Qualitative, comparative, and collaborative research at large scale: An introduction to GENNOVATE

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•In memoriam

Abstract

What is the relationship between gender norms, agency, and agricultural innovation? How might we undertake and what can we learn from a comparative approach to this question? GENNOVATE—a comparative and collaborative research project—addresses these questions using contextually embedded qualitative analyses that also allow for comparison and extrapolation of patterns across multiple locations. This paper provides an overview of the conceptual approach and the methodological strategy that informed GENNOVATE's twin objectives and research design. The conceptual framework underlying this original research initiative is introduced and the challenges and opportunities faced when combining inductive and deductive analytic approaches are discussed. The empirical and methodological issues are explored and the broad relevance of GENNOVATE's research approach beyond the field of agricultural development is reflected upon.

Key words: Gender norms, agency, innovation, social embeddedness, qualitative comparative research, collaborative research.

Introduction

How do gender norms and agency advance or impede the capacity to innovate, and shape technology adoption in agriculture and natural resource management (NRM) across different contexts? And vice versa: How do new agricultural technologies or practices affect gender norms and agency across different contexts? How are norms about gender relations and women's and men's agency changing, and under what conditions do these changes catalyze innovation and lead to desired development outcomes, e.g. empowerment; poverty reduction; improved food security, nutrition and health; and the sustainable management of natural resources? What contextual factors influence these interactions?

These are key research questions addressed by GENNOVATE[i] (Enabling Gender Equality in Agricultural and Environmental Innovation), a qualitative comparative research initiative that focuses on the nexus between gender norms, agency, and innovation in agriculture and natural resource management. An international collaborative effort, the initiative involves 137 community case studies across 26 countries of the Global South and draws on the voices and

lived experience of over 7,000 rural women and men of different socioeconomic levels and age groups.

The idea for a large multi-site gender and agriculture study took hold in 2013. Inspired by a set of large qualitative studies by the World Bank (e.g. Muñoz Boudet, Petesch, and Turk, 2013; Narayan and Petesch, 2007; Narayan et al., 2000), a group of international gender and social development specialists saw potential for collaborating to understand how local social contexts, and especially gender norms, condition who can (and cannot) access, adopt, and benefit from agricultural innovations. The idea was to introduce qualitative comparative approaches to provide an authoritative basis for wider explanations and offer evidence of broad relevance to policymakers while also addressing their concerns with maximizing the potential for large-scale impact. The goal was thus to deliver gender research of relevance for investments in agricultural and rural development, while at the same time strengthening the rigor and contributions of qualitative comparative research methodologies.

With initial support from the CGIAR Gender and Agricultural Research Network and the World Bank, and additional intellectual inputs from external experts, a strong team of gender and agriculture researchers coalesced to develop a research design to be applied across diverse socio-cultural and agro-ecological contexts. Other objectives included strengthening agricultural research for development (AR4D) capacities and learning from inductive comparative qualitative research. The result of these efforts was the development of a bottom-up, joint, comparative, qualitative research initiative focusing on the linkages between gender norms, agency, and innovation in agriculture and NRM. The collaborative and comparative methodology offers contextually grounded insights into the how's and why's behind social change processes in the diverse settings of rural communities.

To implement the contextual and comparative design, a collaborative approach was adopted involving a large team of principal investigators and local field teams worldwide. While GENNOVATE focuses on the nexus between gender norms, agency, and agricultural innovation, the multi-site research design is relevant for a broad range of qualitative comparative research projects aimed at providing evidence for decision makers at different levels.

This first paper to this special issue introduces GENNOVATE as an innovative research project addressing the challenge of developing and testing a research design for large-scale, comparative qualitative research about the processes that both enable and disable inclusive agricultural innovation at the community level. We argue that to strengthen AR4D and inform policy and decision making for agricultural research and development investments, qualitative research with a strong gender dimension is needed that is contextually embedded, while *also* allowing for rigorous comparison at scale and extrapolation of patterns across locations. We begin by taking stock of the empirical literature on the interaction of gender norms and agency in relation to agricultural innovations and planned interventions. After an overview of the key study concepts and perspectives informing the research design, we introduce GENNOVATE's conceptual framework, which underlies the entire research process and the many diverse case studies from different world regions. In the following sections, we address issues related to qualitative comparative research at medium to large scale and the need to engage a collaborative research approach. Thus, having set the background for GENNOVATE, we highlight empirical and

methodological contributions from the other articles in this special issue, before concluding with a set of reflections on how GENNOVATE provides a valuable complement to traditional gender and agricultural research paradigms in today's AR4D environment of short-term, results-oriented funding.

Gender norms, agency, and agricultural innovation—lessons from the empirical literature

In order to assess the literature on interactions between gender norms, agency, and innovation in agriculture and NRM, we identified 53 agricultural field studies[ii] that addressed concerns for interactions between gender norms, agency, and innovation in agriculture and NRM. This literature spans approximately 60 countries, mostly from Sub-Saharan Africa (25 studies) and South Asia (17 studies). The majority of these studies focus on women's agency and capacity to innovate, with scant attention to the various situations of men and their roles in relation to innovation and normative change. The studies were framed by diverse research questions, which can be largely categorized under two broad themes:

- How gender norms or women's agency and related assets and capacities, such as technical knowledge or social capital, influence women's access to, participation in, and benefits from agricultural innovation (e.g. Aregu et al., 2010; Kinkingninhoun-Medagbe et al., 2008; Sultana and Thompson, 2008);
- How commercial agricultural development, new technologies, or planned agricultural or NRM interventions affect women's agency, intra-household relations and decision making, asset control, gender norms, and gender relations more broadly (e.g. Freele, 2011; Friis-Hansen, Duveskog and Taylor, 2012; Najjar, 2008; Padmaja and Bantilan, 2007; Quisumbing et al., 2013; White and White, 2012).[iii]

This literature offered a complex picture of regularities across sites, but, also, evidence of the variability and fluidity of gender norms around the world. For example, studies that have explored questions concerning the control of agricultural production and other assets find that women's agricultural roles are often constrained by specific social conventions that legitimate men's or the male household head's control over land ownership, land use, ponds, and large livestock (e.g. Aregu et al, 2010; Dolan, 2002; Freele, 2011; Oxfam, 2013; Quisumbing et al., 2013; Radel, 2011). In other contexts, however, including in Kalimantan, Indonesia, the indigenous highlands of Ecuador, and northern Sudan, women are able to exercise control over land (Bernal, 1988; Hamilton, 1998; Naved, 2000; Sorensen, 1996; White and White, 2012). Likewise, while men generally control the allocation of household agricultural labor in Sub-Saharan Africa and Turkey (Dolan, 2002; Gallina, 2010; Morvaridi, 1992; Sanginga et al., 1999; Sorensen, 1996), in the Ecuadorian highlands, labor decisions are negotiated jointly by women and men, or, as in parts of Nigeria, women or other adult household members have a strong say in these decisions (Hamilton, 1998; Sanginga et al., 1999). Furthermore, various studies in the review indicate that few, if any, women participate in new commercial agricultural or aquacultural opportunities in contexts as varied as Bangladesh, Kenya, Honduras, and Mexico (Barman, 2001; Friis-Hansen, Duveskog and Taylor, 2012; Radel, 2011); and that it is primarily men who can access extension services in Sub-Saharan Africa and parts of Asia and Latin America (Aregu et al., 2010; Freele, 2011; Maarse, Wentholt, and Chibudu, 1998). Men

generally control earnings from agricultural products, although this varies widely with socioeconomic status, geography, crop, share of labor, and participation in marketing activities. In far fewer cases do women have more say than men (Ahmed, 1999; Aregu et al, 2010; Bergman Lodin, Paulson, and Mugenyi, 2012; Colfer, 2008; Dolan, 2002; Farnworth et al., 2013; Gallina, 2010; Karim, 2006; Quisumbing et al., 2013; Radel, 2011; Schroeder, 1999).

Another critical aspect shaping women's productive roles in field agriculture and agri-product sales are practices of seclusion that limit women's physical mobility, including in rural Bangladesh, many parts of India, northern Nigeria, Mali, Ethiopia, and Turkey (Baden, 2013; Barman, 2001; Costanza Torri, 2010; Hallman, Lewis, and Begum, 2007; Morvaridi, 1992; Naved, 2000; Quisumbing et al., 2013). But, even in localities without norms of seclusion, other conventions restrict women's mobility, including local traditions and religious practices, limited public safety, women's more limited access to means of transport, and, critically, women's lack of time due to household reproductive obligations (Lahai, Goldey, and Jones, 2000; Muñoz Boudet, Petesch, and Turk, 2013; Oxfam, 2013).

Significantly, too, the literature documents how agricultural and NRM innovations can sometimes disadvantage women, as for example when women have lost access to farmland for household production with the introduction of irrigation in The Gambia (Freele, 2011) and of contract farming in Kenya (Dolan, 2002). As Colfer (2008) shows, among Kenyah Dayak communities in Indonesia, local men's adoption of labor-saving chainsaws and canoe motors resulted in new opportunities for men, but eroded women's agentic capacities and high status gained from their roles in rice production. Advances in agriculture and NRM may also interact with gender norms and women's agency in ways that increase the labor burdens of women and reduce household food security, as women and other household members may be pressed to provide labor for cash crops at the expense of food crops or livestock activities oriented to provisioning the family (Fonjong and Athanasia, 2007; Lebel, Chaibu, and Lebel, 2009).

More encouraging, however, are findings of increased female agency or more equitable norms resulting from agricultural and NRM interventions. A few studies show how women's own agricultural and NRM innovations fuel their agency and can create a new normative space in agricultural production. Many of these cases feature group-based or participatory approaches that combine clear gender objectives and components, such as a polyculture fishpond scheme in Bangladesh that worked through local women's groups to support women's access to the innovation and increase their income, which, in turn, led to women's increased participation in household decision making (Hallman, Lewis and Begum, 2007; Naved, 2000). Other examples include successful programs that applied participatory learning approaches with women and men farmers engaged in mixed-gender farmer research teams (Humphries et al., 2012; Najjar, 2008); and household approaches that fostered more inclusive household decision making in farming and livelihood activities (Farnworth, 2010; Farnworth et al., 2013; Gallina, 2010). Taken together, these studies highlight how processes of normative change can be unpredictable, as when innovations that target women face male backlash, or when women contest the promotion of schemes that exclude or discourage their participation or add to their work burdens (Baden, 2013; Barham and Chitemi, 2008; Costanza Torri, 2010).

What we learn from these studies is that they generally focus on women, sometimes provide insight into gender relations, and, in some cases, explore how gender norms and expectations shape women's behavior and also that of men's agentic and breadwinning roles which are seen

to constrain men's behavior. However, drawing out key lessons or patterns from this evidence is challenging because of differences in the research questions and concepts animating the different studies, and in the sampling measures and data collection strategies deployed. Motivated by a commitment to both comparison and contextual specificity, GENNOVATE set out to address this challenge and provide insights across diverse settings about how gender norms, agency, and agricultural innovation processes interlink to shape change in rural livelihoods.

Key elements informing GENNOVATE's research design

GENNOVATE focuses on the interlinkages between gender norms, agency, and innovation from the standpoint of agriculture and NRM as socially embedded practices. In this section we provide an overview of how these concepts are employed in the study and inform the research design. The papers that follow in this special issue each address different substantive issues which these concepts help unfold.

Gender norms

We understand gender as a social relation (Feldman and Welsh, 1995) and a key organizing principle in all societies (Ridgeway and Correll, 2004). Social norms include perceptions about others that are shared and reproduced within social groups and serve as critical drivers that either enable or constrain particular social practices. However, and significantly, gender roles and norms differ across contexts and exist in tension with other identities, expectations, and practices; they are never fixed but, rather, constantly negotiated and (re-)constructed.

Gender norms are socially constituted rules that prescribe men's and women's everyday behavior. As defined by Knight and Ensminger (1998, p. 105), social norms ". . . govern social relations and establish expectations as to how we are to act in our everyday affairs." Gender norms are largely maintained by everyday social interactions, internalized beliefs, and psychological processes that come to define power relations, including women's subjectivity.[iv] These social rules, however, may be questioned, disregarded, or come into conflict with everyday realities in ways that can provide space for negotiation, contestation, and change, spurring a process in which the diffusion of new normative expectations take hold and spread across key reference groups (Bicchieri, 2006). Different actors can play a role in unlocking such processes, including, for example, agricultural extension agents who may include women farmers in activities previously reserved for men, thus potentially initiating a process of normative change and greater inclusion.[v]

Normative expectations are reinforced by social sanctions for those who dare to flout them, for instance the ridicule of men who show their emotions, or the opprobrium towards women who interact in public with men who are not their relatives. Nonetheless, negotiation and contestation of norms are widely practiced. For instance, a woman farmer may decide to attend agricultural trainings in her village, even if other women do not, because she believes she would benefit from the training even though she risks the ostracism of family and community members in doing so.

Social norms and power relations operate at multiple levels—from household, social group, and community to agro-ecological landscapes, market systems, and the overall policy and legislative environment—and influence the extent to which women and men, and girls and boys, are able to access, use, and benefit from new knowledge and technologies. Thus, to understand, design, and undertake AR4D that is not only technologically but also socially robust, it is necessary to

account for how diverse agri-food systems operate across different scales, and how *social relations and gender norms* influence technical innovation and rural development processes in local, real-life contexts.

Agency

Naila Kabeer defines agency as "the ability to define one's goals and act upon them" (1999, p. 438). She also links agency to women's and men's "subjectivity and consciousness ('the power within') as a critical aspect of the process of change" (2012, p. 6). This resonates with perspectives on agency as interest-oriented action and capacities for action, such as that of Norman Long, who describes agency as "the capacity to process experience, make decisions, and to act upon them" (2001, p. 56). Relatedly, Anthony Giddens argues that "agency refers not to the intentions people have in doing things, but to their capability of doing those things in the first place. . . . Agency concerns events of which an individual is the perpetrator, in the sense that the individual could at any phase in a given sequence of conduct, have acted differently" (1984, p. 9). Thus, in this perspective, agency and choice are accompanied by notions of knowledgeability and the power to mobilize resources.

GENNOVATE rests on the understanding that women and men living in farming and forest environments are key stakeholders in innovation processes. They must exercise agency and actively learn about, try out, and adapt a new technology or practice to their needs, which may require that they resist or break with normative conventions in order to pursue new undertakings (Klerkx, 2014). When individuals or groups of people act or exercise agency, it may trigger a process of challenging, redefining, or otherwise (re-)negotiating dominant views or practices, whether intentionally or not. Often, those who first modify a practice or adopt something new face criticism, ridicule, pity, or even physical harassment, or other types of social reproach. At the same time, for some individuals or communities, this same process can create space for maneuver. For Long it is precisely in the complex interlocking of social actors' projects and practices, and their intended and unintended outcomes that the constraining and enabling frameworks of social action are composed (2001). In these processes certain possibilities are excluded and others are made possible or realized. These emergent processes are complex, often ambiguous, and highly contingent upon the evolving conditions of different social arenas (Long, 2001). Kabeer's analysis also recognizes the contingency of these processes, when she points to the ability to marshal expanded agency, or empowerment, not only to improve one's own life, but also to challenge and change the "structures of constraint" underlying inequalities (2012, p. 6).

This conceptualization reveals how the interaction between the conditions of the specific context or opportunity structure and the exercise of agency can contribute to drive change, including the process of empowerment. For instance, where development interventions enable women to access new resources and develop agricultural and NRM capacities, such as through participatory varietal selection,[vi] or hosting and managing demonstration plots, this can increase women's self-confidence and recognition from others for their new roles, knowledge, and skills. These combined changes in knowledge and recognition can help enable women to challenge their subordinate roles and position in the family, as well as to expand their engagement in the marketplace, and in the civic and political life of their communities. Recognition by value chain actors of women's capacities as farmers, marketers, and engaged community members can help change ideas about what is acceptable women's behavior in the agricultural sector, and enable

women to contribute in new and more visible ways to the wellbeing of their families as well as to agricultural and wider development outcomes.

GENNOVATE retains a commitment to investigating social action and lived experience as closely related to the particular contexts in which they unfold, and thus necessary for understanding processes of relaxation, negotiation, and change in gender norms. As a consequence, we understand social agency as embedded within, rather than separate from, local settings and their particular mix of institutions, relationships, and resources. As Long puts it: "Agency itself is framed and hedged in by various cross-cutting discourses, institutional constraints, and processes of 'objectification,' though these very same processes also permit or promote certain modes of agency" (2001, p. 4).

While empowerment may not necessarily ensue from exercising agency, for GENNOVATE we consider that the assets and capacities which underpin individual and collective agency need to be within the "agent's" control and of potential use at any time. In this way, an expansion of assets and capacities, or increased agency, would indicate empowerment (Sen, 2001).

Innovation

As Douthwaite (2002) points out, innovation in agriculture has a long and contested history. For most of the post-war period, innovation has been understood as a type of top-down technology "push and shove" with early adopting "advanced farmers" (almost always men) playing a key role (Röling, 2002; Rogers, 2003). However, following Douthwaite, Röling, and others, innovation encompasses a process of technology change, including new technical configurations, management practices, learning opportunities, and relationships among multiple actors and entities, including farmers, their communities, and external parties. Innovation, then, may include not only technical changes in production, but also processes of socioeconomic and institutional change, such as new ways to gain access to resources or to organize marketing activities. Significantly, it also includes the new normative conventions for social behavior that these changes imply. Berdegue's notion of innovation is consistent with this framing: "Innovations are 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" (2005, p. 3).

Current innovation systems research has emphasized the contextual embeddedness and complexity of innovation processes and their multi-leveled, inter-meshed and evolving nature (e.g. Geels, 2011; Klerkx, van Mierlo and Leeuwis, 2012; Leeuwis, 2013; Schut et al, 2014; Schut et al, 2016). Amidst these dimensions, the role of interaction and relations between actors emerges as central, and these interactions are often governed by institutions, which include formal and informal rules, norms, and procedures. This brings us back to the relevance of GENNOVATE's inquiry about social norms related to gender and their influence on agricultural innovation processes. However, as Pyburn (2014) observes, although the issues of gender dynamics and social inclusion would seem to fit well with multi-stakeholder approaches and complex systems as central tenants of the current thinking on agricultural innovation systems (AIS), this remains scarcely reflected in the literature. One example is the World Bank's AIS framework (2009), which points out the importance of equality in access and opportunity for participation, but fails to differentiate between farmer types (Pyburn, 2014).

GENNOVATE is informed by recent perspectives on innovation in agriculture and NRM as outlined here, and aims to contribute to the knowledge base by drawing attention to how gender norms and agency shape agricultural innovation processes and vice versa.

Social embeddedness

The concept of social embeddedness captures the notion that human actors are influenced by and constituted through the relational, institutional, and cultural contexts within which they exist. As Granovetter (1985, p. 487) puts it: "Actors do not behave or decide as atoms outside a social context, nor do they adhere slavishly to a script written for them by the particular intersection of social categories that they happen to occupy. Their attempts at purposive action are instead embedded in concrete, ongoing systems of social relations." Embeddedness approaches prioritize the different conditions within which social action takes place. Originally formulated by Polanyi (1968) in relation to his work on economic activities in non-market societies, the concept of social embeddedness, if not always the term itself, has since taken hold in a variety of disciplines, including in agricultural research and development. Over the past several decades, for example, it has become increasingly recognized that socioeconomic and cultural contexts strongly influence agricultural and NRM interventions and their impacts. Once deployed at local levels, the interactions between technology and local contexts are non-linear, multi-directional, and contingent on complex social relations, behaviors, and norms on the ground (Douthwaite, 2002; Hall, 2007).

The historical trajectory towards this recognition in the field of agricultural research began with the gradual appreciation that agricultural technologies and commodities are part of farming systems (Collinson, 1987; Norman, 1980) and that a more holistic understanding of farming was needed for new technologies to benefit smallholder farmers. Hence farming systems research emerged in the 1970s and 1980s as a response to the contextual limitations of the transfer-of-technology approach. As theoretical perspectives broadened and innovation was recognized as a co-development process between various social actors, including farmers, the notion of agricultural knowledge and information systems (AKIS) took hold in the 1990s (Röling and Engel, 1991). Further, with the evolving recognition of innovation as technical, social, economic, and institutional change, and as a highly complex and non-linear process, the discourse shifted from AKIS in the early 2000s to AIS (Hall, 2007; Klerkx, van Mierlo, and Leeuwis, 2012). The various shifts in perspectives increasingly focused on understanding farmers' perspectives on the systems and of the opportunities they perceive for improvement. These shifts reflect a growing realization of the complexity and contextual contingency of agricultural change processes.

Farmer-to-farmer, farmer first, and putting people first (Cernea, 1991; Chambers, Pacey, and Thrupp, 1989; Rhoades and Booth, 1982) were similar proposals that challenged the popular view on innovation, and called for more sensitive and immediate methods to understand farmer perspectives. Drawing especially on anthropology, the introduction of gender-aware research, and adult education, a wide range of participatory qualitative tools were deployed to propose actions and give voice to and document farmers' perspectives, needs, and opportunities (Bellon, 2001; Mukherjee, 2004). The approaches and methods have since been applied in many different thematic areas of AR4D, including local crop genetic conservation and experimentation (Bellon, 2001; Prain, Fujisaka, and Warren, 1999), participatory plant breeding and varietal selection (Bishaw and Van Gastel, 2009; Sperling et al., 2001; Witcombe et al., 2005), and seed practices (Badstue et al., 2007).

Though diverse in topics addressed, widespread in application, and highly contextualized, the large number of qualitative studies addressing agricultural change and innovation have provided uneven attention to gender and often lacked consistency, comparability, and rigor in approach and methods (Lilja, Ashby, and Sperling, 2001). This may well account for some evidence of a decline in participatory research (Thiele, Van de Fliert, and Campilan, 2001). An audit of publications related to research on roots, tubers, and bananas over the past 10 years indicated that the use of participatory methods involving both men and women sometimes served as a proxy for gender analysis (Mudege, 2013). Similarly, the trend towards taking households as the unit of analysis for participatory approaches during the 1990s (Niehof and Terpstra, 1999) was often a barrier to intra-household gender analysis. These issues, including the limited use of qualitative approaches to probe gender norms within households and communities, weakened the salience and relevance of this work for clarifying and addressing key gender barriers to experimentation with new technologies or endogenous innovation.

However, designing comparative research across multiple contexts which acknowledge and draw on the embeddedness of social action and lived experience poses the challenge of combining inductive and deductive analyses. Indeed, reconciling the development of international public goods (IPGs) for impact at large scale with the recognition that agricultural and NRM interventions are embedded in complex socioeconomic and cultural contexts, which strongly influence the kinds of impact achievable, constitutes a significant challenge for public sector international AR4D. To address this, there is need for an alternative, complementary scientific approach which is both contextually sensitive and comparative in scope. This approach can benefit from feminist and constructivist ideas (Feldman and Welsh, 1995; Röling, 1996; Long, 2001; Jackson, 2002) that emphasize the benefits of qualitative approaches and the use of thick description (Geertz, 1973).

Contributions from feminist research

Feminist research engages questions of method and techniques of data gathering while also questioning the epistemic foundations of different methodologies. Under the umbrella of feminist inquiry are those who employ quantitative and qualitative approaches to data gathering and analysis with the goal of making broad, generalizable claims (McCall, 2005; Oakley, 1998). Others emphasize the contributions that come from thick description and in-depth understanding of site-specific relations to reveal the complex processes that shape everyday lives and livelihoods and their meanings for particular participants (Burawoy et al., 2000; Marcus, 1998).

The definition of feminist methodologies remains under debate, but common characteristics of feminist research include: recognition that knowledge is a co-production of the researcher and those they study; a concern for the power relations between researcher and researched, and how this affects knowledge production; a concern for reflexivity in order to mitigate bias from researchers' own experience and background; a commitment to research *for* and *with* rather than simply *on* women, including a commitment to social justice and social change; and the ethical issues that attend to research and the interpretation of evidence (Doucet and Mauther, 2006; Kerr, 2007; Hussain and Assad, 2012). For many authors, what make both quantitative and qualitative techniques feminist are the questions asked and their usefulness for improving women's lives (Fonow and Cook, 2005; Doucet and Mauther, 2002 and 2006; Ramazanoglu and Holland, 1999; Miner-Rubino and Jayaratne, 2007; see also Hussain and Assad, 2012). Reinharz (1992) also explores the value of qualitative and quantitative methods for what they offer to

realize the feminist goal of gender equality (see also Anderson, 1995; Hesse-Biber, 2012).

Other feminist scholars offer an epistemic critique of science and challenge the notions of science neutrality and objectivity, power relations in knowledge production, and implications of the "sex of the knower" (Doucet and Mauther, 2006). As social epistemologist Steve Fuller (2007, p. 1) suggests, "[s]ocial epistemology advances beyond other theories of knowledge by taking seriously that knowledge is produced by agents who are not merely individually embodied but also collectively embedded in certain specifiable relationships that extend over large chunks of space and time." What is essential for feminist epistemology is the importance of thinking from women's lives and experiences to acknowledge the various influences of norms and conceptions of gender and gendered interests and experiences on the production of knowledge (Anderson, 1995).[vii] Code (1991) similarly argues for recognition of the embedded knower and the need to make explicit the place of power structures and relations in approaches to knowledge production. This epistemic critique emphasizes the agency of the knower and the need to cast the researcher-researched relationship as dialogic so as to acknowledge the interviewee not as the object of study but, rather, as its subject and sometimes as a co-researcher.

While current epistemological debates are less robust than in the past, the arguments posed are especially apt when practicing participatory action research and find a parallel in the qualitative methods used in agriculture and development research that often include open-ended interviews, participant observation, and, less frequently, ethnography. While these methods continue to be highly valued, a number of constraints shape their current use in applied social research and raise important questions for comparative analysis. Ethnography and thick description, for example, do not readily lend themselves to drawing general conclusions although, as we suggest later in this paper, collaborative research initiatives offer one way to mitigate this limitation.

Conceptual framework

All the 137 community case studies are based on GENNOVATE's conceptual framework and apply the same research methodology (for more details on the field methodology, see Petesch et al., in this issue). The conceptual framework is elaborated in three domains: 1) focal elements of the local opportunity structure; 2) the activation of agency—e.g. mobilizing resources and creating space for maneuver in order to innovate; and 3) empowerment and other development outcomes which may result from exercising agency. Figure 1 illustrates the set of flows and interactions that are understood to influence women's and men's ability to create space for maneuver and, in turn, their wellbeing and enjoyment of benefits derived from improved access to resources and innovations.

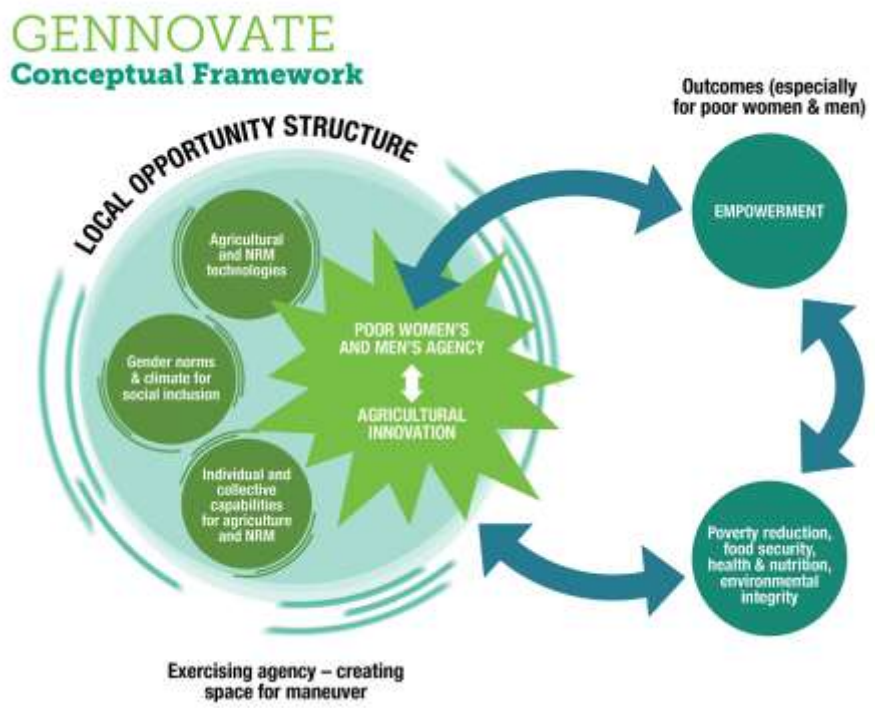

Figure 1: GENNOVATE conceptual framework

1: Focal elements of the local opportunity structure

The focus on local opportunity structure reflects the social embeddedness of processes of exercising agency and innovation. These processes also mediate the influence of broader societal forces in ways that cannot be readily predicted. Rural men and women, girls and boys, live and operate in specific settings, e.g. a community, village, or town. These settings are characterized by particular combinations of resources including infrastructure, institutions, and social organization. Borrowing from Narayan (2002) and Petesch, Smulovitz and Walton, (2005),[viii] we call this the local opportunity structure[ix]—represented on the left side of the diagram. The notion of local opportunity structure provides a basic building block for GENNOVATE's comparative analysis, and the multiple interactions in which this structure is enmeshed. We emphasize its fluid and emergent character resulting from the ongoing interplay and interlocking of various actors' agendas and undertakings (Long, 2001). For GENNOVATE, we are particularly attentive to three key dimensions:

- *Agricultural and NRM resources and technologies* in the local setting includes a mix of natural and physical capital such as plant diversity, agricultural land, and irrigation systems often inherited from earlier generations, as well as newer technologies such as new varieties, soil fertility enhancement techniques, and water management practices.
- *Individual and collective capabilities* among the local population address the access, use, and adaptation of agriculture and NRM resources and technologies for the benefit of local livelihoods.
- Local institutions and power relations, especially related to *gender norms and the climate for social inclusion*, represent different formal and informal rules which

> (differentially) enable or constrain men's and women's agency and participation in the local innovation processes of their communities. The gender norms and power relations that shape the division of labor and resources of farming households are highly variable on the ground and subjects of continuous negotiation. Communities with less restrictive norms on women's control of resources and physical mobility, for instance, often, but not always, provide a more supportive local institutional context for women's inclusion in new agricultural opportunities.

The methodology employs a lengthy community profile instrument with male and female key informants to gather numerical and narrative data on demographic, social, agricultural, market, political, and civic conditions in each case. Additionally, focus group and semi-structured individual interview instruments gather perceptions of local conditions and trends, and of men's and women's experiences with innovation from diverse population groups in the research contexts. Together these data provide many rich opportunities for triangulating and interpreting different perspectives on how local conditions are interacting with our major topics of interest: gender norms, agency, and local innovation processes.

2: Exercising agency—creating space for maneuver

We illustrate the exercise of agency and creation of space for maneuver in the diagram using a graphic shape that symbolizes a chemical reaction, a spark—or an explosion. The effect of the "spark or explosion" or, alternatively, a cumulative series of sparks, pushes against the opportunity structure and existent normative practices to eventually alter people's ability to act and to drive institutional and structural change.

The data collection instruments engage women and men of different socioeconomic and age groups. The fieldwork approach, described by Petesch et al. (a, this issue), explores choices and negotiations that surround agricultural innovation and offers opportunities for women and men to reflect—both individually in interviews and together with others in focus groups—on their capacities to make consequential decisions for their lives, such as about their education, livelihoods, marriage, and childbearing.

3: Empowerment and other development outcomes

The right side of the diagram calls attention to the links between expansion of agency and the process of empowerment and other desired outcomes, which, in turn, feed back into the local opportunity structure.

The diverse frameworks for measuring empowerment which informed GENNOVATE's approach are discussed in Petesch et al. (a, this issue).[x] To assess perceptions of agency, one ladder activity elicits women's and men's conceptions of and trends in power and freedom in their own lives (if an interview), or in the lives of village women (if a women's focus group) or men (if a men's focus group). A second "Ladder of Life" activity engages focus groups in constructing their own ladder to depict the different wellbeing groups in their community; from there, they identify a community poverty line, assess changes in the share of poor households in their village, and reflect on how women and men of their village have escaped, become trapped, or fallen into poverty.

Qualitative comparative research

Qualitative comparative research has long been a topic of interest among social scientists (e.g. Collier, 1993; Hantrais and Mangen, 1996). An important contribution to the discussion was the publication of Charles Ragin's *The Comparative Method* (1987). The method builds on mixed data gathering strategies or triangulation that seek to synergize qualitative and quantitative approaches for what they each contribute to analyses. The deployment of mixed data-gathering techniques recognizes that the strength of qualitative approaches lies in paying attention to the complexity of social phenomena, while quantitative methods stress the collection of extensive, variable-oriented data from which analysis emphasizes the making of broad general claims.

The commitment to comparison begins with the notion that social phenomena in similar settings, such as in the agriculture producing households and communities of interest to GENNOVATE, "may parallel each other sufficiently to permit comparing and contrasting them" (Ragin, 1997, p. 2). As discussed further by Petesch et al. (a, this issue), GENNOVATE's comparative methodology draws on elements of quantitative and qualitative approaches to "enhance generalizability or transferability [of findings in one place] to other contexts," without losing the commitment to the importance of temporal and spatial specificity (Miles, Huberman, and Saldaña, 2014, p. 101).

A commitment to comparative methods, however, does not provide a homogenous rendering of how the two broad research strategies—qualitative and quantitative—come together. The use of qualitative comparative analysis (QCA) can be viewed as a middle ground between qualitative and quantitative research approaches, although it is more accurate to say that it assumes many of the goals of quantitative analysis in seeking to make broad general claims, while acknowledging the significance of context and complexity of people's own understandings and interpretations of their experiences.[xi]

However, as Ragin (1987) makes clear, QCA offers a conception of causality that leaves room for complexity, since causality is context and conjuncture sensitive. He thus recognizes the importance of knowing a place intimately, that is, of in-depth studies that "offer important insight into the diversity and complexity of social life, which, in turn, offers rich material for theoretical development and refinement" (Ragin, 1997, p. 8). The ability to make comparisons across cases requires producing some level of parsimony across cases to allow for "modest generalization" (Ragin, 1987). Similarly, as Miles, Huberman, and Saldaña (2014, p. 101) argue:

> One advantage of studying cross-case or multiple cases is to increase generalizability, reassuring yourself that the events and processes in one well-described setting are not wholly idiosyncratic. At a deeper level, the purpose is to see processes and outcomes across many cases, to understand how they are qualified by local conditions, and thus to develop more sophisticated descriptions and more *powerful explanations* (emphasis added).

In practice, this means that the researcher neither expects nor anticipates causal uniformity across cases but, rather, different combinations of causes for the same outcome. This recognizes the "diverse ways a common outcome may be reached" where outcomes are causally heterogeneous, and opens a space to identify "complex patterns of conjunctural causation" (Ragin, 1997, p. 8). Such processes are evident, for instance, in the variability of the impacts of economic growth on gender equality due, among other factors, to how sectoral differences in patterns of growth

intersect with the durability of gender segregation in labor markets and the varied and fluid discriminatory norms which underlie these dynamics (Kabeer, 2016). In these circumstances, a central issue is not primarily the identification of common causal pathways but, instead, plausible explanations that stimulate efforts to uncover patterns in diversity (Ragin, 1997).

Comparative research in this tradition highlights the importance of sharpening the concepts that are employed, while remaining attentive to the fact that cases must maintain their integrity, since each "is examined in detail, using theoretical concepts, substantive knowledge, and interests as guides" (Ragin, 1997, p. 7). The integrity of each case also permits an intimacy with the research site while remaining attentive to what might be similar across cases. It is precisely this intimacy that enables access to the multiple meanings and experiences that are included in our understanding of a range of practices, some of which may be similar, as may be the norms and agency that enable them (Berg-Schlosser et al., 2009; Rihoux, 2006).

Once a shared research strategy is designed and implemented, where the kinds of information to be gathered are collaboratively developed and deployed across cases, the challenge is to compare cases in ways that also can account for their distinctiveness. For instance, while it may be relatively easy to compare specific practices or divisions of labor in agriculture, such as describing women's work in relation to particular crops, it is likely to be more difficult to understand the particular norms that shape these women's shared or different practices. To understand such normative differences (which may yield apparent similarities in observation), as well as women's agency and choice, it also is important to attend to the historical and context-specific constraints and sanctions that may be in place for those who fail to play by the rules. In short, comparison across cases may reveal that women's behavior is constituted by, and a product of, normative expectations and a gendered division of labor. However, the meanings of these norms for individuals and their communities, often garnered through qualitative data gathering techniques and case-specific experience, also may be critical for understanding the multiple causal pathways of particular practices with consequences for innovation and change. Case-specific evidence garnered through in-depth interviews and narrative analysis can thus prod further research to identify what Luhmann (1994) refers to as the latent structures that shape the everyday lives of people.

The success of comparative work thus resides in developing a shared instrument able to address common questions, but still register the great complexities with how women and men pursue goals and innovate in their daily lives, in order to identify regularities. But, as we show below, capturing the complexities and identifying robust and meaningful broad patterns requires strong teamwork and continued collaboration across the large team.

GENNOVATE's multi-level collaborative approach

While individual researchers are less likely to garner thick descriptions from multiple sites, collaborative initiatives open this possibility, not only at the level of field research, i.e. when different people are gathering evidence from different sites, but also at the interpretive stage where collaborators can tease out the nuances of the meanings and practices embodied in their evidence and, together, identify similarities and differences across sites as in the empirical papers of this issue (see also Burawoy, 1998). GENNOVATE's research is collaborative on several levels which are mutually reinforcing.

First, the research design draws on feminist and participatory traditions concerned with the relationship between researcher and study participants, and the question of whose knowledge counts? GENNOVATE's research approach emphasizes study participants as the knowers and co-researchers, and in consequence gives primacy to study participants' own perspectives and lived experience. This improves the quality and relevance of the research and supports local processes of social change that empower poor women and men to perceive their circumstances in new ways and potentially with this awareness identify opportunities to materially improve their lives (Cosgrove and McHugh, 2000; Chambers, 1997). Second, GENNOVATE represents a major collaboration of social science researchers from research for development organizations with headquarters across the Global South, supported by colleagues from partner institutions, and committed to strengthening the capacities of their respective research programs to contribute to more gender-equitable outcomes from agricultural innovation. Establishing a shared conceptual framework across the research team, including agreement of the key study questions and concepts, was an instrumental initial step for this collaboration to make it possible to produce case studies that allow for comparative analysis and generalization. This ensured a common point of departure and a shared understanding of the primary topics of interest in the overall study. It additionally provided the platform for the joint sampling strategy, and the development, piloting, and application of the standardized data collection tools and procedures for the implementation of the case studies. Third, in each of the 26 countries where GENNOVATE case studies were implemented, local field research teams, trained in the application of the same standardized tools and procedures, brought their specialized knowledge and intimacy with the study context to the process.

Though there have been other medium- or large-scale qualitative comparative studies of agricultural development processes (e.g. Colfer, 2005; Colfer and Pfund, 2011; Kristjanson et al., 2017), what is distinctive about GENNOVATE's project is precisely the breadth of its institutional research collaboration to further a qualitative comparative methodology in AR4D. That collaboration has provided new evidence of how local gender norms mediate innovation capacities, and has strengthened research for development capacities to respond to the limitations of positivist and extractive research paradigms with a complement of inductive comparative methodologies that explicitly seek to expose the contributions to be garnered from both women's and men's local knowledge.

To be sure, most research-based innovations do not achieve broad diffusion, and the contribution has been limited of traditional approaches to understanding the willingness of "early adopters" to test a new practice or technology, or to explain the distinctions among farmers' interests, willingness, and ability to either adopt or reject an innovation (Glover, Sumberg, and Andersson, 2016). GENNOVATE's focus on contextual embeddedness gives us insight into the social dimensions of local innovation processes that are rarely treated in traditional adoption studies, and allows us to identify innovators and learn from them in ways that enhance our understanding of the critical early stage when new knowledge or technology first appears in a community (see also Badstue et al., this special issue). Better understanding of the gender and other social dynamics at play at this strategic juncture, and their implications from a technology development and diffusion perspective, have relevance for research and development targeting and priority setting, in our study areas and beyond.

Scope and overview of the papers in this special issue

This special issue profiles GENNOVATE as an empirically and methodologically innovative research initiative. Empirically, GENNOVATE examines the interlinkages between gender norms, agency, and local innovation processes in agriculture and natural resource management, an intersection still sparsely addressed in the literature, but central to understanding barriers and opportunities for gender-transformative change in agriculture- and natural resource-based livelihoods. The papers that follow address diverse aspects of these interlinkages at different levels. For example, in their examination of what drives individual capacity to innovate, Badstue et al. bring a new angle to the interplay of gender and agricultural innovation using personality traits and agency as an entry point for understanding the capacity to innovate. Their findings make a strong case for looking beyond farmers' financial and productive resources to other dimensions that influence innovation, such as personality traits, relationships and informal institutions, and how these can be leveraged for more equitable and expanded innovation and development outcomes. The intersection between gender and generation is addressed by Elias et al., who analyze how gender norms influence young women's and men's incentives to aspire for agricultural occupations. Their findings illustrate how "youth" and "gender" issues in agriculture are inextricably intertwined, and thus cannot be understood in isolation from one another. Engaging the concept of local normative climate, Petesch et al. (b) shift the focus to the powerful influence of gender norms on local opportunity structures across Sub-Saharan Africa and examine how community level processes enable or constrain women's and men's experience of agency and empowerment. The authors find that men's sense of empowerment tends to be closely associated with their abilities as decision makers and economic providers, and therefore contingent on the conditions of the local economy. Finally, Petesch et al. (c) explore the concatenation of community conditions that are most likely to enable inclusive innovation processes in agriculture and beyond. The authors differentiate among three types of communities highlighting one where normative conditions are more open to negotiation and encourage both women and men to exercise agency and innovate in their rural livelihoods.

Methodologically, GENNOVATE's project is to develop and test a research design that is sensitive to contextual specificity and the complex, evolving conditions of different social arenas and lived experience, while also addressing the need for comparison and extrapolation across multiple contexts. While the rationale for this undertaking and the conceptual and theoretical thinking informing the research design was presented in this paper, the operational field methodology of the study is described by Petesch et al.(a), who also reflect on some of the challenges of twinning contextual and comparative goals in field research and the measures employed to respond to them. Engaging different parts of the GENNOVATE data set, the remaining four articles in this special issue each combines variable-oriented comparative analysis and qualitative context-sensitive analysis at different scales. Badstue et al. compare data from individual women's and men's innovation experiences from rural communities in Africa, Asia, and Latin America. Through qualitative analysis of study participants' own reflections on their experiences with trying to innovate in their agricultural livelihoods, the authors ground the variable-oriented analysis in the lived experience of specific women and men. Findings show that women and men innovators from across different contexts share strong personal drive and high levels of perceived agency. However, although women innovators move skillfully on the border between resistance and conformity, comparisons reveal that structural inequalities make men better positioned to access resources and leverage support than women. With a special focus

on the perspectives and experiences of young women and men from a number of contexts in different world regions, Elias et al., weave together variable-oriented comparative analysis across their sample with careful context-sensitive analysis of the narrative data to uncover a set of strong patterns in the situation of young people despite their highly diverse, yet at times converging, normative experiences.

In their comparison of local normative climates in Sub-Saharan Africa, Petesch et al. (b) highlight regularities across contexts such as the effects of life cycle transitions on both women's and men's agency, and how community-level economic conditions are an overriding concern for men. To illuminate how the comparative findings play out in real life situations, the authors present detailed case studies revealing how local norms and contextual factors contribute to shaping women's and men's practices and opportunities. The combination of variable-oriented and case-oriented analysis across contexts makes evident how invisible, but powerful and elastic, qualities of local gender norms contribute to shaping individual agency, and how they intertwine with local circumstances to give rise to processes whereby local women and men residing in the same village often perceive their agency and opportunities wholly differently.

In the last paper, Petesch et al. (c) bring together case studies from widely diverse agro-ecological and cultural conditions in the Global South to develop a typology of study communities drawn directly from patterns in study participants' assessments of changes in their power and freedom, and of poverty transitions in their villages. Informed by Ragin's notion of "patterns in diversity," each of the three types identified exemplifies a different pace of local social change. This provides a valuable entry point for engaging the complex and fluid influences of gender norms on the daily life and innovation processes of farming communities where in-depth case-oriented analysis illustrates how regularities or patterns play out in particular contexts.

As illustrated in these papers, GENNOVATE's approach offers innovative methodological avenues for the study of gender, innovation, and rural transformation that also has relevance for addressing other research questions and fields of analysis. First, it highlights research on innovation and change as a study of outliers rather than general trends. Second, as local innovation and change processes take place in specific contexts, the methodology enables researchers to understand how these dynamics take place in real life situations. Third, the GENNOVATE initiative provides an example of how qualitative comparative research can be done based on a collaborative approach and a shared standardized methodology. Finally, approaching the issue of local innovation and change processes through an optic of gender norms reveals new dimensions of change processes of relevance for research, applied development, and social policy.

Conclusion

Our purpose in this introduction was to address the challenge of devising a robust research strategy to enable comparative qualitative research at large scale that could explore interactions among gender norms, agency, and innovation in agriculture and NRM. Thus, we have elaborated upon the key theoretical currents and insights from the literature which informed the development of GENNOVATE's research design and helped to define our research questions and conceptual framework. Significantly, these were the result of a collaborative research

strategy involving social science researchers from several CGIAR centers and partner institutions.

While GENNOVATE's approach differs from the deep intimacy of traditional ethnographic or anthropological fieldwork, the study's conceptual framework remains firmly based on an understanding of social action as contextually embedded; and on the need to give primacy to local women's, men's, and youth's lived experiences and perspectives. As applied research, GENNOVATE's comparative design embraces the diagnostic approach informed by attention to relevant causal processes while employing a large comparative case study methodology to "identify key variables present or absent in particular settings so as to understand successes and failures" (Basurto and Ostrom, 2009, p. 39). In this way, the approach facilitates the analysis of complex social processes—here, the interplay between gender norms, agency, and innovation, as these play out in different socio-cultural, economic, and agro-ecological contexts.

We expect that GENNOVATE's approach will help improve understanding of the complex processes through which the interplay of gender norms and agency influence innovation at the local level and how this, in turn, shapes the unfolding of technology diffusion and adaptation processes, and, ultimately, development outcomes. From the perspective of gender and AR4D, and within the current context of limited, results-oriented, time-bound funding, GENNOVATE offers a critical complement to traditional research paradigms, which is able to inform the scaling up and out of new technologies in agriculture and NRM. From a social science perspective, GENNOVATE's research design offers a strategic contribution to discussions of how to devise strategies that are meaningfully informed by the socially embedded ways men and women engage with local innovation processes, while also allowing for comparison at scale —a question of broad relevance for research beyond the field of agricultural development and NRM.

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References

Ahmed, S. (1999) 'Changing gender roles in irrigation management: Sadguru's lift irrigation cooperatives', *Economic and Political Weekly,* 34(51), pp. 3596-3606.

Alkire, S. (2008) *Concepts and Measures of Agency*. OPHI Working Paper Series. University of Oxford.

Alkire, S., Meinzen-Dick, R., Peterman, A., Quisumbing, A. and Seymour, G. (2013) 'The Women's Empowerment in Agriculture Index', *World Development,* 52, pp. 71-91.

Alsop, R., Bertelsen, M., and Holland, J. (eds.) (2006) *Empowerment in Practice: From Analysis to Implementation.* Washington, DC: World Bank.

Anderson, E. (1995) 'Feminist Epistemology: An Interpretation and a Defense', *Hypatia*, 10(3), pp. 50-84.

Aregu, L., Bishop-Sambrook C., Puskur R. and Tesema, E. (2010) *Opportunities for promoting gender equality in rural Ethiopia through the commercialization of agriculture*. IPMS (Improving Productivity and Market Success) of Ethiopian Farmers Project Working Paper 18. Nairobi: International Livestock Research Institute.

Baden, S. (2013) 'Women's collective action in African agricultural markets: The Limits of current development practice for rural women's empowerment', *Gender and Development* 21(2), pp. 295-311.

Badstue, L. B., Bellon, M. R., Berthaud, J., Ramírez, A., Flores, D. and Juárez, X. (2007) 'The dynamics of farmers' maize seed supply practices in the Central Valleys of Oaxaca, Mexico', *World Development,* 35(9), pp.1579-1593.

Badstue, L., Lopez, D. E., Umantseva, A., Williams, G., Elias, M., Farnworth, C. R., Rietveld, A., Njuguna-Mungai, E., Luis, J., Najjar, D. and Kandiwa, V. (2018) 'What drives capacity to innovate? Insights from women and men small-scale farmers in Africa, Asia, and Latin America', *Journal of Gender, Agriculture and Food Security3(1), pp. 54-81*.

Barham, J. and Chitemi, C. (2008) *Collective action initiatives to improve marketing performance: Lessons from farmer groups in Tanzania.* CAPRi Working Paper No. 74. International Food Policy Research Institute, Washington, DC.

Barman, B. K. (2001) 'Women in small-scale aquaculture in North-West Bangladesh', *Gender, Technology and Development*, 5, pp. 267-287.

Basurto, X. and Ostrom, E. (2009) 'Beyond the tragedy of the Commons', *Economia Delle Fonti Di Energia E Dell'ambiente*, 1, pp. 35-60.

Bellon, M. (2001) *Participatory methods for technology evaluation: A manual for scientists working with farmers.* Mexico: CIMMYT.

Berdegue, J.A. (2005) *Pro-Poor Innovation Systems*. Rome: IFAD.

Bergman Lodin, J., Paulson, S. and Mugenyi, M.S. (2012) 'New seeds, gender norms and labor dynamics in Hoima District, Uganda', *Journal of Eastern African Studies,* 6(3), pp. 405-422.

Berg-Schlosser, D., De Meur, G., Rihoux, B. and Ragin, C. (2009) 'Qualitative Comparative Analysis (QCA) as an Approach', in Rihoux, B. and Ragin, C. C. (eds.) *Configurational Comparative Methods: Qualitative Comparative Analysis (QCA) and Related Techniques*. Thousand Oaks: SAGE Publications, Inc., pp. 1-23.

Bernal, V. (1988) 'Losing ground—women and agriculture on Sudan's irrigated schemes: Lessons from a Blue Nile village', in Davison, J. (ed.) *Agriculture, Women and Land: The African Experience*. Boulder, CO: Westview Press, pp. 131-156.

Bicchieri, C. (2006) *The Grammar of Society: The Nature and Dynamics of Social Norms*. New York: Cambridge University Press.

Bishaw, Z. and Van Gastel, A. J. G. (2009) 'Variety release and policy option', in Ceccarelli, S., Guimaraes, E. P. and Weltzien, E. (eds.) *Plant breeding and farmer participation*. Rome: Food and Agriculture Organisation of the United Nations.

Burawoy, M. (1998) 'The extended case method', *Sociological Theory,* 16(1), pp. 4-33.

Burawoy, M., Blum, J. A., George, S., Gille, Z. and Thayer, M. (2000) *Global Ethnography: Forces, Connections, and Imaginations in a Postmodern World*. Berkeley: University of California Press.

Cernea, M. (1991) *Putting People First: Sociological Variables in Rural Development*. Second edition. Oxford: Oxford University Press.

Chambers, R., Pacey, A. and Thrupp, L.A. (1989) *Farmer First: Farmer Innovation and Agricultural Research.* Intermediate Technology Publications

Chambers, R. (1997) *Whose Reality Counts? Putting the First Last*. London: Intermediate Technology Publications.

Cislaghi, B., Gillespie, D. and Mackie, J. (2016) *Values, Deliberations and Collective Action: Community Empowerment in Rural Senegal.* Palgrave MacMillan.

Code, L. (1991) *What Can She Know? Feminist Theory and the Construction of Knowledge*. Ithaca: Cornell University Press.

Colfer, C.J.P. (2005) *The complex forest: communities, uncertainty, and adaptive collaborative management*. New York: Resources for the Future and Bogor, Indonesia: Center for International Forestry Research.

Colfer, C. J. P. (2008) *The Longhouse of the Tarsier: Changing Landscapes, Gender and Well Being in Borneo.* Phillips, ME: Borneo Research Council Monograph Series.

Colfer, C. J. P. and Pfund, J. L. (Eds), (2011) *Collaborative Governance of Tropical Landscapes,* London: Earthscan.

Collier, D. (1993) 'The Comparative Method' in Finifter, A. W. (ed.) *Political Science: The State of the Discipline II*. Washington, D.C: American Political Science Association.

Collinson, M. (1987) 'Farming Systems Research: Procedures for Technology Development', *Experimental Agriculture,* 23, pp. 365-386.

Cosgrove, L. and McHugh, M. C. (2000) 'Speaking for Ourselves: Feminist Methods and Community Psychology', *American Journal of Community Psychology,* 28(6), pp. 815-838.

Costanza Torri, M. (2010) 'Power, structure, gender relations and community-based conservation: The Case study of the Sariska region, Rajasthan, India', *Journal of International Women's Studies,* 11(4), pp.1-18.

Dolan, C. S. (2002) 'Gender and Witchcraft in Agrarian Transition: The Case of Kenyan Horticulture', *Development and Change,* 33(4), pp. 659-81.

Doucet, A. and Mauthner, N. (2006). 'Feminist methodologies and epistemology', *Handbook of 21st Century Sociology. Thousand Oaks, CA: Sage,* pp. 36-45.

Doucet, A. and Mauthner, N. (2002). 'Knowing Responsibly: Linking Ethics, Research Practice and Epistemology', in Mauthner, M., Birch, M., Jessop, J. and Miller, T. (eds.), *Ethics in Qualitative Research*. Sage Publications Ltd: London.

Douthwaite, B. (2002) *Enabling Innovation: A practical guide to Understanding and Fostering Technological Change*. London: Zed Books Ltd.

Elias, M., Mudege, N., Lopez, D. E., Najjar, D., Kandiwa, V., Luis, J., Yila, J., Tegbaru, A., Ibrahim, G. and Bentaibi, A. (2018) 'Gendered Aspirations and Occupational Trajectories among the Rural Youth: A Cross-regional Perspective', *Journal of Gender, Agriculture and Food Security, 3(1), pp. 82-107* .

Farnworth, C.R. (2010) *Gender Aware Approaches in Agricultural Programmes: A Study of SIDA-supported Agricultural Programmes.* Stockholm: SIDA.

Farnworth, C.R., Sundell, M.F., Nzioki, A., Shivutse, V. and Davis, M. (2013) *Transforming Gender Relations in Agriculture in Sub-Saharan Africa*. Stockholm: SIANI.

Feldman, S. and Welsch, R. (1995) 'Feminist Knowledge Claims, Local Knowledge, and Gender Divisions of Agricultural Labor: Constructing a Successor Science', *Rural Sociology,* 60(1), pp. 23-43.

Fonjong, L.N. and Athanasia, M.F. (2007) 'The fortunes and misfortunes of women rice producers in Ndop, Cameroon and the implications for gender roles', *Journal of International Women's Studies,* 8(4), pp.133-147.

Fonow, M. M. and Cook, J. A. (2005). 'Feminist methodology: New applications in the academy and public policy', *Signs: Journal of Women in Culture and Society, 30*(4), pp. 2211-2236.

Freele, E. (2011) 'Garden growers' grievances: An exploration of mandikan gender relations in post-colonial agrarian Gambian communities', *Undercurrent Journal,* 8(1), pp. 17-23.

Friis-Hansen, E., Duveskog, D. and Taylor, E.W. (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), pp. 44-55.

Fuller, S. (2007). *The knowledge book: Key concepts in philosophy, science, and culture.* McGill-Queens University Press.

Gallina, A. (2010) *Gender aware approaches in agricultural programmes – International literature review.* UTV Working paper 2010:3. Stockholm: SIDA.

Geels, F. W. (2011) 'The multi-level perspective on sustainability transitions: Responses to seven criticisms', *Environmental innovation and societal transitions,* 1(1), pp. 24-40.

Geertz, C. (1973) 'Thick Description: Toward an Interpretive Theory of Culture', in Geertz, C. (ed.) *The Interpretation of Cultures: Selected Essays.* New York: Basic Books, pp. 3-30.

Giddens, A. (1984 [reprinted 1986]) *The Constitution of Society: Outline of the Theory of Structuration.* Berkeley and Los Angeles, CA: University of California Press.

Glover, D., Sumberg, J. and Andersson, J.A. (2016) 'The adoption problem; or why we still understand so little about technological change in African agriculture', *Outlook on Agriculture,* 45(1), pp. 3-6.

Granovetter, M. (1985) 'Economic action and social structure: the problem of embeddedness', *The American Journal of Sociology,* 91(3), pp. 481-510.

Hall, A. (2007) *Challenges to Strengthening Agricultural Innovation Systems: Where Do We Go From Here?* Working Paper Series 2007-038. Maastricht: United Nations University.

Hallman, K., Lewis, D. and Begum, S. (2007) 'Assessing the impact of vegetable and fishpond technologies on poverty in rural Bangladesh', in Adato, M. and Meinzen-Dick, R. (eds.) *Rural Agricultural Research, Livelihoods and Poverty*. Baltimore: The Johns Hopkins University Press, pp. 103-149.

Hamilton, S. (1998) *The Two-headed Household: Gender and Rural Development in the Ecuadorian Andes.* Pittsburgh: University of Pittsburgh Press.

Hantrais, L. and Mangen, S. P. (eds.) (1996) *Cross National Research Methods*. A & C Black.

Hesse-Biber, S. (2012) 'Feminist Approaches to Triangulation', *Journal of Mixed Methods Research,* 6, pp.137-146.

Humphries, S., Classen, L., Jiménez, J., Sierra, F., Gallardo, O. and 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), pp. 2078-2095.

Hussain, B. and Asad, A. Z. (2012). A critique on feminist research methodology. *Journal of Politics and Law,* 5, pp. 202-207.

Jackson, C. (2002) 'Disciplining Gender?', *World Development,* 30(3), pp. 497-509.

Kabeer, N. (1999) 'Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment', *Development and Change,* 30, pp. 435–64.

Kabeer, N. (2001) 'Reflections on the Measurement of Women's Empowerment', in Kabeer, N., McFadden, P., Arnfred, S., Dominguez, and Sadallaah, S. (eds.) *Discussing Women's Empowerment: Theory and Practice*. SIDA Studies No. 3, pp. 17-57.

Kabeer, N. (2012) '*Women's Economic Empowerment and Inclusive Growth; Labour markets and enterprise development'*, SIG Working Paper 2012/1. Ottawa: IDRC.

Kabeer, N. (2016) 'Gender Equality, Economic Growth, and Women's Agency: the "Endless Variety" and "Monotonous Similarity" of Patriarchal Constraints', *Feminist Economics,* 22(1), pp. 295-321.

Karim, K.M.R. (2006) 'Gendered social institutions and the management of underground irrigation water resources in a Bangladeshi village', *Gender, Technology and Development,* 10(1), pp. 13-36.

Kerr, A. (2007) 'Feminism and Science, Feminist Epistemology', *The Blackwell Encyclopedia of Sociology*. Ritzer, G. (ed). Blackwell Publishing, 2007.

Kinkingninhoun-Medagbe, F.M., Diagne, A., Simtowe, F., Agboh-Noameshie, A. R. and Adégbola, P. Y. (2008) 'Gender discrimination and its impact on income, productivity, and technical efficiency: Evidence from Benin', *Agricultural Human Values*, 27, pp. 57-69.

Klerkx, L., van Mierlo, B. and Leeuwis, C. (2012) 'Evolution of systems approaches to agricultural innovations: concepts, analysis and interventions', in Darnhover, I., Gibbon, D. and Dedieu, B. (eds.) *Farming Systems Research into the 21st Century*. The New Dynamic. Dordrecht, NL: Springer Science and Business Media, pp. 457-483.

Klerkx, L. (2014) 'How innovation networks interact with their environment: a complexity view on innovation systems', in Pyburn, R. and Woodhill, J. (eds.) *Dynamics of Rural Innovation – a primer for emerging professionals*. Arnhem, NL: LM Publishers, pp. 59-66.

Knight, J. and Ensminger, J. (1998) 'Conflict over Changing Social Norms: Bargaining, Ideology, and Enforcement', in Brinton, M.C. and Nee, V. (eds.) *The New Institutionalism in Sociology.* Stanford, CA: Stanford University Press, pp. 105-126.

Kristjanson, P., Bryan, E., Bernier, Q., Twyman, J., Meinzen-Dick, R., Kieran, C., Ringler, C., Jost, C. and Doss, C. (2017) 'Addressing gender in agricultural research for development in the face of a changing climate: where are we and where should we be going?', *International Journal of Agricultural Sustainability*, pp. 1-19.

Lahai, B., Goldey, P. and Jones, G.E. (2000) 'The gender of the extension agent and farmers access to and participation in agricultural extension in Nigeria', *Journal of Agricultural Education and Extension*, 6(4), pp. 223-233.

Lebel, P., Chaibu, P. and Lebel, L. (2009) 'Women farm fish: Gender and commercial fish cage culture on the upper Ping River, Northern Thailand', *Gender, Technology and Development,* 13(2), pp.199-224.

Leeuwis, C. (2013) *Coupled Performance and Change in the Making*. Professorial inaugural lecture. Wageningen University.

Lilja, N., Ashby, J. A. and Sperling, L. (eds.) (2001) *Assessing the impact of participatory research and gender analysis.* Cali: International Center for Tropical Agriculture (CIAT).

Long, N. (2001) *Development Sociology. Actor Perspectives*. London and New York: Routledge.

Luhmann, N. (1994) 'What is the Case?' and 'What Lies Behind it?' The Two Sociologies and the Theory of Society', *Sociological Theory*, 12, pp. 127-139.

Maarse, L., Wentholt, W. and Chibudu, A. (1998) *Making Change Strategies Work: Gender sensitive, Client oriented Livestock Extension in Coast Province, Kenya.* Amsterdam: Royal Tropical Institute.

Mackie, G., Moneti, F., Shakya, H. and Denny, E. (2015) *What Are Social Norms? How Are They Measured?* Working Paper. UNICEF/UCSD Center on Global Justice.

Malhotra, A., Schuler, R.S. and Boender, C. (2002) *Measuring Women's Empowerment as a Variable in International Development.* Background paper for the World Bank workshop on Poverty and Gender. Washington, DC.

Marcus, G. E. (1998) *Ethnography through Thick and Thin*. Princeton, NJ: Princeton University Press.

McCall, L. (2005). 'The complexity of intersectionality', *Signs: Journal of Women in Culture and Society, 30*(3), pp. 1771-1800.

Miles, M. B., Huberman, A. M. and Saldaña, J. (2014) *Qualitative Data Analysis: A Methods Sourcebook.* Los Angeles, CA: Sage Publications.

Miner-Rubino, K. and Jayaratne, T. E. (2007) 'Feminist Survey Research', in Hesse-Biber, S. and Leavy, P. (Eds.), *Feminist Research Practice: A Primer*, Sage Publications Inc.

Morvaridi, B. (1992) 'Gender relations in agriculture: Women in Turkey', *Economic Development and Cultural Change*, 40(3), pp. 567-586.

Mudege, N. (2013) An Overview of Gender Research undertaken by RTB Centers, 2007 – 2012. Report available at: http://www.rtb.cgiar.org/publication/view/overview-gender-research-undertaken-rtb-centers-2007-2012/

Mukherjee, A. (2004) *Participatory Rural Appraisal: Methods and Applications in Rural Planning. Essays in Honor of Robert Chambers.* New Delhi, India: Concept Publishing.

Muñoz Boudet, A.M., Petesch, P. and Turk, C. (2013) *On Norms and Agency: Conversations about Gender Equality with Women and Men in 20 Countries*. Washington, DC: World Bank.

Najjar, D. (2008) *Learning through farmer field schools: A Case study of the Taita Hills, Kenya*. Thesis submitted to the Natural Resources Institute, University of Manitoba.

Narayan, D. (2002) *Empowerment and Poverty Reduction: A Sourcebook.* Washington, DC: World Bank.

Narayan, D. (ed.) (2005) *Measuring empowerment: cross-disciplinary perspectives.* Washington, DC: World Bank.

Narayan, D., Chambers, R., Shah, M.K. and Petesch, P. (2000) *Voices of the Poor: Crying Out for Change.* New York: Oxford University Press for the World Bank.

Narayan, D. and Petesch, P. (eds.) (2007) *Moving Out of Poverty: Cross-Disciplinary Perspectives on Mobility. Vol. 1*. New York and Washington, DC: Palgrave Macmillan and World Bank Group.

Naved, R. T. (2000) *Intrahousehold impact of the transfer of modern agricultural technology: A gender perspective*. FCND Discussion Paper No. 85. Washington, DC: International Food Policy Research Institute.

Niehof, A. and Terpstra P. (eds.) (1999) *Households in an Interdisciplinary Perspective. Liber Amicorum for Antine Hardon-Baars.* Wageningen University, Wageningen, H & C Publication Series 2.

Norman, D. W. (1980) *The Farming Systems Approach: Relevancy for the Small Farmer*. MSU Rural Development Papers, No 5. East Lansing, USA.

Oakley, A. (1998). 'Gender, methodology and people's ways of knowing: Some problems with feminism and the paradigm debate in social science', *Sociology*, 32(4), pp. 707-731.

Oxfam (2013) *Women's collective action: Unlocking the potential of agricultural markets.* An Oxfam International Research Report. Oxford: Oxfam GB.

Padmaja, R. and Bantilan, C. (2007) *Empowerment through technology: Gender dimensions of social capital build-up in Maharashtra, India.* CAPRI Working Paper No. 63.

Peterman, A., Behrman, J. and Quisumbing, A.R. (2010) *A Review of empirical evidence on gender differences in non-land agricultural inputs, technology and services in developing countries.* IFPRI Discussion Paper 975. Washington, DC: International Food Policy Research Institute.

Petesch, P., Badstue, L., Camfield, L., Feldman, S., Prain, G. and Kantor, P. (2018a) 'Qualitative, comparative and collaborative research at large scale: the GENNOVATE field methodology', *Journal of Gender, Agriculture and Food Security 3(1), pp. 28-53.*

Petesch, P., Bullock, R., Feldman, S., Badstue, L., Rietveld, A., Bauchspies, W., Kamanzi, A., Tegbaru, A. and Yila, J. (2018b) 'Normative dimensions of agency and agricultural decision-making in Sub-Saharan Africa', *Journal of Gender, Agriculture and Food Security 3(1), pp. 108-130.*.

Petesch, P., Feldman, S., Elias, M., Badstue, L., Najjar, D., Rietveld, A., Bullock, R., Kawarazuka, N., and Luis, J. (2018c) 'Community tipping points: The more equitable normative climate enabling rapid and inclusive agricultural development', *Journal of Gender, Agriculture and Food Security 3(1), pp. 131-157.*

Petesch, P., Smulovitz, C. and Walton, M. (2005) 'Evaluating Empowerment: A Framework with Cases from Latin America', in Narayan, D. (ed.) *Measuring empowerment: cross disciplinary perspectives*. Washington, DC: World Bank, pp. 39-67.

Polanyi, K. (1968) 'The Economy as Instituted Process' in LeClair, E., Schneider, H. and Herskovits, M.H. (eds.) *Economic Anthropology: readings in theory and analysis.* New York: Holt, Rinehart and Winston.

Prain, G., Fujisaka, S. and Warren, M. D. (eds.) (1999) *Biological and cultural diversity: the role of indigenous agricultural experimentation in development.* London: Intermediate Technology Publications.

Pyburn, R. (2014) 'Gender dimensions of agricultural innovation', in Pyburn, R. and Woodhill, J. (eds.) *Dynamics of Rural Innovation – A primer for emerging professionals*. Arnhem, NL: LM Publishers, pp.74-86.

Quisumbing, A. R., Roy, S., Njuki, J., Tanvin, K. and Waithanji, E. (2013) *Can Dairy value chain projects change gender norms in rural Bangladesh? IFPRI* Discussion Paper 01311.

Radel, C. (2011) 'Becoming farmers: Opening spaces for women's resource control in Calakmul, Mexico', *Latin American Research Review,* 46(2), pp. 29-54.

Ragasa, C. (2012) 'Gender and Institutional Dimensions of Agricultural Technology Adoption: A Review of Literature and Synthesis of 35 Case Studies', *International Association of Agricultural Economists (IAAE) Triennial Conference*. Foz do Iguacu, Brazil, 18-24 August. International Association of Agricultural Economists.

Ragin, C. C. (1987) *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*. Berkeley: University of California Press.

Ragin, C. C. (1997) 'Turning the Tables: How Case-Oriented Research Challenges Variable-Oriented Research', *Comparative Social Research*, 16, pp. 27-42.

Ramazanoglu, C. and Holland, J. (1999). Tripping over experience: Some problems in feminist epistemology. *Discourse: studies in the cultural politics of education*, 20(3), pp. 381-392.

Rao, S. (2016) *Indicators of gendered control over agricultural resources: A guide for agricultural policy and research.* Working Paper No. 1. Cali: CGIAR Gender and Agriculture

Research Network, CGIAR Consortium Office and International Center for Tropical Agriculture (CIAT).
Reinharz, S. (1992) *Feminist methods in social research*. Oxford: Oxford University Press.
Rhoades, R. E. and Booth, R. H. (1982) 'Farmer-back-to-farmer: A model for generating acceptable agricultural technology', *Agricultural Administration,* 11(2), pp. 127-137.
Ridgeway, C.L. and Corell, S.J. (2004) 'Unpacking the gender system: A Theoretical perspective on gender beliefs and social relations', *Gender and Society,* 18(4), pp. 510-531.
Ridgeway, C.L. and Correll, S. J. (2000) 'Limiting Inequality through Interaction: The End(s) of Gender', *Contemporary Sociology*, 29(1), pp. 110-120.
Ridgeway, C.L. and Smith-Lovin, L. (1999) 'The Gender System and Interaction', *Annual Review of Sociology*, 25, pp. 191-216.
Rihoux, B. and Marx, A. (2013) 'Qualitative Comparative Analysis at 25: State of Play and Agenda', *Political Research Quarterly,* 66(1), pp. 167-171.
Rihoux, B. (2006) Qualitative Comparative Analysis (QCA) and Related Systematic Comparative Methods. Recent Advances and Remaining Challenges for Social Science Research, *International Sociology*, 21(5), pp. 679-706.
Röling, N. (1996) 'Towards an interactive agricultural science', *European Journal of Agricultural Education and Extension,* 2(4), pp. 35-48.
Röling, N. (2002) 'Beyond the aggregation of individual preferences: Moving from multiple to distributed cognition in resource dilemmas', in Leeuwis, C. and Pyburn, R. (eds.) *Wheelbarrows full of frogs. Social learning in rural resource management.* The Netherlands: Van Gorcum.
Röling, N. and Engel, P. (1991) 'The Development of the concept of the agricultural knowledge and information system (AKIS): Implications for extension', in Rivera, W.M. and Gustafson, D.J. (eds.) *Agricultural Extension*. Amsterdam: Elsevier Science Publishers.
Sanginga, P.C., Adesina, A. A., Manyong, V.M. Otite, O. and Dashiell, K.E. (1999) 'Social impact of soybean in Nigeria's southern Guinea's Savanna', Working Paper. Ibadan, Nigeria: International Institute of Tropical Agriculture.
Schroeder, R. (1999) *Shady Practices: Agro-forestry and Gender Politics in The Gambia.* Berkeley: University of California Press.
Schut, M., Klerkx, L., Sartas, M., Lamers, D., Mc Campbell, M., Ogbonna, I., Kaushik, P., Atta-Krah, K. and Leeuwis, C. (2016) 'Innovation platforms: experiences with their institutional embedding in agricultural research for development', *Experimental Agriculture*, 52(4), pp. 537-561.
Schut, M., van Paassen, A., Leeuwis, C. and Klerkx, L. (2014) 'Towards dynamic research configurations: A framework for reflection on the contribution of research to policy and innovation processes', *Science and Public Policy*, 41(2), pp. 207-218.
Sen, A. (2001) *Development as freedom*. Second edition. Oxford New York: Oxford University Press.
Sorensen, P. (1996) 'Commercialization of food crops in Busoga, Uganda, and the renegotiation of gender', *Gender and Society*, 10(5), pp. 608-628.
Sperling, L., Ashby, J.A., Smith, M.E., Weltzien, E. and McGuire, S. (2001) 'A framework for analyzing participatory plant breeding approaches and results', *Euphytica,* 122, pp. 439-450.
Sultana, P. and Thompson, P. (2008) 'Gender and local floodplain management institutions: A

case study from Bangladesh', *Journal of International Development*, 20, pp. 53-68.
Sumberg, J., Anyidoho, N.A., Leavy, J., te Lintelo, D. and Wellard, K. (2012) 'Introduction: The young people and agriculture "problem" in Africa', *IDS Bulletin*, 43(6), pp. 1-8.
Tarrow, S. (1998) *Power in Movement: Social Movements and Contentious Politics*. Cambridge: Cambridge University Press.
Thiele, G., Van de Fliert, E. and Campilan, D. (2001) 'What happened to participatory research at the International Potato Center?' *Agriculture and Human Values*, 18(4), pp. 429-446.
White, J. and White, B. (2012) 'The Gendered Experiences of Dispossession: Oil Palm Expansion in a Dayak Hibun Community in West Kalimantan', *Journal of Peasant Studies*, 39(3-4), pp. 995-1016.
Witcombe, J. R., Joshi, K. D., Gyawali, S., Musa, A. M., Johansen, C., Virk, D. S. and Sthapit, B. R. (2005) 'Participatory plant breeding is better described as highly client-oriented plant breeding. Four indicators of client-orientation in plant breeding', *Experimental Agriculture*, 41, pp. 299-319.

Endnotes

[i] https://gender.cgiar.org/collaborative-research/gennovate/

[ii] The review identified relevant studies published between 1977 and 2013 from an extensive search of journal articles across fields of anthropology, economics, sociology, development and gender studies, program evaluation reports, and other grey literature related to development practice. The methodology varied greatly and included 13 comparative case studies, nine formal evaluations with control groups, and various cross-sectional surveys, in-depth ethnographies (with engagement of weeks, months, or years), rapid qualitative and participatory tools such as focus groups, and mixed methods applied to a single case study as well as with larger samples. Other recent reviews of gender and agricultural technology issues include Ragasa (2012) and Peterman, Behrman, and Quisumbing (2010).

[iii] Hamilton (1998), Dolan (2002), Baden (2013) and Morvaridi (1992) are among the few studies in the review that look explicitly at two-way interactions between local gender norms—and associated dynamics of gender relations and asset control—and broader processes of agricultural innovation and development.

[iv] These mechanisms also foster the persistence of deeply rooted perceptions of men's greater competence than women in most things (Ridgeway and Smith-Lovin, 1999; Ridgeway and Correll, 2000 and 2004).

[v] A literature is growing about interventions that work at building new expectations (social norms) across entire reference groups to engender more inclusive behaviors (Friis-Hansen, Duveskog, and Taylor, 2012; Najjar, 2008). For more theoretical discussion as well as insightful case studies, also see Mackie et al. (2015); and Cislaghi, Gillespie, and Mackie (2016).

[vi] The assessment and rating by farmers of finished or near-finished products from plant breeding programs.

[vii] Anderson (1995) elaborates by arguing that "an adequate feminist epistemology must explain how research projects with such moral and political commitments can produce knowledge that meets such epistemic standards as empirical adequacy and fruitfulness … and that retain commitments to a modest empiricism and to rational inquiry. Feminist naturalized epistemologists therefore demand no radical break from the fundamental internal commitments of empirical science" (p. 51).

[viii] This term, used in the empowerment model devised by Petesch, Smulovitz and Walton (2005), was inspired by Tarrow (1998), who refers to political opportunity structure as the "consistent—but not necessarily formal, permanent or national—signals to social or political actors which either encourage or discourage them to use their internal resources to form social movements" (p. 54).

[ix] This is similar to the notion of opportunity space, used by Sumberg et al. (2012).

[x] Other useful efforts to flesh out measurement indicators of empowerment include Alsop, Bertelsen, and Holland (2006); Narayan (2005); Malhotra, Schuler, and Boender (2002); Alkire (2008); the Women's Empowerment in Agriculture Index—WEIA; Alkire, Meinzen-Dick, Peterman, Quisumbing, and Seymour (2013); and Rao (2016). See also http://www.ifpri.org/publication/womens-empowerment-agriculture-index

[xi] QCA is not simply a set of techniques but a distinctive research approach with its own goals and set of assumptions (Rihoux and Marx, 2013). QCA is a "set-theoretic approach [that] starts from the idea that attributes

of cases are best described in set relations and not in terms of variables. Variables aim to capture a dimension of variation across cases and distribute cases on this variation. A set assesses whether, or to what degree, a case is a member of a set and then analyzes the intersection between sets" (Rihoux and Marx 2013, p. 168).