



Women's agency in changing contexts: A case study of innovation processes in Western Kenya



Renee Bullock^{a,*}, Amare Tegbaru^b

^a International Livestock Research Institute, Nairobi, Kenya

^b Independent Consultant, Stockholm, Sweden

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ABSTRACT

In this paper we describe social change and the potential of agricultural innovation processes to create, or expand, spaces for women to exercise agency in economic and agricultural decision-making in Kenya. Rural communities are increasingly drawn into global processes that create local economic and agrarian change, with marked influences on gender relations, roles and responsibilities. We draw on a qualitative case study with 140 research participants from rural and peri-urban villages in Western Kenya. We examine how global processes have fostered local level changes in the last decade to contextualize innovation processes. Economic changes related to paid work and an evident increase of women's participation in rural development programs reflect, in part, a gender, often women-centred development agenda that targets women in rural programming. Next, we describe a more recent agricultural innovation process to explore decision-making about time use, access to and control over productive resources. Lastly, we describe patterns in gender relations, roles and responsibilities that have changed in response to broader community change and how innovation specific decision-making may create spaces for women to exercise agency in local contexts. We draw on feminist geographic perspectives to better understand these processes through an exploration of everyday practices. Our focus on gender relations and agency as spatial phenomena facilitates an understanding of how roles and responsibilities are created, reproduced and, in some cases, transformed to increase women's agency in particular spaces. Our key findings highlight how economic pressure and agricultural programs that focus on women have brought women into public spaces in new ways and created gendered opportunity spaces amidst persisting roles of men as authorities and final decision-makers and women playing supportive roles. Innovation processes often replicate gender patterns through decision-making in productive assets, however access to agriknowledge offers avenues for women to expand their opportunity spaces by expanding social networks and their ability to negotiate for resources in the household. We recommend further studies that draw on feminist geography to inform the design of agricultural innovations and interventions to benefit women, men and to improve overall livelihoods.

1. Introduction

Globalization processes have influenced rural livelihoods and shifted local gender roles, responsibilities and relations in both communities and households. Economic change, that we examine here over the last decade in a peri-urban and rural village, can be rapid and tense, and the introduction of new agricultural practices and technologies into these contexts will create new spaces in which women and men must negotiate and contest their roles and responsibilities in response to changing realities and pressures. Over the last 40 years gender concerns have increasingly been incorporated in agricultural interventions, however simplified approaches to gender have challenged efforts to identify how to support equitable social and economic change

(Cornwall et al., 2008; Chant and Sweetman, 2012). Most agricultural innovations focus on closing the gender gap in resources, technologies and markets but technical approaches will not achieve lasting poverty reduction and food security outcomes where women also benefit (Meinzen-Dick et al., 2011). Understanding the dynamic processes of change related to gender and agriculture is paramount to enhancing faster and sustained agricultural growth, however, analytical frameworks to analyze gender in innovation processes are often lacking (Pyburn and Woodhill, 2016; Kingiri, 2013). In this paper we describe social change and the role and potential of agricultural innovation processes to create, or expand, spaces for women to exercise agency in economic and agricultural decision-making.

In sub-Saharan Africa (SSA) there are important gender differences

* Corresponding author.

E-mail address: r.bullock@cgiar.org (R. Bullock).

in women and men's participation and access to agricultural knowledge, extension services, and inputs (Doss and Morris, 2001). Material and social resources are typically acquired through a multiplicity of social relationships and access often reflects rules and norms that govern distribution and exchange (Kabeer, 1999). Gender-ascribed constraints are deeply rooted in the customary norms, beliefs, and values that characterize family and kin members' relationships (Kabeer, 2016). Benefit-sharing may be based on gendered intra-household and intra-community resource allocation and bargaining power during the distributional decisions and outcomes (Berdegué, 2005; Quisumbing and Maluccio, 2003). Although laws to change these practices that favor men are in place, norms tend to persist over time and are slow to change (Deere and Doss, 2006) and norms that establish and reinforce men's provider roles have been stable (Petesch et al., 2018). A better understanding of men's and women's gender roles in innovation processes can be used to identify opportunities that will improve women's well-being, advance gender equality and support women's empowerment (Malhorta et al., 2009; Tegbaru et al., 2015; Kingiri, 2013).

The dynamics around different activities and roles that poor communities engage in to address their social and economic needs through agricultural production systems epitomize the gender dimension of agricultural innovation (Kingiri, 2010). Agricultural innovation processes refer to the new products, knowledge, processes, services and forms of organization that individuals or organizations use to bring new innovations into social and economic use (Rajalahti et al., 2008). Innovations are critical to modernization of agriculture and new technologies or practices that improve smallholder agricultural productivity will improve smallholder livelihoods in developing countries (FAO, 2012; World Bank, 2009). Gender dimensions of the institutions that regulate innovation processes are important (Berdegué, 2005) and, unless addressed explicitly, most innovation processes will limit women's opportunities to participate in, and benefit from, innovation processes (Crowden, 2003).

In this paper, our aim is to understand local gender transitions in roles, relations and responsibilities and the role of agricultural innovation processes to create, or expand, spaces for women to exercise agency in economic and agricultural decision-making. We draw on feminist geographic perspectives to better understand global processes through an exploration of everyday practices. Our focus on gender relations and agency as spatial phenomena facilitates an understanding of how roles and responsibilities are created, reproduced and, in some cases, transformed to increase women's agency in particular spaces. The complementary use of concepts and perspectives from feminist geography and feminist literature supports a contextualized and relational understanding of innovation processes to better assess whether and how agricultural innovation processes create spaces for women's agency in decision-making. While men's agency is similarly important, we focus primarily on women because literature demonstrates gender inequalities that discriminate against women in the majority of SSA contexts.

We first examine how global processes have interacted with, and fostered, significant local level change in the last decade in order to contextualize innovation processes. Economic changes, especially access to paid work and women's participation in rural development programs, reflect, in part, more women-centred development agendas that target women through rural programming. Next, we describe a recent agricultural innovation process. We use a qualitative case study of hybrid maize (HM) varieties in rural and peri-urban sites in Western Kenya to explore decision-making about time use, access to and control over productive resources. Lastly, we describe patterns in gender relations, roles and responsibilities that have changed in response to broader community change and how innovation specific decision-making creates and delimits spaces for women to exercise agency in local contexts.

This paper makes empirical, theoretical and practical contributions. The work provides a feminist understanding of globalization through local and household analyses of activities. Gendered analysis of

globalization "reveals how inequality is actively produced in the relations between global restructuring and culturally specific productions of gender difference" (Nagar et al., 2002). Our findings highlight how economic pressure and agricultural programs that focus on women have brought women into public spaces in ways that create new gendered opportunity spaces. Women play more important economic and development roles in the household than a decade ago. Men are often locally viewed as authorities and final decision-makers and women are viewed as playing supportive roles in the household, a position that generates tension in married households. We use HM innovation processes as a case study to explore the roles of context in shaping agricultural decision-making. Frameworks to analyze gender in innovation processes are lacking (Pyburn and Woodhill, 2016; Kingiri, 2013; Kingiri et al., 2011). Innovation processes related to HM often replicate gender patterns through decision-making about productive assets, however access to agriknowledge offers avenues for women to expand their opportunity spaces by building social networks and enhancing their ability to negotiate for resources in the household. But, agriknowledge is not sufficient as a mechanism to transform gender relations and we elaborate practical lessons concerning how better to support more inclusive approaches.

2. Background

Rural agricultural contexts have been marked by deep economic and linked social changes in recent decades. Kenya's economy stagnated in the early 1980s as a result of adverse world prices for its cash crops, corruption, and mismanagement (UNDP, 2005). Low levels of economic growth, intensifying poverty and inequality, increasing unemployment, and the erosion of livelihood systems have influenced gender relations within the household and women have assumed new roles in providing for the household (Amuyunzu-Nyamongo and Francis, 2006). Women's role in the community has also been enhanced by development agencies that require their increased participation in development initiatives and through increased literacy and funds allocated for women's empowerment (Atieno, 2001). Trends show that women's participation in economic decision-making is increasing. Nearly half (49%) of married employed women who earned cash made independent decisions about how to spend their earnings, a 7% increase from 2008 to 09 (KNBS, 2015). As women's responsibilities increase, men's access to a material base, considered essential to establishing household headship, is under pressure in a context in which women's responsibilities are increasing, leaving men feeling disempowered (Silberschmidt, 2001). Given these rapid changes in gender relations, we seek to better understand how agricultural innovation processes may support, or undermine agency in gender relations and what the implications may be for community level social change processes.

An estimated 70% of Kenya's population relies on agriculture to meet food and economic needs and maize is a key staple crop that is primarily produced through smallholder production (Olwande et al., 2015). Kenya has relied on modern agricultural technology to increase productivity to satisfy national food demands and HM varieties have been developed over the last few decades, yet uptake has been low (De Groote et al., 2005; Wang et al., 2017). Maize is a key staple and source of food and income and the majority of maize is grown through smallholder production in virtually all agricultural regions of the country (Olwande et al., 2012). In the last decade there has been a renewed focus on increasing and improving the diversity of HM varieties that are drought and stress tolerant. Such varieties would improve food security amidst increasingly unfavourable, consecutive rainy seasons that affect crop and livestock production (FAO, 2018). An estimated 0.7 million people were severely food insecure between mid-2016 and late 2017, when drought and flood conditions devastated maize production and led to surges in maize prices (ibid). Hybrids often perform better and produce higher yields than traditional varieties (Mathenge et al., 2014), but smallholders' face constraints to plant HM

exist because of investments needed to purchase complementary inputs that include fertilizers and herbicides (Odame, et al., 2009). Gender differences and discrimination in women’s access to land, credit and education have been found to reduce female headed households’ maize yields and adoption rates of seeds and fertilizers in Kenya (Alene et al., 2008; Ouma, et al., 2006).

3. Theorizing social change

3.1. Global processes and everyday relations

Feminist analyses are “well suited for developing understandings of globalization that go beyond the narrowly economic renditions that are characteristic of the mainstream economic globalization literature” (Nagar et al., 2002). Globalization can both empower and disempower women and more research is needed to explore how globalization transforms patriarchal power structures and how new forms of resistance emerge as women are increasingly integrated into the global production process (Afshar and Barrientos, 1999). In this paper we are particularly interested in understanding women’s diverse, lived experiences. Women take advantage of, and exploit, new opportunities that are created through agrarian change that provide openings for women to transform their lives in ways that influence gender relations (Hanson, 2009; Hovorka, 2006).

Feminist geography has always investigated issues of power and scale and sought to build knowledge based on women’s experiences (McDowell, 1993). The symbolic meanings of particular spaces, practices and bodies that are (re)produced through everyday, embodied activities have profound consequences and attention to everyday, seemingly mundane, spatial practices gives insight into how people produce a particular relationship with others (Nightingale, 2011). Everyday activities are not simply a local matter, rather they are the “effects of the stretching of social, political and economic relations over space, constructed and negotiated at interlocking scales of bodies, homes, cities, regions, nations and the global” (Drydyk, 2005). We focus on understanding gender relations and how roles and responsibilities are practiced through daily activities, such as paid and unpaid work activities and intrahousehold decision-making. These approaches allow us to use relational and embedded approaches to identify opportunity spaces, that we here define as gender relations, or spaces, through which women express agency in decision-making.

Social relations, themselves gendered, provide a lens on understanding everyday practices as spatial, dynamic processes that influence, and are influenced by, individuals’ agency. Spatial and temporal dimensions of social relations have been a focus of feminist geographers who are interested in demonstrating the ways in which hierarchical social relations are both affected by, and reflected in, the spatial structure of societies (McDowell and Sharp, 1997). Space is constructed out of social relations that are inherently dynamic (Massey, 1994) and spatial relations are social, socially produced and socially reproducing (Urry, 1981).

Gender relations refer to the socially constructed power relations that ascribe different abilities, attitudes, personality traits, and behavior patterns to women and men (Agarwal, 1997). Feminist scholars highlight the ways in which gender relations interact with and shape agency, that is “the ability to define one’s goals and act upon them” that encompasses the meaning, motivation, and purpose that individuals bring to their activity and their ability to bargain, negotiate and to manipulate (Kabeer, 1999). We conceptualize gender relations and decision-making as spaces through which agency is reshaped and/or reproduced. “Opportunity spaces” used here, refer to spaces through which women increase their agency. People and places recursively shape each other through their interactions (Hanson, 2009) and opportunity spaces are similarly dynamic. Whereas a constriction of space takes away capacity to act and narrows alternatives for behavioral decisions to changes in that person’s life, processes that expand space

allow a person the place and freedom to do what she or he intends to do (Deshmuchi-Ranadive, 2005, 109–110). We are interested in the dynamics of these gendered spaces and, in particular, how these spaces may be created and recreated through economic change, such as urbanization and commercialization, and agrarian change linked to development agendas and agricultural innovation processes.

We first contextualize people and place by describing women and men’s roles, responsibilities in relations and changes, where they may exist, over the last decade. We then examine HM innovation processes with a specific focus on understanding how decisions are made about participation, access to and decision-making about agriknowledge and assets, that include land, inputs, labor, and sales. This approach allows us to situate innovation processes in wider dynamic community contexts and to assess their potential in enhancing opportunity spaces for women, or those spaces in which women exercise agency in decision-making.

4. Methods

4.1. Study Site

Data was collected in 2015 using 6 different instruments in each site from a total of 140 research participants. The ambition of the study was not to generalize, but to use case study narratives to understand gender dynamics in gender relations and innovation processes. Village sites were selected based on criteria that included differences in economic performance (Table 1). The sites are located in Busia and Vihiga counties in Western Kenya (Fig. 1). Pseudonyms for the villages are used: Amatuma refers to the rural village and Likanda to the peri-urban village.

Farming systems have intensified in the peri-urban more than in the rural area, largely due to rapid population growth and consequent land constraints. Plots are on average 0.25 acres and up to 2.5 acres. Plot sizes are relatively small and yields are generally insufficient to produce enough food for the year, so supplementary food is purchased in local markets. Maize is cultivated intensively in crop-livestock farming systems that also feature small-scale zero grazing of dairy cattle. Maize is often consumed and the remainder, if any, is sold in local markets, however net sellers are generally few (See Mather et al., 2013 for more details). HM shares similar characteristics to other innovations that are resource and knowledge intensive. Hybrid maize varieties and technologies, e.g. fertilizers, have been disseminated through various public and private institutions and specific details about the numbers of producers adopting new varieties and inputs was not within the scope of this study, however HM was identified as the most important innovation in 4/6 FGDs. Hybrid maize requires complementary inputs and fertilizers are applied during planting and mid-season stages. Some maize producers have tried to lower costs by using cattle manure. Two rounds of weeding before harvest are recommended. Time to maturity

Table 1
Village sampling criteria.

Sampling criteria	Indicators	Sites	
		Amatuma	Likanda
Gender gaps in assets and capacities	Education	High	Medium
	Physical Mobility	Medium	Medium
	Literacy	High	Medium
Economic Dynamism	Competition over resources	Low	High
	Road network	Low	High
	Off farm employment	Low	High
	Density (persons per sq km)	439	1045
	Land area (sq km)	1695.00	530.9



Fig. 1. Field site location.

varies based on the seed variety and ranges from 3 to 8 months.

4.2. Data collection

A total of 2 community profiles, 16 personal interviews and 6 focus group discussions (FGDs) were conducted. Two women and two men were trained and pre-tested the data collection instruments for one week. Key informants, who included men and women local leaders, were interviewed using the community profile to provide details about historical, demographic, economic, agricultural and service provision characteristics for each site. FGDs were used to collect information about the community context, including information about gender norms, agricultural enabling and constraining factors for agricultural innovation.

FGD participants and interview respondents were selected based on criteria related to socioeconomic status that are detailed in a Methodology Guide developed for the study (Badstue et al., 2014, unpublished). Two sex-disaggregated adult FGDs, with poorer and with better off men and women (as defined through classification in FGDs) were conducted with a maximum of 10 adults in each site. One FGD was conducted with 12 young women and men, (ages 18–24) in each site. Four in-depth personal interviews were used to explore gender differences in the trajectory of individual experiences with HM and four personal interviews were conducted to capture life-cycle event and change to understand how gender norms, assets and capacities for innovation in agriculture/NRM, and other assets and capacities influence household poverty dynamics.

4.3. Limitations

During data collection we implemented measures to reduce bias related to discussions about sensitive topics. FGDs are particularly

subject to bias, particularly when discussing sensitive topics such as norms and practices in a group setting. Jackson (2012) discusses the presentation of selves to others through a performance that is socialized to fit into the understanding of the society in which it is presented. We implemented measures to reduce bias, including holding FGDs in private spaces, using an informed consent process promising anonymity, encouraging participants to express their opinion freely, and emphasizing that there were no right or wrong answers.

Our sample is not representative, nor does it dutifully capture diverse life experiences shaped by the intersection of gender, age and ethnicity. However, our sampling included respondents in different marital arrangements that offered some perspectives on the role of marital status in social difference, that influences household decision-making. Marriage relations operate in a wider social and institutional context. For example, polygynous arrangements and kinship networks often create hierarchical relations that mediate access to, and control over land. We focus primarily on women and to a lesser extent, men, due to the focus of the paper. However, we recommend inclusion of men to grasp fuller relational understanding of social changes.

4.4. Analysis

Qualitative and thematic analysis was performed using NVivo 10 software. Following data collection, data were coded for content analysis using a coding tree developed by the GENNOVATE global study. The study questions and conceptual framework informed the major categories of the coding tree. The authors then created 4 additional nodes and coded data accordingly. The final coding framework was validated and cross-checked using 4 iterative steps: using the pre-existing codes from the coding tree, comparing responses from similar questions across instruments, performing a word search, and re-reading the interviews to fill gaps.

A total of 9 nodes, composed of 300 statements, were then analyzed using *Attride-Stirling's (2001)* approach to document and systematize analysis of textual data, disclosing each step in the analytic process. First, text segments in each node were reviewed to identify salient, common themes to identify underlying patterns and structures. Statements were then re-organized to develop an understanding of women's agency in decision-making in economic and agricultural decisions. Themes were identified and refined to be specific enough to be discrete, yet broad enough to encapsulate a set of ideas contained in numerous text segments based on *Attride-Sterling (2001)*. The original set of themes were renamed to render a conceptual division of themes that were classified as Basic Themes and issues listed within each of the basic theme provided salient details to better understand supporting and constraining factors that influence agency in relations. Sources were triangulated to develop and identify key themes.

5. Results

5.1. Sample characteristics

Luhya are the main ethnic group in both areas. Marriage is patriarchal and the most common family structure is nuclear, consisting of husband, wife and their children. Polygynous practices have declined in both villages, for which pseudonyms were used, and are nearly absent in periurban Likanda and somewhat common in Amatuma. FGD participants' average age of men in Likanda was 42, and 48 in Amatuma (*Table 2*). The average age of women in Likanda was 43, two of whom were widows. The average age of women in Amatuma was 44 and one was a widow. The average age of young men in Likanda was 21, and 22 in Amatuma. The average age of young women was 22 in both Likanda and Amatuma. Two male interview respondents were in polygynous marriage arrangements in the rural areas.

The average age of adult male interview respondents was 45 years (range 27–53) and of adult women 46 (range 35–55) (*Table 3*). The average age of both young women and men was 22 years (range 16–25 for young women and 17–25 for young men). The majority of adult respondents were married with children residing in male-headed households. The exceptions were three women from polygynous arrangements in the rural site, one of whom is a first wife of two, and two widows, one being a second wife of two, and one being a second wife of 4 wives in total. One widow from a monogamous marriage was interviewed in the peri-urban site.

Wealth ranking exercises showed that the characteristics of those living above and below the poverty line are similar in the two villages. Those living above the poverty line own 1–2 acres, typically own livestock, e.g., cows and goats and hire labor. Those below the poverty line have smaller plots or no land, work as hired labor, may own chickens, and are generally food insecure.

Table 2
FGD participants characteristics.

Location	Sex	Sample selection	# of participants	Age range	Lowest education	Highest education
Amatuma	Men	Poor	8	30–50	Primary	Secondary
		Middle	8	32–52	Primary	Secondary
		Youth	10	17–22	Primary	Secondary
	Women	Poor	10	30–52	None	Secondary
		Middle	10	28–56	Primary	Secondary
		Youth	10	16–25	Primary	Degree
Likanda	Men	Poor	10	32–55	Primary	Degree
		Middle	10	29–55	Primary	Degree
		Youth	10	19–25	Primary	Degree
	Women	Poor	10	36–57	Primary	Secondary
		Middle	10	28–46	Primary	Secondary
		Youth	10	18–24	Primary	Degree

5.2. Empirical results

We present results in two subsections. First we contextualize people and place by describing women and men's roles, responsibilities in relations and changes, where they may exist, over the last decade. We then focus on HM innovation processes. All results, including figures, are based on primary data collection. Narratives from interviews and dialogue excerpts from FGDs are presented where relevant.

5.2.1. Gendered opportunity spaces: Paid work and collective action

Over the last decade, urbanization and commercialization have influenced household livelihood strategies and have had significant gendered impacts on access to paid work opportunities. Economic pressures and reliance on purchased food, and increased emphasis on education and subsequent need to pay school fees have increased. Women's access to, and participation in, paid labor opportunities has increased to meet these demands, while men spoke of an altogether different experience, in which they find fewer, poorly remunerated work opportunities.

Mechanization has resulted in losses in particular types of labor, e.g. building roads, that was often performed by men. Maize mills and piped water, especially in the peri-urban area, have replaced women's remunerated extra-household work of pounding maize and fetching water. Today paid work, that is often informal since there are few formal employment opportunities, is similarly gender specific. Women sell vegetables and pursue casual work on farms. In both locations, key informants enthusiastically described women's work opportunities and highlighted the role of education improvements.

“Many women here are beauticians, some are teachers, hairdressers, and lecturers. Also, we have colleges and university programs. Women are also motivated by the phrase ‘what a man can do a woman can do better’, so there is competition. There are more opportunities in the county government, including providing disabled women with work. Women now go to school now and have gotten better jobs in organizations in human resource and management” (Likanda Community Profile). In the rural area, a woman explained that an estimated 75% of women in the community work, “because women from some communities have come with new skills, techniques and knowledge which has widened the scope of thinking in this area” (Amatuma Community Profile).

Men pursue work in construction and transport, such as motorcycle driving, but these opportunities are limited due to high competition among men in search of work. Consequently, men's estimated rates of migration have increased over the last decade. Men temporarily migrate in approximately 1/2 of the households and 1/4 migrate permanently in both locations. Explanations were provided in both locations.

“Most men here rarely move out permanently; even when they buy land elsewhere they still come back or leave someone in charge.

Table 3
Characteristics of the sampled interview respondents.

Code in text ^a	Age	Group member	Time in village	Marital status	Education	# Children
<i>Women's characteristics</i>						
IPAW1	35	Yes	20	Married, 1st wife	Primary complete	4
IPAW2	48	Yes	27	Married	Secondary complete	2
ILAW1	48	No	30	Widow, Second wife	Primary complete	5
ILAW2	46	No	20	Widow	Primary complete	4
IPLW1	37	Yes	18	Widow	Secondary complete	5
IPLW2	48	Yes	25	Married	Secondary complete	3
ILLW1	55	Yes	41	Married	Primary complete	5
ILLW2	54	Yes	27	Married	Primary complete	4
<i>Men's characteristics</i>						
IPAM1	32	Yes	32	Married, 2 wives	Primary complete	6
IPAM2	27	No	24	Married	Secondary complete	1
ILAM1	52	Yes	46	Married	No/incomplete primary	10
ILAM2	48	No	48	Married	Primary complete	6
IPLM1	53	No	46	Married	Vocational/technical	5
IPLM2	45	Yes	41	Married	Secondary complete	5
ILLM1	48	No	30	Married	Vocational/technical	5
ILLM2	54	No	43	Married	Secondary complete	1

^a The coding is as follows. The first two letters refer to the abbreviation of the instrument. IP (Innovation Pathway); IL (Life History). The third letter refers to the location, A is for Amatuma, L is for Likanda. The fourth letter refers to sex, M for male, F for female.

Many men go in search of jobs outside but return. Some men have decided to settle at home because of the post election violence so they prefer to work near home" (Likanda Community Profile). In the rural area, a key informant explained: "Men have moved because they do not like loans that have put them at risk of losing their farms. Women, on the other hand, are more development focused. NGOs have made women more stable so they can do more business, hence don't feel the need to move elsewhere" (Amatuma Community Profile).

Women's migration rates have not changed over the last decade, in part because their time is often divided between unpaid housework and paid work. Women still perform most of the household chores that include cooking, cleaning and childcare. Married women and widows complete household chores before leaving for work, unlike men, who often leave the house early in search of work and return later in the day. Women complained that they have too many childcare activities and seldom have time for business.

A widow who sells dried fish explained her daily routine: "When I wake up in the morning I clean the home, check my calves, then I leave for business. But, first I make sure I have water, firewood and the house is clean. In the evening I come back and cook. Even though I get money, the needs are numerous. But whatever I get I try to manage" (ILAW1).

In addition, women, previously excluded from collective action and financial services, now engage in more civic groups because of a combination of interest and opportunities created through NGOs and various women centered development programs. Groups are diverse in terms of type, service, and whether they are solely women, or mixed groups of women and men together. Women are members of both formal and informal groups and have taken advantage of these opportunities, to the extent possible, to learn and gain access to information, credit and to build social networks. The most common types of group mentioned were table banking groups that prove to be especially important to secure capital to purchase agricultural inputs and livestock. Women's participation rates in these activities, economic and development oriented, have had a profound influence on their daily practices. This change has accompanied a shift in norms towards more flexible and accepted roles of women as economic agents in their households.

In the peri-urban site women explained that, "Today women are in various social and development groups, for example the table

banking which helps women grow financially and in business". Florence continued, "Ten years ago women were just housewives with nothing to do" and Jessica said, "I agree with Florence because women were restricted by men, even family members like in-laws were not supportive of the idea that a woman should work. In such a case, can one really progress?" Margaret agreed, "Back then women were less informed but today we attend seminars and even women can keep cattle for milk produce which gives cash" (Women's FGD, Likanda).

Men's descriptions of their opportunities differ from women's. Men in FGDs described higher rates of unemployment and challenges in acquiring land, that was previously common through inheritance and continues to be an important asset to help men establish economic independence from parents. Over the last decade, men complained about parents' unwillingness to share land and difficulties in acquiring titles. Their narratives conveyed a sense of powerlessness that undermines their ability to fulfil traditionally held beliefs about men as breadwinners in the household.

Japheth explained, "Many men don't have jobs here, yet they have ability". Jerome, a 22 year old single man, said that "Young people have little power because they don't have money" (Men's FGD, Likanda)

5.2.1.1. Shifting expectations and enduring gender roles in the household. Although gender roles and expectations are changing, gender patterns in the household have persisted. Men and women often perceive men as heads and authorities, while women assume supportive roles in the household, however, women's frustration is growing. The combination of opportunity and necessity to earn has placed women in new positions in public spaces in ways that influence women's daily practices and create new expectations of women as financial contributors to households. Women's increased levels of participation and engagement in economic and civic spaces represent a rapid shift because their current activities and contemporary roles contrast with deeply rooted traditions associated with women and men's positions in the household. These changes have ushered in new expectations and burdens on women to be more "independent". In both locations men and women frequently described a characteristic of a good wife as being one who is financially independent, yet supportive of husbands.

In Likanda men said that the characteristics of a good wife are that:

“She should be independent and able to provide if the husband is absent and work to earn money”. Men cautioned that good wives do “not depend on husbands too much, but work and encourage their husband” (Men’s FGD, Likanda).

Men readily explained that women must earn because of their own shortcomings to provide for the household. Nevertheless, men retain their authority in the household, that is both important to maintain rapport with their wives and to uphold a good reputation within the community. When asked about women’s roles in the household, men in the rural site defended their roles as heads of household, claiming that women could not be key providers. Perspectives in peri-urban men’s groups varied and were debated, reflecting place and gender specific variations in terms of flexibility of norms.

In the rural site, Barasa said that “A man and woman cannot be the same; the man is the head for effective homes.” A younger man continued, “A man in a house in which women take a lead in decisions means that the man is cursed”

Rural men described their preference for women to work from home, unlike peri-urban men, who see fewer opportunities for women to work at home, thus encourage women work in town.

In Amatuma, if a woman’s contribution is higher than a man’s “... it is bad [because] my wife will not respect me. George agreed, “If a wife helps and contributes more to the household, more than you, a man will be despised by women.” A rural man explained, “The husband will not have peace, it is better for the wife to work from home because the wife needs to organize the home and keep it clean. I could open a shop for her, for example”.

Women’s narratives revealed the ways they sustain men’s roles as heads of household, often through supportive roles in decision-making about economic and productive assets. For example, women provide financial support to the household “carefully”, or in ways that sustain men’s perception of themselves as breadwinners.

Eva in Likanda said, “Women help men search for food so that when the man is unable or unavailable they can head the home.” Another woman in Amatuma said, “Sometimes if the woman helps out she should not be arrogant and abuse the man for lack of provision, or his inability to provide. She should be free to give the man handouts sometimes if he needs” (Women’s FGD, Amatuma).

Similarly, compliance with norms and roles are enacted through decisions about major assets. Men and women, through their negotiations, emphasize the position of men as authorities. When asked to describe ownership and decisions over sales of household assets, women described changes in exercising voice over the last decade, however frequently referred to men as the “final decision maker”.

“The plot and cow are our biggest assets and today I make some decisions about the farm because things are different than a decade ago. I have my plot and my co-wife has her own so I have some authority. However, the man makes decisions about selling the farm. This has not changed in the last decade because the man is still the head and owner. Now I can oppose a sale, but ten years ago I had no voice. Concerning the sale of a cow, as a woman my opinion is that she can be heard even though the man’s decision is final. At least he can listen...So for the sake of peace the man is consulted on the ideas that I may have” (IPBW1).

Although changes in women’s levels of participation are evident, namely through voicing their opinions in decisions about major assets, the continued role of men as primary decision-makers has persisted, even in cases in which women purchase assets themselves. Women recognize their important economic contributions and simultaneously acknowledge the need to maintain peace in the household, that is important to achieve household food and income security. However,

women’s growing frustration with men who are opting out of work and/or failing to support the household was evident. In both the rural and peri-urban locations, young and adult women complained about men’s alcohol abuse and engagement in extramarital affairs as practices that deepen household poverty.

Maxi said, “A man should not depend on the wife for everything because then the wife becomes head”. Eunice, explained that: “There are some men who do not care about progress at home and when a woman has a vision with such a man it is difficult. Even when he gets money he just wastes it” and, “An irresponsible man will not think of any projects so he is the head by title but the woman gives direction” (Young women’s FGD, Amatuma).

In summary, over the last decade, there have been significant changes alongside continuation of household dynamics that position men as heads of household and as authorities in decision-making. Women, often financially active, sometimes more so than men, are often perceived to be supporters of men, stepping in as needed when men fail to find work or migrate for work, for example. Next, we turn to HM agricultural innovations.

5.3. The case of hybrid maize innovation processes

We examine hybrid maize innovation processes with a specific focus on understanding how decisions are made about participation, access to and decision-making about agriknowledge and assets, that include land, inputs, labor, and sales. Hybrid maize varieties were identified as the most important innovation in most of the FGDs. HM maize is considered to be knowledge, labor and capital intensive. Gender dimensions of HM innovation processes explored here include participation, access to and decision-making about agriknowledge and assets that are required for adoption, that include land, inputs, labor, and sales. Over the last decade many new varieties and associated practices have been introduced, thus we present general descriptions about HM, e.g. use of complementary inputs.

5.3.1. Feminizing agriknowledge: “Few men are willing to learn¹”

Hybrid maize was described as being knowledge intensive and requires attending seminars or services to learn about correct planting methods and use of complementary inputs, that are key to improving productivity. Successful HM production requires using recommended spacing and fertilizer application.

Women and men gain access to agri-knowledge from both formal and informal sources, the latter including friends, neighbors and progressive farmers in the community. Poorer or less well-off households often turn to informal sources because of their inability to meet and pay monthly membership fees in formal groups. There was debate in women’s FGDs about whether men attend. Women in both locations explained that men participate and attend fewer sessions about agricultural knowledge because they are busy with other tasks that include looking for work or simply choosing to opt out of what has increasingly become “women’s work.” Men frequently described women as “liking development” and “change” which may also explain why more men are choosing not to participate.

Sarah explained, “Some men do not want to be taught; they are just in their own world. Gladys continued, “Some prefer that the woman learns on their behalf. Beatrice said, Men think that is a woman’s work to go and learn” (Women’s FGD, Amatuma).

Women’s exposure to new knowledge increases their ability to impart technical skills in the community and in the household. In both villages, women’s uptake of knowledge and subsequent sharing of the information in the community has given them greater visibility as

¹ (Women’s Group, Amatuma).

progressive farmers, particularly important in the rural area, where formal institutions are less common than in the peri-urban site. In the household, women share information with husbands and may use their knowledge to negotiate better access to resources, especially land, but their narratives reveal the limitations of collective action and community level interventions to change power structures in households.

5.3.1.1. Cooperative relations: “When there are disagreements in the home between the man and his wife there can be no innovative ventures²”. Decisions about which crops to plant and management often center around land, that is typically inherited or purchased by men. Women’s access to land depends on whether she has siblings, specifically brothers, and marital status. Women who never marry, or divorce, may acquire land through family lines. However, married women typically negotiate access to their husband’s land. Thus women often cannot proceed with an innovation that requires land without their husbands’ support. Although women may have the technical know-how, they exercise low levels of decision-making when it comes to deciding how to use land. It is clear that, while men may proceed without support of their wives, women cannot proceed without their husbands’ consent. Agreement in the household is critical to undertaking new innovations.

A widow explained, “It took me 7 years to try HM because I did not have the authority on the plot. My husband used to follow local examples so when I tried with the new technology my mother in law was impressed by the results ”(IPVW1).

Since men’s access to land has become more tenuous over the last decade, women often turn to alternative relations, including affective relations and kin members, that was less explored in this dataset. Wives may provide labor in exchange for space on a plot, for example. Widows and divorced women’s access to land similarly depend on affective relations that mediate access that sometimes deny women access to any land.

Women and men discuss whether to adopt and, more importantly, how to pay for resources to support the process, e.g. inputs and labor. Complementary inputs are a substantial cost to households and HM requires spouses to cooperate to purchase required fertilizer and herbicides. Although men, typically the land owners, are expected to pay for HM inputs, current day challenges to finding paid work have made this more difficult. Consequently, women often contribute to the purchase of inputs to support HM adoption in the household. Cooperation is needed to adopt HM and thus differs from other less resource intensive innovations that may be managed more independently. A rural woman described HM as an exception to common in crop management decisions in her household.

“My husband makes the major decisions, but with the hybrid maize we work together as a team. We plan how we will get the seeds. When the planting season comes I remind my husband and we do the budget so we know how much seed and fertilizer it requires so he buys” (Women’s FGD, Amatuma).

Labor tasks on maize farms are gender-specific and men’s activities include preparing the land and planting, while women carry out weeding and harvesting tasks. Labor and time intensive tasks include spacing of maize and weeding, scheduled twice over the growing season. Labor may be sourced from the family, hired, or through groups, formal and informal. Payment is in cash and in-kind. One of the most common characteristics of better off households in the wealth ranking that they hire labor. Meanwhile households that are less well off rely on family labor. When constraints to hired labor exist, family, and especially women’s labor, can be substantial because of the arduous weeding and harvesting tasks. Also, informal labor groups may be

created to reduce labor burdens.

Selling decisions are commonly made by men in the household. Wives may contest sales, however tend to support men as the main decision-makers about maize. Gender patterns differ in the two locations in terms of who manages the sale in the rural area men tend to sell, while in the peri-urban area, women and men sell together. Patterns of use of income were similar in both locations. Income from sales are often used to pay school fees and to invest in household diversification.

“Sometimes my husband has no money and he becomes harsh when I want to sell the maize so we argue. Sometimes even if he wants to sell I also refuse. The man is the head so I have to respect him and ask him when making all decisions. Though I make some decisions on how to plant the maize, I am limited when it comes to selling the maize. If I make the decisions by myself, he gets offended. There was a time I felt discouraged because I am the one who got the innovation yet he is the one with the final say but I just continue because of its benefits” (IPBW1).

Hybrid maize agricultural innovation processes simultaneously create and restrict spaces for women’s agency through the various decisions about access to, and decision-making about agriknowledge and assets that are required for adoption, that include land, inputs, labor, and sales. In the following discussion we elaborate the ways in which the dynamic and changing context similarly influence decision-making spaces in agricultural innovation processes.

6. Discussion

We first described local contexts, where economic change and rural development programs have had a marked influence by creating and expanding women’s opportunity spaces by facilitating women’s entry into economic and agricultural development domains. We next turned to innovation processes. This approach allows us to situate innovation processes in wider dynamic community contexts and to better assess their potential in enhancing opportunity spaces for women, or those spaces in which women exercise agency in decision-making.

6.1. Women’s economic and development roles amidst enduring household roles

Gender relations are changing rapidly but at different rates and in often spatially explicit ways. Over the last decade economic change and pressures have had uneven effects and have created different, often diverging, gendered opportunity spaces. Globalization both connects women into networks across varied spaces and plays on and reconstitutes differences among them, as well as inequalities between women and men (Nagar et al., 2002). As women’s spaces have expanded, men’s spaces have seemingly contracted, particularly in terms of local paid opportunities. Women have taken advantage of economic opportunity and are key economic contributors in the household. Changes in women’s roles and entrance into economic spaces are, by and large, adaptive practices to meet challenges in current times to achieve food security and improve incomes. Women, more than men, have also taken advantage of the increased number of NGOs and programs that focus on women. However, women’s paid work and participation in such programs is often in addition to unpaid household activities, for which they are still responsible.

Our results are similar to others’, who have found that micro- and macrolevel interactions perpetuate asymmetric flexibility in gender divisions of labor or major change in one domain of gender relations yet marked continuity in another (Evans, 2016). Women’s agency often differs in public, private intra-household, rural and periurban locations. Within married households there is a common pattern in which men are the primary decision-makers and women assume significant supportive roles. As they become increasingly responsible for their household’s

² (Women’s FGD, Amatuma).

income, women acquire a new awareness, autonomy, and feeling of self-worth (Silberschmidt, 2001) and women are beginning to demand their own space (Amuyunzu-Nyamongo and Francis, 2006). This is evident through women's descriptions of their own voices, especially to make greater claims on resources in their households. Socioeconomic change has left men with a patriarchal ideology bereft of legitimizing activities; unemployment and low income prevent them from fulfilling roles as head of household and breadwinner (Petesch et al., 2018; Silberschmidt, 2001). However, men maintain their position as heads of household and as authorities in the household through economic changes, in spite of their decreased earning capabilities. Furthermore, women play a more significant role than a decade ago, but continue to exercise limited agency in decision-making about key productive assets. In spite of women's entrance, or perhaps because of men's sense of loss of economic agency, men continue to assert authority by placing restrictions on women's economic activities and retaining authority in decision-making in most household decisions. Dolan (2001) similarly found that men, under similar socioeconomic conditions of economic, social, and political uncertainty that make it more difficult to fulfill expected breadwinner role, still desire to fulfil roles that provide anchors and points of leverage, namely through maintaining authority in decision-making.

6.2. Agricultural innovation processes and opportunity spaces

Innovation processes are embedded in these gendered contexts and influence women's agency in HM innovation processes. Contextual and spatially explicit patterns of women's engagement in public space and their role as a supporter in household decision-making, are replicated in innovation processes. Gender roles are reproduced in decisions about participation, access to and decision-making about agriknowledge and assets that are required for adoption, that include land, inputs, labor, and sales.

However, the feminization of agriknowledge spaces, through women's interest, and targeting of women by development agencies, has expanded women's opportunity spaces in a few ways. Women gain more access to agricultural knowledge than a decade ago, in what was once a male-dominated domain, in part because of development agenda's focus on women. Similar to Hanson (2009) who found that entrepreneurship links people and place in a number of ways, most notably through networks of social relations in place, we find that access to agriknowledge, that is also marked by deep stereotypical gender divisions, is an activity through which people can change the meaning of gender and the way in which gender is lived. Hovorka (2006) similarly found that the context of rapid urbanization and agrarian change in Botswana provided openings for women to transform their lives by making claims on land and capitalising on their traditional roles. Here, women exploit new opportunity spaces in at least two ways. Engagement in paid work and civic groups broadens and deepens their social networks and they use agriknowledge to negotiate access to husband's productive resources. While women expand their agency in this regard, women exert less agency in household decision-making about the use of productive resources. Also, women take on new, often unremunerated time burdens in addition to their housework (See also Bergman et al., 2019). We thus emphasize the limitations of knowledge or efforts to close gender gaps and provide extension services to women, because these have few transformative effects in changing gender relations in the household.

6.3. Household as a site of conformity and contestation: practices, roles and expectations shift to accommodate new realities

Agricultural innovation processes, and HM in particular, in communities where intensification of limited, gendered resources often creates conflict, tensions and create pressure to cooperate in the household (see also Iradukunda et al., 2019). The household is a space

in which contestation and negotiation often coexist among various forms of cooperation (see Kandiyoti, 1988). In our study, we find that men, and to a large extent, women, protect male breadwinner status and male authority through conforming practices. Women consistently describe their husbands as the primary decision-makers, while they themselves assume supportive roles. Although gender identities and place are fluid and fungible and have the ability to interact dynamically, both are also characterized by inertia and constrained by prevailing cultural norms, that signifies an important characteristic of places and people (Hanson, 2009; Petesch et al., 2018).

We postulate that household norms are firm because of a combination of societal expectation and self interest amidst challenging economic pressures. For example, we believe that others conform to and value these societal expectations and perceive that our own social approval hinges on compliance (Bicchieri, 2006). In both sites, women and men said that maintaining a good reputation in the community was important. Men and women also conform to gender divisions of labor because they perceive this as being in their self-interest (Evans, 2016). We found frequent references to disagreement in the household as an obstacle to household stability in income and food security. Although gender norms are often held in place by subconscious beliefs of men's greater competence at most things, beliefs which also invisibly shape an individual's (stereotypical) perceptions and social interactions (Ridgeway, 2009), we find here that women's narratives, young and old, reflect confidence in their abilities and a clear sense of capacity to aspire, that Appadurai (2004) defines as the forward looking capacity of individual and groups to envision alternatives and to aspire to different and better futures. These aspirations also reflect increases in women's education access, that have increased in the last decade.

6.4. Theoretical and practical implications

Feminist understandings of global processes have largely remained separate (Nagar et al., 2002) and similarly excluded from innovation processes and wider systems approaches. Our study demonstrates the applicability and value of feminist geographic perspectives in understanding agricultural innovation processes, that are typically understood through narrow technical and agriculture-specific lenses. Rather, agricultural processes and interventions may reflect wider political and global agendas, particularly as efforts to attain global gender equality gain momentum.

Innovation processes can serve as a lens to both frame and query global and local processes and interactions, with an especial focus on women's and men's everyday lives. A holistic geographic and temporal approach affords a situational and contextualized understanding of gender and opportunity spaces for agency. Such research can contribute to wider discussions regarding the malleability of gender systems and the need to understand the effects of global restructuring on local gender relations, including performances of masculinity (Whitson, 2010), that we found similarly here to be very important.

Women-centered rural development programs have important consequences for local processes of change, not least gender dynamics, that are also in flux. Change is neither automatic nor necessarily progressive in the sense of disrupting existing power relations (Hanson, 2009). While women's entrance and participation in programs increases, intra-household gender hierarchies persist (See Petesch et al., 2018; Evans 2016). Our findings show women's role in perpetuating supportive, as opposed to, leading roles in the household. Gender hierarchies are affected by new configurations of women's identity and practice and women are central in processes that construct masculinities (Connell and Messerschmidt, 2005). Our work signals important changes for future generations and important areas of research to understand these transitions.

Our findings also highlight practical lessons for designing innovation processes. It will be imperative to address women's low levels of agency in decisions about productive resources through responsive and

transformative approaches. Studies can inform and identify gender strategic entry points to enhance social change processes that expand spaces for women's agency. While it is important to engage women early on in innovation processes, institutional support is also needed. Women's organizations have an important role to play in creating the conditions for change (Kabeer, 1999), but do not address, or shift, the gender hierarchy that exists, and persists, in the household. It is not possible to address and change household gender relations through interventions that are external to the household (Agarwal, 1997). Programs must also engage men, who have been sidelined in development, especially the poor in rural areas and in many cases their efforts to reassert themselves include, in some cases, turning to violence to reassert their masculinity (Amuyunzu-Nyamongo and Francis, 2006).

6.5. Further study

We recommend further study because our case studies are not generalizable. More relational studies and efforts to understand differences between rural and peri-urban men and their sense of agency and responses to changing contexts would lend insights to better understand social change at multiple scales. While we often focused on women's narratives, we also found men's experiences with social and agrarian change to be important, especially in shaping and reshaping gender relations. Notably, in the peri-urban area, men showed greater flexibility in acceptance of gender equality and this deserves further attention. Further interrogation of the role of informal networks as platforms for fostering inclusivity/exclusivity would also yield insights about interrelationships between actors within informal networks and cultural aspects (particularly patriarchal) that are embedded in specific rural and private/relational spaces.

Our study highlights the ways in which innovation specific resource requirements and decision-making process through which individuals negotiate access to and use of resources, may reproduce context specific gender roles and relations. Diverse innovations will operate differently across diverse different contexts. An individual innovation is unlikely to lead to sea change in social order, yet cumulatively, within a place and over time, innovations can transform and lead to shifts in gender ideologies that result in greater access to resources for women entrepreneurs (Blake and Hanson, 2005). Capital intensive innovations in contexts where women have few opportunities to earn income will likely increase women's dependence on men or their resources, which can compromise social benefits and agency gains anticipated through innovation processes. Gender responsive and gender transformative approaches or innovations are needed to address these patterns and articulate clear strategies to support women's agency.

7. Conclusion

In this paper we describe social change and the role of agricultural innovation processes to create, or expand, spaces for women to exercise agency in economic and agricultural decision-making. Rural communities are increasingly drawn into global processes that create and interact with local economic and agrarian changes, with marked influence of gender relations, roles and responsibilities. We draw on feminist geographic perspectives to better understand these processes through an exploration of everyday practices. Our focus on gender relations and agency as spatial phenomena facilitates an understanding of how roles and responsibilities are created, reproduced and, in some cases, transformed to increase women's agency in particular spaces.

We contextualize people and place and use HM innovation processes as a case study to understand how decisions are made about participation, access to and decision-making about agriknowledge and assets, that include land, inputs, labor, and sales. Our key findings highlight how economic pressure and agricultural programs that focus on women have brought women into public spaces in new ways and created gendered opportunity spaces amidst persisting roles of men as

authorities and final decision-makers and women playing supportive roles. Innovation processes often replicate gender patterns through decision-making in productive assets, however access to agriknowledge offers avenues for women to expand their opportunity spaces through social networks and their ability to negotiate for resources in the household. We recommend further studies that draw on feminist geography to inform design of agricultural innovations and interventions to benefit women, men and to improve overall livelihoods.

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