	8	8	8	8
Total	27	27	27	27	27	27	26	25	54	54	54	54

GENNOVATE stands apart from most applied large-scale social research which operates principally with decontextualized data. In this regard, the study represents a major cross-CRP effort to strengthen understanding of significant local-level patterning in the social processes that enable and constrain agricultural innovation.

SECTION II. OPPORTUNITY STRUCTURES FOR INCLUSIVE INNOVATION

“Women are doing petty business and poultry keeping. They are able to sell chicks after the training given by the Sokoine University of Agriculture.”—Poor women’s focus group, Kilosha, Tanzania

In this section we present evidence of the strong influence of gender norms on men and women’s understandings of their agency and wellbeing, and of poverty trends in their villages (see box 2 for descriptions of questions probing on these topics). These findings then set the stage for introducing the striking patterns associated with the five research communities we refer to as *tipping points*. The tipping points showcase the highly favorable forces unleashed by circumstances where gender norms have shifted to encourage women’s as well as men’s agency and agricultural innovation, and this is contributing to rapid poverty reduction.

Changes in the macroeconomic and political environments combine with technological advances in ways that open opportunities for women and men farmers to adapt and change their livelihood strategies as, for example, through the adoption of improved agricultural technologies and practices, off-farm income generation in the local economy, and outmigration of household members to better jobs. While current levels of poverty are perceived to be very high by study participants’ estimates—ranging between a median of 50 to 60 percent across cases—large majorities nevertheless report falling poverty, greater empowerment, and better livelihood opportunities for the men and women of their communities when compared to a decade ago.

Men’s temporary labor migration has risen in 80 percent of the research communities. This contributes fresh resources, ideas, and skills into the villages. Men’s migration also drives a continuing feminization of agriculture, with women managing farms and petty trades in ever growing numbers. Nevertheless, women’s growing economic role continues to remain below the radar in the

study participants' testimonies about their lives and the changes underway, unless specifically probed about these activities. Gender norms which ascribe authority and provider roles to men and submissive and domestic roles to women, contribute to dampening recognition of women's agency and innovation in their rural livelihoods. In five of the 27 study communities, however, the social rules governing gender roles have become more fluid and inviting of both women's and men's agricultural innovation, and this is associated with transformative change.

Box 2. Ladder exercises to assess perceived agency and poverty dynamics⁴

The youth and nonpoor focus groups open with the **Ladder of Power and Freedom** activity. Rather than use technical terminology such as agency or empowerment, we ask study participants to consider the "power and freedom" of their own gender. Focus group members consider the extent to which the majority of the men in their community (if a men's focus group, or "majority of local women" if a women's focus group) have the capacity to make their own decisions about important affairs in their life, such as "where they will work or whether they will start or end a relationship with the opposite sex" (informed by Kabeer, 1999, concept of strategic life choices). The facilitator then shows them a five-step Ladder of Power and Freedom on a flipchart and explains that women (if a women's focus group) who are on the bottom step have almost no power and freedom to make these types of major life decisions. Women on the top step enjoy great power and freedom to make most all major life decisions. Each participant is then asked to write privately on a small slip of paper the step they believe the majority of their own gender to be positioned in their village *today*. These slips are collected and the responses posted anonymously next to the relevant step on the flipchart. After describing the pattern of responses, facilitators invite respondents to discuss the ratings. This is the end of the Ladder of Power and Freedom activity for focus groups with young men and young women.

For the nonpoor focus groups a further step is added. Individual focus group members are asked to rate levels of agency *ten years ago* for women of their community (or for men, if a men's focus group) and these are added to the flipchart. They then discuss the reasons for the trends observed. A summary statistic (Change in agency = Mean step now – Mean step 10 years ago) is generated for comparing perceptions of change on the ladder among the focus groups. *A positive summary statistic indicates empowerment.*

The **Ladder of Life** activity is conducted with focus groups of poor women and men. It explores perceptions of wellbeing and experiences with moving in and out of poverty. The facilitator begins the activity by asking focus group members to reflect on the characteristics of the "best-off" households in their village. Next, the focus group moves to the bottom step of the ladder and describes its "worst-off" households. Then the focus group is free to add however many steps it needs to capture the different wellbeing groups—and their corresponding traits—which are present in its village. During these testimonies, the facilitator captures key traits of each ladder step on a flipchart for the group. Most ladders are three or four steps, although a few have more steps. Once agreement is reached on the ladder steps and traits, the focus group identifies the step at which local people are no longer considered poor, or its own "community poverty line." The focus group next works together to sort 20 seeds across the different steps which are representative of the households in its community. The sorting exercise is then repeated to indicate the distribution 10 years ago. Following this, the activity turns to discussions about the assets and capacities of farmers at the different steps and the experiences of women and men in their communities with moving up, getting stuck and falling down the ladder. The numerical findings provide the basis for generating a summary statistic [Moving Out of Poverty =

⁴ The ladder activities are adapted from previous methodology guides (Narayan & Petesch, 2005; Turk, Petesch, & Muñoz Boudet 2010).

$(\text{Share poor 10 years ago} - \text{share poor now}) \div (\text{share poor 10 years ago})$ for comparing perceptions of local poverty dynamics across the focus groups and case studies. *A positive summary statistic indicates poverty reduction.* While it is not possible to compare the ladders directly because they differ, it is possible to compare views about change on the Ladders of Life.

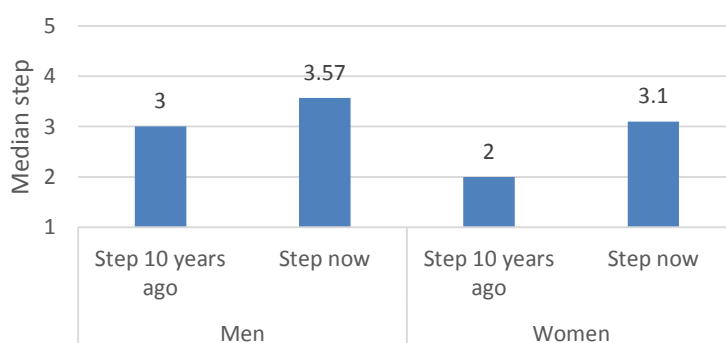
A. Expanding power and freedom

“I started to farm with my girls, and we have changed our lives completely.”
—A divorced mother, farmer, and petty trader, Nebele, Ethiopia

The large majority (83 percent) of the nonpoor focus groups⁵ report empowerment, and that the men and women of their villages are moving up their Ladders of Power and Freedom. These testimonies provided a valuable introduction to the strong normative forces which color conceptions of their position on the ladder (or level of agency) and their movement up, or empowerment. Men’s understandings of power and freedom are rooted in their gender ascribed roles as decision makers and providers for their households. Women, by contrast, are more likely to reflect on how their gender roles are changing as they become increasingly involved in household decision-making and income earning, which they view as empowering. As such, both men and women relate how their position in the household shapes their sense of agency, as do life-cycle transitions from sons to husbands or from new brides to mothers of younger and then older children.

Figure 1 presents the ratings from the Ladder of Power and Freedom activity, both for the current period and 10 years ago. The 27 women’s groups perceive a median of more than a one-step climb up their ladders to just above step three over the 10 years, while the 27 men’s groups report a greater sense of agency in the current period, with a smaller upward climb or sense of empowerment than the women. In two thirds of the cases (18 of the research communities) both the women’s and men’s focus groups report empowerment. The remaining third of the cases is roughly divided between, on the one hand, men reporting empowerment and women falling or remaining at the same step, and on the other, women rising and men falling or feeling stuck.

Figure 1. Levels of agency for own gender, now and 10 years ago (ratings by individual focus group members on five-step Ladder of Power and Freedom, 54 nonpoor focus groups)

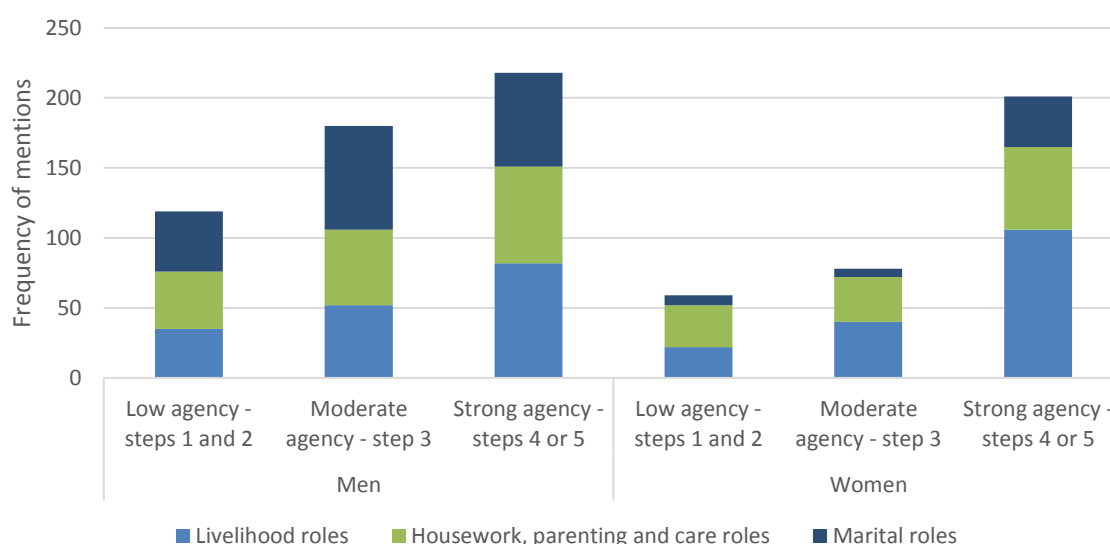


Note. Ratings refer to median levels reported for majority of men or women in study participants’ own communities. The lower steps indicate more limited agency.

⁵ Ladder findings from poor women and men follow in the next section, while the youth findings are presented at the opening of the youth section.

Figure 2 presents findings from the coded dataset on the three most prevalent themes which emerged during discussions about the ladder ratings (see annex 4 for code definitions). By way of explaining their empowerment, women speak in roughly equal measure about their different roles as wives, mothers, and providers for their families. By comparison, men stress their provider roles as they become more empowered, followed by their roles as fathers or sons, and say relatively little about their role as husbands. Moreover, the men's focus groups with ratings below steps four and five spoke much less about their power and freedom relative to all of the other focus groups, a response which likely indicates an inability to provide sufficiently for their families and thereby breaking norms of masculinity that are sensitive for men to discuss among peers (Connell & Messerschmidt, 2005).

Figure 2. Overview of key roles associated with agency on different steps of the Ladder of Power and Freedom (54 nonpoor focus groups)



	Women			Men		
	<i>Low agency - steps 1 and 2</i>	<i>Moderate agency - step 3</i>	<i>Strong agency - steps 4 or 5</i>	<i>Low agency - steps 1 and 2</i>	<i>Moderate agency - step 3</i>	<i>Strong agency - steps 4 or 5</i>
Livelihood roles	35	52	82	22	40	106
Housework, parenting and care roles	41	54	69	30	32	59
Marital roles	43	74	67	7	6	36

Note. Includes all codes with > 60 mentions. See annex 4 for code definitions.

Given that the adult men in our sample have been decision makers for some time in their own lives (and for generations), it is not surprising that they would perceive more limited empowerment than do women. Men's testimonies on steps three and higher most often focus on their roles as providers, with many indicating that they have been empowered by their improving agricultural livelihoods. Men in Pandhera, Nepal, for example, mainly position the local men on steps four and five, and say their confidence in farming has grown due to what they have learned from organizations working in their village. Or, as a farmer, from Agua Esperanza, Mexico, similarly explains about men's climbs from step two to step three, "[They] have achieved some things like Conservation Agriculture and improved cultivation." In Gbodomu, Nigeria, men on average rate themselves nearly at step four, and

attribute this to “improved varieties of maize, cassava, vegetables,” and other activities that have helped “to increase yield and thus money.”

The coding patterns also highlight how men frequently reflect on their power and freedom in relation to their roles as fathers and sons, and needing to shoulder “all of the responsibility” of their households. In Ranagar, Nepal, the men rate themselves nearly at step five, and explain that “we are capable because all of the children are on track.” Another in this group relates how he now takes decisions for his household because his mother has become “weak and unhealthy.” Similarly, in Kilosha of Tanzania, where men have moved up from step two to three, respondents say they are now “able to make decisions that move our families ahead,” while in the past this was not possible because they were living with their parents.

On the rarer occasions when men specifically reference their wives in relation to their sense of agency, it is mainly from the top steps and positions of authority: “We as men are to pass all the decisions. Although we do involve our wives, at the end of the day we are the ones to decide,” declares a member of the men’s focus group from Medu of Tanzania. They all rated themselves step five.

Although less evident in the coding patterns, women’s testimonies often reference their gender-ascribed roles and responsibilities as constraining rather than enabling their power and freedom. To explain their empowerment they speak instead of growing decision-making and economic roles, which are helping them to better manage their household responsibilities: “There is change because now we [women] decide, while before [parents or husbands] decided for us . . .,” reports a 36-year-old mother of three, housewife, and shopkeeper from Palo Verde, Mexico. In this village, women mostly say that over the past decade they have moved from the bottom steps of their ladder to step four. Or, in Mikita, Zimbabwe, half the women report climbing up to step five, with the first participant in that group exclaiming, “I think it is about gender because now as women we are able to stand on our own and have the same rights as men. We make the decisions even when it comes to digging holes. We are now on the forefront, and the men now take some advice from us.” In Kamunbu of Malawi, one woman explains that they have now climbed up to step two, because “There was no emphasis on gender equality in the past. Many women were not active but now women are active. They are informed of their rights. They now participate in some income generating activities and other programs that were initially dominated by men.”

In Hanawa of Ethiopia, the women disagree on the trends they are experiencing, with most positioning themselves on steps two or three in the current period, and barely perceiving any movement on their ladder. According to a 50-year-old farmer and petty trader in this group who perceives little change in the local women’s power and freedom, “I have to show respect to my husband and his views. I often agree or he would be angry.” Another in this group counters that the “situation has changed for the better these days” and mentions the church and *kebele* [lowest level of government] teachings in recent years that encourage women not to remain in the house and “that we are equal when we do the same work as our husbands. . . . We plant in rows with our husbands . . .”

Together with their changing roles, women may also conceive of their agency in relation to longstanding norms associated with gender-ascribed roles and household position as daughter, wife

or mother. In Nebele, Ethiopia, a woman offers a rating of step one because “my husband makes every decision in the house. . . .” Or, in communities where norms are supporting more collaborative household relations, women who were still single ten years ago may relate how their parents used to make important decisions for them, and they have become empowered from marrying and participating more in decisions with their husbands. Women may also speak of parenting as empowering, “Life gets hard for us as the mother of the house. So we are bound to make decisions because we are the ones mostly affected by events of life,” explains a 42 year-old mother of four children from Mikita, Zimbabwe.

The importance of household status and the relative fluidity of norms is most evident in the testimonies of women running their households, who frequently report top step ratings even as the rating activity is supposed to apply to the local women in general: “My reason is that my husband died and I am living with my children for this reason I make every decision” volunteers a 35 year-old widow and mother of five from Wariso, Ethiopia, on why she is the only one in her focus group with a rating up on step four.

What is clear from our evidence is that gender norms are central to men’s and women’s notions of power and freedom and, in contexts like Hanawa, where gender norms are in flux and contested, women tend to perceive more limited empowerment and sometimes disempowerment.

B. Improving wellbeing

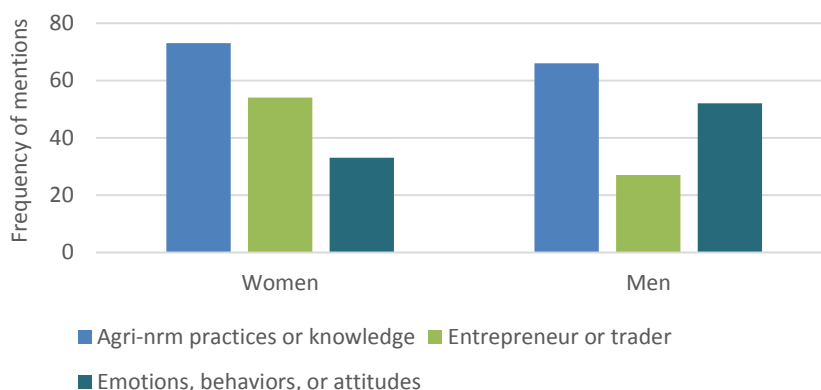
The large majority of focus groups with poor men and women report upward mobility on their Ladders of Life. The men observe that over the previous decade a median of 27 percent of the once-poor households in their villages moved above the community poverty line agreed by their focus group. Women put local poverty reduction at 17 percent overall. This variance is inconsistent by gender and location. Men and women in San Antonino, Mexico, report 83 percent and 72 percent declines in poverty, respectively, from very high levels ten years ago. At the other extreme, men in Mashowa, Zimbabwe, report 80 percent of the local households slipping into poverty, while women observe a healthy third of the once-poor households moving above the poverty line. Nevertheless, overall, men generally perceive more poverty reduction than do women.

Figure 3 indicates that both women and men most often describe agricultural activities in their efforts to bring their households out of poverty; however, important gender differences emerge in these narratives. Men stress stepped-up farming activities in their initiatives to escape poverty, but refer to financial and nonfarm strategies, too. The narratives about women’s initiatives to escape poverty more often detail how they thread together diverse small agricultural, petty trading, and savings activities. In particular, women report entrepreneurial activities twice as often as men in their descriptions of how local women helped their households to move out of poverty.

In Orile Anko, Nigeria, the men report 31 percent poverty declines. As one farmer in the poor focus group stresses, “We have men who are hardworking and resilient, and with the help of God, they have been able to move up. Their farms are expanding.” Another from the group concurs, elaborating that the farmers climbing the ladder are “doing the right thing at the right time, making sure [they] carry out land preparation, planting, and other activities when it is due. This is because

there is hardly any other activity that thrives here except farming.” For many men, achievements with farming are fundamental to their possibilities for leaving poverty behind.

Figure 3. Most prevalent themes associated with movements out of poverty by own gender in coded data (54 poor focus groups)



Note. Includes all codes with > 50 mentions by at least one sample group. Coding frequencies to marital roles were set aside, however, due to questions which specifically focused on couples and mobility processes that biased the coding.

Men reflect more often than women on the psychosocial dimensions of mobility (captured by the emotions, behaviors, or attitudes node in figure 3), such as the need for strong drive, hard work, persistence, and avoidance of antisocial behaviors. In Wariso of Ethiopia, where men report 11 percent poverty reduction, a 40-year-old widower and father of four cautions that local men escaped the bottom ladder steps by avoiding “obstacles such as addiction to khat and alcohol,” which allows them to save their earnings for renting or share cropping land. Or, as a 35-year-old farmer and father of four explains, [I] “always had a dream to change my life style,” and shares how he invested over the years in livestock to provide draught power and expand his landholdings for farming.

If poor women are less vocal on these attitudes and behaviors for themselves, it is perhaps because norms discourage them from imagining and voicing great economic aspirations, that they take for granted a need for grit, and that vices in women are harshly sanctioned. Women’s testimonies about escaping poverty detail how they take farm jobs, save tiny amounts day-by-day, and borrow as stepping stones to accessing more remunerative activities for moving their households up the ladder. Many provide labor to their spouse’s crop production. Women also climb the ladder by mobilizing assets such as land and inputs to cultivate food crops in home gardens or cereal crops, and many also raise livestock. These activities enable them to provision their families and reduce household expenditures, while they also earn income from vending primary and processed goods from their excess produce.

This explanation from a 32-year-old farmer of Zirashawe in Zimbabwe is illustrative of how women integrate diverse livelihood initiatives: “If she decides to join the farming club the other members will assist her with labor in her fields. She can then go and sell sisal fiber mats and use the money to buy seed. This will give her a good yield which will move her up the ladder.” Women of Zirashawe report local poverty declines of 19 percent. Box 3, which concludes this section, weaves together both the agency and poverty findings from a village of Tanzania; and here members of the poor women’s focus group describe the households who are just above the community poverty line accordingly: “They are respected, and their wives are doing business either in kiosks or petty business.”

Less frequently, women describe undertaking more significant agricultural activities in their upward mobility processes. In Nkhopa, Malawi, women grow maize, groundnuts, pigeon peas, and soybeans, and they cultivate their own plots in addition to small home gardens. They also take loans and invest their proceeds from petty trades of vegetables to purchase fertilizer and herbicides. This poor women's focus group observes poverty declines of nearly 30 percent. In Ranagar of Nepal, where men's migration is especially high, women explain that they "actively participate in training and agricultural excursions" and use remittances to support their agribusinesses and vegetable farming for escaping poverty. In Ranagar, women say poverty has fallen by half.

Box 3. Case study: Contested norms surrounding empowerment and poverty reduction in a Tanzanian village

Study participants of Mogorowi, which is also in the Morogoro region of Tanzania, engaged in especially rich focus group discussions about their agency and wellbeing. These testimonies bring to life the fluid and slowly changing gender norms of their village, and important differences in perceptions of these changes. The discourse from Mogorowi's young women's focus group stands out as the most encouraging, while poor women express strong frustration and suggest that poverty in their village would fall much faster if men would only cooperate and support them more.

Farmers of Mogorowi cultivate maize and rice, raise livestock, and fish (mostly men). They also grow and market vegetables collectively using irrigation. The focus group of nonpoor men largely place themselves on step four of their Ladder of Power and Freedom and explain, for instance, that their vegetable groups, irrigation, and other agricultural developments have fueled their empowerment. Local women report themselves on step three, observing that married women cannot make independent decisions; and, should they leave their husbands, "they again return to live with their parents."

When reflecting on their power and freedom a decade ago, four of the ten men in this group placed their ratings one step higher—making them the only group of men in the 27 case studies to observe modest disempowerment from steps four and five. Changes in intra-household decision-making proved to be at the heart of their concerns. In the past, men "used to decide about everything," but today decision-making is largely, though not always, shared. In some cases, women take decisions in men's absence as when someone falls sick and assets must be sold to ensure treatment. "We are at the fourth step meaning that we never make all decisions. There are times you are not at home so there are decisions your wife will take," explains a member of the group. Another adds, "As a human being, it is impossible that you will make all the decisions. Sometimes you need to leave room for other members to help you in finalizing the decisions otherwise you cannot succeed. You will end up becoming a dictator."

For some of these men, the increase in women's participation in intra-household decisions has pushed them down a step. Nevertheless, these men speak comfortably about their agency in relation to women assuming new roles, and some men counter that they are not disempowered. One man, for instance, says that 10 years ago he relied on his father "to buy me clothes and shoes, but today I can do this for myself." And another declares, "As you know, I am the household head. The whole household waits for me to decide." Again, across the wider set of cases in this study, most men derive empowerment from moving into and maintaining their gender-ascribed roles as their household's main authority and provider; and unlike this Mogorowi focus group, they talk little of their wives.

The women's nonpoor focus group of Mogorowi identify themselves as farmers, with half of them running petty businesses, and the large majority rated women on step one 10 years ago. Echoing the men, they associate their empowerment with gaining greater say in decision-making because they have since married and "now that you have your own household you can plan with your husband." Also, when single, their parents

directed all of the farming. Again, one's position in the household and life cycle often interact to shape perceptions of agency.

At a mean of step 3.6, young women of Mogorowi report a higher level of power and freedom than the older adult women and ascribe this to having more education and being good with business. They explain that they have reached an age when "we have to express our feelings and take actions . . ." Young men position themselves on step three, seeing themselves as still dependent on their parents to provide starting capital for businesses.

The focus groups with poor men and women report levels of poverty reduction of 29 and 13 percent, respectively. Poverty now affects some 70 percent of the village, according to the men's focus group, and 75 percent, according to the women's.

Table 2 presents the descriptions for the four-step Ladder of Life developed by the focus group with poor women. As to be expected, land size and ownership are critical determinants of a household's status on their ladder. Adult children who are "employed," meaning they have (more or less) stable jobs and income, also figure as a marker of status, as do the frequency of meals. The women associate step three with households that include women running petty businesses; it is revealing of changes in gender norms that such businesses are a source of respect for them and their families. By contrast, members of households in the bottom steps, underneath their community poverty line, "depend on the mercy" of others and struggle for recognition and voice.

Table 2. Ladder of Life, poor women's focus group, Mogorowi, Tanzania

Step 4	<ul style="list-style-type: none"> – They have many and large farms. – They have more than one house. – They are able to eat three or more meals a day, in the morning, lunch time, and supper. – They can eat and have food left over. – Their children are studying; others are employed. – Some of them are studying in good schools outside the community. – They can go to the hospital at any time they get sick even if it is at two in the night! – They have a ready budget for health. – They are respected because many people depend on them for help.
Step 3	<ul style="list-style-type: none"> – They meet their basic needs. – Their children are going to school with no difficulties. – They have land and can easily rent more land during farming season. – They are respected, and their wives are doing business either in kiosks or petty business.
	COMMUNITY POVERTY LINE
Step 2	<ul style="list-style-type: none"> – They have problems obtaining their daily needs. – They manage to eat two meals once in a while, but most of the time they are able to obtain only one meal. – Their ability to get food mainly depends on relatives or community members. – Some are disabled but some have chronic diseases that discourage them from struggling to make a living. – They are respected as community members but are never taken seriously. – Even if they have a point they are not taken seriously because in most of the time they are drunk or have scandals in the community.
Step 1	<ul style="list-style-type: none"> – We have households who have no land at all and depend on the mercy of other people or relatives to give them land and housing for farming and staying. – People on the first step have a very small piece of land and some do not have any at all.

In Mogorowi, like so many other communities in the study, some women have helped their households to climb up the ladder and escape poverty by joining groups that provide low interest loans, which they invest in businesses, such as selling bananas and vegetables, and in their children's education. Men, they say, help their households move up by renting land and earning money from maize and rice. When directly asked about whether poor women use improved seed varieties to get ahead, the women reply that it would be impossible: "If someone works on other people's farms in order to get food, how can she manage to buy the improved varieties?"

A 35-year-old mother of three further explains that what prevents more local women from escaping poverty is "male dominance"; she then proceeds to speak to the gender inequalities and uneven and slow processes of normative change in her village: "Although some men are losing the habit, some still make decisions and hide opportunities from their women. Men have opportunities to go and work far from home, unlike women, yet women have no say in the income they earn there. This slows down women's efforts to forge ahead." For the many poor men of the village still unable to move up the ladder, the women identify causal factors such as landlessness, laziness, drinking, floods, and prolonged drought.

Poor men report that they have helped their households get ahead and move up the ladder with brickmaking, rice farming, joining vegetable groups, and using water pumps to irrigate. Men also say that they have moved up by allowing women to work, and "this is different from the past when women were denied opportunities to work." Like women's focus group participants, men report it to be difficult for bottom step men to take advantage of improved crop varieties due to the expense and procedures required.

In Mogorowi, when directly asked how women and men support one another's initiatives to move their household out of poverty, a sense of frustrated expectations emerges in one poor woman's response: "He must recognize that the woman has rights in the utilization of the available resources in the family." Poor men, meanwhile, say they are being supportive by allowing the women to work.

C. The freedom and power of tipping points

The MAIZE sample features five cases where the Ladder of Power and Freedom and the Ladder of Life data are consistently and significantly favorable. These *tipping point* cases are also marked by evidence of greater encouragement of women's agricultural innovation and growing gender equality across varied economic, social, and political domains. In these five communities, where both women and men perceive strong empowerment and poverty reduction, their initiatives to better their lives are fueling and being fueled by a more inclusive normative environment and better functioning local level institutions. The five tipping point cases feature communities where:

- i. Nonpoor focus groups report climbing up their Ladders of Power and Freedom an average of one step or more,
- ii. Poor focus groups report at least 10 percent of their village's poor households crossing the community poverty line, and,
- iii. Youth focus groups report at least step three on the Ladder of Power and Freedom.

In other words, *all* six focus groups in each of the five cases consistently report favorable trends on their respective ladders (or a favorable level of agency for youth). Two of these cases are in Mexico, and one each in Nepal, Nigeria, and Tanzania. Relative to the other cases, the women and men residing in the tipping point contexts observe much greater poverty reduction *and* empowerment,

and youth display substantially more agency (table 3).⁶ This suggests that youth as well as older adults both perceive and contribute to these favorable dynamics.

Table 3. Comparing tipping points and other cases on perceptions of local poverty and empowerment trends
(median ratings by individual focus group members in 159 poor, nonpoor, and youth focus groups)

<i>Sample group</i>	Household movement out of poverty on Ladder of Life		Movement up Ladder of Power and Freedom by own gender		Current status on five-step Ladder of Power and Freedom for own gender	
	<i>Poor men</i>	<i>Poor women</i>	<i>Nonpoor men</i>	<i>Nonpoor women</i>	<i>Young men</i>	<i>Young women</i>
5 tipping point cases	38%	50%	1.00 step	1.90 steps	3.75	4.00
22 other cases	25%	14%	.78 steps	1.00 step	3.00	2.70

While favorable trends are consistently reported in eight other cases as well, one or more of their focus groups perceive limited climbing on their ladder. In the remaining 14 cases, focus groups observe a mix of climbing, falling, or no change on their ladders. These more common dynamics in the cases are explored in sections III and IV to follow.

Tipping points and institutional change

In the tipping point contexts where women and men simultaneously perceive strong empowerment and poverty reduction, our data provides evidence of more inclusive local institutional functioning. The normative environments in these contexts had transformed to encourage more equitable intra-household decision-making and greater recognition and support for both women's and men's economic contributions and civic engagement. However, these processes manifest differently in the five tipping point communities.

Table 4 compares characteristics of the tipping point cases with the 22 other research communities. The tipping points stand apart in diverse ways, but most especially for their far higher share of households with i) men who migrate and ii) female headship. Women's job opportunities and temporary migration are higher in the tipping point cases as well. It is interesting that poor men in tipping points more often than elsewhere observe their local job opportunities to be the same or deteriorating, yet they nevertheless perceive strong poverty reduction and opportunities to make a living with own-account farming and jobs beyond their localities. Electricity and educational opportunities are also somewhat better in the tipping points.

These circumstances likely combine to provide women with more space for withdrawing from and changing the norms which most constrain them. Evidence of normative changes can be found, for instance, in the data on greater women's physical mobility, less domestic violence, and higher likelihood of different types of women—single, newly married, older married and widowed—to be

⁶ The contribution of both men's and women's significant empowerment to more inclusive local development is consistent with earlier studies on which this methodology draws (Muñoz Boudet, Petesch, & Turk, 2013; Petesch, 2011). This is the first study, however, to engage all of the focus groups from each case study in ladder exercises on agency or wellbeing.

working for pay relative to the other communities. The tipping points do not differ in the strong presence of women's petty trading nor their limited political leadership.

It is challenging to document processes of normative change because they are often slow, uneven, and contested, although rapid shifts also sometimes occur. Relative to the other cases, focus group testimonies from both women and men in the tipping point cases are more likely to speak openly and favorably about the local women's farm management and trading activities. Across these five cases focus groups with poor men and women mainly indicate that community members are supportive and understanding of working mothers who take local jobs beyond the homestead. The tipping point cases also feature more favorable conditions for women to connect with formal and informal networks to strengthen their livelihoods. In four tipping point cases, women are active participants with men in agricultural extension programs. In the fifth case, an indigenous tropical lowlands village of Oaxaca, Mexico, women are discouraged from attending extension opportunities, although many do manage farms in their husbands' long absences. Local women in this same village also work together in small groups raising and selling livestock and vegetables.

Norms do not necessarily shift in unison. Some norms are more resistant to change than others. Regarding women's ability to take control of their family inheritance, for instance, the testimonies from tipping cases mainly indicate it would be difficult for a woman to exercise control, as in the rest of the sample.

The variability of social change

Processes of normative change and institutional inclusion articulate differently across the tipping point cases. In one case—Ranagar in Nepal—men are investing significantly in their wives' livelihoods and taking on reproductive roles in the household. The poor women's focus group corroborates these normative shifts, explaining that men are moving their households out of poverty by taking jobs abroad "to support their wives' agribusinesses," by saving money and by "cooking, cleaning the house, and taking care of children in the absence of wives." In this community, focus groups of poor women and men report 25 and 40 percent drops in poverty, respectively, from levels of 50 and 60 percent, respectively, a decade ago. Again, these women say they contribute to moving their households up and out of poverty by participating in the various agricultural extension opportunities available in Ranagar as well as in the local farmer associations and cooperatives (see box 4). The women indicate that villagers of both sexes have stopped drinking in order to save money.

Gbodomu, in Nigeria's Oyo state, is another tipping point case where both women and men attest to significant empowerment and poverty reduction. Yet, this case illustrates different processes of normative change and innovation. The poor men's focus group observes poverty to have fallen by nearly 40 percent, with one participant warning that farmers will never get ahead if they fail to adopt the new agricultural practices: "This new maize that we are talking about, due to its early maturity and high demand and price in the market, will help someone overcome poverty. But without it, it may be difficult." In this village, however, practices appear to be changing faster than some norms. It is one of the few communities among the 27 where neither men nor women express favorable views of gender equality when asked, although women are deeply engaged as traders in the local market and some are managing farms.

Table 4. Community characteristics of tipping points and other cases

SOURCE		5 TIPPING POINT CASES	22 OTHER CASES
		Median	
KEY INFORMANT	DEMOGRAPHIC CHARACTERISTICS Share of women-headed households in community Rating on share of households with men who migrate temporarily (1=almost none, 2=1/4, 3=1/2, 4=3/4, 5=almost all) With women who migrate temporarily Rating of households with men or women who migrate permanently	30% 4 (or ¼ of households) 2 (or ¼ of households) 1 (or almost none)	13% 2 (or ¼ of households) 1 (or almost none) 1 (or almost none)
YOUNG WOMEN	Typical age women have first child	17	17
KEY INFORMANT	INFRASTRUCTURE AND ECONOMIC CHARACTERISTICS Share of communities with: Irrigation Health clinic Electricity for most villagers Fewer than ¼ of school-age girls in secondary school Fewer than ¼ of school-age boys in secondary school Share of communities with upper-secondary school Share of men with irrigation (where present) Share of women with irrigation (where present) Rating on share of women sellers in local market (1=almost none, 2=1/4, 3=1/2, 4=3/4, 5=almost all) Share of village women who take jobs as agricultural workers	20% 80% 80% 20% 20% 20% 50% 50% 4 (or ¼ of sellers women) 50%	44% 61% 30% 44% 39% 30% 40% 28% 4 (or ¼ of sellers women) 30%
POOR MEN	Share of communities with rising local job opportunities for men	40%	74%
POOR WOMEN	Share of communities with rising local job opportunities for women Share of communities where common to work for pay for: Single young women Married young women Married older women Widows	100% 80% 80% 80% 100%	70% 49% 61% 83% 87%
YOUNG WOMEN	WOMEN'S PHYSICAL MOBILITY Out of every 10 local women, # can move freely in public (individual FGD member ratings)	7.0	6.1
YOUNG MEN	WOMEN'S PHYSICAL MOBILITY	8.4	6.1
POOR WOMEN	DOMESTIC VIOLENCE Extent women hit or beaten over past year (individual FGD member ratings 1=almost never; 2=occasional; 3=regularly; 4=frequently) In current period A decade ago	1.5 2.3	2.3 3.0
POOR MEN	In current period A decade ago	1.5 2.0	2.0 3.0
KEY INFORMANT	POLITICAL AND CIVIC PARTICIPATION Share of women council members Share of women attending community meetings Share of women active discussants in meetings	10% 50% 20%	10% 43% 20%
KEY INFORMANT	Share of communities with the following local groups characterized by regular- to high-level of activities: Credit groups Economic groups (farming, fishing crafts) Health groups Education groups Youth or sports group	20% 80% 40% 60% 100%	22% 45% 48% 52% 48%
NONPOOR WOMEN	Social harmony in village (individual FGD member ratings, with 1=most villagers very suspicious; and 6=very helpful) In current period A decade ago	4.9 4.7	5.0 5.0
NONPOOR MEN	In current period A decade ago	4.8 4.0	4.7 4.3

Box 4. Woman innovator profile, Ranagar, Nepal

A 44-year-old farmer and mother of two sons, Tara credits her significant climb from step two to step five on the Ladder of Power and Freedom to training she received in agriculture, gender, and leadership. Five years ago she began growing hybrid maize and has been sharing her newly learned improved practices with other farmers. “Now I have become known as an innovator farmer in the village,” she says. While local maize is tastier and they can reuse the seeds, Tara reports that hybrids resist storms and heavy rains, and productivity is one third higher. She has had issues with poor quality improved seeds and inorganic inputs, but credits her thriving agribusiness with being able to send her sons to university. Like her neighbors, Tara reports that “most people have started large-scale production and making good profits from agribusiness.” Of particular interest is her observation about how her relationship with her husband has improved: “Now everything is going smoothly. But in the beginning my husband used to get angry whenever I wanted to participate in trainings and meetings. After getting gender training from Heifer International, he has changed a lot. Now, he reminds me to go for a course if I forget.”

The men explain how the concept contradicts their religious teachings, with another adding that “. . . for me, all the tedious work is meant for men, and I am sure that no woman can try half of what I can do.” Indeed, the local women observe about half as much local poverty reduction as the men. Yet, while gender equality may be a concept with little resonance for them, women agree it’s no longer the “olden days” when “husbands catered for their wives’ needs. . . . I work and cater for my family . . .” Nonpoor women say they now make enough money “to allow us to enjoy the freedom to make major decisions.” Local women vend food and clothing and run laundry and event decoration businesses. They also use agricultural extension. “I have farmland and control it,” says one nonpoor woman.

The tipping points show that there can be phases in the lives of communities when more rapid and inclusive development unfolds, and the transition towards more fluid gender norms is central to these highly favorable dynamics. While it is unlikely that AR4D interventions alone can trigger these processes, evidence indicates how some investments can nevertheless strategically contribute to such transitions by supporting opportunities which better enable both women and men from the same communities to build their capacities *simultaneously* to access and benefit from promising agricultural innovations and other local opportunities.

D. Climbing among women-headed households

An unexpected finding from our sample is the prevalence of women who are heading their households, innovating in their agricultural livelihoods, and working their way out of poverty. While more common in tipping point cases, the initiatives of “unattached” women with farming, livestock, and informal agri-food vending can be found throughout the data, including in the communities with more restrictive norms. The testimonies make clear that it is more acceptable for them than for married women to work for pay, move about their communities unaccompanied, interact with the opposite sex, access information, participate in networks and learning opportunities, and assume leadership positions. In short, across our sample, gender norms are much more fluid for women who are running their own households.

Our findings of more numerous women-headed households in the tipping points are, in fact, consistent with wider trends in sub-Saharan Africa of women-headed households now constituting

one-in-four of the region's households and experiencing *faster* poverty reduction than male-headed households (Milazzo & van de Walle, 2015).

"I am proud to say that I am one of them," remarks a 42-year-old woman farmer from the Ethiopian village of Nebele of how she moved her household out poverty. "I have been moving up since I divorced my husband and started raising my eight children. I have rented land . . . and entered into *equb* [an informal savings group] to buy inputs for my land. I also am growing vegetables as well as selling firewood." In Wariso of Ethiopia, a farmer relates how a widow in his village became "known in the area for her bravery." He shares how she sold false banana (a root crop processed into a variety of staple goods) in the market, and used that income to purchase heifer for cattle-breeding activities. Likewise, we learn of a 48-year-old woman of a village in the Oromia region in Ethiopia who separates from her husband and manages to provide for the six children still living with her by continuing the farming practices with improved maize seeds that she learned from her husband. She was also one of the first to cultivate potatoes in her area, and became one of the woman model farmers of her *kebele*.

Across the case studies well beyond Ethiopia, study participants carefully distinguish between the more fluid gender norms which apply to widows compared to the more restrictive norms for married women. A participant in the focus group of poor women in Kamunbu of the Central Region of Malawi observed that it is easier for a widow to work "because they have no one to provide for their needs. They are also free to make decisions about working because they are not controlled by their husbands like married women." In a poor indigenous community of Mexico, Montevidal, the men's nonpoor focus group explains that the only kind of women to leave their village in order to vend in a market would be widows because, for many men of their village, women are supposed to "work in the home."

Likewise, in the narratives about movement on the Ladder of Power and Freedom, many women explain that they have been empowered by having to assume authority roles as they became widowed, separated, or *de facto* household heads due to spouses who migrate or are disabled. In Pandhera, Nepal where men's migration is especially high, women position themselves on step four of their Ladder of Power and Freedom, with one explaining, "Most of the men go abroad for work so we have to make every single decision at home." In contrast, in Tanwa, Tanzania, a community where women report no movement at all from step three over the past decade, they detail confining norms that leave women fearful of making decisions and needing to explain their every shilling earned. In these circumstances, they indicate that some local women have separated in order to be able to run their own businesses, although this means they must abandon any claim to their crops and land.

In addition to focus group testimonies, women-headed households emerge in disproportionate numbers in our sample of semi-structured interviews with women innovators. They had been singled out for these interviews because they were known for trying out new things. Among the 54 women innovators interviewed, 21, nearly 40 percent, identify themselves as *de jure* heads of household—single, widowed, separated, or divorced. This figure does not include women interviewed who report their status as married but whose husbands may be away working. By comparison, among the 54 men innovators interviewed, there is only one single man and one widower.

This is not to say that households headed by women do not face great struggles. In Ethiopia, especially, but in other countries as well, testimonies gathered attest to the hard lives, impoverishment, loss of respect, and exclusion still endured by women running their own households. “All the burden is on me,” laments a widow from Mwaghavul, Nigeria, of having “to take responsibility for every aspect of my family.”

These findings suggest that women heading their households may offer entry points for strengthening agricultural innovations at the local level as they can provide role models which may help to shift normative environments for other women and men. Further work is needed, however, to identify approaches for supporting this vulnerable population group in ways that do not increase their social exclusion, heavy work burdens, and other disadvantages.

SECTION III. WHAT UNLEASHES AGRICULTURAL INNOVATION?

When it comes to the best new agricultural opportunities in their villages, men and women across the 27 research communities often identify the *same* innovations and the *same* leading reasons for their top ratings. Improved maize varieties, followed at some distance by CA-related practices (defined in footnote 2), emerge as the most highly rated innovations over the past five years. Improved maize varieties are valued for their sharp production gains and, depending on local market conditions, for generating strong cash earnings.

Notwithstanding these widely shared views, the testimonies gathered for this study make evident that men and women experience the benefits and risks arising from innovation processes very differently. In contexts where normative environments are most encouraging of women’s agency (e.g., the tipping points), the benefits to both women and men are larger from innovation processes. In addition to these highly favorable dynamics, we offer two more community typologies which emerge from common patterns in local innovation experiences. In the contexts which we refer to as *climbing cases*, the most common in our sample, many gender norms governing women’s behaviors are in flux and uncertain. Women along with men are actively innovating in their agricultural livelihoods, but relative to the tipping points, women are deriving more limited empowerment and recognition for their growing economic initiatives. More generally, the normative climate is constraining the scope and distribution of the benefits from agricultural innovation in these contexts.

We also examine innovation processes in a few case studies which we label as *churning cases*. In churning contexts, either one or more of the focus groups of either gender testify to being excluded from or disadvantaged by the development processes unfolding in their communities. The different ladder data are often inconsistent, with mobility on one or more ladders being flat or downward. Gender norms may be in flux or highly discouraging of women’s agency.

Communities are highly heterogeneous. The objective of offering the three community typologies of tipping point, climbing, and churning cases is to provide a broad framework for understanding important regularities which emerge from the data in how gender norms and agency interact on the ground to shape innovation processes.

A. The top-ranked innovations

In each of the 159 focus groups facilitators ask: “Thinking back over the past five years or so, what new cropping or livestock practices, ways of managing local natural resources, or organizing agricultural activities have people here tried out or experimented with?” This question is introduced early to the focus groups preceding any discussion of agricultural issues. Facilitators are trained to break down the question and encourage rich discussion on all of the new technologies, practices, and networks—whether devised and introduced locally or externally, and whether through formal or informal channels. The facilitator lists each one mentioned on a flipchart for all to see. The group reviews its list of innovations and ranks the two most important for the men of the community, and separately, the two most important for the women of the community.

In 77 percent of the focus groups, one or both of the top-two rated innovations overlap for both genders, meaning that focus groups often identify one innovation (34 percent of the time) or both of their top-two innovations (42 percent), as the same for the men *and* the women of their communities.

But focus groups did not just hold common views within their own groups. Amongst all of the top-rated innovations identified, study participants favored improved maize seeds by a large margin (table 5).⁷

Table 5. Share of focus groups rating improved maize as a top-two innovation for local women and men
(159 poor, nonpoor, and youth focus groups)

	<i>Improved maize rated top two</i>	<i>Poor focus groups</i>	<i>Nonpoor focus groups</i>	<i>Youth focus groups</i>
Women's focus groups	Top 2 for women	70%	56%	46%
	Top 2 for men	59%	70%	46%
Men's focus groups	Top 2 for men	67%	59%	60%
	Top 2 for women	52%	41%	32%

Overall, improved maize is rated as a top two on average by 62 percent of men's focus groups and 57 percent of women's. Poor women and men are the most likely, and youth the least likely, to rate improved maize as among the top two.

Below is an overview of the other top-two agricultural and natural resource management (NRM) innovations mentioned by focus groups from across the 27 cases:

- **Mechanization:** reaper, thresher, seeder, tractor, rotavator, water pumps.
- **Crops:** limes, vegetables, coffee, potato, enset (false banana), pepper, chat, sorghum, cassava varieties, okra varieties, rice varieties, groundnuts, soybeans, brown cowpea, sugarcane, wheat, new rice seeds, tomato varieties, new varieties of beans.

⁷ In all but one case study conducted, at least one focus group rated improved maize seeds highly for its own or the opposite gender. The exception is Montevidal, Mexico, a very poor and remote mountainside indigenous community where improved varieties have not yet reached.

- **Crop and land management:** Conservation Agriculture, row planting, fertilizer, ox-drawn ploughs using less soil, manure, conservation borders, vaccines, insect traps, agroforestry, forest conservation, afforestation, village forests, tied ridges, making contour ridges, irrigation, ridging for tobacco and soya, planting one seed, weeding three times, agrochemicals, herbicides, polytunnel for vegetable farming, use of compost fertilizer, pesticide-free production, planting a small area scientifically and harvesting more produce, early land preparation.
- **Animals and animal management:** goat-raising, buffalo-raising, poultry, improved chicken breeds, cattle, improved cattle, animal fattening, artificial insemination, vaccination; and
- **Miscellaneous:** credit, protected basins for potable water, clay stoves, watershed management, agricultural trainings, increased agricultural extension services, demonstration farms.

The breadth of innovations identified indicate numerous outlets for men and women to access agricultural and NRM information, services, and products, although the number of new opportunities identified ranges from three or four in some focus groups to nearly two dozen in others. In light of the different opportunities across the cases, the prevalence of improved maize seeds as a top two for so many adult focus groups is an encouraging sign of the technology's relevance and performance in the diverse agroecological and cultural contexts in this sample.

B. Gendered opportunities and constraints with improved maize

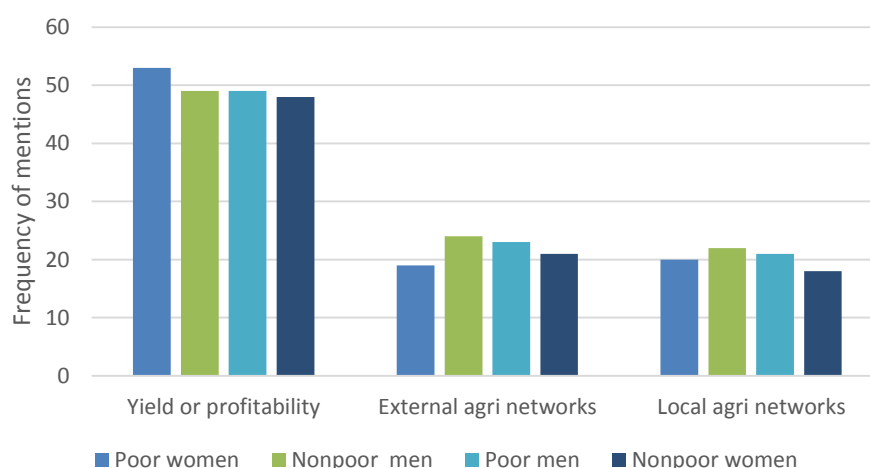
"Yes [improved maize] was rapidly adopted because of the short time it takes to mature and the income we get from it."—Poor men's focus group, Orile Anko, Nigeria

The focus group testimonies of the positive qualities of improved maize are consistent: they rate these varieties highly because they deliver greater yields and economic returns than local varieties. At the same time, study participants also observe challenges and risks, most often poor yields and profits, and the great strain this creates, as well as difficulties with affordability of improved seeds and required inputs. When comparing men's and women's testimonies about the various benefits and hardships in specific localities, the gender inequalities associated with innovation processes become evident. This is especially the case in more restrictive normative environments.

Figure 4 presents findings from the adult focus groups' testimonies about why they rate improved maize highly. Above all, men and women, better-off and poorer, valued the greater yields and profits that resulted from using the seed technology. Testimonies about maize yields are laced with reports from farmers of three-, four-, and even five-fold increases in harvests with improved rather than local varieties. Farmers appreciate how (some) hybrid varieties mature faster and better withstand extreme weather.

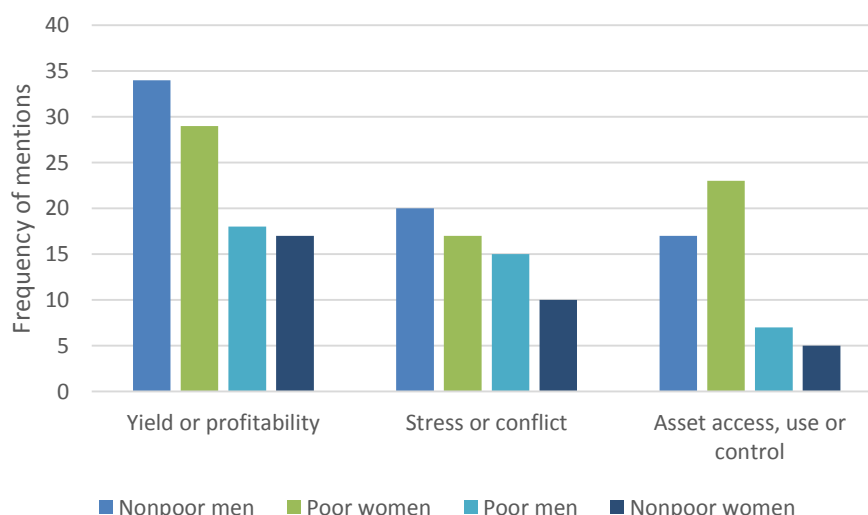
Figure 5 highlights the most prevalent coding associated with unfavorable observations about improved maize across the focus groups. The testimonies from the nonpoor men's and poor women's groups especially report difficulties with obtaining expected yields or profits, stress and conflict due to the additional time or labor required of cultivation practices associated with the seed technology, and hardships with mobilizing the finance required for seeds and inputs. Many testimonies indicate that adoption rates would grow if improved seed and inputs became more affordable.

Figure 4. Most prevalent themes associated with favorable testimonies of improved maize in coded data
(108 poor and nonpoor focus groups)



Note. The figure references positive assessments of improved maize that pertain to one's own gender, and displays all codes with frequencies of mentions > 20 for at least one sample group.

Figure 5. Most prevalent themes associated with unfavorable testimonies of improved maize in coded data
(108 poor and nonpoor focus groups)



Note. The figure provides frequencies for the references that apply to one's own gender, and displays all codes with frequencies of > 20 for at least one sample group.

To bring men's and women's various assessments of improved maize into sharper view, and further demonstrate how agency and gender norms work together to condition innovation processes, we turn first to a "churning" case study from Ethiopia. Hanawa presents an insightful example of the gendered benefits and challenges that men and women identify with adoption of improved maize. Of particular concern, Hanawa's women testify to increased agricultural work burdens and other disadvantages arising from the new seed technologies and cultivation practices in their village. The community's restrictive gender norms are important for making sense of the local women's limited capacities to resist or reduce these hardships in their lives. This is followed by a "climbing" case study where both women and men observe larger benefits and fewer tradeoffs, although these still differ importantly by gender.

Case study: Innovating in a churning community

With a population of 1,777, Hanawa is close to Hawassa city in the Great Rift Valley of Ethiopia. In this semiarid zone, soils are difficult to till and water sources scarce except for the few farmers able to draw water from the nearby lake. Many farmers recently adopted a set of new farming practices which include intercropping improved maize varieties with haricot bean, row planting methods, and applying chemical fertilizers such as Diammonium Phosphate (DAP) and Urea. This replaces use of landraces, broadcasting, and reliance on manure.

Table 6 below reproduces the flipchart from the poor women's focus group of the local innovations that have come into Hanawa over the past five years. The first column on the left presents the innovations identified by the women. The middle column shows that the women rate new intercropping practices (maize/haricot beans) first for the men of the community, followed by vegetable growing. They rate cattle rearing and improved maize varieties as the top two for women.

Table 6. Local agricultural innovations identified in past five years, poor women's focus group, Hanawa, Ethiopia

<i>New agricultural or NRM practices</i>	<i>Two most important for the men of the community</i>	<i>Two most important for the women of the community</i>
Terracing Row planting Improved maize Fertilizer Improved cattle Cattle breeding Fattening cattle (using zero grazing) Irrigated vegetable growing Poultry Intercropping of maize haricot beans	1. New package of intercropping (including row planting of maize and application of fertilizer) 2. Vegetable growing	1. Cattle rearing for milk production 2. Improved maize

A 55-year-old from the group relates that they rated improved maize highly for the local women because “. . . it is our main staple food, and we are responsible for preparing food for our family. As you know women are more concerned about availability of food in the household.” Another explains why they rated improved maize highly for men: “Their preference relates to bigger economic benefits since they are responsible for most of the household's needs in addition to food, like fertilizer. They prefer intercropping since they also sell haricot beans.” The testimonies speak to the highly gender-differentiated roles and responsibilities for the men and women of their village. In this village, norms for women remain highly restrictive of their freedoms, and women report limited physical mobility and significant domestic violence.

For the remaining five focus groups conducted in the village, improved maize or intercropping with improved maize are identified among the top-two innovations, but *only* for the men of the community. Hybrid maize is associated with commercial maize production which remains controlled by men farmers; however, local women contribute labor to the men's maize fields and a few cultivate and sell small quantities on their own. A participant in the nonpoor men's focus group corroborates the women's observations about men's preferences and the importance of income: “The improved maize seed ‘shone’ and ‘limmu’ are special. They provide good yields and income. As a result of the income, we changed our life and that is why we rank it on top.”

Rather than maize, poor men single out false banana and vegetables as the top-two innovations for the women of their community. False banana is Ethiopia's most important root crop which is processed into a variety of staple foods. A member of this men's group explains that "if the women have a false banana tree they know their family will not starve. Heifer and vegetable gardens are also a means of income for the women."

Men and women also speak of difficulties with the new farming practices, including the affordability of improved maize seeds and inputs as well as the added labor that row planting requires (also see box 5). The women of Hanawa report that they became more actively engaged in farming about four years ago because intercropping and row planting practices are more labor-intensive than traditional farming methods, and family members are needed to help in the fields. According to a 40-year-old mother of four in the poor women's group:

Women's role in agriculture has increased recently. Prior to that, we prepared food for *debo* [reciprocal labor] and stayed home. [Working in the fields] was taboo. The man took the entire responsibility for the farming and the woman for the household chores. Now women are taking over farming as men become more and more engaged in other activities, such as at the church and *kebele*.

Others in the group corroborate these experiences of men withdrawing from agricultural work and leaving women alone to tend to the crops.⁸ Such testimonies are not uncommon in the case studies where men report difficulties with their local farming opportunities.

The women express varied experiences and views about the recent changes in their lives. A member of Hanawa's nonpoor women's group relates, "Women are not farmers. They are their husbands' shadows. They work behind their husband. They support him. They do what he does but she is never considered the main farmer." Another woman from her group counters, "No, there are people like me who do farm by themselves. My husband died a few years ago. I do the farming myself." This brisk exchange demonstrates how different types of women, however hard they work, fail to obtain social recognition as farmers in many communities.

The narratives feature other contested accounts. Some women speak openly of selling small amounts of maize, vegetables, and dairy in the village market, while other women stress that men solely control decisions and sales of all produce, whether cultivated by the men or their wives. In some cases, women's inability to manage their increased work burdens can lead to marital conflict or breakup. One woman described how her husband's affair with another woman began "when the harvest started to go down. . . . It was difficult for me to handle all the work as I was also often getting sick. I also have to take care of my son who is blind."

Poor women estimate that perhaps 7 percent of their households have escaped poverty over the past decade, leaving some 70 percent of their village still poor. They attribute the persistence of extensive poverty to restrictive gender norms which constrain their households from adapting and responding to new realities: "Women do not have freedom of movement and we rarely work outside

⁸ Also see, for instance, Doss (2001) or Okali (2011, 2012) for similar findings of women's increased labor burden associated with technology introduction.

the house. . . . With the rising cost of living women are simply watching their household fall into poverty. It's because we have no say in the house." The nonpoor women of Hanawa barely register change on their Ladder of Power and Freedom.

Innovating and toiling to leave poverty behind are deeply gendered and relational experiences. Contradictory and stressful testimonies about gender roles and norms in these processes are more prevalent in the churning cases where the local climate is discouraging either men's or women's agency (also see Muñoz Boudet, Petesch, & Turk, 2013). In Hanawa, men register relatively strong empowerment and poverty reduction, and women little of either.

Box 5. Gendered challenges with maize farming in Ethiopia sample

The Ethiopia cases feature by far the most numerous accounts of hardships with improved maize. Study participants from all four case studies report ongoing issues with seed quality and accessing preferred varieties. According to a member of the nonpoor men's group from Nebele of Ethiopia, "The seed supply is almost never enough or not on time. And another time, the seeds were not good quality. Now we are almost giving up. So frustrating. We reported this, but they always tell us it's going to be different next time. But we don't see any change." In Hanawa, seed supply is observed to be timelier, although not necessarily for preferred varieties.

Many Ethiopian women report seed quality issues, as well, and speak of struggles with increased food insecurity, increased burdens on their time and labor, and violence against them. This observation from the poor woman's group in Oromila is typical of many: "Before we used local seeds called 'Jermen' and 'Sheie.' Now we plant improved seeds (maize 660 and 661). This year we planted 660, and the plant grew beautifully but it had no crop, which is a disaster. We have no idea how to survive. . . . We bought the seed from the Farmers Union and we heard it was mixed. I don't know the exact reason why. What I know is the harvest can only be used for cattle feed."

Study participants also observe that intercropping and row planting are "really time consuming" and require mobilizing additional labor. But deeply restrictive norms which limit women's agency and sanction violence constrain their capacities to manage their time and resist deployment of their labor in this way. "In my case when my husband leaves for the field I have to go with him. I have no one to do the household chores. When we return on the way back I need to collect firewood to make the fire and prepare food. If the food is not ready on time he will beat me. He never thinks I was with him the whole day. I also need to fetch water," relates a woman in the nonpoor focus group of Oromila.

Case study: Innovating in a climbing community

In the climbing communities where women encounter fewer barriers relative to the churning contexts, we still observe gender differences in innovation processes. Yet, these differences are less pronounced because women and men alike are more able to adapt innovation processes to their needs and preferences.

In Orile Anko of Nigeria, testimonies of positive experiences with adoption of improved maize overwhelm reports of challenges with the seeds. Orile Anko is a poor village of 2,500 residents located in Oyo state. Here farmers cultivate maize, cassava, plantain, kola nut, and cocoa for their own consumption and to sell the surplus in an active weekly local market. Much like Hanawa, the village lacks most infrastructure, but unlike Hanawa, practically all women enjoy freedom to move about on their own and women report almost no domestic violence. Orile Anko also has a longer

history of numerous local women earning a living beyond their homestead in petty trades and farm jobs.

Orile Anko's focus groups with poor and nonpoor women each select improved maize as a top two for both genders. The women speak of selling varied foods and drinks which they prepare from maize. A member of the poor women's group explains that improved maize "matures quickly and is marketable, which means we can get money in a timely fashion." Relative to Hanawa, Orile Anko's women speak far more favorably of the contribution of improved seeds to their petty trading initiatives.

Orile Anko's focus groups with poor and nonpoor men also rate improved maize a top two for both genders, but are careful to highlight the different benefits. "It's a quick source of income" for men, but "for women, improved maize is chosen because it can be cooked and roasted and can also be processed into other forms which add to household income," according to participants in the poor men's group. Nonpoor men observe much the same: men like it because "it matures early" and women "because they can process it . . ."

Although improved maize is often rated highly among innovations, important gender differences underpin these ratings throughout the case studies. In some cases, women themselves may not be employing the improved technologies but still identifying benefits for themselves and their families. In other cases, local women as well as men can access the seed, but they are tailoring it to different opportunities. In communities where norms are less restrictive, women as well as men more often report greater benefits for themselves, although men continue to command the larger harvests and sales most everywhere.

In Orile Anko, one poor woman explains that improved maize was quickly adopted, but they are unable to expand their production because this would require chemical fertilizer, "and most of us are poor and can't afford it . . ." Some can apply animal manure, however. Other farming challenges local women identify include needing to manage their "home chores" and having to "work on our husband's farms first before we plant ours . . ." In Orile Anko, nevertheless, *both* women and men report empowerment and poverty reduction.⁹

Across the dataset, testimonies can be found of difficulties with affordability of improved seeds and the chemical inputs they require (rising fertilizer costs receive frequent mentions); weak seed markets, and their changing and unreliable seed stocks on offer; weeds, pests, and diseases attacking crops; additional time and labor of some new practices; extreme weather, which alternately dries up, drowns, rots, or topples their crops; and insufficient access to land and good soils.

Women's capacities to manage and reduce these hardships, however, are constrained by varied normative pressures. As explored more systematically in section IV, these include responsibilities for their family's day-to-day food security. "For me, I have a problem," declares a poor woman from Mgorowi, Tanzania. "If I decide to use improved seeds and I do not get the maize out of it, how shall

⁹ But for modest youth ratings on step two, the case would have registered as a tipping point.

I feed my family? I had better deal with the type I know and that does not need many complications, and I am sure I shall get something out of it, rather than gambling.”

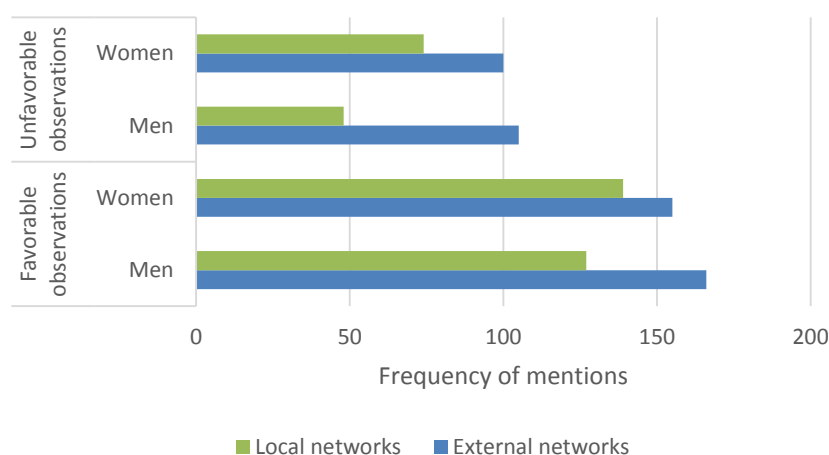
Farming livelihoods are arduous, risky, and stressful. But in “churning” contexts where norms are particularly restrictive, such as in Hanawa, the testimonies reveal that these difficulties are not shared equitably among household members, and women risk being harmed by innovation processes. Mogorowi and Orile Anko are “climbing” contexts where gender norms are less restrictive, and women enjoy varied outlets for strengthening their livelihoods even as men are better positioned to take advantage of agricultural innovations.

C. Capacities to connect and learn

Across the focus groups, facilitators ask study participants to reflect on the formal and informal networks in their villages where they learn about new agricultural methods and opportunities, share advice, and enjoy solidarity with other producers—all invaluable resources commonly referred to as “social capital” (Woolcock, 1998). The breadth and functioning of these social relations are so important because they provide the vital scaffolding for agricultural innovation processes to unfold on the ground, and affect whether these processes are more, or less, inclusive of different social groups in a community.

Figure 6 shows that focus groups speak more of external partners providing services in their communities than of their local networks; however, the coding patterns suggest greater risks with external partners. This is consistent with the wider theoretical and empirical literature on the benefits and limits of “weak” ties with individuals and networks unlike oneself, both near and far (Granovetter, 1973; Narayan & Cassidy, 2001; Portes, 2006).

Figure 6. Favorable and unfavorable testimonies of external and local agricultural networks (108 poor and nonpoor focus groups)



		External networks	Local networks
	Focus groups	Frequency of mentions	
Favorable observations	Men	166	127
	Women	155	139
Unfavorable observations	Men	105	48
	Women	100	74

The numerous favorable observations of women as well as men about their extension experiences are perhaps surprising. When asked by the facilitator whether the local women learn from agricultural extension agents, more than 80 percent of the responses are affirmative from members of nonpoor men's and women's focus groups alike. With some exceptions, the narratives indicate that numerous extension programs take measures to reach women farmers. In addition to mentions of a few female extension agents, study participants describe diverse training or informational workshops, plot demonstrations, excursions, and varied model farmer activities that target women or both genders. A few case studies provide strong testimonies of how agricultural interventions have greatly empowered women's as well as men's agricultural livelihoods and collective action.

This good news about women and extension notwithstanding, it is important to stress that who can benefit is highly variable (see box 6). While, for instance, focus group responses affirm that local women are availing of extension services, many of these testimonies then proceed to describe men as much more actively engaged than women with extension agents and trainings. Particularly in Ethiopia and Mexico, men and women alike qualify their *"yes, women learn from extension"* with explanations that farming activities differ by gender, that women's participation is limited due to household demands and constraints on their physical mobility, that one-on-one interactions with male extension agents (rather than in groups) could risk social disapproval for women, or that only women who head their households engage with extension services. Again, the more relaxed norms for women-headed households is likely an important factor contributing to their disproportionate numbers in this data as participating in agricultural innovation.

Box 6. Extension's reach in Ghodaha

Ghodaha is a fertile and irrigated village of 5,000 inhabitants set in Nepal's dynamic Western Development Region, and is one of the tipping point cases. Numerous men have migrated for jobs in the Gulf states, leaving these better-off women to manage farms independently in ever larger numbers; and it is interesting the degree to which participation in extension reflects changing social structures on the ground.

The poor men's focus group indicates that most very poor farmers do not own land, but they have been able to occupy government land, and "in whatever land we have, we try to grow maize." Poor men farmers "take advice from villagers" and extension agents. Men farmers who are a bit better-off and have some land of their own can also join the local farm cooperative. The poor women's focus group reports, meanwhile, that their village's poorest women "usually grow crops using traditional methods or by seeing others" and "do not participate in trainings and meetings related to agriculture." Further complicating this picture of gender and socio-economic differences in participation in extension, the nonpoor women's focus group say, "About 75 percent of women learn from agricultural extension agents." These testimonies suggest that in Ghodaha only the poorest women are untouched by extension, although their husbands may participate in extension activities.

In a small but still significant share of responses about whether women interact with extension services, study participants respond negatively. In Hanawa of Ethiopia, just as focus members contested women's farming and marketing roles, the nonpoor women also openly disagreed with one another about whether a woman can learn from extension agents. Cautioning her peers who spoke out about local women benefitting from extension, one of the participants warned, "It is not acceptable to stand out from others."

With a focus on cases where CA-related interventions are prevalent, the following section presents additional findings from Mexico, Malawi, and Zimbabwe of significant, albeit uneven, impacts of external partners. The climate and opportunities for different types of women and men to connect with, learn, and support one another to innovate in their agricultural livelihoods vary greatly from one case to the next.

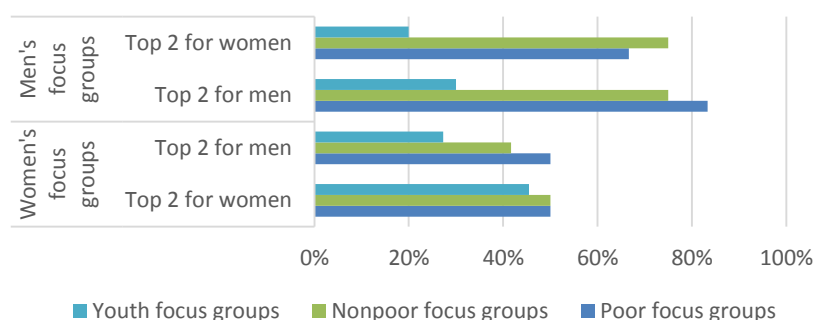
Facilitators further explore agricultural networks and learning opportunities with focus groups of poor women and men, opening with a general question about the kinds of individuals, groups, or institutions that members of their own gender turn to for advice and support for their agricultural activities. This question is then nuanced to inquire whether these outlets differ for the poorest women compared to less poor or better off women of their village (men, if a men's focus group). As illustrated in the following case study, these responses provide an insightful window into the complexity of local normative dictates governing social interactions between different genders, different socio-economic groups, and different types of local and external relations.

D. Conservation Agriculture in Mexico, Malawi, and Zimbabwe

CA-related technologies represent the second most highly rated innovation among focus groups. These top ratings emerge specifically where CA interventions have been active in the 12 case studies from Malawi, Mexico, and Zimbabwe. One outlier group, however, presents an interesting puzzle with this data: unlike all of the other focus groups, the women of Mexico never rate CA highly for themselves and only rarely do for men. Despite the knowledge- and labor-intensive requirements of CA, the women in Malawi and Zimbabwe still quite often rank CA as a top innovation for both women and men of their villages. Together, these testimonies provide insights into how agricultural interventions are not only shaped by local gender norms for agricultural roles but also how interventions, in turn, can slow or speed the transition to more fluid gender norms in a community.

Figure 7, which presents findings from the three study countries where CA-related technologies are mentioned by study participants, shows that three quarters of adult men's groups and nearly half of

Figure 7. Share of focus groups rating Conservation Agriculture as a top two for women and men of their communities (69 poor, nonpoor, and youth ratings)



		Poor focus groups	Nonpoor focus groups	Youth focus groups
	<i>Top 2 rating</i>	<i>Share of focus groups</i>		
Women's focus groups	Top 2 for women	50%	50%	45%
	Top 2 for men	50%	42%	27%
Men's focus groups	Top 2 for men	83%	75%	30%
	Top 2 for women	67%	75%	20%

the women's groups on average rate CA as a top two for their own gender or the opposite sex. The strong gender differences are mainly due, however, to the women's focus groups of Mexico, who rarely rate CA highly and represent half the women's sample. Youth focus groups, as with improved maize, also display less enthusiasm for CA (see youth section).

Across the cases of Malawi and Zimbabwe, both women and men participate in extension opportunities and express high regard for CA-related benefits; however, they also testify to significant obstacles. Diverse focus groups describe heavy costs associated with fertilizer and (sometimes) herbicide inputs as well as extensive labor requirements (and aching bodies) in the start-up years when basins or ridges must be carved into hard soils and heavy crop residues such as maize stalks carried long distances to cover and nurture the plots. Still, the testimonies of CA's benefits greatly outweigh the testimonies of hardships in this sample.

In particular, the communities in Malawi and Zimbabwe mainly report positive experiences with the Model and/or Lead Farmer Programs in which men and women farmers are trained in CA techniques and then are expected to share their knowledge with other local farmers either informally or formally in their farmer groups. Lead farmers provide assistance and reach out to extension workers for additional guidance when needed by local farmers. According to a member of the women's nonpoor focus group of Mikita, Zimbabwe, "We have women lead farmers who encourage other women on how to do Conservation Agriculture and make sure that they do it correctly." A woman from the same group adds, "Trainings always provide us with new information to improve on farming, and therefore when we hear about this we are eager to go out and try out."

In Zirashawe of Zimbabwe, a widow interviewed for the study relates that villagers wondered how it was possible for her to buy a cow and build a house: "I can tell you that they were so excited [by my achievements with CA] that this year they are trying out the basins." In fact, the women of Zirashawe are reported to be better networked than the men in local farming and credit groups. A few men joined the CA groups as well, although the poor women's group reports that most men "run away from this practice" because it is labor-intensive. Still, the women of Zirashawe mainly report strong solidarity and satisfaction with their collective action and the fruits of their hard work.

Encouraging reports of CA can also be found in Nkhopa, Malawi, where five of the six focus groups rate it a top two. There, the poor men's group explains that CA has transformed farming for them because before you weren't considered a man unless you had cattle due to the hard (and perhaps humiliating) work required to plant without draught power. "I have knowledge of CA," relates a member of the group. "I start preparing planting basins early in the dry season, five basins per day . . . CA has made us [without cattle] men among other men." The men rate it highly for women because, "They can work on their own" if they don't have men in their households to help.

With some exceptions, Nkhopa's focus groups also speak highly of CA. According to a young woman, ". . . this method is easy for us because we do not own cattle to practice other farming methods. I just need a hoe to dig basins." Members of the nonpoor women's focus group report that they learned of CA-related practices by attending extension meetings sponsored by different organizations and listening to radio programs, although one participant relates that not everyone has radios in her village. The women praise CA's positive effect on yields and express appreciation for how they help one another with the labor demands in their CA clubs. They also regard Total Land

Care (TLC), which trained them on CA and organized the groups, as one of the most important organizations for the women of the community.

In Nkhopa's poor women's focus group, some say they learned how to apply CA practices from extension programs and others "by observing from some demonstration plots" or by talking with other women in the village when drawing water. The women also mention working in groups, as well as the possibility to hire labor and delay payment until the crops are harvested and sold. Yet, some of the focus group members indicate that they cannot try CA "because they have no chemicals and no fertilizers"; or they had to withdraw from their CA clubs because they could not afford the fees for membership and the deposit for inputs. Poor men in their focus group likewise indicate that the poorest men of their community would be unlikely to participate in trainings and farm groups or to adopt CA and hybrid seeds.

Meanwhile, the absence of CA among the women's top ratings from Mexico is, in fact, consistent with these communities' restrictive norms, which are more discouraging of women's agricultural initiatives and participation in extension opportunities. Here, men and women often frame women's agricultural roles as "help to their husbands," although men's migration rates are very high and many women independently manage farms for long periods. In the Chiapas village of Eldorado, women report that they are rarely invited to extension workshops, and when they attend men make fun of them and ask them to leave. Likewise, poor women from Agua Esperanza of Oaxaca say it is "*puros hombres*" (only men) who participate in the local trainings and field visits and who receive free seeds or other bonuses. "This is because they think only men plant maize," states a participant in the poor women's group; another elaborates further that while women don't attend because they aren't invited, "Yes, we would like to learn how it works . . ." There is one mountainside village in the Mexico sample, Montevidal, where a female extension agent who runs trainings on CA and other practices has mobilized the local men and women into farmers' groups; even so, only one of the village women report applying CA practices (although other women express a desire to do so soon).

The findings on CA's limited reach among women in Mexico are consistent with other literature on CA (e.g., Giller et al., 2009; Whitfield et al., 2015). The quite different types of experiences in this dataset merit further research. In the nonpoor men's group of Mikita, Zimbabwe, a participant confides, "Most agricultural field days are organized by women in this community. Men have copied new agricultural practices from women." Innovation processes unfolding from CA interventions without gender objectives, and in contexts with more restrictive norms like the cases from Mexico, likely limit their effectiveness.

SECTION IV. THE SOCIAL CONTEXT FOR AGRICULTURAL INNOVATION

"Previously soybean was grown on the homestead by mothers for consumption. These days it is grown in larger quantities because it sells for a much better price than maize. So men took it over from women. Otherwise, when it comes to work, there is nothing called division of labor. The division is in the house, where only women work in the household, while men no longer are even working in the farm."

—Young women's focus group, Hanawa, Ethiopia

In this section we unpack gender norms further. Gender and wider social norms glue societies together as girls, boys, sons, daughters, couples, parents, families, and communities. Depending on

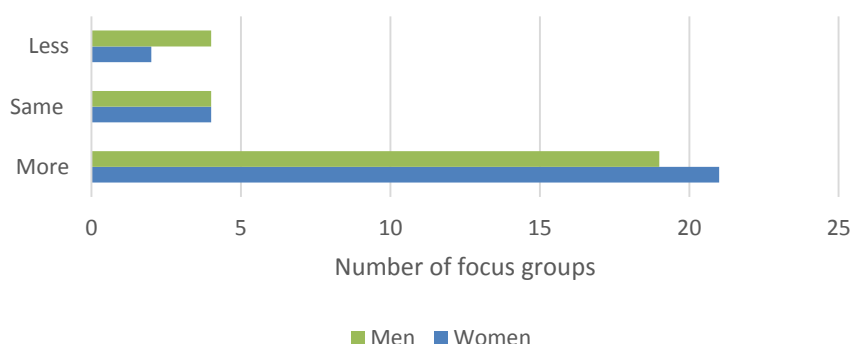
the circumstances, both women and men have interests in maintaining some cherished norms, even as they withdraw from others. Yet, men enjoy a clear advantage in the playing fields of contesting norms which may be restricting their initiatives and upholding other norms, such as those that preserve male authority. Normative expectations are underpinned by gender power relations.

We identify normative change in the case studies where the testimonies from both women and men speak largely favorably of a behavior that used to be unacceptable. For instance, in the tipping points, while there are always some detractors, most focus group members speak openly about the expansion and diversification of the local women's farming and trading activities. As normative change requires some coordinated repositioning of gender relations and social expectations on the ground, both men's and women's agency is essential to processes of recognizing and accepting the new behavior (or not).

More often, the testimonies reveal uneven and slow processes of normative change: women are deeply engaged in farming livelihoods but their initiatives are disparaged, beneath the radar, or deemed "small." Many women work on or very close to homesteads, tending to small livestock and home gardens to provision the family as well as to earn some cash, perhaps by selling small amounts of eggs, vegetables, or cheese, prepared snacks and drinks, or other processed goods. Or, depending on local norms and opportunities, numerous women may be petty trading in the local market and taking daily wage farm jobs. In fact, in most every village in this sample it is acceptable and even appreciated for women to be earning some "small money" to support the family's day-to-day cash needs. Moreover, in most of these cases, poor women as well as poor men report that local opportunities to make a living have improved over the last decade (figure 8). An important caveat to these perceptions, nevertheless, is that no self-respecting man would be pleased to qualify his income earning as "small money" while most women appear keen to keep it small.

As women gain economic independence and stronger voice, their strategies may entail strategically withdrawing from some norms, such as those which regulate their physical mobility and social interactions beyond their households, even as they conform to other norms that require their submission and domesticity. The agentic and risk-taking behaviors needed to innovate in one's

Figure 8. Trend in local work opportunities for own gender (54 poor focus groups)



livelihoods are often associated with norms of masculinity. Men, too, struggle when they may need to withdraw from norms of masculinity, for instance, when they cannot or do not provide for and speak for their families (see box 7). As highlighted in this report, however, men's and women's

maneuverings around norms, and the sanctioning practices that uphold them, can be unfair and stressful.

Contestation around gender norms is centuries-old and well-documented in the literature (e.g., see Stern, 1995). Yet, pressures for greater gender equality, and specifically in economic roles, are gathering force at a varying pace across the case studies. Men and women in many communities report learning of gender concerns in workshops and classrooms, on television and radio, in social media, and from NGOs, religious leaders, and government officials.

Normative framings like women's "small money" or their "supporting" roles in men's field agriculture likely help to keep the uncertain and sometimes stressful processes of normative change more manageable for everyone, even as women's livelihood activities may be quite significant or larger than men's. Yet, the rub with discouraging and obfuscating women's economic agency is that women's advances in their livelihoods then do not afford them the recognition and status and resources that men derive from such initiatives. This slows local normative change, innovation, and poverty reduction, as our data shows in section II.

Box 7. Masculinities on guard in a churning context

Mashowa in Zimbabwe presents a puzzle because while poor men say poverty has skyrocketed and nonpoor men register little empowerment, the two women's focus groups observe highly favorable trends on their respective ladders. In this locality, men's insecurity with their roles and normative changes underway especially come to the fore.

The men's accounts touch particularly on macro forces over which they perceive little control. One man attacked laws giving women the right to report instances of domestic violence. The men also note how jobs have disappeared over the past 10 years for poor workers because local farmers are not hiring labor anymore due to the "deteriorating situation of the country." People are moving back to their villages and "fighting for the few jobs that are locally available." To move up the ladder, the men talk of vegetable gardening initiatives, but the profits are too meager for them to do much other than "buy soap and to pay fees for the children." One man in this group says that "women are number one in helping the family to get ahead. They do gardening. As a man I can go to drink beer, but the women go to the garden." Again, reports of men discouraged by their economic prospects and happy to let women carry the load emerge in other communities as well.

By comparison, participants in the poor women's focus group of Mashowa almost sound as if they live in a different community. They discuss many new job opportunities available to local women, such as drivers, nurses, and teachers, hired farm hands, buying and selling clothes, tending small livestock, and selling produce from their gardens. As in other study communities, poor women of Mashowa say their poorest women can accumulate resources and help their households get ahead by selling crops and vegetables from their gardens, and by baking buns and bread. When looking across the men's and women's narratives, it becomes clear that women's changing roles are perceived by men as a source of insecurity and challenge to men's authority, rather than a source of strength for their families.

A. Local expectations for farming roles

To better understand normative frameworks shaping agricultural roles, we asked poor women's and men's focus groups to reflect on the qualities of a man, and separately, of a woman, who would be considered a "good farmer" in their village. Rather than probe on specific crops or tasks, we let the

study participants bring their own notions of these roles to the fore. The resulting narratives are highly contextual, but a few clear patterns can be discerned.

Both the good women and men farmers are often portrayed as having strong agricultural know-how and providing for their family's needs. The good man and woman farmer differ in two important respects, however. First, a woman farmer has responsibilities to support their husband's farming and manage housework and care needs, while the corresponding responsibilities are rarely mentioned in relation to a good man farmer. Second, vital agricultural resources such as land, inputs, tools, and extension are often more associated with men farmers.

Table 7 presents a flipchart generated by the poor women's focus group of Kamunbu, Malawi about the qualities of a "good" man and woman farmer of their village. As might be expected, focus groups often provide more details about the good farmer of their own gender. Like so many good women farmers around the world, in Kamunbu she "must work at home after coming back from the garden," and capably manage her diverse and interlocking productive and reproductive roles. It is also quite normative that the women qualify their good woman farmer's tobacco growing as "small-scale," but no such qualification applies to the good man farmer. Tobacco is a lucrative commercial crop in Malawi and more often under men's tight control.

Table 7. The good man and woman farmer, poor women's focus group, Kamunbu, Malawi

A man who is a good farmer	A woman who is a good farmer
<ul style="list-style-type: none"> – Grows tobacco – Cultivate dimba (wetland) crops – Grows different crops – Prioritize on buying fertilizer and all farm inputs – Construct bans and sheds for tobacco – Construct granaries 	<ul style="list-style-type: none"> – She must remember to go to the garden – She must work at home after coming back from the garden – She must take initiative to work hard – She must plant different crops such as soya, groundnuts, maize – A good woman farmer also grows tobacco on a small-scale – She must also conduct business to support her farming – She must also grow some vegetables on irrigation

Members of the poor men's group of Kamunbu do not mention crops in their narratives, but indicate that their good man farmer should be "hardworking" and "remember to buy fertilizers, hoes, panga knives, axes" and "follow advice from extension workers." Of their good women farmer, however, they only say she should also be "hardworking" and "active and resourceful."

Cases from Mexico and Nepal showcase the strong norms that govern farming roles. In the Mexican village of Miraflores, poor women say their local women "don't work in agriculture" but they do grow some "little plants" in their home gardens. This is a "churning" village where mechanization of maize production has disrupted the local labor market, men (but not women) observe steep rises in poverty, and gender norms are contested and changing slowly. In contrast to most every other focus group in this study about their good farmers, in the "tipping point" of Ranagar, Nepal, participants in the poor women's group explain that good women farmers "do agricultural works in systematic ways" and their "good man farmers" "help the wife to do agricultural activities." In fact, the poor

men's group of Ranagar describes the good woman farmer as having more technical knowledge than the good man farmer. The narratives about men's and women's agricultural roles in Mexico are among the most highly gender-differentiated in our dataset, while in five of the six focus groups from Nepal their descriptions of the good man and woman farmers are identical or nearly so.

More generally, the narratives of the men farmers stress their agricultural knowledge of, for instance, which farm inputs to purchase and in what quantity to apply them to their fields. According to poor women's focus groups, a good man farmer "uses fertilizer and improved seed appropriately" (Wariso, Ethiopia), "dedicates himself to deciding which type of maize seed to buy" (Agua Esperanza, Mexico), and "knows about new variety of crop seeds, fertilizers, and pesticides" (Ghodaha, Nepal). Good men farmers also command and manage assets skillfully, particularly land and livestock. Poor men's focus groups indicate that a good man farmer has "horses, donkeys, and oxen" (Nebele, Ethiopia), "should have a big farm that he always takes care of" (Orile Anko, Nigeria), and "keeps his cattle in good health, making sure they are not prone to attacks by diseases" (Shanra, Zimbabwe).

Additionally, focus groups identify the good man farmer's gender-ascribed role to provide for his families. According to the poor women's group of Mikita, Zimbabwe, a good man farmer's granary "is always full of food," and poor men from Nebele of Ethiopia say he "keeps his maize farm properly to increase production and get adequate harvest to feed the family."

Likewise, the good woman farmer has strong agricultural knowledge and skillfully manages diverse farming activities. For example, according to poor women's groups, a good woman farmer "applies necessary inputs such as fertilizer and improved seeds" (Hanawa, Ethiopia), "plants different crops such as soya, groundnuts, and maize" (Nkhopa, Malawi), and "learns the types of maize and wheat varieties. When a plant is infested with insects, she knows the chemicals" (San Antonino, Mexico). Likewise, the poor men's focus groups indicate that she "can easily select the best seeds to be planted" (Medu, Tanzania), "plows at the right time of the farming season" (Oromila, Ethiopia), and "knows the exact time of fertilizer application and applies enough fertilizer to her crops" (Mashowa, Zimbabwe).

Moreover, women's focus groups explain that a good woman farmer "supports her husband in his cattle- trading business" (Oromila, Ethiopia), "should remind her husband of what crops to plant and what input to buy for the season" (Nkhopa, Malawi), and "likes to work in the field, likes to help her husband" (Agua Esperanza, Mexico). Poor men's groups similarly indicate that she "must be ready to help her husband during planting and harvesting irrespective of the size of her own farm" (Gbodomu, Nigeria) and "must be able to receive the good advice on farming proposed by her husband" (Kilosha, Tanzania).

Good women farmers also adeptly manage their household tasks, which include provisioning food and ensuring their household's food security. In some cases, focus groups also include food processing and marketing activities in their descriptions of the good woman farmer. According to poor women's focus groups, a good woman farmer "ploughs her land equally with her husband or the laborer, and on top of that she also grows vegetables and fruits in her backyard" (Oromila, Ethiopia), "plans the required amount of crops that will sustain her household" (Medu, Tanzania), "handles household chores and the farm equally" (Wariso, Ethiopia), and "must work at home after coming back from the garden" (Kamunbu, Malawi). Poor men in Orile Anko, Nigeria explain that a

good woman farmer “must be able to carry out some basic farming activities such as planting and at the same time perform her domestic chores” and “must know how to process her farm produce such as cassava into *garri*, maize into pap, and yam into yam flour, etc.”

In the tipping point village of Kilosha of Tanzania where many women are active farmers, a woman relates in her group that a man cannot “be called a good farmer when the family has no food yet you harvested.” For many women, their central role in the household’s daily food security must be managed in relation to what their spouses may (or may not) provide and to their own food provisioning and various other livelihood and savings activities. In Nebele of Ethiopia, their good woman farmer “is able to grow all varieties of crops and vegetables and is able to cover consumption of her family and also has enough to raise income to sustain her farming practice.” Men, too, must provide for their families, but normative framings give them more power and freedom—as well as responsibility—to maximize their farming opportunities.

B. The uneven and shifting terrains of women’s agricultural roles

Here we examine more closely selected gender norms which weigh heavily on women’s capacities for agricultural innovation. These include local expectations around women’s physical mobility, agricultural decision-making, and income earning. In examining our data on these common topics in the gender literature, we emphasize testimonies which illuminate the extent of pliability of these social dictates and how this varies on the ground. These qualities are important for understanding the ways that women maneuver around and, in some cases, effectively change the social rules which constrain their agency.

Physical Mobility

Women’s capacities to move about and interact independently beyond their homesteads vary greatly in this sample. We asked focus groups with young people to estimate, out of every 10 local women, how many can move freely on their own in the public sphere of their villages. In about half (54 percent) of the study villages their responses indicate that an average of five to seven (or 50 to 70 percent) of the local women move freely. In the remaining villages, responses are evenly split between few and most women availing of this freedom. The young women’s focus groups from two Ethiopian communities observe the most limited mobility (around two or three in every 10 women), while those from three Nigerian communities and one from Tanzania report most every woman (90 percent or more) can move freely.

No matter the ratings of the focus groups, we find reports from most every village sampled of constraints to local women’s mobility due to reputational and safety risks (see box 8), religious or other practices, and housework and time burdens, among other reasons. Local mobility norms are often contingent on age, marital status, and life cycle, and weigh particularly heavily on new brides. Many villages also feature conventions of female seclusion which require women and girls to seek permission or be accompanied by a family member when moving in public. Even in the most restrictive environments, nevertheless, we find reports of women negotiating these expectations.

Box 8. Venturing out as a young or newly married woman in Mikita

Youth focus groups from Mikita, Zimbabwe are revealing of the diverse pressures and specific dictates which restrain women’s freedom of movement. When asked whether a young single woman can move freely to the

local market, young women agree it would not be safe, warning that she would hear “vulgar language” or “be lured into marriage . . . and never come back home. From the young men, by contrast, emerges a chorus that it would be “easy” for a single woman to move freely to the local market if not at night.

When next asked about the circumstances for a young married woman, then the Mikita focus group of young women express some disagreement, with some saying she could go “freely,” others qualifying that it “actually depends on one’s husband,” and still others replying she would have to be escorted. One young woman offered that the woman would bring the husband’s sister so that “the husband will feel better about this because he will know that there is no way his wife will flirt with other men in his sister’s presence.” The young men of Mikita suggest it would still be easy for a married woman to walk alone to the market, but “only if she dresses like a married woman.”

Across the four cases in Ethiopia, where mobility of most women and girls is heavily circumscribed, study participants warn that a woman may face abduction, rape, beatings, or divorce if she moves about in public (also see box 9). A young man of Wariso, Ethiopia explains the local dictates accordingly:

This is different from women to women. These unmarried [women] may fear of abduction and other violence. They are even afraid to go through a maize crop plantation. These young married women are afraid their husbands may not approve of their going on their own. They mostly must be accompanied by their husbands if they have to go to different social functions. Older women have no difficulty in this regard.

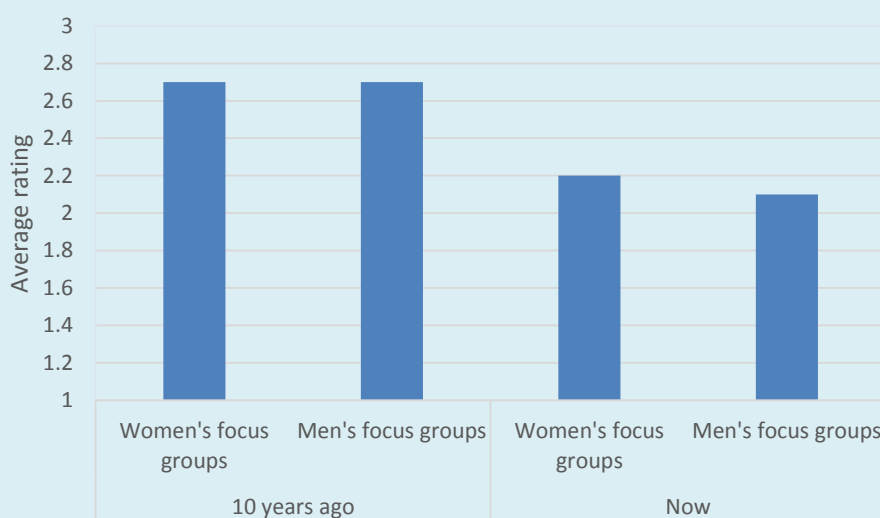
When asked if local women have the same opportunities for agricultural innovation as the local men, a woman of 17 who dropped out of school in Hanawa singles out the local mobility restrictions to explain the strong inequalities in these opportunities: “We are not mobile enough. Now there is no way I can decide to go to town without asking for permission. . . . So as girls we would not even have the chance to get information because we stay back home most of the time.” The young woman also laments the numerous chores she must do at home because, along with the mobility restrictions, they prevent her from taking advantage of new learning opportunities.

The difficult climate for women to pursue independent agricultural livelihoods extends well beyond the Ethiopian cases. In Agua Esperanza, Mexico, young men in their group explain that “you make a commitment when you marry, and a woman cannot go around talking with men.” In Montevidal, also of Mexico, women say they must ask permission to go and sell in a nearby market or to get healthcare. In Orile Anko of Nigeria, young men report that “women are not allowed to cultivate farmlands that are very far from home so that they can easily get home ahead of their husbands for domestic chores.”

Box 9. Gender violence seen declining

Physical violence against women is one of the most evident manifestations of gender inequality and women’s subjugation and powerlessness. Focus groups of both poor women and men report physical violence against women in their villages to have declined from nearly regular occurrences for perhaps a third of local women 10 years ago, to more occasional events affecting some 10 or 20 percent of the local women in the past year (figure 9).

Figure 9. Extent local women have been hit or beaten in their households over past year and 10 years ago
(54 poor focus groups)



Note. Individual focus group members provided anonymous ratings with: 1 = Almost never (0 women in 10); 2 = Occasionally (1 to 2 women in 10); 3 = Regularly (3 women in 10); 4 = Frequently (4 or more women in 10).

Nonetheless, the general trend hides important heterogeneity on the ground. In 27 percent of the villages where this data was available (in one village it was not), the poor women's focus groups rate the level of violence at 3 or greater for the current period, meaning nearly a third of local women are perceived to be survivors of beatings and other physical abuse over the past year. Such levels of violence are observed to be present in half the research villages 10 years ago. Globally, the World Health Organization (WHO 2013) estimates nearly one third (30 percent) of all women who have been in a relationship have experienced physical and/or sexual violence by their intimate partner, with higher averages in some regions.

Intra-household decision-making on “women’s” agricultural resources

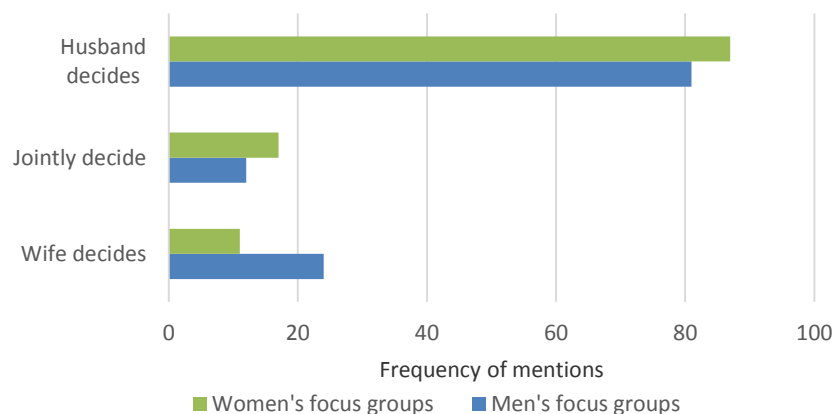
“Traditionally authority belongs to the man.”—Nonpoor men’s group, Miraflores, Mexico

Capacities to mobilize land, finance, inputs, and other resources are fundamental for agricultural innovation. Yet, significant gender disparities in ownership, control, and use of such resources are well documented in the literature (e.g., World Bank & ONE, 2014). The GENNOVATE data explores norms attached to decision-making around resources that a woman could potentially acquire or accumulate independently through family transfers or crop sales. Although focus groups of both genders mainly observe a shift toward joint intra-household decision-making for crop sales, they mainly testify to a discouraging environment for women to control of major resources such as an inheritance (also see Quisumbing, 2011).

Members of nonpoor focus groups reflect on a vignette about a typical local woman who wishes to use her family inheritance to purchase a plot of land near the homestead in order to expand her vegetable garden. The husband, however, would like to use her inheritance to buy himself a motorbike. On a scale of one for very easy, and five very difficult, individual focus group members on average rate the likelihood a four, meaning it would be difficult for the wife to purchase the plot in the face of her husband’s resistance. This vignette, in fact, evoked heated discussions even though a large majority of both the ratings and explanations concur that the husband would prevail in commanding the inheritance (figure 10). When we reverse the scenario and give the husband the

inheritance, few participants feel a need to explain why it would be easy for him to buy the motorbike in the face of his wife's resistance. Some observe that a husband would not bother to consult a wife about his inheritance.

Figure 10. Who makes decisions about a wife's inheritance? (54 nonpoor focus groups)



Note. A small number of responses in the figure above pertain to a follow up question about the husband's control of his own inheritance; however, this doesn't change the overall pattern of responses.

Box 10 provides an overview of the numerous observations stressing men's control of wives' inheritance, the seeming impossibility for a woman to claim such an asset as her own, and the severe repercussions she would face if she proceeded to purchase land without her husband's consent. In only one focus group, the nonpoor women's group of Mashowa in Zimbabwe, did the ratings average toward the easy range, with one woman arguing that "the family will benefit from the garden." The men of Mashowa, however, warn it would be difficult: "If she buys land near my property, then it is my land because if she insists it belongs to her, then it means she is equal to me. That is not acceptable."

A few other women's testimonies relate to how a wife could potentially negotiate control of her inheritance. From Wariso of Ethiopia, for instance, one member parted with the others in her focus group to argue that it is possible for the wife "not [to] accept his interest only. She may send his mother, relatives, or neighbors to change his mind, and if he refused, they fight and she will run away. But finally she will be back home after the neighbors negotiate for her." In Ghodaha, Nepal, a context with less restrictive gender norms, the women's group is divided: a majority rate it easy for the wife to purchase the land because it is her inheritance and "she has the right to it"; however, two focus group members rate it difficult because of the disagreement among the couple. As in Mashowa, the Ghodaha men mostly thought it would be difficult for the wife to make such a purchase. In addition, there are cases where men's groups observe that a wife would be able to control her inheritance, but none of the women's groups in these cases perceive that possibility.

Focus groups also consider how a typical couple of their village would make decisions about the portion of a wife's crop that would be sold rather than set aside for the family's needs. The narratives about crop decisions display much less consensus than for inheritance (figure 11). While most say

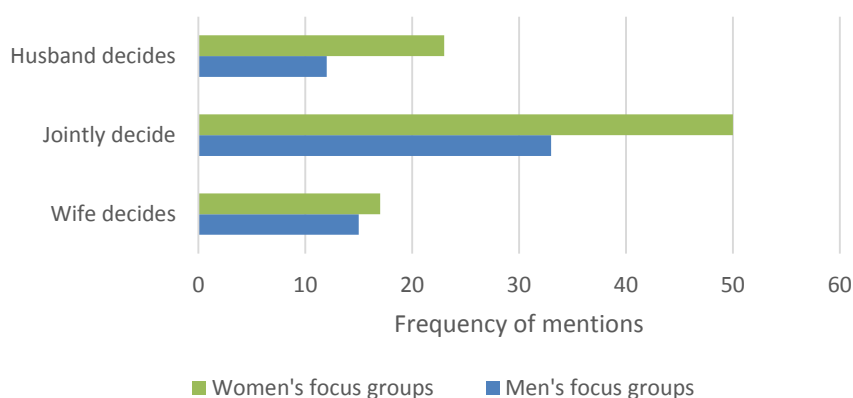
Box 10. “What she owns is his.”

On the matter of who has say over a wife’s inheritance, below is a selection of the very many forceful testimonies across the nonpoor focus groups.

Ethiopia	<ul style="list-style-type: none"> – “The money is his. He can do whatever he wants” (Men’s group, Oromila) – “Once married a woman owns nothing. Everything she has is owned by him. She cannot own anything by herself whether she gets it working or as gift. So she cannot use the money without his consent. If she does, that would be a problem. So she will never try it.” (Men’s group, Hanawa) – “If she resists me I will bring another woman so she would not dare.” (Men’s group, Hanawa)
Malawi	<ul style="list-style-type: none"> – Men’s group, Kamunbu: <ul style="list-style-type: none"> ○ “Because a man has a lot of tricks that he can use to make a woman bend to his will.” ○ “A man cannot accept his plan to fail because a man is the head of the family and it will seem like the wife is undermining him.” ○ “For others this can even lead to the end of the marriage.” – “[The wife] cannot have authority to make the decision even on her property. It may cost her the marriage. The marriage may break.” (Women’s group, Kamunbu)
Mexico	<ul style="list-style-type: none"> – “The couple will lose harmony because although she could [buy the land] this will cause problems with [her husband].” (Men’s group, Agua Esperanza)
Nigeria	<ul style="list-style-type: none"> – “It will be very difficult for [the wife] because she is under her husband.” (Men’s group, Mwaghavul) – “It will be very difficult for [the wife]. She needs to get the husband’s support. He is the head.” (Women’s group, Mwaghavul)
Tanzania	<ul style="list-style-type: none"> – “The husband will convince the wife in all ways until his decision to purchase the motorcycle goes through.” (Men’s group, Mogorowi) – “Men always want their ideas to be respected, and if you don’t agree to their proposals it turns to be disrespect to them.” (Women’s group, Kilosha)
Zimbabwe	<ul style="list-style-type: none"> – “A woman has to get her husband’s support otherwise he will ask her to leave his home.” (Women’s group, Zirashawe) – “She does not have the power to make her own decision if her husband is against it.” (Women’s group, Shanra)

such crop decisions would be taken jointly, numerous study participants perceive otherwise. Moreover, even where joint decisions over the wife’s crop are observed, many men’s focus groups

Figure 11. Who makes decisions about a wife's crop? (54 nonpoor focus groups)



qualify such processes with comments that give the husband the upper hand. Wives and husbands may be consulting one another, but husbands have the final say.

In the tipping point case of Ranagar, Nepal, the men's focus group agrees that "they will go for collective decision-making" over a wife's crop, but another qualifies the process: "Women need a lot of vegetables, and men need delicious food. So the woman will decide how much to eat and sell, but the man has to agree and support her." The women's group of Ranagar maintains that their (typical) couple is wise and would simply come to a "mutual understanding." In Agua Esperanza of Mexico, where many gender norms remain restrictive, the women's focus group describes a similar process whereby the two discuss together what portions of the crop will be sold versus stored for the future when the market price will be better "because if you sell it all at one time, there won't be anything for us." The men's group of Agua Esperanza similarly concurs that the couple would decide together "without any argument," although one man is not quite so quick to agree: "It would depend how the work went and who worked more and who less."

Indeed, when piecing together men's and women's perceptions, it is problematic to categorize a study village according to the normative environment for woman's control of her own crop. The women's group of Nkhopa, Malawi elaborates on a decision-making process that rests somewhere in between joint and men's control, whereby the couple sits down to "discuss that they will sell the produce from the woman's plot and use the man's plot for their needs. It is possible for the man to make a decision, but not the woman." For most women it is important to strike bargains that both advance their interests but also show adequate deference to norms of men's authority. Meanwhile, Nkhopa's men disagree entirely with one another over who decides:

- She can make decisions on her own because the wife is the one who thinks about feeding the children. Since it is a home garden she will be in control and will tell her husband what she intends to do.
- The wife will consult the husband and the husband will make the final decision. She will ask for guidance.
- The decision to sell will come from the wife as much as she will consult with her husband.
- The major decision still comes from the husband.

These contested narratives about decision-making processes help to shed light on the social processes which make it exceedingly difficult for women to acquire and accumulate assets independently. This does not prevent them, however, from influencing important agriculture decisions in their households. The pliability around norms, moreover, provides a foundation on which interventions with gender objectives can build to support women's capacities to realize their inheritance rights or to gain more independence for crop decisions (Mackie, Moneti, & Shakya, 2015).

Markets and entrepreneurship

"Normally small-scale vegetables farming is looked after by women and large-scale farming by men because it is a large transaction."—Nonpoor men's group, Pandhera, Nepal

It is perhaps surprising that despite the many pressures on women not to move in the public spaces of their villages and the difficult climate for them to manage assets independently, women speak far

more often than men of diverse marketing activities across the case studies. In most cases, their activities include petty trades of agricultural produce and prepared foods, but the data also reveals experiences with larger and more formal women-run agribusinesses.

The 54 women innovators interviewed discuss their entrepreneurial activities about 75 percent more often than the men interviewed. The women often relate how they cross-subsidize their farming and business initiatives (box 11). Many also detail in their interviews how their entrepreneurship requires withdrawing from and contesting gender norms, and this exacts a high social cost for them.

A woman innovator interviewed in Ghodaha, Nepal, for instance, testifies to mixed reactions from her family due to her role as a Lead Farmer in a local cooperative that produces and sells diverse crops. While her children gladly help with housework because she has less time at home, her extended family has been disparaging of her: “When our relatives are sick, sometimes I cannot manage to visit them. And they say, ‘This [woman] does not have time to care for her children and also does not come to see us while we are sick.’”

Box 11. Case study: The harmony and disturbance of innovators

Lightness is a 30-year-old mother of two interviewed in Mogorowi, Tanzania. With her husband, Lightness cultivates “SC 115 and 113” maize varieties, rears dairy cows, and grows beans, greens, and other vegetables. From the hybrid seeds, they can harvest about 15 bags per acre, reports Lightness. Yet, she cautions that they struggle with unpredictable rains, pests, and diseases. To save costs, Lightness mainly applies manure to increase production, but sometimes she purchases chemical fertilizers if the plants are not doing well. Lightness does not participate in extension opportunities, but her parents and the “agro best shops” have been valuable resources for information on new seeds and practices.

With proceeds from their farming, Lightness opened a shop and started working with dairy cows to sell milk. Lightness reports that these activities really bolster their farming: “After harvesting we normally invest the money back in business and during farming activities the capital is taken from the shop to do the farming activities.” Together the farming and business cover the children’s education as well as the food and other needs of her family.

Lightness positions herself up on step four, and explains she is there rather than at the top because “when you get married, you cannot make decisions alone. I have to decide together with my husband.” And indeed, her interview points to a harmonious and productive relationship. When asked if she would do anything differently, Lightness replies, “Only that I want to do more farming activities so that I can expand the business and poultry keeping project.”

Samuel, another of the innovators interviewed from Mogorowi, is a 45-year-old farmer and father of three. Samuel saved enough money from brickmaking in order to rent land and try out new cultivation practices with improved maize seeds. He describes learning of these from various local extension opportunities. Due to strong maize harvests, Samuel declares that his family’s food security improved greatly and he was able to build a house with two rooms and a metal roof to replace their thatched house. Samuel continues to interact closely with local extension agents and, like Lightness, recently expanded into livestock activities. But Samuel says he’s very concerned about rising rental costs for land, and he and his wife farm far away from their home where renting is more affordable. This means Samuel relies on his children to manage the livestock.

Samuel positions himself on step five of the ladder, and credits some of this with being “able to advise my wife because at the beginning we were not planning together.” Later in the interview he further relates that his new

agricultural activities affected his entire household because “every household member takes it as a kind of disturbance until they realize the outcome . . .” We unfortunately do not have his wife’s and children’s stories about these changes, but one might anticipate some frustrations. Samuel says he and his wife farm together because if “women sell and get money on their own, they normally become a problem to their husbands.” Additionally, Samuel laments that the children’s care of the livestock is not going as well as he hoped. “I was supposed to be taking care of them myself,” he confides, but the farming consumes his time.

In Mexico, again where gender norms are less welcoming for women’s leadership in field agriculture, a majority of the women innovators interviewed are engaged in agribusiness activities, both micro and larger. In one interview, a craft cheesemaker discusses how, to avoid her husband’s disapproval, she kept experimenting with her product behind the scenes as she transitioned from petty trades to a sizable business with commercial clients and a staff. Ever resourceful, the cheesemaker also managed to convince her husband to sell and distribute her products, which she reports helped to reduce stress on her marriage and contain the village gossip about her business leadership and success.

Jamila is a 45-year-old woman innovator and mother of seven from Wariso, Ethiopia. She started her agribusiness following her husband, who had adopted improved maize varieties and increased his production considerably. With the help of two hired workers, Jamila started planting improved maize on the 0.25 ha plot her husband gave her. With the proceeds, Jamila then opened a coffee shop and began to grow vegetables in her kitchen garden. Jamila declares, however, that her prowess cost her greatly, as her husband objected to her working “like a man,” withdrew his support, and turned to his second family. Neighbors, too, disapprove strongly. Still, Jamila hangs on to her farming and business activities: “Currently I’m not dependent on my husband’s support . . . I can support myself and my seven children . . . I have bought cattle, bought cloths, and send my children to school. In addition, I am feeding my children from year to year.” She added that she even inspired some of the village men to adopt improved maize: “They were saying that if a woman has been successful why not us?”

The men innovators in the sample make less direct mention of their entrepreneurship in their interviews, but scattered accounts can be found. An innovator in Jamila’s village relates how he used his “incredible” income from maize crops to build two rental homes as well as to purchase land and irrigation to expand and diversify his farming into “different vegetables like onion, pepper, carrot and, tomato.” Although not discussed, he likely sells his produce to middlemen rather than hawk small amounts as so many women do.

The freedom and power to move in the community, control resources, and engage with markets often differ significantly for women and men. Women in this sample do not mention rental property investments. Still, their diverse crop and livestock activities combined with petty trades or small shops and savings practices provide women with consistent cash and food security (also see Forsythe, Posthumus, & Martin, 2016). With the exception of the Nepal case studies, the men’s interviews detail more bountiful field agricultural achievements; however, the women’s interviews demonstrate that they, too, actively manage and benefit from innovating in farming and other agricultural value chain opportunities.

Samuel's point in box 11 that innovation is a disturbance for everyone in a household is remarkably perceptive. In the communities and households where norms encourage less hierarchical social relations and greater agency among women as well as men, the data more often point to larger benefits and fewer disturbances from innovation processes.

C. Youth perceptions of their pathways

"As girls, we are engaged in different responsibilities that interfere with farming activities and these include household chores, taking care of children, collecting water, caring for the sick, and going to school."

—Young woman, Nkhopa, Malawi

"We all have set goals. For instance I want to be a businessman."—Young man, Orile Anko, Nigeria

In this section we turn squarely to the youth to learn about their sense of agency and aspirations, and the normative dictates framing these perceptions. Young people often observe their farming and other opportunities as highly dependent on their parents' support, and they describe farming roles as more gender differentiated than the adults, especially the young men in our sample. Mostly, young people say they aspire to nonfarm futures. Yet, despite the discouraging environment for young people in agriculture, young women and men in most villages acknowledge some opportunities for them to learn about new farming methods.

Agency and dependence

The median ratings on the five-step Ladder of Power and Freedom are 3.06 for young men's focus groups and 3.00 for young women's (box 2 describes the rating activity). The most common theme coded in the youth testimonies about their ratings pertains to parental authority. No matter the step, or whether speaking of young women or young men, the youth with great regularity and across diverse contexts reflect on their subordinate status in relation to their parents and how this constrains their power and freedom to make decisions.¹⁰ Where young focus group members are married, young wives speak of subordination to in-laws or husbands, while young husbands reflect on their new authority positions and responsibilities. As with the nonpoor focus groups, the youth testimonies reveal the powerful influence on agency of the normative expectations attached to one's position in the family.

Let's return again to the Ethiopian village of Hanawa, where the young women's focus group mainly rate the women of their village on step two, where power and freedom is more limited. A 20-year-old mother of two, who identifies herself as a student, simply says, "No one allow[s] us to move an inch without their permission, and we are under [our parents' or husband's] watchful eyes every single time. We cannot decide on our own as long as we are living with them." A 22-year-old single woman in the focus group corroborates her peer's testimony and elaborates poignantly on the highly restrictive environment constraining their freedom:

Our families are afraid we will be raped or abducted if they allow us to leave the house alone.
In addition, there are plenty of things to be done in the house so you are also needed there.
Being a woman is very difficult here. I sometime think it is a curse. When I see my younger

¹⁰ In fact, the word "parent" emerges more often (611 times) than the word "farming" (573 times) in the youth testimonies, although there is only one specific question about parents (in relation to their support for education) and numerous questions about farming.

brother free to go wherever he wants without anyone's permission, and sometime when he talks back to my father, I get surprised and envy him. I feel I am born in the wrong place probably. At school they talk about girls' rights, children's rights, etc. We have no rights at all. Now that I think more properly about it, I have even changed my mind: we are on [step] one. Or, if there is a step below that, that is actually the one we're on.

We find that everyone in the focus group then began talking all at once, with not a single voice disagreeing and one woman clapping in support. One young woman offered earlier in the ladder discussion that she is a teacher and on step three, "I have my salary and I am making my own decision. I have made my own choice of who I will marry very soon . . . Once I get married I am not sure where my vote [for the ladder step] would be." Like the nonpoor women's focus groups, young women who indicate higher ratings speak more often of being empowered by their economic initiatives.

The young men's ratings on the ladder in Hanawa display less consensus, falling mostly on step three. "I believe the youth in our area have very limited power and freedom to decide on what we want as long as we live with our parents. We cannot make a decision that requires financial resources . . .," explains an unmarried 17-year-old fisherman of why he chose step two. An 18-year-old farmer with one child concurs with the low step for similar reasons: "I am married but I still don't have the power and the freedom to make decisions. My father gave me land and livestock when I married but I still can't make decisions over this. I live under my father's influence. So I feel at this stage we have very limited freedom to do what we want."

The weight of subordinate household status and gendered social rules is also evident in Nkhopa, Malawi. The young women rate themselves on steps one and two of the ladder, explaining that the young single women of their village "rarely have any power to make decisions and still rely on parents," while the local married women "fear their husbands" and are "told that they should respect their husbands." Another in the group adds that "youth are not given the chance to make important decisions, and they remain future leaders." Meanwhile, in Nkhopa's young men's group, a large majority choose step two. Of their explanations, one centers on problems "with farming and the prices on the market" while three observations speak to parents: "If you do things on your own it is disrespectful to parents," parental guidance is needed to marry, and difficulties would arise if you "make decisions on your own" but need parental help in the future.

In Mwaghavul, a village of Plateau state in Nigeria, young women also position themselves on step two, with a 23-year-old single participant saying she needs to inform her parents "about my movement because I need assistance of money from them." In Medu, which is near Arusha in Tanzania, step two is also popular, with one young woman simply stating, "We are still depending on the parents to decide," and another adding, "It is not possible to make full decisions if you don't have resources." Or in Mikita, Zimbabwe, where young women mainly choose step two of the ladder, a member of the group details her many chores in the garden and house, and how she has little choice but to follow what her mother says. In Miraflores, Mexico, a young woman says she believes most local women are step three because, "For example, in my case I depend on my parents and I have to consult with them first."

Even young men who report high ratings mention parents frequently in their testimonies; however, their observations are more often about parents supporting their goals or about changing family circumstances which would require a young man to take on more responsibility. “I have only mother in my home. I have to take all decisions, either which land to buy or which to sell . . . I even decide on my younger brother’s education . . .,” reports a young teacher from Ranagar, Nepal. The men in Mikita, Zimbabwe provide ratings across steps three, four, and five, saying they are free “to go and chat with our friends,” “have an affair,” and “give our parents advice on new farming practices,” while others in this group caution that they count on parents to “give us a plot to grow crops of our choice” and speak of parents’ decisive role in their education and marriage. Similarly, in Zirashawe of Zimbabwe, the young men mainly report high agency for their gender, but their testimonies still speak of their power and freedom being curtailed by parental authority and resource control: “About 25 percent of youths have plots to grow crops of their choice but the plots are small.”

After parents, the next most common theme in the youth narratives about their agency is education. Most mention education as a source of empowerment—including in relation to their parents who lacked such opportunities: “We have at least received education that enables us to decide or correct our parents wherever they are making wrong decisions,” relates a young man from Medu, Tanzania. Concerns for education move us squarely into a closely related topic discussed by the youth: their aspirations for the future.

Aspirations

Figure 12 presents the most prevalent themes from the young men’s and women’s focus groups narratives about their aspirations for education and for the future, more generally. Young women’s focus groups display nearly double the observations of the young men’s about education and strong desires for completing secondary school and university degrees.

Figure 12. Most prevalent coding associated with youth aspirations for education and for their future (51 youth focus groups)



Note: All codes with > 50 mentions by at least one sample group.

Additionally, figure 12 clearly shows that the large majority of youth desire livelihoods outside of farming (also see Brooks et al., 2013; Sumberg et al., 2012).¹¹

In most every research community, young people mention having hopes to become doctors, teachers, lawyers, engineers, police, business owners, carpenters, accountants, computer programmers, politicians, bankers, truck drivers, librarians, musicians, architects, soldiers, ministers, and professors of diverse disciplines. And while some young women name traditionally woman jobs, such as teachers, tailors, nurses, social workers, and beauticians, there were more expressing aims for less conventional careers for women in their societies, such as electricians, prison guards, pilots, engineers, and even members of parliament, ministers, United Nations officials, and president of her country.

Less numerous are testimonies of young people stating that they hope to work in the agriculture sector. They consider education important for this as well. A young man of Hanawa in Ethiopia remarks that their education “will help them become better farmers at least.” A young woman from Mikita, Zimbabwe states that girls should be “educated up to degree level and be able to buy her own homestead, cattle, and ox-drawn plough to use in her field.”

Again, young women stress the importance of education much more than young men. Another young woman of Mikita hopes that if she can pass her exams, “I can change my life for the better . . . I would no longer go to bed hungry or go to work in other people’s fields for pay. I can get a better job and a better life.” It is clear that young women also perceive education as a pathway for gaining more independence. In Zirashawe of Zimbabwe, a young woman states, “She must be educated up to diploma level so that she gets a good job and makes her own money and not simply waits upon her husband.”

Young people also reflect on reasons why they end their studies. Both young women’s and men’s focus groups most often identify lack of money in their families as a leading factor. Some express frustration with parents who do not value or cannot afford education. In Kamunbu, Malawi, a young man insists that “13-year-olds should still be going to school, not working as laborers and tenants which is very common.” In addition to economic constraints, and as gender norms dictate, young men often report that they withdraw from school in order to start earning money and contributing to their family’s needs. Young women’s narratives stress marriage and pregnancy as well as parental concern for their reputations and safety as common reasons why they withdraw from school. Young women report, on average across the study communities, that they begin their childbearing by age 17, although in quite a few communities the age is still much younger.

Whether a true choice or not, the young men’s testimonies about “starting to work” rather than stay in school, or having “little interest” in their studies, will often suggest greater agency than young

¹¹ Figure 12, in fact, greatly under-represents the number of study participants identifying nonfarm aspirations. Many of the narratives associated with the “economic agency” coding in the figure include general statements about work and earning a living—such as “get a job,” “earn an income,” “get employed,” or “learn a trade”—and these likely imply nonfarm goals. There is also significant under-counting of references to nonfarm jobs due to a software issue of merging the coding for narrative passages which are next to one another (although separated by a blank line) and coding to the same codes. Correcting this would have required costly recoding.

women's descriptions of being compelled to withdraw by parents, brothers, in-laws, and spouses. In Pandhera, Nepal, the young men say leading reasons why girls leave school is because of "early marriage" and the "mentality" in their society that "daughters-in-law cannot go to school." Also unlike the young men's groups, the young women speak of heavy housework and care burdens which prevent them from studying and passing exams.

Although few local opportunities may be accessible beyond agriculture, the young women and men in this study mainly aspire for different livelihoods and futures from their parents. Young women's narratives testify to stronger concerns for education and the more numerous barriers associated with their reproductive roles. Young men, nevertheless, also feel pressure to step into provider roles.

Farming roles

Facilitators ask youth focus groups to consider whether young people in their villages follow any local customs of women doing certain agricultural activities and men doing others; and 82 percent of the young men's observations and 65 percent of young women's respond affirmatively to such gender differences. In these discussions, young men often reaffirm their dominant role in the sector while young women's narratives both acknowledge and contest such positioning. Indeed, these testimonies perhaps more than any others shed light on how, the world over, women's diverse agricultural activities are diminished, dismissed, or rendered invisible in plain light of day—with many young men in our sample, who are still establishing their identities, especially eager to perceive gender differences. Nevertheless, there are communities in our sample where youth of both genders testify to less gender-differentiated agricultural norms, and they identify extension services as a catalyst for this.

In Nebele of Ethiopia, the young women opine that there is no division of labor in agriculture; and while perhaps disingenuous on the surface, their views nevertheless resonate with the adult women's testimonies of how they have stepped into major farming roles in recent years as discussed above. The young men, however, observe strict gender differences and insist that it would be completely taboo for young men to engage in dairy, "There is a problem! How can a man milk and sell butter at the local market. It's not a tradition for a man to sell these items as buyers are also women." In this village and in others in the study, norms continue to restrict women's independent income earning and their movement and interaction with the opposite sex in the public sphere. "The man has the overall power over maize or the other crops. If she sells without his permission, she will be in trouble and be beaten by the man," warns a 24-year-old married farmer in the young men's group.

In Kamunbu, Malawi, where we find reports that some women even grow and sell tobacco, a young man nevertheless proclaims: "Girls wash dishes while boys farm. A boy cannot wash dishes. That is embarrassing for them. Imagine your lover seeing you washing dishes [laughter]." Meanwhile, in their focus group, young women of Kamunbu report similar opportunities for both genders in soya, while acknowledging that women are disadvantaged when it comes to learning tobacco because "parents will mainly train boys," but they can learn about tobacco from their brothers.

In Zirashawe of Zimbabwe, the young women's testimonies similarly speak of gender-differentiated agricultural roles as well as shifts underway from these practices. For instance, they report that it is

only women “still planting, weeding, and harvesting groundnuts and round-nuts on their own,” and it is only men “still tilling the land with cattle and a plough.” The young women elaborate highly normative reasons for the gender differences, such as men lacking patience for weeding and women unable to manage cattle because of high costs and safety concerns in pastures. Nevertheless, one young woman in the group counters these views by pointing out that times have changed, and men now help women with groundnuts and women are plowing with cattle. When asked about agricultural roles in the young men’s group, a single man of 24 remarks, “Women are doing all domestic chores and growing of cowpeas and groundnuts while men do all agricultural activities and are trained to do craft work.” Such are the unsettled and tilted playing fields of gender norms for productive and reproductive roles.

As social sanctions represent a key mechanism by which norms are enforced (Bicchieri, 2006), we also explore with youth the consequences of withdrawing from their local gender dictates attached to an important crop or livestock activity. Nearly 50 percent of the youth testimonies (with minimal difference by gender) stress it would be difficult for a woman to undertake an agricultural activity associated with men in their village. This would be challenging because “men know better” or the woman would be laughed at, considered crazy, risk physical punishment, and be unable to sell the produce because she lacks rights or buyers would shun her.

The share falls to 37 percent of youth observations finding it difficult, however, should a young man wish to engage with a crop or animal associated with women. And for these young men who venture into “women’s” agricultural activities, focus groups rarely mention sanctions or they’re comparatively mild. For instance, a young woman of Mikita, Zimbabwe says that the only difficulties men would face if they try to engage with a local woman’s crop is that “men do not have the patience to sit and pluck out groundnuts.” Again, when compared to the young women’s testimonies, the young men are more eager to maintain the customs which advantage them, and the consequences appear limited should they move into activities associated with women.

Opportunities for agricultural learning

Overall across the case studies, young women are more likely to report equal opportunities for agricultural learning, while young men report the opposite or they differentiate the types of learning available to women and men. Once again, many young men’s narratives forcefully reaffirm restrictive norms, including in villages where we have numerous testimonies from older adults of more fluid norms.

When we break down the general patterns, however, more nuanced and encouraging findings emerge. In five villages, young women and men agree to sharp gender differences which greatly favor young men’s opportunities. In nine villages, the focus groups disagree or qualify their views on this topic. In the remaining 11 villages, encouraging reports surface from both young women and men of equal opportunities for gaining agricultural knowledge—and extension services have clearly been a motor for this.¹² Here we provide a flavor of these different contexts; and again, the community typologies discussed above provide a useful prism.

¹² Complete sets of youth focus groups are lacking in two cases.

Oromila of Ethiopia is a churning village where nonpoor men observe disempowerment. It is also typical of the cases where both young women and men perceive important gender differences in innovation capacities. In their explanations, the young women say their local opportunities to innovate mainly go to the better-off “influential” men who are approached by extension agents or to the young men with land “who learn fast and are very eager for change.” Nevertheless, a member of this focus group offers that “if there is a chance for [young women to learn and try out new practices], I don’t think they would say no.” The young men of Oromila likewise express discouragement about their prospects to try out new agricultural practices because they “didn’t get land from the family to practice.” In their eyes, young women face even greater barriers because they only learn from and work with their mothers in vegetable gardens and dairy activities, and so they do not “get involved in agricultural activities like their brothers.”

Some of the cases from Mexico also feature youth testimonies which point to important gender differences in learning opportunities, and this is consistent with the adult observations of their villages. The large town of Miraflores in Chiapas is another churning case where nonpoor men register no change on their Ladder of Power and Freedom; however, youth can access more diverse educational and economic opportunities than most every other village in the study. A young man of Miraflores considers the capacities for men and women to be the same to engage in agricultural innovation, “but men have more knowledge and more ideas.” Meanwhile the young women’s group reports that most of their peers are concentrating on their studies or lack interest in farming. Similarly, in San Antonino of Mexico, a climbing case, the young women say that while both have training opportunities it is men who are more interested in trying out new agricultural things because “they’re out on the farms more.” They say the few women with any interest in farming are all older than 40 and mostly engaged in vegetable gardening, such as “green beans, tomatoes, lettuce, squash . . .”

In Mikita, Zimbabwe, another churning case where nonpoor men observe disempowerment, young men initially respond that there are no gender differences in opportunities to learn new farming practices, including about improved maize varieties. Nevertheless, the young men then qualify their views with explanations that “women spend less time doing Conservation Agriculture . . . because they have to do other household chores,” and young women have more limited chances than young men to use tractors. Meanwhile, when asked about local learning opportunities, a young woman of Mikita affirms in her focus group that “both young women and men are welcome and have the same opportunities” to learn about and try out CA. These young women feel no need to mention any of their other responsibilities as do the men.

Surprisingly, all 14 of the youth focus groups conducted in Tanzania and Nepal report innovation opportunities to be the same for both women and men, as do youth from four other cases. In their explanations for equality, moreover, a majority of the groups mention extension services which are accessible to young women and men alike. In (climbing) Pandhera, Nepal, a young man says, “In fact, women participate more in agricultural trainings because men go to work abroad.” In Ranagar, Nepal (tipping point), young women similarly explain that young men go for “foreign employment” and therefore they have greater “opportunities to join trainings and excursions, form groups and associations in the village.” Or, young women In Kilosha, Tanzania (tipping point) declare that everyone in their village can engage: “All men and women are engaged in farming activities so every opportunity that relates to improving the way they do their activities concerns them all.” Even in

(churning) Mashowa of Zimbabwe, where young women report early pregnancy to be common and parents discouraging of their education, a young woman reports, “No meeting is ever called saying it is for women or men only. We are all taught about new farming methods, new seeds varieties, and new livestock practices.”

While young people report access to agricultural learning opportunities in tipping point, climbing, and churning cases alike, access is just a first step. Programs targeting youth are more likely to have traction and drive good change where they better recognize young people’s strong social embeddedness in their families and communities, and the opportunities and barriers which this raises for them. Even with their educations and the world changing rapidly around them, both young women and men continue to confront diverse pressures to uphold restrictive norms at a crucial phase of their life cycles.

SECTION V. OPPORTUNITIES FOR MAIZE RESEARCH FOR DEVELOPMENT

The report illuminates how improved understanding of gender norms and agency provides insight into underlying social mechanisms which can influence, and be influenced by, agricultural innovation processes. In contexts where gender norms are more fluid and encouraging both women’s and men’s economic agency, new agricultural technologies and practices can be game-changing and associated with rapid local poverty reduction.

More commonly, the pace of gender norm change is slow and uneven, and this is constraining women’s economic independence and local level institutional functioning. In these contexts, poor and better-off rural women are also engaged in agricultural innovation and reaching for better lives, and, together with men, little by little transforming the social relations and institutions of their villages to become more inclusive. Are their ways to speed up the transition to a normative environment that is encouraging of both women’s and men’s agency in maize farming communities?

In fact, current theory on innovation draws attention to the normative context that informs everyday practices and recommends approaches that “enhance the survival chances of existing initiatives for change” (Leewis & Aarts, 2001, p. 21; Cunningham & Jenal, 2016). With this in mind, we highlight below opportunities for AR4D to identify and strengthen initiatives underway for greater gender inclusion as a strategic complement to wider maize research and development efforts.

Technology development and diffusion that explicitly accounts for strong normative influences on innovation processes, and contributes to gender-transformative change, has a larger probability of success. Three different typologies for how agency and norms interact to shape innovation processes are offered to provide a broad framework for further research and experimentation:

- ***Tipping point contexts:*** In these rarer contexts, existing AR4D models with gender objectives have a good probability of success. Varieties and land management practices that save labor and inputs, improve production, offer resilience to weather shocks, and meet household and market preferences are helpful for women and men alike. Also strategic are investments in both women and men extension agents and AR4D services that can assess and be responsive

to the different and changing opportunities and barriers facing men and women farmers from both poorer and better off households in these dynamic communities.

- ***Climbing contexts.*** In these more typical villages, experimentation is needed to support a normative climate that better recognizes and nurtures women’s agricultural innovation in addition to men’s. Household Methodologies, a suite of participatory tools, offer promise because they tap into community leadership and nurture more equitable intra-household decision-making and resource access (IFAD, 2014). Activities to engage men as well as women in strategies to secure and manage household food security and nutrition are important (Otieno, Farnworth, & Banda, 2016), as are initiatives to deepen learning, build networks, and promote and mentor women innovators as much as men innovators.
- ***Churning contexts.*** These case studies reveal challenges with current development processes for selected population groups. Rather than avoid or withdraw from these villages, experimentation is needed in research partnerships, warning systems and mitigation strategies that better identify and support specific groups of poor and vulnerable women and men to reduce risks (including backlash and violence against women) and connect with better opportunities.

Evidence is growing for multi-faceted intervention models that support both women and men to access opportunities. A recent evidence review of gender interventions finds strong benefits from locally tailored projects which combined farmer groups, financial services, processing and storage technologies, and training; and while these programs targeted women, they also “involved male partners and community leaders” (Buvinic, Furst-Nichols, & Courey Prior, 2016, p. 40). Indeed, many economic empowerment interventions which solely target women or provide limited services have struggled with effectiveness (Kabeer et al., 2013).

Invest in institutional innovation in maize agri-food systems. In many rural communities, women’s meaningful inclusion in agricultural innovation processes requires normative change, especially coordinated shifts among community members in support of women’s economic independence, voice and leadership. To support this transition, the tipping point cases signal the strategic benefit of intervention models that can **effectively strengthen both women’s and men’s initiatives to expand and diversify their livelihood activities in the same communities and at the same time.** Promising avenues for supporting such institutional innovation include initiatives that:

- **Learn from men and women innovators:** Further analysis on the trajectories and experiences of local men and women innovators could strengthen understanding of and support for more inclusive agricultural innovation processes by contributing to the evidence base on factors and processes that help (and hinder) innovation capacities, including for early adopters (and dis-adopters).
- **Proactively cultivate positive role models of both genders for inclusive change:** Investments in women and supportive men role models as part of specific downstream AR4D interventions can create openings for more inclusive innovation processes.
- **Support female-household heads to open space for other women:** Women-headed households who are actively innovating in their agricultural livelihoods emerge across the

three typologies and serve as role models for normative change; however, further learning is needed to ensure that interventions targeting this group do not increase stigma, work burdens and other risks.

- **Work with and build capacity of progressive opinion leaders:** Strong local rural leaders for inclusive agricultural change can complement and enhance the development of mechanisms for institutional innovation in maize agri-food systems.
- **Develop and test agricultural extension services that cater to women as well as men:** A key challenge remains to open space for agricultural learning and information diffusion services which effectively support women farmers as well as men farmers. This can be done as part of research on scaling out, as stand-alone, or as part of larger maize research projects.
- **Experiment with informal education and community learning models—especially in contexts where normative environments highly discourage women’s agency:** Growing evidence finds community-based learning initiatives to be effective that work with local leaders and community members of both genders to improve rural livelihoods, build awareness of human rights, and support social norm change (Cislaghi, Gillespie, & Mackie, 2016; Edström & Shahrokh, 2015; Najjar, Spaling, & Sinclair, 2013; Friis-Hansen, Duveskog, & Taylor, 2012; Humphries et al., 2012).
- **Strengthen the capacities of seed companies and retailers to account for gender as a customer attribute and to develop and test innovative mechanism for timely delivery of quality seed and varietal information.**
- **Enable young people to participate in local innovation processes:** The youth who participated in the study express strong aspirations and are better educated than previous generations, but remain deeply embedded in family and community networks. Young women especially struggle to engage with opportunities in the public sphere and will often require special measures to ensure their inclusion. Schools also offer promising opportunities for engaging children and young people in agricultural innovation through training and education on agriculture.
- **Strengthen initiatives working for equitable asset ownership:** Strong normative barriers to more equitable asset ownership and control, especially land, hamper women’s efforts to apply and benefit from new learning. While addressing these issues is typically not directly within the remit of AR4D, international and national AR4D entities have strong interest in and are well positioned to support efforts that advance national and international decision makers and fora to address issues of inequitable asset ownership and control.
- **Collaborate with partners with strong track records of serving poor rural women and men:** Many interventions with gender objectives struggle because they challenge social conventions, and thus require specialist staffing, flexible designs, and close monitoring to stay on course.

The GENNOVATE study approach provides a means for large-scale research and intervention programs like the MAIZE CRP to better understand and contribute to social processes where *both* women and men effectively access and benefit from agricultural innovation in specific contexts *and* at the same time. In the period ahead, community revisits provide ripe opportunities for further learning as GENNOVATE's multidimensional baseline information can be used to enrich understanding of these dynamics over time.

The transition to more inclusive and diverse livelihood opportunities and faster poverty reduction requires *both* women and men to be actively engaged, simultaneously, in driving these processes in their everyday lives and enlarging their power and freedom along the way. As AR4D moves toward an agri-food systems approach, **research capacities are required for examining and learning from the interdependent elements and evolution of local institutions, and the central role of local actors** in processes of social change and development (Cunningham & Jenal 2016).

Annex 1. Overview of GENNOVATE sampling, data collection, and analysis protocols

The development of GENNOVATE's conceptual framework, sampling framework, and field instruments began at an October 2013 research design workshop. The final methodology package reflects extensive reviews of literature, lessons, and tools from previous field studies¹³; two rounds of field pilots in February and April 2014 and feedback from experts and study participants on the instruments; ongoing technical advisory support and capacity building for PIs; and strong training and supervision for the field teams. In this note we present highlights of the study approach and protocols.¹⁴

Study questions and conceptual framework

GENNOVATE's design is guided by the following study questions:

- How do gender norms and agency advance or impede innovation capacity and technology adoption in agriculture and natural resource management across different contexts and social structures?
- How do new agricultural technologies affect gender norms and agency across different contexts? Under what conditions can technologies do harm?
- How are gender norms and women's and men's agency changing, and under what conditions do these changes catalyze innovation and adoption, and lead to desired development outcomes? What contextual factors influence this relationship?

To address the study questions, GENNOVATE employs a conceptual framework which is informed by selected discourses on agency and structure interactions in feminist literature (e.g., Wharton, 1991; Kabeer, 1999; Ridgeway, 2009). The study questions require exploring interactions between gender norms, agency, and agricultural innovation in specific contexts, or local opportunity structures. The notion of structure refers to "the rules that shape social actions and the resources that furnish agents with the power that makes it possible (to varying extents) for them to act" (Lane, 2001, p. 297). GENNOVATE pays particular attention to gender norms as an important dimension of the local opportunity structure. Gender norms refer to the socially constituted rules that prescribe men's and women's daily behavior. These norms are upheld across generations by internalized psychological beliefs about men's higher status, competence, and appropriate gender behaviors, and by processes of social interaction and sanctions of one's "reference group" through social approval and disapproval (e.g., Ridgeway, 2009; Bicchieri, 2006).

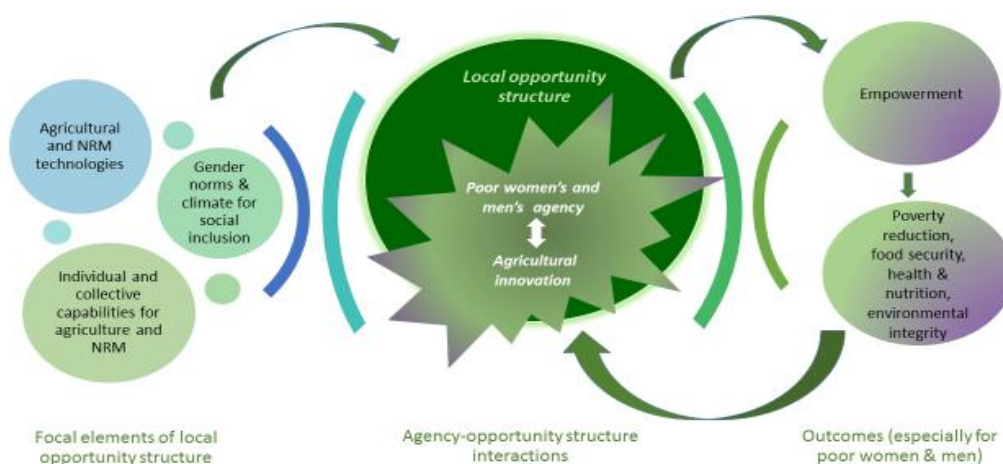
Depicted in figure A1.1, GENNOVATE's conceptual framework conceives of empowerment and other dimensions of improved wellbeing (the far right of the figure) as products of the interaction between

¹³ It was, in fact, a presentation of the World Bank's global qualitative studies which sparked the idea for GENNOVATE. These studies include: *On norms and agency: Conversations about gender equality with women and men in 20 countries* (Muñoz Boudet, Petesch, & Turk, 2013), *Voices of the poor* (Narayan et al., Vol. 2000, 2000a, 2002), and *Moving out of poverty* (Narayan et al., Vol. 2007, 2009, 2009, 2010).

¹⁴ For a fuller discussion of the study rationale, key questions, conceptual framework, and related literature, please see Badstue et al. (forthcoming); and for fuller discussion of the study sampling and data collection methods and experiences, see Petesch et al. (forthcoming).

men's and women's capacities for agency and innovation (in the center), on the one hand, and on the other, the opportunities for and barriers to innovation in their local opportunity structure (with key dimensions depicted on the left).

Figure A1. 1 GENNOVATE conceptual network



Drawing on this conceptual framework, GENNOVATE's methodology addresses concerns for:

- i) *Contextual* influences on, or the embeddedness of social action and lived experience;
- ii) *Comparative* research strategies which offer cross-site learning and permit cautious generalizations to wider settings while remaining attentive to local specificities; and
- iii) *Collaborative* research processes between the researcher and study participants, and among the study's large research team, which strengthen the quality, relevance, and reach of the research (also see Badstue et al., forthcoming).

Sampling

A GENNOVATE case refers to a social group living in a single locality that the inhabitants call their village, community, neighborhood, or hamlet. The cases were selected purposively to introduce variance on two dimensions considered important for understanding gender differences in innovation adoption:

- i. *economic dynamism*, here understood as the existence and nature of competition over agriculture or NRM resources important for livelihoods in the village; infrastructure development that indicates change in the local economy such as penetration of roads or connectivity; changes in the market orientation of small-holder farmers; changes in the sophistication of processing technologies for key commodities; the relative percentages of buyers and sellers (sex-disaggregated if information is available) in local input and output markets; changes in on- and off-farm employment opportunities; changes in the local diversification of livelihoods or the potential for this diversification.
- ii. *gender gaps in assets and capacities*, such as the share of girls completing primary school compared to boys; the extent to which women hold important leadership positions (civic

and political) in local organizations; and the broadly accepted norms in the village about women's freedom of movement.

The two axes for stratification are similar to those applied in *On Norms and Agency* (Muñoz Boudet, Petesch, & Turk, 2013) and reflect an empirical literature finding associations between countries with greater gender equality and higher levels of economic growth (e.g., World Bank, 2011). For substantive as well as practical reasons, the protocols provided PIs with some flexibility in how they stratify their samples along the two dimensions; see Petesch (forthcoming) for further discussion.

Table A1.1 presents the countries, crops, and CGIAR Research Programs spanned by GENNOVATE's fieldwork. Asia contains the largest number of cases (74), followed by Africa (53), and Latin America (10). The regional concentration in Asia and Africa reflects current research priorities in the CGIAR system.

Table A1.1. GENNOVATE countries, target crops and systems, and CRPs

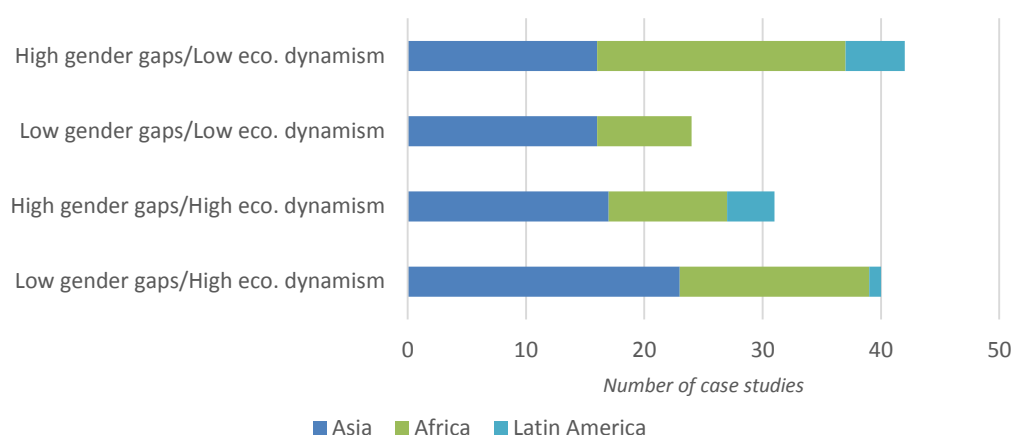
Countries	Target crop & system	CGIAR Research Program (CRP)
<ul style="list-style-type: none"> • Asia: Afghanistan, Bangladesh, India (Andhra Pradesh, Bihar, Haryana, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Uttar Pradesh), Indonesia, Kyrgyz Republic, Nepal, Pakistan, Philippines, Uzbekistan, Vietnam • Africa: Burkina Faso, Burundi, Democratic Republic of the Congo, Ethiopia, Kenya, Malawi, Mali, Morocco, Niger, Nigeria, Rwanda, Tanzania, Uganda, Zimbabwe • Latin America: Colombia, Mexico 	<ul style="list-style-type: none"> • Banana • Cassava • Chickpeas • Groundnuts • Maize • Millet • Pigeon pea • Potato • Rice • Sorghum • Sweet potato • Wheat • Aquaculture • Tree-based systems • Humid tropical systems 	<ul style="list-style-type: none"> • Roots, Tubers and Bananas (RTB) • Humidtropics • Agriculture for Nutrition and Health (A4NH) • Grain Legumes (GL) • MAIZE • Dryland Cereals (DC) • GRISP • WHEAT • Aquatic Agricultural Systems (AAS) • Forests, Trees and Agroforestry (FTA) • Dryland Systems (DS)

The sample includes major food crops such as rice, wheat, maize, cassava, sweet potato, banana, millet, sorghum, and several grain legume crops. In terms of coverage of different agricultural systems, the dryland agro-ecosystems of Africa and Asia are well represented in the study, as are the subtropical and tropical systems of Asia, which included aquaculture cases. Cases from Indonesia and the Kyrgyz Republic include contexts where tree products and agroforestry systems are important.

Figure A1.2 presents the broad distribution of cases along the dimensions in the sampling framework, indicating a cross-site sample with good coverage of all four sampling contexts in the priority regions.

The GENNOVATE cases target agri-food systems or intervention domains of relevance to the CRPs involved, and they are meant to help inform present and future agricultural research for development in these areas. The quality of the fieldwork is greatly enriched by being able to draw on existing relationships with and knowledge of many of the research sites.

Figure A1.2. Regional distribution of cases by sampling framework



These relationships, however, may also prompt concerns for bias in the findings due to factors such as an underrepresentation of difficult places, or study participants being courteous, overstating benefits of or downplaying difficulties with interventions, or expecting some kind of benefits. These concerns are not unique to qualitative samples, and researchers involved in the GENNOVATE studies have applied social science techniques of critical self-reflection to reduce bias in interpretations and findings. GENNOVATE's large comparative dataset, which asks many of the same or similar questions to different population groups within the same community, provides numerous opportunities to cross-check data which may be partial, confusing, or contradictory.

It is also important to keep in mind that GENNOVATE was not designed to assess the performance of or outcomes associated with any particular technology or practice, although study participants do engage in exercises which ask them to identify and assess particular innovations with which they have experience. As demonstrated in the report, the testimonies gathered provide a rich and compelling basis for exploring and comparing qualitatively men's and women's innovation experiences and the normative dimensions of these processes.

Data collection

The methodology package features 15 data collection activities for each research village (table A1.2). The first of three focus group instruments was conducted separately with poor women and men (activity C, table A1.2), the second with nonpoor women and men (activity D), and the third with young women and men (activity E); this makes six focus groups per community. The data collection also includes nine semi-structured interviews guided by three instruments: i) a community profile (to gather background demographic, social, economic, agricultural, and political information about the case (one interview requiring key informants of both genders), ii) an innovation pathways interview with successful adopters of a new technology or practice¹⁵ (two men, two women), and iii) life story interviews (two men, two women).

¹⁵ PIs could frame the selection criteria to focus on successful adopters of either a specific CRP innovation, or of one or more innovations of local significance.

Table A1.2. Overview of GENNOVATE data collection instruments

Tool	Purpose	Respondents
Activity A. Literature review	– To situate the case in a wider context by providing general background information about the case study area and relevant findings from recent studies, particularly about the innovations of interest and their gender dimensions.	(Principal investigator)
Activity B. Community profile	– To provide social, economic, agricultural, and political background information about the community	– One or two men key informants – One or two women key informants
Activity C. Focus group: Ladder of Life (with poor adults)	– Gender norms and household and agricultural roles – Labor market trends and gender dimensions – Enabling and constraining factors for innovation, and their gender dimensions – The culture of inequality in the village, factors shaping socio-economic mobility, poverty trends—and their gender dimensions – Intimate partner violence	– One FGD of 8 to 10 adult women, ages 30 to 55 – One FGD of 8 to 10 adult men, ages 30 to 55
Activity D. Focus group: Capacities for innovation (with nonpoor adults)	– Agency – Community trends – Enabling and constraining factors for innovation, and their gender dimensions – Gender norms surrounding household bargaining over livelihoods and assets – The local climate for agriculture and entrepreneurship, and their gender dimensions – Social cohesion and social capital	– One FGD of 8 to 10 adult women, ages 25 to 55 – One FGD of 8 to 10 adult men, ages 25 to 55
Activity E. Focus group: Aspirations of youth (with older adolescents and young adults)	– Gender norms, practices, and aspirations surrounding education – Enabling and constraining factors for innovation, and their gender dimensions – Women's physical mobility and gender norms shaping access to economic opportunities and household bargaining – Family formation norms and practices	– One FGD of 8 to 12 women youth, ages 16 to 24 – One FGD of 8 to 12 men youth, ages 16 to 24
Activity F. Semi-structured interview: Innovation pathways	– To explore in-depth the trajectory of individual experiences with new agricultural and NRM practices, and the role of gender norms and capacities for innovation in these processes.	– Two men innovators – Two women innovators
Activity G. Semi-structured interview: Individual Life Stories	– To understand the life stories of different men and women in the community who have moved out of poverty, fallen into deeper poverty, or remained trapped in poverty, and how gender norms, assets, and capacities for innovation in agriculture/NRM, and other assets and capacities, shaped these different poverty dynamics.	– Two men – Two women

PIs prepared for fieldwork by conducting a review of literature and secondary data from their research villages and regions; mobilizing and training their field team; and refining, translating, and

validating the data collection instruments. Each field instrument contains a standardized semi-structured interview guide to ensure comparability in the data collection and documentation across the research villages. PIs also tailored sections of the interview guides to address innovations and other issues of importance to their CRPs or the specific case.

The data collection tools draw directly from participatory rural appraisal (PRA) techniques and feature many visual activities and probing questions to support and deepen the study participants' own interpretations and analyses of key study topics and to encourage rich discussion among study participants. The trainings to prepare for fieldwork engaged team members in long hours reviewing, discussing, and practicing—question-by-question—the data collection instruments to ensure common understanding and ease with facilitation. The team also reviewed the quality of the translation of each question, making sure that it not only captured the intent of the English version, but that the phrasing used common, everyday terms rather than a more formal translation. Trainings also required a field practice and clearance by the study's expert advisor of the practice documentation of field notes.

Data analysis

The analysis strategy combines two procedures: i) inductive case-oriented (or thick description) techniques; and ii) deductive variable-oriented (or thematic) techniques (e.g., Miles, Huberman, & Saldaña, 2014). Case-oriented analytic techniques provide the building blocks for GENNOVATE's major findings and conclusions. These approaches require a focus on a single case to explore the interplay of gender norms, agency, and innovation capacities in specific localities, and over time, which can contribute understanding of these processes in the wider set of cases.

This case-oriented work is complemented with variable-oriented analysis aided by pre-coded questions during data collection (from focus group rating exercises and community profile pre-coded questions) as well as data coding with NVivo using 150 common codes broken into 15 topic areas.¹⁶ This supports systematic triangulation of findings across types of respondents and communities and identification of recurring themes which cut across GENNOVATE's cases and subsamples (for example, the experiences of poor vs. nonpoor women in cases with different levels of economic dynamism). To ensure sound case study management during the data coding and analysis phase, significant investments were made in capacity building of PIs; in supervision and collaboration among the data coders; and in the preparation of detailed protocols, one elaborating data coding procedures and another analysis (or "query") procedures with the software.

We wish to add here that the senior field team leaders and members contributed in-depth analyses of their MAIZE CRP case studies to this report. Yet, rapid data collection techniques and power differences between researchers and study participants inevitably limit and shape data gathering and interpretation. While it is very important for a study like this to learn from the poorest women and men farmers, they are likely under-represented in the data for diverse reasons. Additionally, study concerns for agency around innovation processes introduces further biases, including a tendency for study participants to discount or remain silent about "trial and errors" and other events and

¹⁶ The frequencies generated from the coding are based on systematic content analysis and data coding of approximately 6,000 pages of the GENNOVATE field notes.

understandings that run counter to their current circumstances, or counter to the types of questions being asked (no matter how open-ended). Moreover, rapid data collection methods cannot replace longer-term field work and the in-depth insights they provide of innovation and other social change processes in specific contexts. Nevertheless, GENNOVATE’s dataset comprises varied semi-structured instruments and sample groups in each case study, and is precisely designed to allow for systematic triangulation and pattern identification while remaining attentive to contextual realities.

Annex 2. MAIZE sample

This report draws on a sample of 27 GENNOVATE cases from maize regions of Ethiopia, Mexico, Tanzania, Malawi, Nepal, Nigeria, and Zimbabwe. In this annex, we review key macro indicators for the study countries, which mainly point to a constrained development environment, and discuss the selection of the case studies.

Figure A2.1 presents the countries in the sample and their GDP per capita in 2005 and 2015. Ethiopia, Tanzania, Malawi, Nepal, and Zimbabwe are low-income countries with a GDP per capita of \$1,025 or less in 2015. Nigeria and Mexico are considered lower-middle and upper-middle income countries, respectively, although both are marked by strong income inequalities (World Bank, 2014; Bedoya et al., 2013). Samples from these countries include people from the poorest and/or more conflict-affected regions, including Chiapas and Oaxaca states in Mexico, and Kaduna, Oyo, and Plateau states in Nigeria. Figure A2.2 provides an overview of national poverty levels.

Figure A2.1. GDP per capita, 2005 and 2015

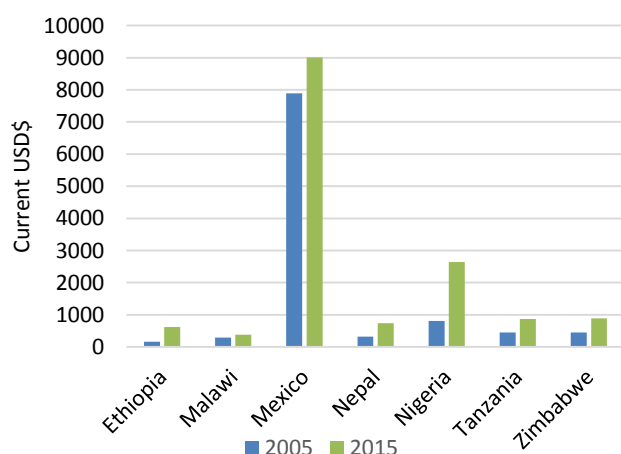
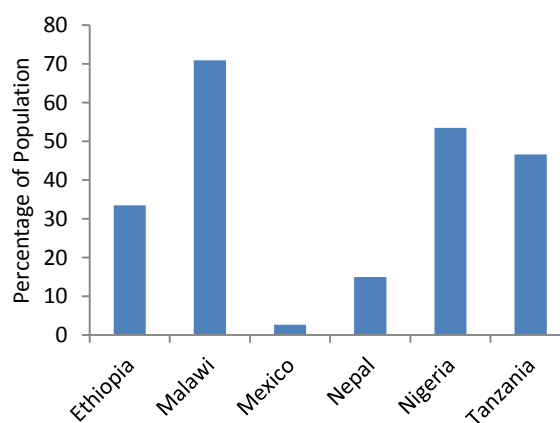


Figure A2.2. Poverty headcount, \$1.90 USD/day, 2012 or latest available



Note. World Bank data (2016). Poverty headcount is defined as the proportion of the population that lives below the poverty line. Information for Zimbabwe's poverty headcount ratio was only available for their national poverty line, and was 72.3 percent of the population in 2011.

Maize is one of the three leading global cereals that feed the world (Shiferaw, Prasanna, Hellin, & Banziger, 2011). Maize, together with rice and wheat, dominate human diets (Ignaciuk, 2014) and provide at least 30 percent of the food calories for more than 4.5 billion people in 94 developing countries (von Braun et al., 2010). Maize alone contributes over 20 percent of total calories in human diets in 21 low-income countries, and over 30 percent in 12 countries that are home to a total of more than 310 million people (Nuss & Tanumihardjo, 2011). In all seven study countries, maize plays

a significant role in food security. In Malawi maize provides half of the food supply, in Mexico and Zimbabwe—around one third, and in Tanzania—one fifth (see table A2.1). Food security is a serious concern for six out of seven study countries with the exception of Mexico, where the Hunger Index is low; however, averages mask important regional and social group disparities in food security across the full set of countries.

Table A2.1. Maize production and maize food supply

Country	Maize area harvested (ha)	Maize yield (t/ha)	Maize production (t)	Maize food supply (kcal/capita/day)	Maize protein supply qty (g/capita/day)	Maize food supply qty (g/capita/day)	Global Hunger Index 2016
Mexico	7,100,000	3.45	24,500,000	986	25.41	0.32	7.2 (low)
Zimbabwe	800,000	0.64	512,000	743	19.57	256	28.8 (serious)
Ethiopia	2,200,000	2.86	6,300,000	398	9.20	115	25.7 (serious)
Malawi	1,650,000	1.44	2,369,000	1125	29.64	354	26.9 (serious)
Nigeria	4,000,000	1.80	7,200,000	285	7.50	90	25.5 (serious)
Nepal	900,000	2.22	2,000,000	342	8.31	119	21.9 (serious)
Tanzania	4,200,000	1.31	5,500,000	523	12.37	160	28.4 (serious)

Note. FAOSTAT Food Balance Sheets (2013); IFRI-Global Hunger Index (2016); United States Department of Agriculture (2016)

Table A2.2 presents governance indicators for the seven study countries. These indicate mixed performance across the board for the six dimensions measured. All study countries have struggled in recent years with controlling corruption, providing rule of law throughout their territory, and ensuring voice and accountability to their citizens. Better scores can be found, for instance, regarding Mexico's government effectiveness and regulatory quality, and for Malawi's political stability and absence of violence.

Table A2.2. Governance indicators of study countries

	2014						
	Ethiopia	Malawi	Mexico	Nepal	Nigeria	Tanzania	Zimbabwe
Control of corruption	-0.4	-0.8	-0.7	-0.5	-1.3	-0.8	-1.4
Government effectiveness	-0.5	-0.7	0.2	-0.8	-1.2	-0.6	-1.2
Political stability and absence of violence/terrorism	-1.2	0.1	-0.8	-0.7	-2.1	-0.5	-0.6
Regulatory quality	-1.0	-0.7	0.4	-0.9	-0.8	-0.3	-1.9
Rule of law	-0.4	-0.3	-0.5	-0.7	-1.1	-0.4	-1.4
Voice and Accountability	-1.3	-0.1	-0.1	-0.4	-0.6	-0.2	-1.3

Note. Created from the World Bank's Worldwide Governance Indicators (2016). Higher scores correspond to better outcomes (with 2.5 as the highest possible).

To varying degrees, the study countries face gender gaps in education, economic participation, and political empowerment (table A2.3). While Mexico compares favorably with others in this sample in domains such as education and women's political leadership, it is similar in areas such as low levels of female labor force participation, early marriage and childbearing, and high rates of gender-based violence (e.g., see INEGI, 2015). And as highlighted in the report, despite the overall more favorable macro climate, women in the Mexico sample report a more discouraging climate than many other research communities for their participation in agricultural innovation.

Table A2.3. Gender Inequality Index, study countries

<i>Study country</i>	<i>Country rank out of 188 countries</i>	<i>2015 Gender Inequality Index</i>
Ethiopia	129	.56
Malawi	140	.61
Mexico	74	.37
Nepal	108	.49
Nigeria	n/a ¹⁷	n/a
Tanzania	125	.55
Zimbabwe	112	.50

Note. The Gender Inequality Index (GII), from UNDP's Human Development Reports (2015), measures gender inequalities in three important aspects of human development—reproductive health, empowerment, and economic status.

As discussed in annex 1, the GENNOVATE case studies were selected to introduce strong diversity in levels of economic dynamism and gender gaps, and the selection criteria are further elaborated there. Table A2.4 highlights the diversity of contexts captured by the MAIZE CRP case studies, and annex 3 provides an overview of the individual cases.

Table A2.4. Distribution of cases according to sampling framework

<i>Study countries</i>	<i># cases</i>	<i>Low gender gaps / High eco. dynamism</i>	<i>High gender gaps / High eco. dynamism</i>	<i>Low gender gaps / Low eco. dynamism</i>	<i>High gender gaps / Low eco. dynamism</i>
Ethiopia	4			2	2
Malawi	2		1		1
Mexico	6	1	3		2
Nepal	3	1		1	1
Nigeria	4	2			2
Tanzania	4	1	1	1	1
Zimbabwe	4	2		1	1
Total	27	7	5	5	10

¹⁷ On the 2014 Social Institutions and Gender Index, Nigeria is classified as a country with highly discriminatory social institutions for women. This index assesses, for instance, gender bias in family legal codes (such as legal age of marriage and inheritance), physical integrity, fertility preference, resource access, and political voice. For further information, see: <http://www.genderindex.org/country/nigeria>.

Annex 3. Overview of case studies

Country State/Province	Community pseudonym	Population & sampling context	CRP Focal Innovation; main crops & agro-ecological conditions	Social characteristic
Ethiopia Oromiya	Nebele	6992 Eco. dynamism: Low Gender gaps: High	CRP Focal Innovations: Improved maize; row planting Main crops: maize, wheat, barley, teff and sorghum Secondary: vegetables such as carrot, beetroots and cabbage Primary crop purpose: Commercial and household consumption Agri-ecological conditions: Average temperature of 16-18 degrees Celsius.	Ethnic groups: Oromo: 100% Religions: Muslim: 85% Christian: 15%
Ethiopia Oromiya	Oromila	3000 Eco. dynamism: Low Gender gaps: High	CRP Focal Innovations: Improved maize; row planting Main crops: maize, sorghum, wheat and teff Secondary: avocado, banana, cabbage, beet roots, potato, swiss chard and carrot Primary crop purpose: Commercial and household consumption Agri-ecological conditions: highland weather; soil type is mostly sandy (80%) and clay soils	Ethnic groups: Oromo: 95% Hadiya: 1% Guraghe: 1% Religions: Majority Muslim
Ethiopia SNNPR	Hanawa	2560 Eco. dynamism: Low Gender gaps: Low	CRP Focal Innovations: Improved maize; row planting Main crops: maize, inset, tomato, onion, carrot, potato, cabbage, khat and pepper Primary crop purpose: Commercial and household consumption Agri-ecological conditions: Soil is mostly sandy and only water resource is Lake Hawassa	Ethnic groups: Sidama: 99% Welayita: 1% Religions: Christian and Muslim
Ethiopia SNNPR	Wariso	9000 Eco. dynamism: Low Gender gaps: Low	CRP Focal Innovations: Improved maize; row planting Main crops: maize, beans, inset Secondary: sorghum, teff, tomato, onion, carrot, potato, cabbage, khat and pepper Primary crop purpose: Commercial and household consumption Agri-ecological conditions: Altitude of 1800 m; 4 water points and traditional ponds, as well as Lake Hawassa; black soil	Ethnic groups: Sidama: 100% Religions: Predominantly Protestant Christian with a very small number of Muslims

Malawi Central Region	Kamunbu	NA	CRP Focal Innovations: Improved maize; Conservation Agriculture Main crops: maize, groundnuts, soya and tobacco Primary crop purpose: Commercial and household consumption Agri-ecological conditions: Crop production includes rain-fed cultivation in their regular fields and off season cultivation in lowlands close to rivers using irrigation	Ethnic groups: Chewa: 60% Tumbuka 20% Yao: 10% Lomwe and Ngoni: 5% Religions: Christian: 70% Gule Wankulu or Nyau cult: 25% Muslim: 5%
Malawi Central Region	Nkhopa	5500 Eco. dynamism: Low Gender gaps: High	CRP Focal Innovations: Improved maize; Conservation Agriculture Main crops: maize, groundnuts, cotton and tobacco Primary crop purpose: Commercial and household consumption Agri-ecological conditions:	Ethnic groups: Chewa: 94% Sena: 4% Yao: 2% Religions: Church of Christ: 50% Jehovah Witness: 20% Anglican: 15% Baptist: 5% New Last: 2% Other: 3%
Mexico Chiapas	Eldorado	800 Eco. dynamism: High Gender gaps: High	CRP Focal Innovations: Improved maize; Conservation Agriculture Main crops: maize, beans and sorghum Seed type: Improved and landrace Primary crop purpose: Commercial Mechanization level: Medium Agri-ecological conditions: Warm, humid climate with summer rain (900-3000 mm of annual rainfall). River runs through village.	Ethnic groups: Majority Mestizo Religions: Catholic: 40%; 7 th Day Adventists: 10% Other Christian religions: 50%
Mexico Chiapas	Miraflores	1147 Eco. dynamism: High Gender gaps: Low	CRP Focal Innovations: Improved maize; Conservation Agriculture Main crops: maize, beans; Secondary: peanuts Seed type: Improved and landrace Primary crop purpose: Commercial Mechanization level: Low Agri-ecological conditions: Warm, fairly humid climate with summer rain (1200 mm of annual rainfall). Hilly terrain with steep slopes and valleys. The Pando River is the village's most important natural resource.	Ethnic groups: Majority Mestizo Religions: Catholic: 75% Jehovah Witness: 15% Christian: 10%

Mexico Chiapas	Palo Verde	500 Eco. dynamism: Low Gender gaps: High	CRP Focal Innovations: Improved maize; Conservation Agriculture Main crops: maize and beans Secondary: coffee Seed type: Improved and landrace Primary crop purpose: Household consumption Mechanization level: n/a Agri-ecological conditions: Warm, humid climate with summer rain (1000-2500 mm of annual rainfall). Cloud forest ecosystem with varied vegetation and wildlife.	Ethnic groups: Majority Mestizo Religions: Catholic: 65% 7 th Day Adventists: 30% Jehovah Witness: 5%
Mexico Oaxaca	Agua Esperanza	610 Eco. dynamism: High Gender gaps: High	CRP Focal Innovations: Improved maize; Conservation Agriculture Main crops: maize and beans Secondary: lime, litchi Seed type: Improved and landrace Primary crop purpose: Household consumption Mechanization level: Medium Agri-ecological conditions: Warm, humid climate with year-round rainfall; small hills with an average altitude of 100 metros above sea level.	Ethnic groups: Chinanteca: 90% Mazatecos/Mestizos: 10% Religions Pentecostal: 60% Catholic: 30% Jehovah Witness: 10%
Mexico Oaxaca	Montevidal	350 Eco. dynamism: Low Gender gaps: High	CRP Focal Innovations: Conservation Agriculture Main crops: maize, beans and wheat Seed type: Landrace Primary crop purpose: Household consumption Mechanization level: n/a Agri-ecological conditions: Temperate dry climate with summer rains (680 mm of annual rainfall). Varied vegetation, including pines and fruit trees.	Ethnic groups: Mixtec: 100% Religions: 7 th Day Adventists: 60% Catholic: 40%
Mexico Oaxaca	San Antonino	360 Eco. dynamism: High Gender gaps: High	CRP Focal Innovations: Improved maize; Conservation Agriculture Main crops: maize, beans and wheat Secondary: Vegetables Seed type: Improved Primary crop purpose: Commercial Mechanization level: High Agro-ecological conditions: Temperate humid climate with annual rainfall of 663.1 mm and frost from November to March. Two rivers run through village. No forest, only bushes and native shrubs.	Ethnic groups: Mixtec and mestizo Religions: Catholic: 95% Jehovah Witness: 5%

Nigeria Plateau	Mwaghavul	2000 Eco. dynamism: Low Gender gaps: High	CRP Focal Innovations: Improved maize; brown cowpea; sugar cane Main crops: cereal crops such as maize, guinea corn, millet, wheat, acha, rice and tuber crops such as Irish potato, yam, cassava and sweet potato Primary crop purpose: Commercial and household consumption Agro-ecological conditions: Located within the northern Guinea savanna and the climate is near temperate.	Ethnic groups: Mwaghavul: 100%
Nigeria Oyo	Gbodomu	20000 Eco. dynamism: Low Gender gaps: Low	CRP Focal Innovations: Improved maize; cassava; soybeans Main crops: maize, cassava, groundnuts, pepper, yam, tomatoes, sorghum, soybean and cowpea Primary crop purpose: Commercial Agro-ecological conditions: Savannah vegetation zone and a low land rain-forest area	Ethnic groups: Yoruba: 70% Ibo: 5% Hausa: 5% Fulani: 3% Egede: 3% Abassa: 3% Sabe: 5% Tifi: 2% Boro: 3
Nigeria Kaduna	Kaduwa	15000 Eco. dynamism: High Gender gaps: Low	CRP Focal Innovations: Improved maize; rice; groundnuts and soybeans Main crops: maize, millet, guinea corn, rice, yam, potato, cassava, groundnut, sugarcane, soybean, sorghum and poultry farming Primary crop purpose: Commercial and household consumption Agro-ecological conditions: Tropical climate. When compared with winter, the summers have much more rainfall. The temperature averages 27.1°C. The average annual rainfall is 1252 mm, and there is a difference of 255 mm of precipitation between the driest and wettest months.	Ethnic groups: Hausa: 50% Kurama: 40% Amawa: 4% Gure: 2% Kahugu: 2% Chawai: 2% Religions: Christian and Muslim

Nigeria Oyo	Orile Anko	2500 Eco. dynamism: Low Gender gaps: High	CRP Focal Innovations: Improved maize; cassava Main crops: maize, cassava, soybean, cowpea, yam, cassava, melon, sorghum and vegetables Secondary: cocoa, oil palm and cashew Primary crop purpose: Commercial and household consumption Agro-ecological conditions: Equatorial, notably with dry and wet seasons and relatively high humidity. The dry season lasts from November to March while the wet season starts from April and ends in October. The vegetation of the zone is mostly evergreen forest.	Ethnic groups: Yoruba: 67% Ibo: 5% Hausa: 7% Fulani: 5% Aghasu: 3% Igede: 6% Igala: 1% Gara: 2% Togo: 4%
Nepal Tandi Chitwan	Ranagar	1080 Eco. dynamism: Low Gender gaps: High	CRP Focal Innovations: Improved maize; Main crops: maize, paddy, mustard, wheat, lentil, dairy products and vegetables Primary crop purpose: Commercial and household consumption Agro-ecological conditions: Fertile soil and tropical climate. Climate change impacts include delayed monsoons and hail storms.	Ethnic groups: Tharu: 50% Brahmin: 30% Chettri: 20%
Nepal Rupandehi	Ghodaha	4950 Eco. dynamism: Low Gender gaps: Low	CRP Focal Innovations: Improved maize Main crops: maize, paddy, vegetables, mango and banana Primary crop purpose: Commercial Agro-ecological conditions: Rain-fed irrigation year round. Fertile soil with two rivers. Climate change having an impact on germination and cross pollination of maize.	Ethnic groups: Brahmin: 50% Magar: 30% Tharu: 10% Gurung: 3% Dalit: 5% Newar: 1% Musahar and Kumal: 1% Religions: Buddhist
Nepal Myagdi	Pandhera	2085 Eco. dynamism: Low Gender gaps: Low	CRP Focal Innovations: Improved maize Main crops: maize, wheat, rice, oats, mustard, peas, tomato, marijuana, spinach, potato and timur farming Primary crop purpose: Commercial Agro-ecological conditions: Climate change impacts, including deforestation, water scarcity and frost	Ethnic groups: Chettri Brahmin Dalit Newar and Magar

Tanzania Kilombero	Mogorowi	2288 Eco. dynamism: High Gender gaps: Low	<p>CRP Focal Innovations: Improved maize; farming methods such as line planting and fertilizer application; vegetable growing</p> <p>Main crops: maize and rice</p> <p>Secondary: bananas, vegetables and coconuts</p> <p>Primary crop purpose: Commercial and household consumption</p> <p>Agro-ecological conditions: Located along the Lumemo River, a tributary of River Kilombero. Major flood in 2013.</p>	<p>Ethnic groups:</p> <p>Bena: 70%</p> <p>Pogolo: 20%</p> <p>Ndwehwe: 4%</p> <p>Ngindo and Sukuma: 6%</p> <p>Religions:</p> <p>Christian: 75%</p> <p>Muslim: 25%</p>
Tanzania Meru	Medu	6032 Eco. dynamism: High Gender gaps: High	<p>CRP Focal Innovations: Improved maize; innovations on vegetable growing, especially greens and green beans; poultry and dairy cow keeping</p> <p>Main crops: maize, beans, vegetables, green beans and tomatoes</p> <p>Secondary: coffee</p> <p>Primary crop purpose: Commercial and household consumption</p> <p>Agro-ecological conditions:</p> <p>Favorable climate with opportunity of streams of water cutting across the village that now is favoring irrigation for vegetable and maize growing.</p>	<p>Ethnic groups:</p> <p>Meru: 50%</p> <p>Chagga: 10%</p> <p>Iraq, Arusha, Gorowa, Hadzabe, Chagga, Pale, Mbulu, Haya, and Masai: 40%</p> <p>Religions:</p> <p>Christian: 90%</p> <p>Muslim: 10%</p>
Tanzania Kilosa	Kilosha	2142 Eco. dynamism: Low Gender gaps: High	<p>CRP Focal Innovations: Improved maize; farming methods such as line planting and fertilizer application; vegetable growing</p> <p>Main crops: rice, maize, bananas, tomatoes, sugar canes, sunflower, water melons and other forms of vegetables</p> <p>Primary crop purpose: Commercial</p> <p>Agro-ecological conditions: Fertile soil. People cultivate on the flood plains of River Wami, which runs through the village and serves as irrigation source. Carry out agriculture during the dry and rainy seasons.</p>	<p>Ethnic groups:</p> <p>Makuwa: 20% Pogolo: 15%</p> <p>Yaho: 8%</p> <p>Matumbi: 8%</p> <p>Sukuma: 15%</p> <p>Gogo: 15%</p> <p>Lugulu: 10%</p> <p>Masai: 9%</p> <p>Walugulu: 10%</p> <p>Religions:</p> <p>Christian: 60%</p> <p>Muslim: 40%</p>

Tanzania Muheza	Tanwa	3526 Eco. dynamism: Low Gender gaps: Low	<p>CRP Focal Innovations: Improved maize; new farming practices with improved maize; new cassava, sesame and vegetable varieties</p> <p>Main crops: maize, oranges, sunflower, sesame, cassava, rice and coconuts</p> <p>Primary crop purpose: Commercial and household consumption</p> <p>Agro-ecological conditions: Peri-urban village built in ridges and with valleys characterized by swampy ground preferred by the small scale farmers.</p>	<p>Ethnic groups: Bondehi: 30% Zigua: 35% Sambaha: 15% Ngoni: 5% Bena: 5% Makonde: 5% Religions: Muslim: 70% Christian: 30%</p>
Zimbabwe Masvingo	Mikita	1762 Eco. dynamism: Low Gender gaps: High	<p>CRP Focal Innovations: Improved maize; Conservation Agriculture</p> <p>Main crops: maize, finger millet, sorghum, groundnuts, round nuts and vegetables</p> <p>Primary crop purpose: Commercial and household consumption</p> <p>Agro-ecological conditions: Perennially-plagued by food shortages induced by low rains. Most of the district is hilly and the streams flow throughout the year. The soils are predominantly sandy.</p>	<p>Ethnic groups: Karanga: 99% Manyika: .5% Ndebele: .3% Venda: .2% Religions: Christian: 75% African Traditional Religion: 25%</p>
Zimbabwe Midlands	Zirashawe	5001 Eco. dynamism: Low Gender gaps: Low	<p>CRP Focal Innovations: Improved maize; Conservation Agriculture</p> <p>Main crops: maize, groundnuts, vegetables and sorghum</p> <p>Primary crop purpose: Commercial and household consumption</p> <p>Agro-ecological conditions: Dam used for irrigation. Have experienced recent droughts.</p>	<p>Ethnic groups: Karanga: 99% Ndebele: .4% Zambians: .2% Ndau: .2% Traditional: .2%</p>

Zimbabwe Mashonaland	Shanra	4933 Eco. dynamism: High Gender gaps: Low	CRP Focal Innovations: Improved maize; Conservation Agriculture Main crops: maize, sweet potatoes, cotton, sugar beans, soya beans, sunflower, groundnuts and tobacco Primary crop purpose: Commercial and household consumption Agro-ecological conditions: Inorganic fertilizers used and CA applied due to low soil fertility	Ethnic groups: Korekore: 75% Karanga: 15% Zezuru: 10% Religions: Christian
Zimbabwe Mashonaland	Mashowa	15000 Eco. dynamism: High Gender gaps: Low	CRP Focal Innovations: Improved maize; Conservation Agriculture Main crops: maize, groundnuts, finger millet, pearl millet, tobacco, sweet potatoes, cotton, sugar beans and soya beans Primary crop purpose: Commercial and household consumption Agro-ecological conditions: Prone to drought.	Ethnic groups: Zezuru: 95% Korekore: 2% Karanga: 1% Malawian and Mozambican: 1% Religions: Christian: 74% Traditional African Religion: 25% Muslim: 1%

Annex 4. Definitions of codes referenced in tables and figures

<i>Code</i>	<i>Definition</i>
Agri employer	Employers of paid work ¹⁸ in agri-nrm sectors, including for daily wage jobs.
Agri work for others	Regular or irregular paid work for others in agri-nrm sectors.
Agri work for self or household	Agri-nrm paid work, such as farmer or herder, which may be carried out on family property, leased property, or unspecified locations. This could be work in commercial or cash crops or mentions of income earning with other agri-nrm activities, such as livestock, dairy or collection of wild goods for market sales.
Agri-nrm practices or knowledge¹⁹	A general code to capture all references to agricultural and NRM activities, traditional knowledge, or new knowledge related to testing, adopting or adapting a new agri-nrm practice.
Agri-related livelihoods	A compound code that combines the following codes: Agri-nrm practices or knowledge; Agri employer; Agri work for others; Agri work for self or household; Entrepreneur or trader.
Asset access, use, or control	Roles and capacities related to ownership, control or use of assets. This includes individual or household finance/budgets/money, land/plots (owned or leased), animals, jewelry, and so forth. Also decisions about sale of, or use of proceeds from, agricultural produce.
Economic agency or provider role	References about being/not being an income earner, working for pay or gaining/losing economic power, influence, or control.
Education, knowledge, or skills	References to education access and attendance; grade levels, learning and degrees attained or desired; or usefulness. Also to having or gaining new knowledge or skills from other outlets, e.g. training centers, radio, newspapers.
Favorable assessments	References to benefits —or factors that support access to, use of or benefits— from new agri technologies or practices. Also mentions of helpful or supportive formal or informal institutions that, for example, provide useful information or resources, responsive or respectful services, and so forth.
Emotions, behaviors, or attitudes	Descriptions of emotions, behaviors or attitudes, such as: caring, helpful, cooperative, dress or behave modestly; or assertive, driven, macho, hard working or persevering, immodest. Also descriptions of social relations, such as loving, harmonious, supportive (or the opposite).
Entrepreneur or trader	All mentions of buyers/traders/sellers/shop or kiosk owners involving agri produce or processed goods.
External agri networks	Governmental, private or civic providers of agri-related trainings, advisory services, inputs, or subsidies.
Housework, parenting, and care roles	Reports about mothers, fathers, sons, daughters, in-laws as well as mentions of feeding family and other chores.
Livelihood roles	A compound code that combines the following codes: Economic agency or provider role; Agri-nrm practices or knowledge; Non-agri livelihoods; Agri employer; Agri work for others; Agri work for self or household; Entrepreneur or trader

¹⁸ Paid work in this study could be payments with money or with goods and services, such as crops, meals, housing, or education fees. It does not include unpaid family labor or unpaid reciprocal types of labor.

¹⁹ When displaying agricultural findings from the coded data, the often large frequencies associated with our general codes for “agricultural practices” and “physical technologies” are set aside because this coding overwhelms more specific coding on agricultural topics such as those related to external and local agri networks.

Local agri networks	Community-based formal or informal agri networks or producer groups, knowledge sharing, neighbor-to neighbor learning, helping, or labor exchanges.
Marital Roles	References to couples, husbands and wives.
Non-agri livelihoods	All non-agri types of livelihoods/jobs.
Physical technologies	Seed varieties, planting material, animal races, agricultural machines, tools; enhanced mulch, granary/storage facilities; inputs.
Requirements for inputs or capital	Mentions of need for land, machines, animal draught power, herbicides, chemical or organic fertilizer, mulch.
Stress or conflict	Frustration, fear, anxiety, grief, jealousy. Stress due to roles: women frustrated by dual roles, scarce time, reputational risks, unreliable spouse; men's struggles with joblessness, bad jobs, peer pressure.
Unfavorable assessments	Barriers to accessing, using, benefitting from agri technologies or practices as well as unfavorable reports about formal and informal institutions, perhaps related to corruption, abuse of authority; difficulties with trust, accessing information; excluding community networks or general references to jealous/discouraging community members. (Emotions or stress codes used for assessments of individuals.)
Yield or profitability	Mentions of costs, benefits or qualities of agri technologies or practices related to change in: affordability/profits; need for less/more land, labor, water, inputs, or; fertility/productivity of soil, crop, livestock, aquatic or forest resources.

Annex 5. Researchers and institutions involved in case studies

<i>Country</i>	<i>Principal investigator</i>	<i>Partner institutions</i>	<i>Other researchers</i>
Ethiopia	Lone Badstue		Team leader: Mahlet Hailemariam; External research support: Cathy Farnworth; Team members: Methiset Abreham, Ayele Eshetu, Eliyas Gebreyohannes, Lidiya Gizaw, Manbegerot Kebede, Yene Akal Tamerat, Ehitamariam Tadesse
Malawi	Vongai Kandiwa		William Chimombo, Misonzi Gundo, Tasokwa Kakota, Lorraine Lusinje, Cyton Maliro
Mexico	Lone Badstue		Alejandro Ramirez, Dagoberto Flores, Gloria Martinez, Diana Lopez, Patti Petesch, George Williams
Nigeria	Amare Tegbaru	IITA	Ibrahim Gaya, Anuhu Melton, Bitrus Hassan, Decent Dimas, Nathaneal Sangotebge
Nepal	Lone Badstue	Glasgow Caledonian University; WOCAN	Co-PI: Tahseen Jafry; Field work supervision: Anuprita Shukla; Coordination and supervision: Kanchan Lama and Sushila Nepali; Shova Shakya, Radha Thapa, Shykia Sunil, Suman Dhakal, Shanta Thapa
Tanzania	Lone Badstue		Team Leader: Adalbertus Kamanzi,; Alexander Katura, Dennis Beatus, Judith Namabira, Neema Obwana, Wendo Mbutu, Stanslaus Msuya
Zimbabwe	Vongai Kandiwa		Tinashe Gwaze, Stephen Matema, Modester Ngwerume, Maureen Tshuma

Annex 6. References

- Agarwal, B. (2010). *Gender and green governance: The political economy of women's presence within and beyond community forestry*. Oxford, UK: Oxford University Press.
- Badstue, L., Petesch, P., Feldman, S., Camfield, L., Prain, G., & Kantor, P. (Forthcoming). Qualitative, comparative and collaborative research at large scale: the GENNOVATE conceptual approach. Unpublished manuscript. El Batán, Texcoco, Mexico: CIMMYT.
- Bedoya, H., Freije, S., Vila, I., Echeverria, G., Biller, D., Grandolini, G., Albisetti, R., Quintrell, E., & Vish., R. (2013). *Country partnership strategy for the United Mexican States (2014-2019)*. Washington DC: World Bank Group.
- Berdegue, J.A. (2005). *Pro-poor innovation systems*. Rome: IFAD.
- Bicchieri, C. (2006). *The grammar of society: The nature and dynamics of social norms*. New York: Cambridge University Press.
- Brooks, K., Zorya, S., Gautam, A., & Goyal, A. (2013). Agriculture as a sector of opportunity for young people in Africa. Policy Research Working Paper 6473. Washington, DC: World Bank.
- Buvinic, M., Furst-Nichols, R., & Courey Pryor, E., (2016). A roadmap for promoting women's economic empowerment. United Nations Foundation and Exxon Mobil. Retrieved from http://www.womeneconroadmap.org/sites/default/files/WEE_Roadmap_Report_Final_1.pdf.
- CARE. (2016). The Role of Collectives in Achieving Women's Economic Empowerment: A Cross-Project Analysis. Atlanta: CARE.
- Cislaghi, B. & Heise, L. (2016). Measuring gender-related social norms. Report of a meeting: *Learning group on social norms and gender-based violence of the London School of Hygiene and Tropical Medicine*. Baltimore, Maryland.
- Cislaghi, B., Gillespie, D., & Mackie, J. (2016). *Values deliberations and collective action: Community empowerment in rural Senegal*. Palgrave MacMillan. Competence for Rural Innovation and Transformation, 17 (1), 21-36.
- Connell, R.W., & Messerschmidt, J.W. (2005). Hegemonic masculinity: Rethinking the concept. *Gender and Society*, 19 (6): 829-59.
- Cornwall, A. & Edwards, J. (2010). Introduction: negotiating empowerment, *IDS Bulletin*, 41(2): 1-9.
- Cunningham, S., & Jenal, M. (2016). Rethinking systemic change: economic evolution and institution.
- Doss, C. R. (2001). Designing agricultural technology for African women farmers: Lessons from 25 years of experience. *World Development* 29 (12):2075-92.
- Edström, J., & Sharokh, T. (2015). Poverty, work and employment. In Edström, J., Hassink, A., Shahrokh, T., & Stern, E. (Eds.), *Engendering men: A collaborative review of evidence on men and boys in social change and gender equality, EMERGE evidence review*, (22-38). Promundo-US: Sonke Gender Justice and the Institute of Development Studies.
- Food and Agriculture Organization of the United Nations (FAOSTAT). (2013). Food Balance Sheets [Data file]. Retrieved from <http://www.fao.org/faostat/en/#data/FBS>.
- Forsythe, L., Posthumus, H., & Martin, A. (2016). A Crop of one's own? Women's experiences of cassava commercialization in Nigeria and Malawi. *Journal of Gender, Agriculture and Food Security*, 1(2): 110-128.
- Friis-Hansen, E., Duveskog, D., & Taylor, E., (2012). Less noise in the household: the impact of farmer field schools on gender relations. *Journal of Research in Peace, Gender and Development*, 2(2): 44-55.
- Giller, K.E., Witter, E., Corbeels, M., & Tiftonell, P. (2009). Conservation Agriculture and smallholder farming in Africa: The heretics' view. *Field Crops Research*, 114 (1), 23-34.
- Granovetter, M.S. (1973). The strength of weak ties. *American Journal of Sociology* 78(6): 1360-1380.
- Humphries, S., Classen, L, Jiménez, J., Sierra, F., Gallardo, O., & Gómez, M. (2012). Opening cracks for the transgression of social boundaries: An Evaluation of the gender impacts of farmer research teams in Honduras. *World Development*, 40 (10), 2078-2095.
- IFAD. (2014). *Household Methodologies: Harnessing the family's potential for change*. International Fund for Agricultural Development.
- IFPRI Global Hunger Index. (2016). [Interactive Map designed by International Food Policy Research

- Institute]. Retrieved from <http://ghi.ifpri.org/>. Ignaciuk, A. & Mason-D'Croz, D. (2014). Modelling adaptation to climate change in agriculture. *OECD Food, Agriculture and Fisheries Papers*, 70. DOI: <http://dx.doi.org/10.1787/5jxrclljnxbxq-en>
- Instituto Nacional de Estadística y Geografía (INEGI). (2015). *Estadísticas a propósito del día internacional de la eliminación de la violencia contra la mujer*. Aguascalientes: INEGI, 1-22.
- Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*, 30, 435-64.
- Kabeer, N., Assaad, R., Darkwah, A., Mahmud, S., Sholkamy, H., Tasneem, S., & Tsikata, D. (2013). *Paid work, women's empowerment and inclusive growth: Transforming the structures of constraint*. New York, New York: UN Women.
- Knight, J. & J. Ensminger. (1998). Conflict over changing social norms: Bargaining, ideology, and enforcement. In Brinton, M.C., & Nee, V. (Eds.), *The new institutionalism in sociology* (pp. 105-126). Stanford, CA: Stanford University Press.
- Kumar, N. & Quisumbing, A.R. (2010). Access, adoption, and diffusion, *IFPRI discussion papers*, 995. International Food Policy Research Institute (IFPRI).
- Lane, D. C. (2001). Rerum cognoscere causas: Part II: Opportunities generated by the agency/structure debate and suggestions for clarifying the social theoretic position of system dynamics. *System Dynamics Review*, 17 (4), 293-309.
- Leeuwis, C., & Aarts, N. (2011). Rethinking communication in innovation processes: creating space for change in complex systems. *The Journal of Agricultural Education and Extension*.
- Mackie, G., Moneti, F., Shakya, H., & Denny, E. (2015). *What are social norms? How are they measured?* New York: UNICEF and UCSD.
- Malapit H.J., Sproule, K., Kovarik, C., Meinzen-Dick, K., Quisumbing, A., Ramzan, F., Hogue, E., & Alkire, S. (2014). *Measuring progress toward empowerment: women's empowerment in agriculture baseline report*. Feed the Future. Washington, DC: IFPRI.
- Milazzo, A., & van de Walle, D. (2015). *Women left behind? Poverty and headship in Africa*. Policy Research Working Paper 7331. Washington, DC: World Bank.
- Miles, M. B., Huberman, A.M., & Saldaña, J. (2014). *Qualitative data analysis: a methods sourcebook*. Los Angeles, CA: Sage Publications.
- Muñoz Boudet, A.M., Petesch, P., & Turk, C. (2013). *On norms and agency: Conversations about gender equality with women and men in 20 Countries*. Washington, DC: World Bank.
- Najjar, D., Spaling, H., & Sinclair, A.J. (2013). Learning about sustainability and gender through farmer field schools in the Taita Hills, Kenya. *International Journal of Educational Development* 33: 466–475.
- Narayan, D., Pritchett, L., & Kapoor, S. (2009). *Moving out of poverty: Success from the bottom up*, 2. New York and Washington, DC: Palgrave Macmillan and World Bank Group.
- Narayan, D. (Ed.). (2009). *Moving out of poverty: The promise of empowerment and democracy in India*, 3. New York and Washington, DC: Palgrave Macmillan and World Bank Group.
- Narayan, D., & Cassidy, M. F. (2001). A Dimensional approach to measuring social capital: development and validation of a social capital inventory. *Current Sociology*, 49 (2), 59-102.
- Narayan, D., & Petesch, P. (2002). *Voices of the poor: From many lands*. New York: Oxford University Press for the World Bank.
- Narayan, D., & Petesch, P. (2005). *Moving out of poverty: Understanding freedom, democracy, and growth from the bottom up—methodology guide*. Washington, DC: Poverty Reduction Group, Poverty Reduction and Economic Management Network, World Bank Group.
- Narayan, D., & Petesch, P. (Eds.). (2007). *Moving out of poverty: Cross-disciplinary perspectives on mobility*, 1. New York and Washington, DC: Palgrave Macmillan and World Bank Group.
- Narayan, D., & Petesch, P. (2010). *Moving out of poverty: Rising from the ashes of conflict*, 4. New York and Washington, DC: Palgrave Macmillan and World Bank Group.
- Narayan, D., Patel, R., Schafft, K., Rademacher, A., & Koch-Schulte, S. (2000). *Voices of the poor: Can anyone hear us?* New York: Oxford University Press for the World Bank.
- Narayan, D., Chambers, R., Shah, M.K., & Petesch, P. (2000). *Voices of the poor: Crying out for*

- change. New York: Oxford University Press for the World Bank.
- Nuss, E.T., & Tanumihardjo, S.A. (2011). Quality protein maize for Africa: Closing the protein inadequacy gap in vulnerable populations. *Advances in Nutrition*, 2. doi: 10.3945/an.110.000182.
- Okali, C. (2011). *Achieving transformative change for rural women's empowerment*. Expert paper prepared for the Expert Group Meeting "Enabling rural women's economic empowerment: Institutions, opportunities and participation." UN Women.
- Okali, C. (2012). *Gender analysis: engaging with rural development and agricultural policy processes*. Working Paper 026. Future Agricultures Consortium. Brighton: IDS.
- Otieno, P. E., Farnworth, C.R. , & Banda, M. (2016). *Involving men in nutrition (Global Good Practice Note)*. Note 26. Global Forum for Rural Advisory Services (GFRAS).
- Patton, M.Q. (1990). *Qualitative evaluation and research methods*. (2nd ed.) Newbury Park, CA: Sage.
- Petes, P., Badstue, L., Camfield, L., Feldman, S., Prain, G., & Kantor, P. (Forthcoming). *Qualitative, comparative and collaborative research at large scale: The GENNOVATE field methodology*. Unpublished manuscript. CIMMYT, Mexico.
- Petes, P. (2011). *Women's empowerment arising from violent conflict and recovery: Life stories from four middle-income countries*. Washington, DC: USAID.
- Portes, A. (2006). Institutions and development: A conceptual re-analysis. *Population and Development Review*, 32 (2), 233-262.
- Quisumbing, A. R. (2011). *Do men and women accumulate assets in different ways? Evidence from rural Bangladesh*. IFPRI Discussion Paper 01096. Washington, DC: IFPRI.
- Quisumbing, A. R., & Pandolfelli, L. (2010). Promising approaches to address the needs of poor female farmers: Resources, constraints, and interventions. *World Development*, 38(4), 581-592.
- Ragasa, C. (2012, August). Gender and institutional dimensions of agricultural technology adoption: a review of literature and synthesis of 35 case studies. In *2012 Conference* (pp. 18-24). International Association of Agricultural Economists Foz do Iguacu, Brazil.
- Ridgeway, C. (2009). How gender shapes social relations. *Gender and Society*, 23(2), 145-60.
- Ripoll, S., Andersson, J., Badstue, L., Büttner, M., Chamberlin, J., Erenstein, O., & Sumberg, J. (Forthcoming). *Rural transformation, cereals and youth in Africa: a research agenda*. Unpublished manuscript. Institute of Development Studies, University of Sussex and CIMMYT.
- Shiferaw, B., Prasanna, B., Hellin, J., Banziger, M. (2011). Crops that feed the world 6. Past successes and future challenges to the role played by maize in global food security. *Food Security*, 3, 307-327.
- Stern, S. J. (1995). *The Secret history of gender: Women, men and power in late colonial Mexico*. Chapel Hill: North Carolina Press.
- Sumberg, J., Anyidoho, N.A., Leavy, J., te Lintelo, D.J.H., & Wellard, K. (2012). Introduction: The young people and agriculture 'problem' in Africa. *IDS Bulletin*, 43 (6). DOI: 10.1111/j.1759-5436.2012.00374.x.
- Sun, Y., Mwangi, E., & Meinzen-Dick, R. (2011) Is gender an important factor influencing user groups' property rights and forestry governance? Empirical analysis from East Africa and Latin America. *International Forestry Review* Vol 12(2), 205-219.
- Turk, C., Petesch, P., & Muñoz Boudet, A.M. (2010). "Gender & Economic Choice: Methodology Guide." Washington, DC: World Bank.
- United Nations Development Programme. Human Development Reports. (2015). *Gender Inequality Index [Data file]*. Retrieved from <http://hdr.undp.org/en/composite/GII>.
- United States Department of Agriculture. Foreign Agricultural Service. (2016). Production, supply and distribution [Data file]. Retrieved from <https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery>
- von Braun, J., Byerlee, D., Chartres, C., Lumpkin, T., Olembo, N., & Waage, J. (2010). A draft strategy and results framework for the CGIAR. 20 March 2010. CGIAR, The World Bank, Washington DC.
- Wharton, A. S. (1991). Structure and agency in feminist theory. *Gender and Society*, 5, (3): 373-389.
- Whitfield, S., Dougill, A.J., Dyer, J.C., Kalaba, F.K., Leventon, J., Stringer, L.C. (2015). Critical reflection on knowledge and narratives of Conservation Agriculture. *Geoforum*, 60, 133-142.

- Woolcock, M. (1998). Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society*, 27, (2), 151-208.
- World Bank and ONE. (2014). *Leveling the field: Improving opportunities for women farmers in Africa*. Washington, DC.
- World Bank. (2011). *World development report 2012: Gender equality and development*. Washington, DC: World Bank.
- World Bank. (2013). *Poverty headcount ratio at \$1.90 a day (2011 PPP) (% of population)* [Data file]. Retrieved from <http://data.worldbank.org/indicator/SI.POV.DDAY?end=2013&locations=1W&start=1981&view=chart>.
- World Bank. (2014). *Nigeria economic report*, 2. Washington, DC: World Bank Group.
- World Bank. (2015). Worldwide Governance Indicators [Data file]. Retrieved from <http://databank.worldbank.org/data/reports.aspx?source=Worldwide-Governance-Indicators>.
- World Health Organization (WHO). (2007). *Engaging men and boys in changing gender-based inequity in health: Evidence from program Interventions*. Geneva: WHO.
- World Health Organization (WHO). (2013). *Global and regional estimates of violence against women: prevalence and health effects of intimate partner violence and nonpartner sexual violence*. Geneva: WHO.

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GENNOVATE's qualitative comparative methodology and large sample mark a first in the CGIAR, as well as, the collaboration of principal investigators from nearly all CGIAR Research Programs worldwide.

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