

# Gender and seed entrepreneurship: Case studies in Ethiopia, Ghana, Kenya and Tanzania

Working Paper No. 412

CGIAR Research Program on Climate Change,  
Agriculture and Food Security (CCAFS)

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**Contact us**

CCAFS Program Management Unit, Wageningen University & Research, Lumen building, Droevendaalsesteeg 3a, 6708 PB Wageningen, the Netherlands. Email: [ccaafs@cgiar.org](mailto:ccaafs@cgiar.org)

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## **Abstract**

Our paper seeks to identify factors that inhibit and promote women's success in seed businesses, through three case studies of women's and men's entrepreneurship across varying seed-related value chains and country contexts in Africa south of the Sahara. The cases include chicken seed dissemination in Ethiopia and Tanzania, tilapia seed production in Ghana, and marketing and trading of improved maize and sorghum seeds in Kenya. Applying a gender lens, we use qualitative methods to analyze women's and men's motivations to engage in seed businesses, the challenges they confront to start and succeed, and prospects for sustainability and continued success. We also use quantitative data to characterize the levels of empowerment of the entrepreneurs sampled. Results show that time flexibility and profitability of the business can be important considerations for women's engagement in seed entrepreneurship, and the social normative context of the sector is also critical. Furthermore, outside support can be a key factor influencing women's seed entrepreneurship, per the Kenya case.

## **Keywords**

Gender; entrepreneurship; seed systems; Africa South of Sahara.

## About the authors

**Tatiana Gumucio** (coordinating author) is a Research Scientist at Clark University. Email: [tgumucio@clarku.edu](mailto:tgumucio@clarku.edu)

**Berber Kramer** is a Senior Research Fellow at the International Food Policy Research Institute.

**Catherine Ragasa** is a Senior Research Fellow at the International Food Policy Research Institute.

**Rhiannon Pyburn** is a Senior Advisor in the department of Sustainable Economic Development and Gender at the KIT Royal Tropical Institute.

**Alessandra Galiè** is a Senior Gender Scientist at the International Livestock Research Institute.

**Samson Dejene Aredo** is a Research Analyst at the International Food Policy Research Institute.

**Humphrey Jumba** is a Research Associate-Gender at the International Livestock Research Institute.

**Eva Nimorme** is a M.S. student at the University of Ghana.

**Immaculate Omondi** is a Monitoring, Learning and Evaluation Scientist at the International Livestock Research Institute.

**Farha Deba Sufian** is a Consultant working with the International Livestock Research Institute.

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## Introduction

All agricultural production starts with seeds, that is, any propagation material used in the cultivation of crops, trees, fodder, forages, livestock or fish. Recognizing this, donors, private sector, and development actors have invested heavily in promoting seed security among smallholder producers, with an increase in initiatives in breeding higher-quality seeds and seed systems development targeting both formal and informal systems to bring these improved genetic materials into the hands of smallholder farmers (Almekinders et al., 1994; Louwaars et al., 2013; Donovan et al., 2021). Several initiatives focus on improving value chains and business models to meet smallholder needs concerning seed quality, availability, accessibility, and use and control (McGuire and Sperling, 2011). While it is widely recognized that gender-responsive design of seed systems interventions can improve these interventions' cost-effectiveness, very few studies analyze the effects of integrating gender considerations in program or initiative design, and even less is understood on how seed systems development can be gender-transformative and promote women's empowerment and gender equality (Kramer and Galie, 2020; Brearley and Kramer, 2020).

Women's seed entrepreneurship is one potential pathway for seed systems development to contribute to women's empowerment (Puskur et al., 2021). Whereas existing seed marketing channels often ignore gendered preferences and demands for seeds, women seed entrepreneurs may pay attention more to the types of varieties and breeds preferred by fellow women in their social networks, provide more information to female farmers than male entrepreneurs would do, and help overcome mobility barriers in accessing seeds by being more accessible for women farmers in terms of both social barriers and physical location. Combined, this can increase access to and utilization of high-quality seeds, indirectly contributing to women farmers' empowerment. Promoting women's entrepreneurship can also directly empower women entrepreneurs by enabling them to start their own business, generate personal income, enhance women's self-efficacy, and reduce reliance on land or other productive assets that might not be in women's control. Outside of seed systems, studies have found large impacts of interventions promoting women's entrepreneurship on empowerment (Green et al., 2015; Bandiera et al., 2020).



Despite its promise, gender biases in seed businesses can challenge the viability of women's entrepreneurship. For example, due to systemic gender inequities and community bias, women tend to have limited access to finance, training, and seed production, processing, and conditioning technologies (Nyantakyi-Frimpong et al., 2019). They are often unable to attract and retain skilled labor and may suffer from delayed payments for their services. A societal bias against women in business may be further aggravated by the lack of husbands' support and the heavy burden of domestic work and other care responsibilities. Previous research has found that involving women in seed production and management generates extra income and contributes to their empowerment (Mudege et al., 2020).

Correspondingly, our paper seeks to advance knowledge on gender-transformative seed systems development by assessing how women and men start and succeed in seed businesses.

Our objective is to identify factors that inhibit and promote women's success in seed businesses, through three case studies on women's and men's entrepreneurship across varying value chains and country contexts in Africa south of the Sahara. We define seeds broadly, recognizing them as propagation material including crop varieties and seeds (botanical seeds, as well as other planting materials for crops, such as tubers and cuttings), livestock breeds and animal seed stock (young animals of any livestock and fish seed or fingerlings that can be brought into a farm, including quality semen). The three cases include chicken seed dissemination in Ethiopia and Tanzania, tilapia seed production in Ghana, and marketing and trading of improved maize and sorghum seeds in Kenya. In all of the cases, women and men engage in other value chain nodes besides that involving their seed activities, for example, poultry trading, grow-out farming and fish processing, and crop farming; they also engage in other non-farm livelihoods. We use qualitative methods to analyze women's and men's decisions to become entrepreneurs and take on an entrepreneurial role in the production, multiplication, distribution or trading of seeds. Using a gender lens of analysis, we document their histories and assess the factors that motivated them to become entrepreneurs, what barriers they had to overcome in starting up their businesses, what prospects and constraints they currently face in operating their seed businesses.

## Context

While entrepreneurship can be generally thought of as new venture creation, it inherently involves identification of opportunities, allocation of resources and creation of value (Baliyan et al., 2020). For many rural producers, accessing markets for their produce and creating new farm or non-farm business enterprises are crucially important to earn income but can be very challenging. Multiple barriers can limit women and men smallholder producers to business ownership and value chain participation. Moreover, gender-specific barriers can prevent women in entering and succeeding in the value chains.

Gender-specific barriers – in this case, to entering and succeeding in value chains - have a range of individual, relational and systemic or institutional aspects (Hillenbrand et al., 2015; Lombardini, Bowman, and Garwood, 2017; van Eerdewijk et al., 2017; Lombardini and McCollum, 2018; Pyburn and van Eerdewijk, 2021). For a commodity typically within women's sphere of influence, women's value chain participation tends to be less inhibited than for commodities that typically fall under men's control (Ihalainen et al., 2021). When targeting male-dominated value chain activities or nodes, space for women's participation needs to be carved out not only materially, but also in people's minds: that is, increasing women's participation requires changes in gender norms on what is acceptable for men and women to do in a given context.

But normative change can trigger backlash. Where men or other family members feel that a woman's empowerment infringes upon their own opportunities or sense of power, this may result in gender-based violence, or men taking over economic opportunities generated by women's increased participation. That is, when women-led activities become more lucrative, men may take over. Multiple studies have documented how the increased demand for high-value products often leads men to take over women-dominated crops (Bernard et al., 2018). Rigid gender relations and norms can also influence access to information in the form of knowledge and skills, mobility, and cross-gender interaction with customers—resources and capacities necessary for being successful or for accessing more remunerative nodes of value chains.

Another key consideration for inclusion in value chain development are the impacts of value chain participation on women's time use, domestic workload, and drudgery (Ambler et al., 2021; Stoian et al., 2018; Mayoux, 2020, Hirvonen et al., 2020). An increase in workload can be problematic particularly where women's workload increases without sufficient increases in income and control over benefits.

Much value chain research and development focuses on the production node of the chain where women are active and little normative change is required for participation and inclusion. However, it is often further up the chain where more lucrative opportunities lie. Seed value chains are less explored through a gender lens than many chains (Kramer and Galie, 2020). In terms of women's empowerment, an area for further exploration is that of women seed producers and agripreneurs, including the financial products, business development services, skill development and policy support required to incentivize and support them (Puskur et al., 2021).

Perhaps more importantly, (women's) livelihoods are often comprised of a diversity of activities, which may include participation in several value chains as well as other productive, reproductive and community work (Pyburn and Kruijssen, 2021). Looking at the full picture of the composition of rural livelihoods and how seed enterprises fit into that - is critical to understanding the breadth of the gender dynamics at play.

This paper brings these strands – gender dynamics in value chains beyond the production node, agripreneurship, diversified livelihood strategies and seed systems development – together. We consider these gender-related challenges for different value chains and women-led seed enterprises in four countries, namely:

- the poultry value chain in Tanzania and Ethiopia (300 farmers and 43 women-led seed businesses disseminating chicks);
- the tilapia value chain in Ghana (605 fish farmer-agripreneurs of which 53 are women farmer-agripreneurs and 10 women-led seed businesses producing fingerlings);

- sorghum and maize value chains in Kenya (3000 farmers and 181 agripreneurs – in this case, they are marketing seeds; some agripreneurs are also involved in marketing other products, for instance insurance for the marketed seed).

## **Poultry value chain and project in Tanzania/Ethiopia**

A first case study focuses on agripreneurs in the poultry value chains of Tanzania and Ethiopia. In East Africa, livestock markets are often the domain of men (Coles & Mitchell, 2011). Women tend to lose their traditional control over agricultural assets (e.g., milk or eggs) to men when increased production allows households to sell these assets (Omondi et al., 2014). The ‘Women in business: chicken seed dissemination in Ethiopia and Tanzania’ project therefore aims to develop and implement women-led business models and to then analyze under what circumstances these enterprises can be kept under the control of women, and young women in particular. The project’s research goal is to test empirically how improved chicken seed can be utilized to enhance the economic empowerment of women by both supporting the chicken business of women agripreneurs, and by enhancing the access of women farmers to relevant chicken breeds. The intervention develops and implements women-led small-scale business models to disseminate existing locally-relevant chicken breeds to remote areas of Tanzania and Ethiopia in combination with private sector chicken multipliers. Given that the role of seed dissemination was so new that nobody, including women, was carrying it out at the start of the program, the project recruited young women veterinary/animal health graduates as seed vendors. They link or take chicks that are four weeks old from brooders to farmers, provide animal health and extension services to farmers, and when the chicken/eggs are ready, they link farmers to the market. The project is research for development, led by the International Livestock Research Institute (ILRI), in collaboration with the national research institutions in the respective countries and private sector players.

## **Aquaculture value chain and the tilapia project in Ghana**

A second case study focuses on promoting agripreneurship in the aquaculture value chain in Ghana. Aquaculture is among the fastest growing food value chains globally and has surpassed capture fisheries in fish production (FAO, 2018). While the aquaculture in Sub-Saharan Africa is small, several countries have also experienced aquaculture boom, with production growing at 12–23 percent per year over the past two decades (Ragasa et al.,

2021a). Aquaculture in SSA grew almost twice as fast as in the rest of the world, largely due to rapid growth in tilapia and catfish production, which account for about 70 percent of subcontinent's aquaculture production (Ragasa et al., 2021a). Ghana is the largest producer of tilapia in SSA and is experiencing tremendous growth, led mainly by large-scale commercial cage operators (Ragasa et al., 2021b). A major objective of the government and its partners is to ensure that this rapid growth is sustainable and includes small-scale farmers and poor rural producers (MoFAD, 2018; Ragasa et al., 2021b). Kassam and Dorward (2017) also show that small-scale pond farming has greater backward and forward linkages and a larger multiplier effect on local economic growth and poverty reduction than commercial cage farming. Nonetheless, pond farming, practiced by a vast majority of small-scale rural producers faces major challenges, including low productivity, inbreeding, low-quality seeds, low feed use, and poor aquaculture management practices such as poor water management and biosecurity (Ragasa et al., 2021b).

The Ghana Tilapia Seed Project was initiated to help address these issues. The project aims to generate and share knowledge on how to best develop the public and private hatchery sector and to promote high-quality Nile tilapia seed and good aquaculture practices among small-scale cage and pond tilapia farmers. The specific objectives are to improve the quality and service of public and private hatcheries; and increase access to and use of high-quality fish seed for new and existing producers, with specific attention to women and youth. The project also aims to assess the motivations and aspirations of women and youth currently not engaged in aquaculture with the goal of designing and implementing strategies to encourage them to enter aquaculture. Project interventions include seed quality monitoring, technical support and trainings to different actors in the value chain; setting-up broodstock multiplication centers and nurseries in strategic locations; piloting digital tools for various actors along the value chain; and supporting inclusive and sustainable hatchery, nursery, feed production business models. These are evaluated through action research, diagnostic assessments, biological and social experimental design, and impact evaluation methods. The research project is being implemented in Ghana by a consortium led by the International Food Policy Research Institute (IFPRI), with the Water Research Institute of the Council for Scientific and Industrial Research (CSIR-WRI), KIT Royal Tropical Institute in the Netherlands,

WorldFish, Ghana Fisheries Commission (a government institution), and two private hatcheries (S-HOINT Ltd. and Crystal Lake Ltd.).

## **Maize and sorghum value chains and project in Kenya**

A final case study focuses on agripreneurs trained to promote stress-tolerant varieties of maize and sorghum in Kenya, through the project “Promoting stress-tolerant varieties at scale: Interlinking the private seed sector and insurance advisory services in Kenya”. This project is led by the International Food Policy Research Institute (IFPRI) in partnership with ACRE Africa, the Kenya Agricultural and Livestock Research Organization (KALRO), and Wageningen University and Research. Maize is the main crop grown in Kenya, with more than 90 percent of farmers in the project growing this staple crop. Adoption of improved hybrid varieties of maize is already high, as breeding efforts have heavily focused on improving maize productivity and extension programs and seed companies have made seeds of improved varieties widely available. Yet, in the face of climate change and increasing uncertainty around the timing of rainfall in the horn of Africa, including Kenya, water requirements for common improved maize varieties are too high to sustain in resilient farming systems. More drought-tolerant crops such as sorghum and drought-tolerant maize varieties such as those launched under the Drought Tolerant Maize for Africa (DTMA) project offer promising pathways to improve farmers’ adaptive capacity. However, despite superior yields under both stress and optimum growing conditions, adoption rates of drought-tolerant crops and varieties remain low in Kenya (Fisher et al., 2015; Cairns and Prasanna, 2018).

Major barriers to adoption of stress-tolerant varieties, when accessible, included inadequate information, high seed prices, and perceived attributes (Fisher et al., 2015). In fact, while often being more expensive than other varieties, high-quality stress-tolerant seeds fail to deliver under extreme weather conditions, improper adoption of suitable farming practices, or non weather-related risks such as pests and disease. Finally, due to the presence of counterfeit seeds on the market, many farmers have lost trust in improved seeds (Bold et al., 2017; Ashourt al., 2018). The Kenya project therefore aims to ramp up promotional efforts to ensure widespread awareness and understanding of the benefits of drought-tolerant crops and varieties, and remove other barriers to adoption, such as the risk of crop failure and a lack of trust. To that end, this project promotes stress-tolerant varieties through a

network of 181 champion farmers, recruited because of their agri-preneurial mindset and their potential social influence in their villages. Champions were trained to provide product bundles including seeds of improved varieties, crop insurance to protect farmers' investments in these more expensive seeds, and at a later stage also pesticides, which farmers reported was often unavailable to them. Champions are paid a monthly incentive to mobilize farmers within their community, and they receive a commission per bag of seed or insurance policy sold.

# Methodology

We use qualitative methods to assess the factors influencing women's and men's seed entrepreneurship across the three cases. We also use quantitative data to describe the women and men sampled for each case, including measurements of empowerment.

## Qualitative methods

### Interview guides and data limitations

Due to the differing project goals and contexts across the three cases, the interview guides used vary; however, all cases collected data relevant to the themes of motivations, barriers, and opportunities in starting and operating seed businesses. For example, the Ghana and Kenya projects asked questions concerning respondents' *motivations* to engage in their business activities, while the poultry project posed questions related to respondents' *reasons* for engaging in the business. All cases inquired as to challenge or barriers that respondents confront to engage in their businesses, with an interest in distinguishing between barriers to start the business and challenges in day-to-day operations. Projects also collected information, although to a more varying extent, related to how respondents manage or overcome the challenges they confront. Furthermore, all cases inquired of respondents as to what changes or additional support would help them overcome challenges and have increased success in their businesses. All the projects included data collection with producers not engaged (or no longer engaged) in businesses in the seed-related value chains, in addition to data collection with the agripreneurs; comparison with non-seed business owners allowed for additional understanding of challenges to enter and factors motivating agripreneurs to start their seed businesses. Given the extent of ACRE Africa's support of women and men agripreneurs in the project, the Kenya qualitative data collection included questions on how helpful agripreneurs perceived ACRE Africa's interventions to be.

Additionally, the projects inquired as to motivations, challenges, and opportunities for the other value chain nodes and associated livelihood activities that respondents are involved in, recognizing the importance of considering the seed activity's contribution to larger livelihood portfolios. Correspondingly, the Ghana project inquired as to motivations and



challenges as they concerned hatcheries and also grow-out farming; challenges to engage in hatchery and grow-out farming businesses are similar for women, and women hatchery owners and managers are often also engaged in grow-out farming. The Kenya case posed questions concerning seed sales but also insurance marketing, activities jointly promoted by the ACRE Africa project.

Due to the timing of research and interventions in the Tanzania and Ethiopia cases, qualitative data was collected as part of the project's Situation Assessment, at a time when the new seed vendor role was not yet created by the project. Consequently, qualitative data was not collected from chicken seed vendors; however, they were collected from poultry traders, who engage in one component of the business activities that comprise the chicken seed vendors' role (the vendors provide chicks to farmers, but they also buy the chickens, once grown, from the farmers to sell in markets). While this is an important limitation of the qualitative data collected from Tanzania and Ethiopia, they provide insights for the motivations, challenges and opportunities the seed vendors face in the poultry trading part of their business.

### **Procedures**

In January and February of 2021, in Ethiopia the study was conducted in Finote Selam, Debre Birhan, Fiche, and Mojo woredas (districts), while in Tanzania it was conducted in Hai, Mtama, Ruangwa, and Siha districts. Semi-structured Focus Group Discussions (FGDs) were conducted with women live-bird/egg/poultry meat traders. In total, 8 (4 in Tanzania and 4 in Ethiopia) women only FGDs were conducted. Key Informant Interviews (KIIs) were conducted locally (within the targeted districts) with women and men live-bird/egg/poultry meat traders. In total 8 KIIs (4 men and 4 women) were conducted with poultry traders in Ethiopia, and 8 KIIs (4 men and 4 women) with poultry traders in Tanzania. In addition, 6 KIIs (2 in Ethiopia and 4 in Tanzania) were conducted with women who had ceased to be traders due to various reasons.

In Ghana, qualitative research was carried out in each of the six regions where quantitative surveys had previously been conducted: Ashanti, Ahafo, Bono, Bono East, Eastern, and Volta. Since there are a few of the hatchery and first pilot nursery operators, we attempted to interview all of them, although some of them were not available even after several attempts

to contact them. We then focused on the locations of these hatchery and nursery operators and interviewed the women grow-out farmers in nearby communities. We interviewed 3 women hatchery operators, 2 pilot women nursery operators, and 6 women grow-out farmers. In addition, we conducted 4 women-only, 2 men-only, and 1 mixed-gender focus group discussions (total of 7 FGDs; 7 participants each; and a total of 49 women and men respondents) with non-agripreneurs to understand aspirations of women and youth and insights on their motivations to engage in aquaculture. The research was approved by the Ministry of Fisheries and Aquaculture Development and the IFPRI Institutional Review Board.

In Kenya, the study was conducted in one county in each of the three regions that the inclusive business models for seed distribution project targets: (Meru) Upper Eastern Kenya, (Machakos) Lower Eastern Kenya, and (Bungoma) Western Kenya. In each county, KIIs were conducted with 6 women and 6 men agripreneurs, all adults aged 18 to 64 years. Sex-disaggregated FGDs were conducted with farmers who are not agripreneurs; one FGD was conducted with women and one FGD with men in each county, all adults age 18 to 64 years. Approximately 8-10 individuals were identified to participate in each FGD. Participants were selected via random sampling, using a list from the Innovations for Poverty and Action (IPA) survey, and farmers represented a range of different villages. For the purposes of the present paper, we present results from Bungoma county in Western Kenya. The local implementing partner of the project, ACRE Africa, obtained a research permit for this research from the National Commission for Science, Technology and Innovation (NACOSTI) in Kenya, and IRB approval was obtained from the Ethics Review Committee of Maseno University and the Institutional Review Board of the International Food Policy Research Institute (IFPRI). See Table 1 below for summary of qualitative methods and sampling across the countries.

**Table 1. Qualitative methods and sampling per country.**

Method		Sample			
		Tanzania	Ethiopia	Ghana	Kenya
KII	Women	4	4	11	6
	Men	4	4		6
	Women ex-traders	4	2		
FGD	Women	4	4	4 <sup>a</sup>	1 <sup>a</sup>

	Men			2/ <sup>a</sup>	1/ <sup>a</sup>
	Mixed			1/ <sup>a</sup>	

Note: <sup>a</sup>Carried out with non- seed agripreneurs.

The data were qualitatively coded and analyzed in NVivo and in Excel, according to the key themes for our study. Where the data permitted, we also sought to assess trends according to marital status and life-stage (youth/non-youth), recognizing that the factors influencing women’s and men’s agri-preneurship can vary depending on how other aspects of their identity intersect with gender.

### Quantitative surveys/WEAI

All projects collected quantitative household survey data, including a version of the Women’s Empowerment in Agriculture Index (WEAI). The WEAI is a tool that uses a set of survey questions to measure empowerment, agency, and women’s inclusion in the agricultural sector (IFPRI, 2021). It assesses the roles and extent of women’s engagement in agriculture across specific domains of empowerment. Several different versions of WEAI exist, each version addressing different project and research needs. Correspondingly, the Ghana case in our paper used the abbreviated WEAI (A-WEAI), a shortened version of the original WEAI. The Kenya case used the Project-level WEIA (Pro-WEAI), a version of the WEAI developed for measuring the impact of agricultural development projects on women’s empowerment. The Tanzania and Ethiopia case used the Women’s Empowerment in Livestock Business Index (WELBI), an adapted version of Pro-WEAI focused on agri-preneurs in livestock value chains, which is still under development.<sup>1</sup> In our paper, we use quantitative data collected via the various WEAI tools to characterize current levels of empowerment and empowerment gaps among the agri-preneurs in the different projects.

In Ethiopia and Tanzania, quantitative data come from the project’s 2021 baseline face-to-face survey, conducted in June-July 2021. The WELBI data was collected to provide a baseline on women’s empowerment and household nutrition prior to the implementation of the project’s development intervention. The survey was conducted in project areas in both

<sup>1</sup>The WELBI differs from the WEAI and a modified version, the Women’s Empowerment in Livestock Index (WELI), since it integrates business (economic) and household spheres of livelihood into one tool. Indicators that were established in the pilot version of pro-WEAI were revisited to devise a tool that would be able to quantify women’s agency and empowerment status in the livestock business sector.

countries: in Tanzania these included three districts in Kilimanjaro region, and three districts in Lindi region; in Ethiopia they were four districts, Debre Birhan, Mojo, Fiche and Finoteselam. Totals of twenty-three and twenty of the seed vendors newly recruited for the project were interviewed in Tanzania and in Ethiopia, respectively. This was essentially a census of all seed vendors, since the seed vendors in both countries are few and increasing this form of agri-preneurship among women was a core project objective. The data were collected through computer-aided personal interview (CAPI) on open data kit (ODK). Because a composite score requires non-missing responses across all modules, the final sample size eligible for the scores for all countries were 18 Tanzania and 21 for Ethiopia.

Household and individual surveys in Ghana were led by the International Food Policy Research Institute (IFPRI) and CSIR-Water Research Institute (WRI), implemented by FMMS survey firm from May to June 2019, and validated by a team of CSIR-WRI and Fisheries Commission (FC) zonal officers in October—November 2019. The survey covered all 605 small-scale tilapia grow-out farmers and 10 commercial hatchery operators<sup>2</sup> in the six major producing regions in Ghana: Ashanti, Ahafo, Bono, Bono East, Eastern, and Volta. Similarly to the poultry business case, the number of women seed businesspeople is small. Of the total grow-out farmers surveyed, 53 are women owners or managers. Thirty-three of the total grow-out farmers surveyed have hatcheries and at least 10 of them also have nurseries. There are 8 and 2 women owners or managers of hatcheries and nurseries, respectively.

The Ghana study implemented most modules of the Abbreviated-WEAI (A-WEAI), namely inputs to productive decisions, access to and decisions over financial resources, group membership, ownership of land and assets, and control over income. Two questions were introduced as a proxy to time constraint or work balance. The interviewee was either the manager or owner (if different) of the farm/firm, or the person who made most decisions on fingerlings and inputs and who would likely attend production trainings. The project also interviewed the primary decision maker in the sample households of the opposite gender

<sup>2</sup> The life cycle of fish is as follows: “Broodstock” or broodfish are spawning adult fish that produce viable eggs, which develop into healthy fry that are used as seeds and reared to table-size tilapia. Hatcheries are facilities that receive broodstock and produce and condition fish fry (1-10 grams). Nurseries are facilities that receive fry from hatcheries and produce fingerlings (10-30 grams). Fish seed are the fry or fingerlings from hatcheries or nurseries. Grow-out farms receive fingerlings and grow them into table-size tilapia. Some farmers operate two or more of these stages (e.g., hatchery and nursery, hatchery and grow-out, or nursery and grow-out).

(this was often the spouse of the interviewee) to get some sense of gender-based constraints or opportunities and intrahousehold dynamics. A total of 603 households were interviewed, of which 279 had second respondents interviewed (usually the wife of the owner or manager). Tablet-based and computer-assisted personal interviewing were used.

In Kenya, the project collected Project-level WEAI (Pro-WEAI) data for the 181 agripreneurs, and for a randomly selected subsample of 16 registered farmers per champion (see Cecchi et al., 2021, for further detail on sampling procedures). Similar to the Ghana case, data were also collected from primary decision makers of the opposite gender in the households sampled. Quantitative data were collected in the seven counties where the project was active (Busia in Western, Makueni in Lower Eastern, and Embu and Tharaka Nithi in Upper Eastern). These data were collected by means of phone surveys from April to June 2021 by a team of trained enumerators from Innovations for Poverty Action (IPA) using SurveyCTO software to implement the phone-based interviews. Technical support was provided by researchers from the International Food Policy Research Institute (IFPRI) and Wageningen University.

# Results

## Demographics of the sample

We use quantitative data collected through the three projects' household and individual surveys to present demographic information on the women and men engaging in seed and associated livelihood activities per country (See Table 2). Women and men in Kenya and in Ghana tend to be in the same age category, aged 41 and 43 years and 49 and 48 years on average, respectively; however, women chicken seed vendors in Tanzania and Ethiopia are substantially younger than seed businesspeople sampled for the Kenya and Ghana projects, with average ages of 30 and 29, respectively. In Kenya and in Ghana, most of the women and men sampled are married (77 and 89 percent, and 62 and 86 percent, respectively); however, a substantial proportion of women agripreneurs in Ghana are divorced, separated or widowed (26 percent) in comparison to women and men in Kenya and men in Ghana. For the women agripreneurs in Tanzania and Ethiopia, small proportions are divorced, separated, or widowed (four and three percent, respectively), as in the Kenya case; however, substantial proportions are single, (62 percent in Tanzania and 39 percent in Ethiopia) in comparison to women and men in Kenya and in Ghana (13 and 9 percent, and twelve percent, respectively). Concerning education, the samples of women agripreneurs in Tanzania and Ethiopia also tend to be distinct from the samples of women and men agripreneurs in Kenya and Ghana: the majority of the former have completed post-secondary education (77 and 90 percent in Tanzania and Ethiopia, respectively). In Kenya women and men have completed primary or secondary education; however, substantially more men than women have completed post-secondary education (42 percent in comparison to 26). In Ghana, the majority of women and men have no formal schooling or have completed up to primary school; and have the least proportion completing at least secondary school compared to the sample in the other three countries.

**Table 2. Demographic statistics of respondents engaged in businesses per country (in % except for age).**

	Kenya		Ghana		Tanzania	Ethiopia
	Women	Men	Women	Men	Women	Women
<b>Age (mean)</b>	41.32	43.23	49.46	47.67	29.65	29.13
<b>Marital status</b>						

Single	13	9	12	12	62	39
Married	77	89	62	86	35	58
Divorced/separated/widowed	9	2	26	2	4	3
<b>Education</b>						
Has not completed primary education	4	3	21	7	---	---
Completed primary education	29	15	46	50	---	7
Completed secondary education	42	40	10	21	23	3
Completed post-secondary education	26	42	23	22	77	90
<b>Number of obs.</b>	94	65	43	575	26 <sup>a</sup>	31 <sup>a</sup>

Note: <sup>a</sup>The observations in Tanzania and Ethiopia include 4 brooders in Tanzania and 10 in Ethiopia; the remaining observations are chicken seed vendors.

## Empowerment of women and men in the sample

Using quantitative data from each of the projects, Table 3 provides summary statistics related to empowerment, with a focus on agripreneurs and their spouses. We present the proportion of male and female respondents that are considered empowered based on the specific WEAI instrument that was used (Pro-WEAI in the case of Kenya, A-WEAI in the case of Ghana, and WELBI in the case of Ethiopia and Tanzania), the proportion of households achieving gender parity (i.e., the proportion of households where either the woman achieves empowerment or her empowerment score is equal to or greater than the man's empowerment score) and in households without gender parity, the size of the empowerment gap. WEAI scores for men as well as gender parity metrics are missing for the Tanzania and Ethiopia samples, since there, only women agripreneurs and not their male household members were interviewed.

We observe substantial variation in the rates of achieving empowerment and in gender gaps across the samples. In Kenya, 57 percent of female agripreneurs versus 72 percent of male agripreneurs achieve empowerment, whereas among the Ghanaian aqua-agripreneurs, 58 percent of female and male achieved empowerment.<sup>3</sup> The least empowered samples of agripreneurs are the women in Tanzania and Ethiopia, with 28 and 14 percent achieving

<sup>3</sup> When we break down seed and grow-out farmers in Ghana, all women seed producers and only 67 percent of men seed producers are considered empowered. At the same time, grow-out farmers, who are considered agripreneurs as well, have substantially lower WEAI scores, as in this sample, less than 60 percent achieve empowerment.

empowerment, respectively. Thus, the sample of male agripreneurs in Kenya is the most empowered, followed by the female and male agripreneurs in Ghana and female agripreneurs in Kenya, with the poultry agripreneurs in Tanzania and Ethiopia being the least empowered.

Data on gender parity were collected only in Kenya and Ghana, but again, we observe substantial variation across contexts. Among male agripreneurs and their female spouses, gender parity is substantially lower in Ghana than in Kenya, mainly because a mere 22 percent of female spouses for male agripreneurs in the Ghanaian sample achieve empowerment. Among female agripreneurs, gender parity is higher, especially in the Ghanaian sample, where all female agripreneurs and their male spouses achieve gender parity. In other words, in Kenya, empowerment and gender parity do not differ substantially depending on whether someone is an agripreneur or that person’s spouse, but in Ghana, this holds true only for men; among women, an agripreneurial role in the project is associated with significantly higher empowerment and gender parity.

**Table 3. Statistics related to empowerment per country.**

	Kenya				Ghana				T <sup>c</sup>	E <sup>c</sup>
	Agripreneurs <sup>a</sup>		Spouses		Agripreneurs <sup>b</sup>		Spouses			
	W	M	W	M	W	M	W	M	W	W
Achieves empowerment	.57	.72	.59	.54	.58	.58	.22	.69	.28	.14
Achieves gender parity	.78	.73	.73	.78	1.0	.34	.34	1.0	n/a	n/a
Avg empowerment gap	.11	.14	.14	.11	0.0	.56	.56	0.0	n/a	n/a
No. of obs	77	61	49	56	34	55 0	23 2	17	18	21

Note: <sup>a</sup> farmers selected as seed traders (champion farmers) and evaluated using pro-WEAI; <sup>b</sup> fry, fingerling, or table-size tilapia producers and evaluated using modified A-WEAI; <sup>c</sup> chicken seed vendors and evaluated using WELBI.

Contributors to disempowerment also vary across the projects (Figure 1). In Ghana, disempowerment among female and male agripreneurs is primarily driven by low group

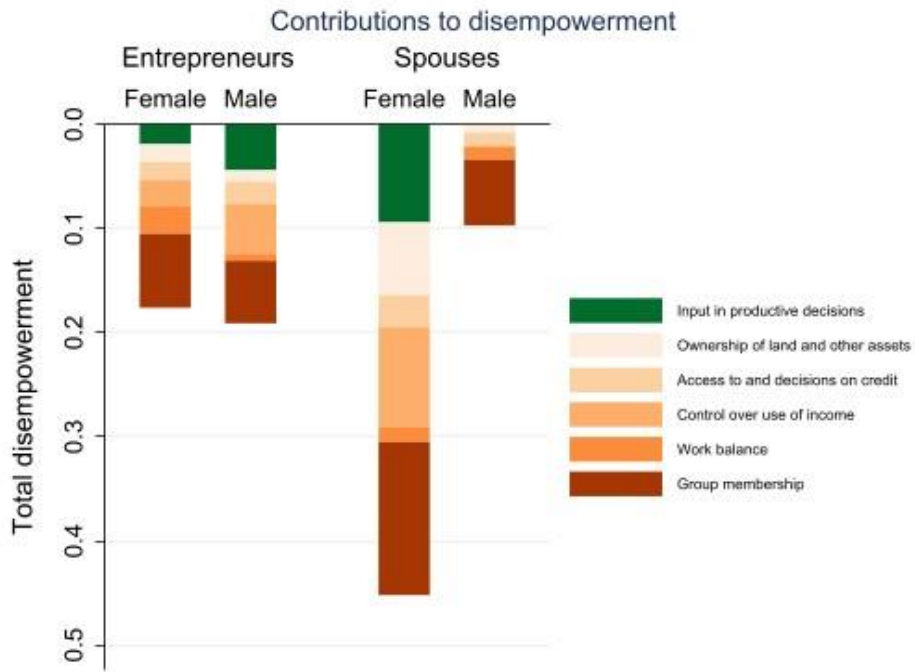


membership and, especially among male agripreneurs, a lack of control over the use of income (left figure). Lack of group membership is also the main contributor of disempowerment among male spouses (right figure); whereas lack of group membership, control over income, inputs to productive decisions and ownership of land and other assets are the main disempowering factors among female spouses.

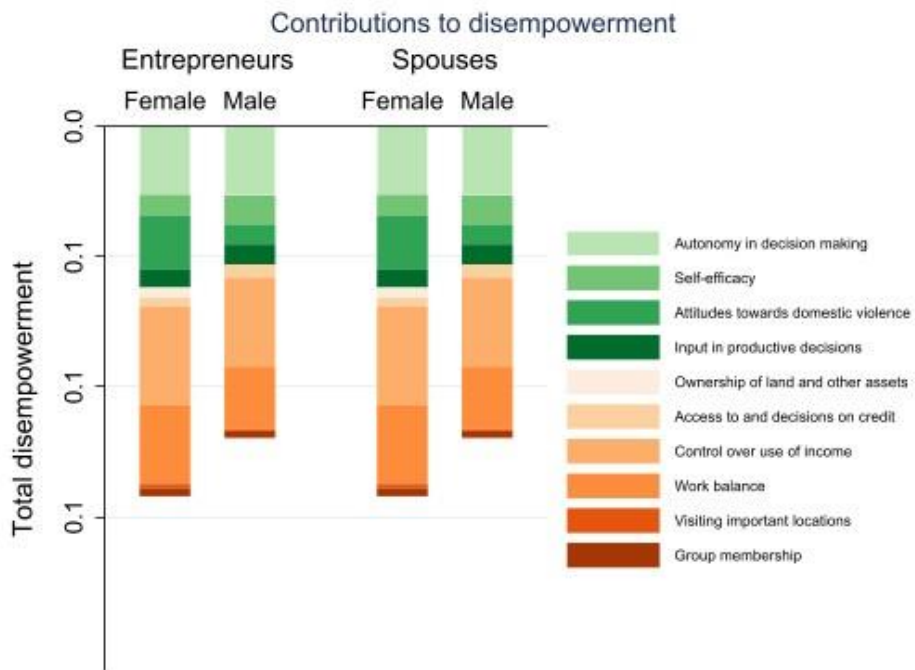
Also in Kenya, workload and a lack of control over the use of income are major drivers of disempowerment, but now across agripreneurs and spouses, regardless of gender. A lack of autonomy in decision making and (especially among women) being accepting of domestic violence—indicators that are included in the Pro-WEAI that was administered for the Kenya sample, but not in the A-WEAI, which was administered for the Ghana sample—are also contributing to disempowerment for both agripreneurs and their spouses. Thus, in the Kenya sample, contributions to disempowerment do not differ as much across the type of respondent (agripreneur versus spouse) or the respondent's gender (male or female) as in the Ghana sample.

Finally, the Tanzania and especially the Ethiopia samples are the least empowered; and several main factors are contributors to disempowerment as seen in figure 1. Lack of work balance is the main contributor to disempowerment. And, as in the Kenya sample, women's acceptance of domestic violence lowers many respondents' likelihood of achieving empowerment. Whereas limited group membership is not contributing as much to disempowerment in the Kenya and Tanzania samples, it is a major factor driving disempowerment in the Ethiopia and Ghana samples.

a. Ghana



b. Kenya



c. Tanzania and Ethiopia

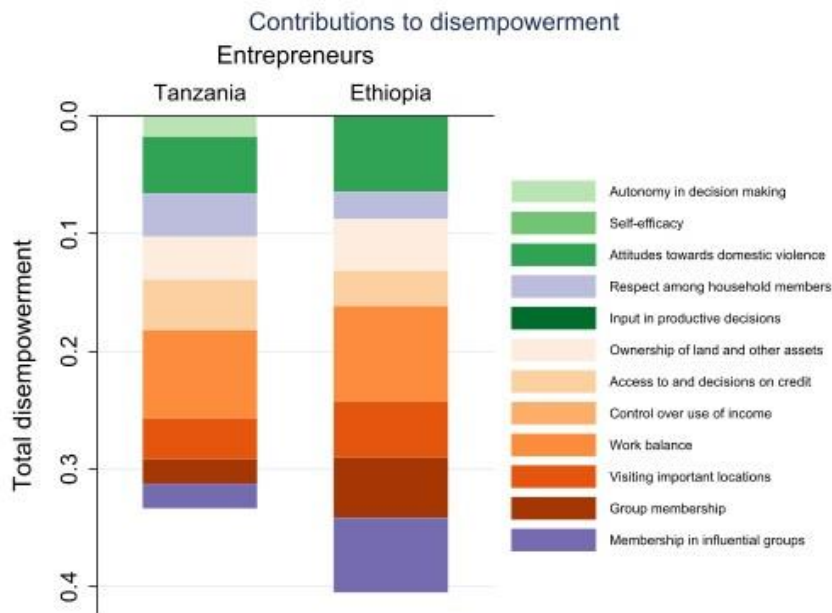


Figure 1. Contributors to disempowerment. Source: IFPRI/CSIR-WRI household survey (2019), IFPRI/ACRE Africa/IPA household survey (2021), and ILRI survey (2021).

### Motivations to start seed businesses

Across the countries, a frequently named motivation or benefit of going into the respective businesses concerned their profit-making opportunity and income to be gained. In Tanzania and Ethiopia, low capital constraints and high income streams, in comparison to other livelihood activities available to them, make the business attractive to women. For example, women stated that establishing a poultry trade business is easier in comparison to others because it only requires a few live birds to start, and it does not require obtaining trade licenses. In Tanzania, men and women poultry traders claimed to use agri-preneur identity cards to run the business, which functions as a business permit, introduced by the former regime of Tanzania to help men, women, and youth easily run various types of business by paying \$ 20 per year<sup>4</sup>. Women in Ethiopia noted that selling live birds does not require formal shade nor space to rent in a market and they often do not pay tax. Furthermore, some women traders claimed that the poultry trade business is lucrative, and the returns on the small amount of capital invested are high. In both Tanzania and Ethiopia, women poultry

<sup>4</sup> However, it is being phased out by the current government, and men and women are now being required to obtain a poultry trade license.

traders claimed that the business has a great market demand compared to others such as vending vegetables. In Ethiopia, women traders claimed that the poultry trade is more sustainable and reliable than seasonal vegetable vending, and it has a great growth potential in comparison to other traded commodities. Moreover, both women and men in Tanzania and Ethiopia noted that poultry trading was a primary, if not the most important, component of their livelihood portfolios. Women hatchery and grow-out farmers in Ghana also highlighted that the activity was good business and provided important income especially in comparison to other livelihood activities. In contrast, women and men in Kenya noted that they would not have considered getting involved in the seed and insurance business if it had not been for ACRE Africa. Women and men noted that income in the form of incentives from the project and commission from seed sales motivated their involvement; however, most men highlighted that the income was small.

Furthermore, responses from women in the poultry trade and fish businesses highlighted how empowerment was a benefit motivating their involvement in their agri-preneurial activities. In most FGDs in Tanzania and Ethiopia, women claimed to engage in the poultry trade business to reduce over-dependency on their husbands and extended family members for financial support. A woman trader in Ethiopia highlighted how the financial resource control was important to them:

*“We need money to take care of our needs and support our families; we do not want to leave all the family responsibilities to our husbands. Therefore, we participate in the poultry trade to make money.”*

Women hatchery and grow-out farmers in Ghana also noted that a benefit of having started their businesses is the self-confidence gained and the respect and recognition as knowledge holders by community members.

Moreover, the flexibility or small amount of time required for poultry trading motivated women to engage in the business in Tanzania and Ethiopia. In most FGDs, women traders said that the poultry trade requires less time to manage than other businesses, as most women traders reported that they only go to markets when they have live chicken to sell. When they do not have stock, they stay at home and focus on other family businesses such as farming. A few women poultry traders in Ethiopia further opined that the poultry trade is

better than vending vegetables, which usually get spoilt quickly due to high temperatures in the region. Women who engage in vegetable vending are forced to sell vegetables very early in the morning, in conflict with the time when they are usually busy with household chores. Some women in Ethiopia also noted that it is hard for older women to sit in the direct sun for long hours selling, as typically occurs in vegetable vending; therefore, they prefer chicken trading since it is an activity that takes less time.

Respondents from the Kenya and Ghana cases highlighted that the opportunity to build knowledge and experience that would help their career advancement motivated their involvement in seed businesses. Women hatchery owners or managers hoped that the knowledge and experience gained would help them eventually obtain jobs in aquaculture consulting and in international agricultural organizations. In Kenya, women's motivations were related to benefits of being involved in the project with ACRE Africa; correspondingly, they highlighted that the trainings provided, for example, on good farming practices, on smart phone usage, and on how to teach people, drove their involvement. Men seed distributors similarly noted that the learning opportunity, in general, was a motivating factor.

Women in Kenya and Ghana also emphasized social, leisure, and cultural aspects of their seed activities as motivating factors and benefits. The opportunity to interact with farmers as customers, trainees, and in project meetings motivated women to get involved in the ACRE Africa project in Kenya. Moreover, women hatchery owners in Ghana perceived that their fish farming provided them a form of relaxation and aligned with their interests in nature and being active in the field.

Furthermore, prior experience and possession of skills (soft and hard) and resources relevant to the businesses motivated women to start seed businesses. For instance in Kenya, several women seed distributors highlighted that their prior similar experiences in agricultural development projects and the customer base developed from them motivated them to work for ACRE Africa. Some women in Tanzania and Ethiopia mentioned that they have good negotiating language compared to men; hence it is easier for them to negotiate with farmers and even buyers in order to increase their profit margins. Similarly, women in Ghana noted that possessing technical knowledge and resources important for hatchery and grow-out

farming motivated them to start their businesses. They had received technical knowledge and assistance from other farmers and hatchery operators in the area, extension agents and via ICT tools. Commonly women hatchery owners had also had financial resources, access to land or water resources, and access to skilled labor. For example, some women inherited the business from a father or husband who had passed away or migrated. Similarly, encouragement from family members often motivated women to become involved in hatchery businesses.

Altruistic aspects of their activities also provide benefits to seed agripreneurs in the Ghana and Kenya cases. Women owners and managers of hatchery and grow-out farms noted that the opportunity to give employment to others is important to them. Furthermore, women and men seed distributors in Kenya highlighted that an interest in helping farmers through the ACRE Africa project motivated them to get involved. Both women and men felt that they were addressing farmers' needs by providing them certified, good quality seeds. In particular, men emphasized that their capacity to facilitate easier access to the products and provide a specific variety needed by the farmer motivated their involvement.

### **Barriers faced in starting up seed businesses**

Comparing the projects, a few (or the absence of) barriers to start up seed businesses may be value chain related; however, the primary ones may be related to gender norms. In Tanzania and Ethiopia in most FGDs, women noted that they did not face great challenges in starting their poultry businesses largely because start-up requires small capital (i.e., a few live birds). They do not need to rent a place nor pay for licenses. Despite low capital costs, egg traders and those involved in selling chicken meat in Tanzania noted that obtaining customers can be challenging when first establishing the poultry business. In most cases women who are starting poultry business usually end up making losses due to lack of customers. In the Kenya case, the challenge of establishing a customer base was avoided because the seed distributors had prior experience and social networks beneficial for marketing of agricultural products (further discussed in results below).

Normative structures surrounding gender roles are particularly limiting to women's entry in tilapia hatchery businesses in Ghana. Results from interviews and focus group discussions highlighted how the socially accepted belief that fish farming is "men's job" can inhibit

women's involvement in the business. Similarly, the perception that women have less technical knowledge in terms of fish farming or hatchery can constrain women's involvement in the value chain. Taboos concerning the menstrual cycle can limit women from engaging in cage farming, and harassment by customers of the opposite sex affects female youth agri-preneurship.

Correspondingly, household and spousal responsibilities can limit women's free time, constituting a barrier to their involvement in hatchery and poultry businesses in Ghana, Tanzania and Ethiopia. Women's responsibilities in the home can overlap with the time of hatching, inhibiting women's full engagement in the hatchery. For example, one married woman who owns a hatchery and grow-out farm and engages in catfish processing noted:

*“The time of the hatching is the major barrier hindering most women from being in the hatcheries. I have been taken through training on how to hatch the catfish but I am not able to practice it because I need to be at the farm very early in the morning and commuting from my home to the farm is far. Before I get there the worker has finished the hatching. The eggs are taken very early for the hatching and when selling the fingerlings the counting sometimes starts very late in the evening at the time I have to go home or very early in the morning when I am not on the farm yet.”*

Married women in particular can be stressed to balance family- and home-care with hatchery activities simultaneously. Furthermore, some women in Tanzania and Ethiopia noted that a woman needs to seek permission from her husband to become a poultry trader. A married woman poultry trader in Ethiopia argued, ‘becoming a trader for a man is very easy, and the only requirement is his interest in starting the business. However, for a woman having permission from her husband is mandatory.’ In some cases, their husbands might refuse to approve their request. Married women poultry traders in Ethiopia-based on their experience-argued that they had to use extended family members to help them seek permission from their husbands to allow them to engage in poultry business. It is important to consider that single women (as well as those from other categories without a spouse, such as those divorced or widowed) may not contend with the challenge of seeking spousal permission, although they may have to seek permission from other male household

members; a substantial proportion of the chicken seed vendors in Tanzania are single (62%, see Table 1).

A value chain related barrier affecting both women and men in Ghana concerns a lack of knowledge on hatcheries to start the business. Some farmers have the interest and the capital to start but do not have the needed knowledge. While the barrier affects both women and men, it can be more constraining for the former, who are often not recognized as fish farmers and less likely to be invited to trainings. Furthermore, although poultry traders did not mention challenges related to lack of technical knowledge, it is possible to infer that achieving the formal education (graduate degree) in veterinary health can be a significant challenge for women chicken seed vendors to overcome in order to be recruited for the role.

### **Challenges currently faced in operating seed businesses**

Challenges in current operations of seed businesses concern the value chains and markets specific to the four country contexts. In the Kenya case, supply-chain related challenges are the most significant; the late arrival of project-supported seeds has made it difficult to sell seeds in time for seasonal planting, in accordance with farmers' demand. If distributors do not have seeds available, customers source seed from competitors. Correspondingly, managing competition poses a significant challenge for women and men seed distributors in Kenya. For instance, customers expect price reductions or permission to purchase seeds on credit because of competitors' practices. Similarly, farmers expect to be given free items (i.e., seeds, other inputs) to accompany purchases of insurance. Understanding and carefully identifying farmer demand is also a challenge in order to supply the particular variety a farmer wants.

Demand and market-related challenges also prevail in the Ghana, Tanzania, and Ethiopia cases. In Ghana, it is difficult to obtain buyers, and the few buyers determine the price of the fish. In Tanzania and Ethiopia, the price of chicken fluctuates depending on the season of production, making it hard for traders to run their business efficiently throughout the year. In Ghana, macroeconomic influences on demand related to the Covid-19 pandemic posed challenges for both women and men business owners.



Challenges specific to the tilapia value chain, for example, rising prices of feed and maintenance of water quality and biosecurity measures also tend to affect women and men indiscriminately. Moreover, fish disease and mortality pose a risk for women and men hatchery owners, particularly the low survival rate of catfish fryers, contributing to increased production costs. Poultry disease is also a significant and costly challenge hindering trading in Tanzania and Ethiopia; however, the project circumvents it by recruiting and supporting women who have education in veterinary medicine to carry out the business activities (more in subsequent results section).

In contrast, in Kenya, women and men agripreneurs face significant challenges corresponding to their product itself: champions are engaged not only in marketing seeds but also in marketing insurance, and as farmers may not have a clear understanding of how insurance works, they may expect compensation, or more substantial compensation, for any loss. They can also perceive that the insurance premium is too high. Consequently, discouraged insurance purchasers can become distrustful of the product, as well as the seller, and spread rumors.

Other challenges can be related to local gender dynamics and affect women and men businesspeople differently. In Ghana, the barriers to starting hatchery businesses related to gender norms also prevail as challenges in current operations. Normative structures that assign leadership roles to men over women make it difficult for male employees to accept supervision by a female hatchery manager. This challenge affects young women particularly. Similarly, lack of skilled and trusted workers affects both women and men hatchery businesspeople; however, it can affect women more due to male resistance of female supervision. It can also be especially challenging for young women and men, and for those who are absent from their farms. In general, respondents highlighted that youth disinterest in aquaculture is also responsible for the lack of skilled and trusted workers.

Moreover, due to aquaculture's perception as men's domain, women owners of hatcheries and grow-out farms can contend with problems in the home, stemming from lack of acceptance of their work by husbands and other male family members. Women also continue to contend with challenges related to time management and balance of care work with fish farming activities; consequently, they can neglect their business activities and face

escalated household tensions, depending on how they manage the two. In the Kenya case, women and men both recognized that women can be more time-constrained in comparison to men, due to the former's home-care work. One single young woman explained:

*“A man will just wake up and leave but a woman will have to do house chores before leaving for work. By evening, a woman will still have to think about what people will eat for supper while a man works without distractions till evening. There is a difference in time. The time that a woman spends in the business is less compared to the man.”*

A few women seed distributors in Kenya also noted that their movement and activities may be constrained in that they must inform or, in some cases, seek their husbands' permission to attend meetings and leave the home to engage in other activities related to their marketing.

Norms defining appropriate activities for women and for men can create gender-specific challenges for women's seed transport and mobilization for marketing activities in Kenya. Driving a motorbike (boda boda) is considered a men's activity and inappropriate for women. Although focus group discussions explained that the belief is changing, it prevails and can still limit women from driving bodabodas themselves. Correspondingly, women seed distributors often noted that transporting seeds via a hired bodaboda could be a costly but necessary expense for them in order to ensure seed delivery and maintain a customer base. In contrast, it was common for men seed distributors to own their own motorbike and make use of it for seed delivery and other mobilization related to their work. Nonetheless, some men still highlighted that they contend with challenges related to costs of fuel and motorbike repair, and that the sales activities were costly in that they took away time from farming, their main enterprise. Women also noted that they faced challenges to negotiate with village elders and obtain opportunities to speak in community meetings to advertise their business; in contrast, men did not mention it.

While access to bank loans was highlighted as a challenge for both women and men hatchery owners in Ghana, in Tanzania and Ethiopia it was noted as a challenge plaguing women specifically. This was due to women poultry traders' asset poverty and inability to

provide collateral. Consequently, without access to bank loans, they are forced to operate using smaller capital and sell their chickens in the open market since they cannot pay rent.

## **Overcoming barriers and managing challenges**

Across the four countries, women and men discussed means they have employed to manage and, in some instances, overcome the challenges they confront to be successful in their business ventures. Some concern strategies they have developed themselves; they also rely upon knowledge and skills developed previously to manage challenges. Other factors that have helped them overcome challenges are related to outside support they have received.

In Ghana, women hatchery managers and owners manage time limitations stemming from their multiple household responsibilities by strictly scheduling their fish farming activities and ensuring that they are compatible with the timing of their homecare work. Some women managers and owners also manage their time across fish farming and home care by training and hiring more labor to help in the farm. One woman who owns a hatchery and grow-out farm and processes catfish explained how she organizes her time among multiple livelihood activities over the week:

*“With the house chores, I stay with my stepchild, after school she takes over. For Sunday, I take my time to work at home. I go to work on Monday, Wednesday and Friday. I use the weekends to pleat hair. I have been in the hair dressing business for 20 years now.”*

Women seed distributors in Kenya also manage time limitations by organizing their time well. Moreover, they noted that they take advantage of other skills and opportunities available to them to make up for the limited amount of time they may have for their seed and insurance marketing activities. For example, one married woman mentioned that she has better communication skills than most men and can more effectively convince farmers to accept and purchase the products. Another young single woman highlighted that she markets her products and makes sales while circulating in the community and carrying out other livelihood activities.

Women hatchery owners also address challenges related to gaps in knowledge on hatcheries by hiring skilled employees to manage their farms for them. Furthermore, they employ

young high school graduates or dropouts with no prior knowledge, provide them with on the job training, and support their additional training in hatcheries.

In Tanzania, married women deal with challenges of accessing bank loans by using their husbands as guarantors. While this helps them gain access, in some cases the strategy can create other problems. For example, some women complained that once their husbands know they have received loans, they channel the money to other investments rather than allowing women to invest it in the poultry trade. Correspondingly, the women are left to repay the loans themselves. Other women manage lack of access to formal finance by borrowing small amounts of money from friends and relatives or taking live birds on credit and paying later; however, they admit that these practices are not sustainable or reliable.

Other strategies that women hatchery owners and managers have used entail management of their human resources. For instance, they resort to contract-based engagement of workers, as opposed to salary-based, to enhance worker efficiency; this can be important to manage challenges related to male resistance of female supervision. Managers also laid off workers when responding to reduced demand and related challenges brought on by the Covid-19 pandemic.

Women and men in Kenya managed many of the challenges related to demand and attaining a large, loyal customer base by leveraging past experiences they have had distributing agricultural products and providing capacity building to farmers. A majority of the women and men interviewed had established farmer networks and reputation from their previous experiences working with agricultural and livestock development organizations.

Consequently, in several cases the seed distributors could save time and effort by advertising their products at meetings from other activities they were engaged in or via contacts established previously. For instance, women and men often used contacts who were agrodealers with shops to store their seeds and advertise them there; they also circumvented the challenge of seed transport and reaching farmers by coordinating for farmers to obtain seeds from the agrodealers' shops.<sup>5</sup> In a few cases, women and men used

<sup>5</sup> In those cases where farmers were remotely located and distanced from shops, the seed distributors would transport products to the farmers' homes. A key aspect of the project involves facilitating farmers' access to improved varieties by delivering at the farmgate.

their agrodealer contacts to source seeds to sell when the project-supported seeds were delayed in arriving. Those who had no prior experience working with agricultural development organizations had other social networks and social capital (i.e., participation in community organizations, church leadership roles) that they leveraged to advertise their products and services. Women and men also highlighted that communication and good marketing skills, referred to as knowing “how to talk to people,” were important for their success in convincing farmers to purchase insurance and explain to them when seeds were late in arriving.

In the Kenya case, women’s and men’s strategies to manage challenges diverged, concerning the types of individuals who assisted them with their work. Men noted that contacts within the community served as informers, advertising their products to others and letting them know of farmers’ requests for seeds. They also varyingly mentioned that their spouses assisted with financing, advertising, and selling. In comparison, women emphasized that they received help from fellow colleagues of the project, who would share customers and help each other to make sales. Women did not note help from spouses; however, they mentioned that relatives assisted with advertising.

Across the country and project cases, outside support has also been an important factor that helps women and men manage business challenges. In Kenya, ACRE Africa provided various means of support; in particular, women and men highlighted that seed trial samples provided by ACRE Africa created good publicity for the product and for their sales services. The seeds were good quality, and they helped farmers trust the company and the marketers; this also made it easier to convince farmers that the insurance products were trustworthy. Seed distributors also mentioned that ACRE Africa’s provision of seeds and incentives was a means of financial support to them, although limited. While all traders under ACRE Africa received T-shirts with the company name and training on marketing and on customer approach, women tended to emphasize that the T-shirts were advantageous to them, as it helped farmers take them seriously and publicized their work. In comparison, men from the Kenya case tended to highlight the utility of the trainings. In Ghana, women and men noted that they benefited from training programs related to hatcheries and fish farming consistently offered by various organizations. Also, technical assistance, guidance and

direction for example from veterinary services and aquaculture groups, via visits and Whatsapp groups, have supported farmers to remain in business.

The project in Tanzania and Ethiopia addressed challenges faced by poultry traders related to poultry diseases and unavailability of live birds and eggs by supporting women with veterinary training to take 4 week old chicks from brooders to farmers. Diseases are a significant hindrance to the poultry trade, and due to lack of proper knowledge to identify and manage chicken disease, traders can buy already infected chickens. The project-supported women also provide animal health and extension services to the farmers. Correspondingly, the women are able to promote a source of live birds and eggs for themselves to sell.

### **Prospects for seed businesses**

From interviews in Ghana and Ethiopia, informants identified collective actions that they could take or initiate to address challenges to sustainability and widespread success of their businesses. For example, informants in Ghana highlighted that their dialogue with feed sellers on prices and feed support could help facilitate feed subsidies for their hatchery businesses. Women in Ghana also noted that a united front of the fish farmers would position them more powerfully in relation to customers and help them negotiate a uniform price for their fish. In Ethiopia in comparison, support to engage in collective action was emphasized as a need for success: a woman noted that traders need a market association to mobilize and ensure good markets for their chickens. It is worth noting, in light of the collective action needs highlighted by the women agripreneurs in Ghana and Ethiopia, that group membership had been contributing a large portion of disempowerment for the women agripreneurs sampled in both countries (Figure 1). Concerning youth engagement in hatchery business, informants in Ghana highlighted that youth could address challenges related to lack of capital by first acquiring knowledge on hatcheries; this would facilitate their employment as hatchery managers and enable them to earn income and raise capital to start their own farms.

Concerning the outside support or enabling environment necessary for success in their seed businesses, informants across countries emphasized the need for capital and land. In particular, respondents in Ghana noted that land and financial resources are key to start the

hatchery business. Consequently, provision or financial assistance to acquire the ponds or cages and fish feed would be valuable, which then farmers could pay back in instalments on harvest until they complete repayment and take ownership of the ponds/cages. This would address challenges faced specifically by women, who tend to have less access to land than men, as well as youth who often do not have the needed collateral to access bank loans. Women and men in Kenya also noted the need for capital to provide an agrovet shop where seed could be stored ahead of farmers' demand and facilitate selling. They also emphasized the need for financial assistance or ACRE support to provide inputs along with seeds, provide seeds on credit, acquire a license to formalize their seed selling, and fund their transport for their marketing activities. Moreover, agripreneurs in Ghana noted the need for additional financial support in the form of fish feed subsidies. In Tanzania, women highlighted a role for financial institutions particularly to facilitate their access to capital and loans: to make available loan products for which they can qualify (for example, such that they can borrow money without using their husbands' names).

Discussion of prospects and challenges to expand might not be relevant to chicken seed vendors, due to the early development stage of their agripreneurial node; however, the data collected from poultry traders on the theme can suggest future challenges the vendors may encounter when seeking to expand their businesses in the future. In Tanzania and Ethiopia, women traders indicated that they are unable to expand their business due to lack of capital. Most of them said that they are forced to operate on a small scale since they are unable to buy equipment such as many eggs trays or buy bigger flocks of birds. How to manage poultry stock is also a potential challenge: most women in Ethiopia argued that due to the lack of permanent (shops) rental places where they can store their live birds and eggs, they are forced to work with a smaller number of birds or tray of eggs because it is easier to carry home the remaining stock; also, feed costs and loss risks become a concern when there are larger numbers of unsold birds. Furthermore, transport of stock can be an additional cost to contend with.

Businesspeople in Kenya and Ghana highlighted that outside support for enhanced knowledge and capacity-building on themes related to their businesses would help ensure success and innovation in their businesses moving forward. Women hatchery owners and managers noted specifically the need for knowledge on water quality management; those

involved in hatcheries and grow-out farms emphasized the need for leadership skills training. Men seed distributors in Kenya noted the need for training on marketing and on how to expand their customer bases; in comparison women in Kenya noted that they would benefit from agricultural trainings, which various public and private actors could play a role in providing, to help them sell their products and support farmers better. Informants in Ghana also highlighted that sponsoring women and youth to visit hatcheries in countries with more successful fish farming sectors than their own would be an important support. Furthermore, women and men in Kenya emphasized that donors, government, NGOs and private sector could all play important roles in awareness raising and education of farmers on the utility of certified seed and the various varieties and the importance of insurance; this would address a significant challenge constraining their stress tolerant seed sales and insurance marketing.

Informants in Ghana noted that awareness-raising on the issues of women's involvement in hatcheries and fish farming in general would address important gender-related challenges to women's entry and success in the business, for example, community-level gender awareness campaigns. Those in grow-out farming also mentioned that women's empowerment programs specialized to the sector would help.

Leaders in the aquaculture sector can play an important role in addressing youth disinterest and lack of skilled and trusted workers for hatchery and grow-out farming by making the sector more attractive to youth. Furthermore, women and men informants in Kenya emphasized the need for the government to refrain from small business harassment created by costly regulations and documentation required; they also called for civil society mobilization to lobby the government to refrain.



## Discussion and conclusions

The results suggest that gender-related factors might be more influential on women’s success in the seed businesses in the Ghana, Tanzania and Ethiopia cases, in comparison to that in the Kenya case. Although the qualitative data available for Tanzania and Ethiopia characterizes the situation of poultry traders and not the new group of chicken seed vendors, the results provide insights into the motivations, challenges, and prospects that the latter face in the poultry trading part of their business. Table 4 summarizes the agri-preneurial motivations and challenges faced per each of the cases. In Kenya, the most significant challenges confronted by seed distributors are value chain related, concerning seed supply management, competition, and managing demand. The challenge concerning transport is gender-related; however, the effects can be disadvantageous for both women and men (women must manage costs to hire boda boda to transport them since it can be socially inappropriate for women to own or drive boda bodas; men in comparison manage costs related to boda boda repair and fueling). In contrast, in Ghana, Tanzania and Ethiopia challenges related to gender can significantly disadvantage women in relation to men. Sociocultural norms defining gender appropriate activities limit women from engaging in fish farming and hatchery businesses; time labor burdens can also make it difficult for women in Ghana to succeed in hatchery business. Correspondingly, male resistance to female supervision can challenge women’s success in ownership and management of hatcheries and grow-out farms. In Tanzania and Ethiopia women may have limited autonomy and depend on spousal permission to engage in poultry trading and to access finance, although these last factors might be most relevant to married women.

**Table 4. Summary of motivations and challenges in agri-preneurship per country case (Shaded cells pertain to motivation or challenge confronted by women alone and unshaded cells pertain to those faced by both women and men)**

	Kenya	Ghana	Tanzania and Ethiopia <sup>a</sup>
<b>Motiva-tions</b>	ACRE Africa project	Profit-making opportunity	Profit-making opportunity
	Altruism	Empowerment	Low capital barriers to entry
	Training and learning opportunity	Career advancement	Empowerment
	Farmer interaction	Family encouragement	

	Possession of prior customer base and experience in agricultural development	Prior access to land/water, financial, and human resources	
		Leisure enjoyment	
		Altruism	
<b>Challenges to start</b>		Sector gender-“inappropriateness”	Establishing customer base
		Women’s home-care responsibilities (married women)	Husband’s permission (married women)
		Lack of technical knowledge	
<b>Current challenges</b>	Supply of seeds	Feed costs	Unstable price
	Competition	Business risk of fish diseases (fish farming especially cage)	Limited access to bank loans
	Understanding farmer demand	Water quality	
	Costs of seed transport and mobilization	Biosecurity	
		Lack of technical knowledge	
		Unfavorable market and price	
		Male resistance to female supervision	
		Balance of care work and fish farming	

Note: <sup>a</sup>For poultry trading.

The significance of gender-related barriers to success in seed agri-preneurship can be influenced by normative structures surrounding the particular sector and by the local empowerment context. In Ghana, norms attribute aquaculture to men’s realm of control, inhibiting women’s engagement in aquaculture-related livelihoods. In contrast, similar norms might not exist for maize and sorghum in Kenya and for poultry in Tanzania and Ethiopia. Table 5 below summarizes some of the key considerations that have arisen in our findings concerning factors that influence women’s entry and success in their businesses, and how significant the themes are across each of the cases. One consideration is the extent to which women’s participation in the sector challenges prevailing gender norms. Although women agri-preneurs in the Kenya case may be less empowered in comparison to the women agri-preneurs in Ghana, the latter are particularly stressed to manage their time and

work responsibilities associated with fish farming and home care. Although women agripreneurs in Ghana are experienced in managing their time across multiple livelihood activities (they had noted being involved in hair-dressing and other farm/non-farm livelihood activities), hatcheries management can require their time during parts of the day when women are busiest with home care, the early morning and evening. In comparison, maize and sorghum seed sales and poultry trading may have more flexible time requirements (See Table 5). Despite the higher levels of empowerment of women agripreneurs in Ghana, their work in a sector deemed inappropriate for them may inhibit shifts in gendered domestic labor roles, despite the value of the livelihood activity for household income generation. The women agripreneurs in Tanzania and Ethiopia are the least empowered of all; consequently, their low level of empowerment can constitute a barrier to success in itself, such as limited access to finance and credit.

**Table 5. Considerations in women’s agri-preneurship across the three cases.**

	Kenya: maize and sorghum	Ghana: tilapia	Tanzania and Ethiopia: poultry <sup>a</sup>
Women’s participation challenges prevailing gender norms		√	
Time-flexible	√		√
Lucrative		√	√

Note: <sup>a</sup> Based on data on poultry trading activities.

### **On challenges to start**

In addition to high levels of empowerment, gender parity may be an important factor contributing to women’s entry into hatchery businesses in Ghana. In many instances the women had received moral support and encouragement to begin their businesses from spouses and other male family members, which can be important for challenging societal beliefs that disfavor women’s participation in the sector; the women also had land and water resources in their control to initiate their businesses. These can be critical factors to enable them to start their businesses, despite the significant gender norms inhibiting their entry into the sector. In Tanzania and Ethiopia, while the women chicken seed vendors have low empowerment in comparison to women agripreneurs in the other cases, the barriers to entry in the poultry value chain are meager, requiring little capital, as well as manageable time requirements, especially in comparison to other income generating activities available

to women. Information concerning barriers to enter the new chicken seed vendor node would be important for complete analysis of the Tanzania and Ethiopia case; for example, it is possible that attaining the veterinary health knowledge required for the role would be a challenge. In the Kenya case, challenges to start seed businesses for women tend to be insignificant or the same as those confronted in day-to-day operations; the support of ACRE Africa may be a particularly important factor influencing women's and men's capacities to start their businesses. For example, ACRE Africa provided substantial training on marketing, improved agricultural practices, and the insurance products themselves; in comparison in Ghana, where women agripreneurs lacked technical knowledge on hatcheries to start their businesses, they hired trained staff (or sent staff for training) to fill the knowledge gap. This can be a costly strategy that not all agripreneurs, particularly capital-constrained women, could be able to undertake. ACRE Africa also provided branding and publicity support to help women and men seed distributors gain initial customers and trust. Furthermore, their networks and social capital helped both women and men circumvent any barriers related to developing an initial customer base in a highly competitive environment. (It is telling that group participation is not a substantial contributor to disempowerment in the Kenya case.)

## **On motivations**

Motivations to start seed businesses also varied, depending on aspects specific to the sector. Participation in the ACRE Africa project may have been an important motivating factor for women in the Kenya case; in comparison, profits and business opportunity were key motivators for women to be involved in hatchery, fish farming, and poultry trading businesses in Ghana and in Tanzania and Ethiopia. Seed sales and insurance marketing may not be lucrative, in comparison to the businesses in the other cases, crowding in agripreneurs with different motivations (See Table 5). Although the data is not available for the Tanzania/Ethiopia project, it would be important to consider how ILRI project support is a motivating factor for chicken seed vendors to engage in the business.

The local empowerment context can also influence motivations. In Ghana, Tanzania and Ethiopia, empowerment is a motivating benefit of women's seed businesses; however, it may not be a substantial factor for seed distribution in Kenya. Recognition as aquacultural knowledge holders is a significant change for women in the Ghana case, and the financial autonomy gained is important for women in the Tanzania and Ethiopia cases; however, for

Kenya the income to be gained through marketing of seeds and insurance is not substantial enough to contribute to increased financial autonomy, and women in the project have been social influencers in the community already. Correspondingly, motivating factors related to altruism and to helping fellow farmers may be more significant to agripreneurs in the Kenya case in comparison to the other two.

The findings from the three project cases highlight important insights and recommendations for gender-transformative research and practice on seed systems development.

- 1. Know the gender normative context of the sector.** Our findings illustrate that the local normative context surrounding gender critically influences women's capacities to start and be successful in seed businesses. Sectors and value chains are not gender neutral. As the Ghana hatcheries case shows, deeply ingrained beliefs concerning who ought to work in the aquaculture sector can limit the business opportunities available to women in comparison to men. Consequently, gender awareness campaigns to influence normative change and acceptance of women's role in aquaculture were important interventions recommended by women agripreneurs in the Ghana case, to help more women be able to participate and play leading roles in aquaculture and hatchery businesses. Our recommendation to understand the gender normative context echoes that of Puskur et al. (2021), who highlight that analysis of gender dynamics and norms in seed systems is necessary, not only to understand the barriers limiting women's agripreneurship but also the extent to which their inclusion in seed managerial roles can promote women's empowerment (while there are findings relevant to the question in the Ghana case, concerted analysis of empowerment impacts can be an important next step in our research).
- 2. Understand how empowerment and gender parity can be conditions for starting seed businesses.** Empowerment can be a precondition for women to start seed businesses; however, other factors in combination with empowerment are important. Moreover, the findings can suggest that high levels of empowerment are not key, but rather empowerment as it relates to particular domains, relevant to the specific situation. While not conclusive, in the Ghana case women's comparative

equality with men in their households can be related to the male household support they received to start their hatchery businesses. The male support was a key factor promoting their agri-preneurship, especially considering aquaculture's social normative context; however, access to physical and human capital were also important for enabling the women to start their businesses. For the Kenya project, women agri-preneurs had lower levels of empowerment in comparison to their male counterparts and in comparison to women and men agri-preneurs in Ghana. However, the women in Kenya had substantial social capital, in the form of group memberships and social networks including important community contacts; they were also social influencers in their villages to begin with. Despite their empowerment in these domains, ACRE Africa's support through capacity building on insurance and marketing, and branding them as "champions" formally working for the organization, also helped the women start their sales activities. Understanding what combination of factors, per the particular seed systems context, can help determine what interventions will support women's agri-preneurship.

- 3. Assess how outside support can help overcome gender-related barriers.** Women agri-preneurs received varying degrees of outside support to start and continue operating their seed-related businesses, across the different cases. While women in the Kenya case have strong social capital, our results suggest that women particularly appreciated ACRE Africa's support to publicize and formally recognize them; this facilitated their sales activities in their communities. Additionally, the women highlighted that continued training concerning good agricultural practices would be helpful to them in their business activities moving forward, to better support farmer-customers. Community recognition as agricultural experts can often be more easily acquired by men in comparison to women; the support of ACRE Africa, and that of other agricultural development organizations, who can provide training and capacity-building to women, may be key in this respect.

In the Ghana case, training and technical assistance related to aquaculture and hatcheries can be an important support to the women agri-preneurs and their hired labor; however, the more significant gender-related barrier may concern the social normative context that deems their work in the hatcheries gender-inappropriate.

Consequently, women are expected to uphold their home-care responsibilities regardless and contend with balancing multiple home and work schedules. Gender awareness campaigns can help influence normative change, with an understanding of the long-term process required. Furthermore, although women owners and managers of hatcheries and grow-out farms had critical access to physical and other important resources, financial support and access to land/water may be crucial for more resource-poor women to participate and benefit from the fish value chain. There are roles for government, non-governmental organizations, and donors to play in addressing the gender resource gaps to promote women's seed agri-preneurship in the tilapia value chain.

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